

# Appendix D - ADS506-01-FA22 - Final Project

Team 1

12/05/2022

## RMarkdown global setup

```
knitr::opts_chunk$set(echo = TRUE)

knitr::opts_chunk$set(
  fig.align    = 'center', # how to align graphics in the final doc. 'left', 'right',
  ↪   'center'
  tidy         = TRUE,
  message      = FALSE,    # if FALSE knitr will not display any messages generated by
  ↪   code
  strip.white = TRUE,     # if FALSE knitr won't remove white spaces at beg/end of code
  ↪   chunk
  warning      = FALSE)   # if FALSE knitr will not display any warning messages in the
  ↪   final
```

## Load packages

```
library(car)
library(caret)
library(class)
library(corrplot)
library(forecast)
library(gridExtra)
library(here)
library(imputeTS)
library(lubridate)
library(MLmetrics)
library(padr)
library(psych)
library(reshape2)
library(scales)
library(tidyverse)
library(timetk)
library(tseries)
library(zoo)

set.seed(1699)
```

## Import and merge data sets

```
# Import 4 separate CSV files
curr_dir01 <- here("data/Ocean Water/water_quality_1990_1999_datasd.csv")
#curr_dir01
curr_dir02 <- here("data/Ocean Water/water_quality_2000_2010_datasd.csv")
#curr_dir02
curr_dir03 <- here("data/Ocean Water/water_quality_2011_2019_datasd.csv")
#curr_dir03
curr_dir04 <- here("data/Ocean Water/water_quality_2020_2021_datasd.csv")
#curr_dir04

owt_df01a <- read.csv(curr_dir01, header = TRUE, sep = ",")
owt_df01b <- read.csv(curr_dir02, header = TRUE, sep = ",")
owt_df01c <- read.csv(curr_dir03, header = TRUE, sep = ",")
owt_df01d <- read.csv(curr_dir04, header = TRUE, sep = ",")

# Merge 4 seperate dataframes into 1
owt_df01 <- rbind(owt_df01a, owt_df01b, owt_df01c, owt_df01d)

# DF Sort & Reindex Citation:
# https://gist.github.com/makexu93/05ef0f34306d3ab6c9ca8ddcd702cee1
owt_df01 <- owt_df01[order(owt_df01$date_sample, decreasing = FALSE), ]
row.names(owt_df01) <- NULL

print(head(owt_df01, 7))

##           sample station depth_m date_sample time project parameter qualifier
## 1 9011158743      C5      9 1990-11-15     PLOO CHLOROPHYLL
## 2 9011158743      C5      9 1990-11-15     PLOO      DENSITY
## 3 9011158743      C5      9 1990-11-15     PLOO       DO
## 4 9011158743      C5      9 1990-11-15     PLOO       PH
## 5 9011158743      C5      9 1990-11-15     PLOO    SALINITY
## 6 9011158743      C5      9 1990-11-15     PLOO      TEMP
## 7 9011158743      C5      9 1990-11-15     PLOO      XMS

##           value units
## 1   0.870 ug/L
## 2 23.855 sigma-t
## 3   6.550 mg/L
## 4   8.080 pH
## 5 33.617 ppt
## 6 19.430 C
## 7 44.850 %

describe(owt_df01)

##        vars      n   mean      sd min   max range   se
## sample      1 1236769   NaN     NA Inf -Inf -Inf   NA
## station     2 1236769   NaN     NA Inf -Inf -Inf   NA
## depth_m     3 1152608 19.38  25.07   1   116   115 0.02
## date_sample 4 1236769   NaN     NA Inf -Inf -Inf   NA
## time        5 1236769   NaN     NA Inf -Inf -Inf   NA
## project     6 1236769   NaN     NA Inf -Inf -Inf   NA
## parameter   7 1236769   NaN     NA Inf -Inf -Inf   NA
```

```

## qualifier      8 1236769      NaN       NA Inf     -Inf     -Inf   NA
## value          9 1231466 124.24 1785.21 -37 1100000 1100037 1.61
## units          10 1236769      NaN       NA Inf     -Inf     -Inf   NA

```

## Exploratory Data Analysis (EDA) and preprocessing, phase 1

Create custom function to generate boxplots and descriptive statistics for continuous variables

```

box_comp <- function(xcol = c(),
                      df = NA,
                      rtn_met = TRUE,
                      grph_title = "All",
                      box = TRUE) {
  # Define function to produce formatted boxplots & basic descriptive stats
  sig <- 3
  metrics_df01 <- data.frame(metric = c("",

                                         "Total N:",
                                         "Count",
                                         "NA Count",
                                         "Mean",
                                         "Median",
                                         "Standard Deviation",
                                         "Variance",
                                         "Range",
                                         "Min",
                                         "Max",
                                         "25th Percentile",
                                         "75th Percentile",
                                         "Subset w/o Outliers:",
                                         "Count",
                                         "%",
                                         "Outlier %",
                                         "NA Count",
                                         "Mean",
                                         "Median",
                                         "Standard Deviation",
                                         "Variance",
                                         "Range",
                                         "Min",
                                         "Max"
                                         )))

  for(var in xcol) {
    df_s1 <- df[, var]
    df_s1s1 <- data.frame(df_s1)
    df_s1_fit <- preProcess(df_s1s1,
                             method = c("center", "scale"))
    df_s1_trans <- predict(df_s1_fit, df_s1s1)

    # Calculate quartiles
    var_iqr_lim <- IQR(df_s1) * 1.5
    var_q1 <- quantile(df_s1, probs = c(.25))
    var_otlow <- var_q1 - var_iqr_lim
  }
}

```

```

var_q3 <- quantile(df_s1, probs = c(.75))
var_othigh <- var_q3 + var_iqr_lim

# Subset non-outlier data
var_non_otlr_df01 <- subset(df, (abs(df_s1_trans) <= 3))
df_s2 <- var_non_otlr_df01[, var]

# Begin calculating measures of centrality & dispersion
var_mean <- mean(df_s1, na.remove = TRUE)
var_non_otlr_df01_trunc_mean <- mean(df_s2, na.remove = TRUE)
var_med <- median(df_s1)
var_non_otlr_df01_trunc_med <- median(df_s2)
var_mode <- mode(df_s1)
var_non_otlr_df01_trunc_mode <- mode(df_s2)
var_stde <- sd(df_s1)
var_non_otlr_df01_trunc_stde <- sd(df_s2)
var_vari <- var(df_s1)
var_non_otlr_df01_trunc_vari <- var(df_s2)
var01_min <- min(df[, var])
var01_max <- max(df[, var])
var01_range <- var01_max - var01_min
var02_min <- min(var_non_otlr_df01[, var])
var02_max <- max(var_non_otlr_df01[, var])
var02_range <- var02_max - var02_min

# Configure y-axis min & max to sync graphs
plot_min <- min(var01_min, var02_min)
plot_max <- max(var01_max, var02_max)
nonoutlier_perc <- round((as.numeric(dim(var_non_otlr_df01)[1] /
→ as.numeric(dim(df)[1]))) * 100, 1)

# Fill in metrics table
measure_val01 <- c(paste0("Variable: ", var),
                     "",
                     as.character(dim(df)[1]),
                     sum(is.na(df_s1)),
                     round(var_mean, sig),
                     round(var_med, sig),
                     round(var_stde, sig),
                     round(var_vari, sig),
                     round(var01_range, sig),
                     round(var01_min, sig),
                     round(var01_max, sig),
                     round(var_q1, sig),
                     round(var_q3, sig),
                     "",
                     as.character(dim(var_non_otlr_df01)[1]),
                     paste0(nonoutlier_perc, "%"),
                     paste0(round(100 - nonoutlier_perc, 1), "%"),
                     sum(is.na(df_s2)),
                     round(var_non_otlr_df01_trunc_mean, sig),
                     round(var_non_otlr_df01_trunc_med, sig),
                     round(var_non_otlr_df01_trunc_stde, sig),

```

```

        round(var_non_otlr_df01_trunc_vari, sig),
        round(var02_range, sig),
        round(var02_min, sig),
        round(var02_max, sig)
    )

var_name <- paste0("Variable: ", var)
metrics_df01[, ncol(metrics_df01) + 1] <- measure_val01
}

# Format boxplot titles based on number of plots
if(box == TRUE) {
    if(length(xcol == 1)) {
        boxplot(df,
            ylab = "Parameter Values",
            main = paste0("Boxplot for ", xcol, " (", grph_title, ")"))
    }
    else {
        boxplot(df,
            ylab = "Parameter Values",
            main = paste0("Boxplot for Multiple Parameters", " (", grph_title, ")"))

    }
}
# Return & print metrics table(s)
if(rtn_met == TRUE) {
    print(metrics_df01)
    return(metrics_df01)
}
}

```

Factorize and format column types; print NA counts

```

# List of parameter values
param_lst01 <- c("CHLOROPHYLL",
                 "DENSITY",
                 "DO",
                 "ENTERO",
                 "FECAL",
                 "OG",
                 "PH",
                 "SALINITY",
                 "SUSO",
                 "TEMP",
                 "TOTAL",
                 "XMS")

# List of col names
col_lst01 <- c("sample",
               "station",
               "date_sample",
               "time",
               "project",

```

```

    "parameter",
    "qualifier",
    "units")

# Convert categorical features to factors
owt_df02 <- owt_df01
for(c in col_lst01) {
  owt_df02[, c] <- as.factor(owt_df02[, c])
}

# Generate NA Summary Tables Citation:
# https://www.geeksforgeeks.org/replace-character-value-with-na-in-r/
owt_df02[owt_df02 == ""] <- NA
print(head(owt_df02, 7))

##           sample station depth_m date_sample time project parameter qualifier
## 1 9011158743      C5      9 1990-11-15 <NA>     PLOO CHLOROPHYLL      <NA>
## 2 9011158743      C5      9 1990-11-15 <NA>     PLOO      DENSITY      <NA>
## 3 9011158743      C5      9 1990-11-15 <NA>     PLOO       DO      <NA>
## 4 9011158743      C5      9 1990-11-15 <NA>     PLOO       PH      <NA>
## 5 9011158743      C5      9 1990-11-15 <NA>     PLOO SALINITY      <NA>
## 6 9011158743      C5      9 1990-11-15 <NA>     PLOO      TEMP      <NA>
## 7 9011158743      C5      9 1990-11-15 <NA>     PLOO      XMS      <NA>

##           value units
## 1   0.870 ug/L
## 2 23.855 sigma-t
## 3   6.550 mg/L
## 4   8.080 pH
## 5 33.617 ppt
## 6 19.430 C
## 7 44.850 %

owt_df02_na <- sapply(owt_df02, function(x) sum(is.na(x)))
owt_df02_notna <- sapply(owt_df02, function(x) sum(!is.na(x)))
owt_df02_tb101 <- rbind(owt_df02_notna, owt_df02_na)
owt_df02_tb102 <- rbind(owt_df02_tb101, round(prop.table(owt_df02_tb101, margin = 2), 4))
print("All parameters")

## [1] "All parameters"

print(owt_df02_tb102)

##           sample station depth_m date_sample time project
## owt_df02_notna 1236769 1236769 1152608.000 1236769 1075929.00 1236769
## owt_df02_na      0      0  84161.000        0 160840.00      0
## owt_df02_notna      1      1      0.932        1      0.87      1
## owt_df02_na      0      0      0.068        0      0.13      0
##           parameter qualifier      value units
## owt_df02_notna 1236769 394867.0000 1231466.0000 1236769
## owt_df02_na          0 841902.0000  5303.0000      0
## owt_df02_notna      1      0.3193     0.9957      1
## owt_df02_na      0      0.6807     0.0043      0

owt_df02a <- owt_df02[which(is.na(owt_df02), arr.ind=TRUE), ]
#print(head(owt_df02a, 7))

```

```

for(p in param_lst01) {
  df = owt_df02[owt_df02$parameter == p, ]
  print(head(df[which(is.na(df$value)), arr.ind=TRUE], , 7))
  df_na <- sapply(df, function(x) sum(is.na(x)))
  df_notna <- sapply(df, function(x) sum(!is.na(x)))
  df_tbl01 <- rbind(df_notna, df_na)
  df_tbl02 <- rbind(df_tbl01, round(prop.table(df_tbl01, margin = 2), 4))
  rownames(df_tbl02) <- c("Not NA n", "NA n", "Not NA %", "NA %")
  print(p)
  print(df_tbl02) # This table w/ null counts and proportions for each feature not
  → displayed for space purposes
}

##           sample station depth_m date_sample time project parameter
## 272260 1229972635     B10      1.5 1997-12-29 <NA>    PL00 CHLOROPHYLL
## 272267 1229972638     B10     42.7 1997-12-29 <NA>    PL00 CHLOROPHYLL
## 272274 1229972633     B10     61.0 1997-12-29 <NA>    PL00 CHLOROPHYLL
## 272281 1229972634     B10     79.2 1997-12-29 <NA>    PL00 CHLOROPHYLL
## 272288 1229972637     B10     97.5 1997-12-29 <NA>    PL00 CHLOROPHYLL
## 272295 1229972636     B10    115.8 1997-12-29 <NA>    PL00 CHLOROPHYLL
## 272302 1229972643     B11      1.5 1997-12-29 <NA>    PL00 CHLOROPHYLL
##           qualifier value units
## 272260      <NA>   NA ug/L
## 272267      <NA>   NA ug/L
## 272274      <NA>   NA ug/L
## 272281      <NA>   NA ug/L
## 272288      <NA>   NA ug/L
## 272295      <NA>   NA ug/L
## 272302      <NA>   NA ug/L
## [1] "CHLOROPHYLL"
##           sample station depth_m date_sample      time project parameter
## Not NA n  88471    88471    88471      88471 74093.0000  88471    88471
## NA n      0        0        0          0 14378.0000    0        0
## Not NA %   1        1        1          1  0.8375      1        1
## NA %      0        0        0          0  0.1625      0        0
##           qualifier      value units
## Not NA n      0 87911.0000 88471
## NA n       88471  560.0000    0
## Not NA %      0    0.9937    1
## NA %       1    0.0063    0
##           sample station depth_m date_sample      time project parameter
## 429235 1018012132     E16      1.5 2001-10-18 8:32:00 PST    PL00 DENSITY
## 503878 513032821      C8       1.0 2003-05-13 10:30:00 PST    PL00 DENSITY
## 547108 601042705      C4       1.0 2004-06-01 11:37:00 PST    PL00 DENSITY
## 720423 702082492      A6       1.0 2008-07-02 9:42:00 PST    PL00 DENSITY
## 720433 702082490      A6      12.0 2008-07-02 9:42:00 PST    PL00 DENSITY
## 720443 702082491      A6      18.0 2008-07-02 9:42:00 PST    PL00 DENSITY
## 720453 702082495      A7       1.0 2008-07-02 9:05:00 PST    PL00 DENSITY
##           qualifier value units
## 429235      <NA>   NA sigma-t
## 503878      <NA>   NA sigma-t
## 547108      <NA>   NA sigma-t

```

```

## 720423      <NA>    NA sigma-t
## 720433      <NA>    NA sigma-t
## 720443      <NA>    NA sigma-t
## 720453      <NA>    NA sigma-t
## [1] "DENSITY"
##           sample station depth_m date_sample      time project parameter
## Not NA n   88317    88317    88317        88317 73999.0000 88317    88317
## NA n       0         0         0             0 14318.0000 0         0
## Not NA %    1         1         1             1 0.8379 1         1
## NA %       0         0         0             0 0.1621 0         0
##           qualifier      value units
## Not NA n     0 88256.0000 88317
## NA n       88317    61.0000 0
## Not NA %     0 0.9993 1
## NA %       1 0.0007 0
##           sample station depth_m date_sample      time project parameter
## 82185 CTD014940 A11    42.7 1993-05-06 10:45:00 PST PL00    DO
## 168703 1024942994 A1     1.5 1994-10-24 9:10:00 PST PL00    DO
## 168713 1024942995 A1     3.0 1994-10-24 9:10:00 PST PL00    DO
## 168723 1024942996 A1     6.1 1994-10-24 9:10:00 PST PL00    DO
## 168733 1024942997 A1    12.2 1994-10-24 9:10:00 PST PL00    DO
## 168734 1024942998 A1    12.2 1994-10-24 9:10:00 PST PL00    DO
## 168748 1024942999 A1    18.3 1994-10-24 9:10:00 PST PL00    DO
##           qualifier value units
## 82185      <NA>  NA mg/L
## 168703      <NA>  NA mg/L
## 168713      <NA>  NA mg/L
## 168723      <NA>  NA mg/L
## 168733      <NA>  NA mg/L
## 168734      <NA>  NA mg/L
## 168748      <NA>  NA mg/L
## [1] "DO"
##           sample station depth_m date_sample      time project parameter
## Not NA n 109542 109542 109542        109542 83392.0000 109542 109542
## NA n       0         0         0             0 26150.0000 0         0
## Not NA %    1         1         1             1 0.7613 1         1
## NA %       0         0         0             0 0.2387 0         0
##           qualifier      value units
## Not NA n     0 109437.000 109542
## NA n       109542    105.000 0
## Not NA %     0 0.999 1
## NA %       1 0.001 0
##           sample station depth_m date_sample      time project parameter
## 25057 M0001828 A2     1.0 1991-10-09 8:27:00 PST PL00    ENTERO
## 81650 SH000903 D5     NA 1993-05-04      <NA> PL00    ENTERO
## 103629 1208931380 A2     3.0 1993-12-08 8:20:00 PST PL00    ENTERO
## 103642 1208931381 A2     6.1 1993-12-08 8:20:00 PST PL00    ENTERO
## 103655 1208931382 A2    12.2 1993-12-08 8:20:00 PST PL00    ENTERO
## 103668 1208931383 A2    18.3 1993-12-08 8:20:00 PST PL00    ENTERO
## 103701 1208931385 A2    30.5 1993-12-08 8:20:00 PST PL00    ENTERO
##           qualifier value units
## 25057      e  NA CFU/100 mL
## 81650      <NA>  NA CFU/100 mL
## 103629      <NA>  NA CFU/100 mL

```

```

## 103642      <NA>    NA CFU/100 mL
## 103655      <NA>    NA CFU/100 mL
## 103668      <NA>    NA CFU/100 mL
## 103701      <NA>    NA CFU/100 mL
## [1] "ENTERO"
##           sample station   depth_m date_sample      time project parameter
## Not NA n 144341 144341 116186.0000 144341 144012.0000 144341 144341
## NA n      0      0 28155.0000      0 329.0000      0      0
## Not NA %  1      1 0.8049      1 0.9977      1      1
## NA %      0      0 0.1951      0 0.0023      0      0
##           qualifier      value units
## Not NA n 136251.000 143075.0000 144341
## NA n      8090.000 1266.0000      0
## Not NA %  0.944 0.9912      1
## NA %      0.056 0.0088      0
##           sample station depth_m date_sample      time project parameter
## 39760     M0003378 B3 61.0 1992-03-04 9:23:00 PST PLOO FECAL
## 73538     M0002093 A4 79.2 1993-02-03 9:15:00 PST PLOO FECAL
## 81651     SH000903 D5 NA 1993-05-04 <NA> PLOO FECAL
## 82671     SH001257 D7 NA 1993-05-11 9:43:00 PST PLOO FECAL
## 103630    1208931380 A2 3.0 1993-12-08 8:20:00 PST PLOO FECAL
## 103643    1208931381 A2 6.1 1993-12-08 8:20:00 PST PLOO FECAL
## 103656    1208931382 A2 12.2 1993-12-08 8:20:00 PST PLOO FECAL
##           qualifier value units
## 39760      < NA CFU/100 mL
## 73538      < NA CFU/100 mL
## 81651      <NA> NA CFU/100 mL
## 82671      <NA> NA CFU/100 mL
## 103630     <NA> NA CFU/100 mL
## 103643     <NA> NA CFU/100 mL
## 103656     <NA> NA CFU/100 mL
## [1] "FECAL"
##           sample station   depth_m date_sample      time project parameter
## Not NA n 137649 137649 109633.0000 137649 137322.0000 137649 137649
## NA n      0      0 28016.0000      0 327.0000      0      0
## Not NA %  1      1 0.7965      1 0.9976      1      1
## NA %      0      0 0.2035      0 0.0024      0      0
##           qualifier      value units
## Not NA n 127994.0000 136405.000 137649
## NA n      9655.0000 1244.000      0
## Not NA %  0.9299 0.991      1
## NA %      0.0701 0.009      0
##           sample station depth_m date_sample      time project parameter
## 112401    112941961 A1 12.2 1994-01-12 8:36:00 PST PLOO OG
## 125289    309941665 A4 79.2 1994-03-09 10:06:00 PST PLOO OG
## 136304    503941704 B5 1.5 1994-05-03 10:24:00 PST PLOO OG
## 136346    503941705 B5 24.4 1994-05-03 10:24:00 PST PLOO OG
## 136396    503941706 B5 61.0 1994-05-03 10:24:00 PST PLOO OG
## 136772    504941833 A2 24.4 1994-05-04 8:02:00 PST PLOO OG
## 137186    504941844 A6 1.5 1994-05-04 9:17:00 PST PLOO OG
##           qualifier value units
## 112401     <NA>    NA mg/L
## 125289     <NA>    NA mg/L
## 136304     <NA>    NA mg/L

```

```

## 136346      <NA>    NA mg/L
## 136396      <NA>    NA mg/L
## 136772      <NA>    NA mg/L
## 137186      <NA>    NA mg/L
## [1] "OG"
##           sample station depth_m date_sample      time project parameter
## Not NA n   7944     7944    7944          7944 7940.0000 7944     7944
## NA n       0        0      0            0 4.0000 0        0
## Not NA %    1        1      1            1 0.9995 1        1
## NA %       0        0      0            0 0.0005 0        0
##           qualifier value units
## Not NA n 7673.0000 7922.0000 7944
## NA n     271.0000 22.0000 0
## Not NA %  0.9659  0.9972 1
## NA %     0.0341  0.0028 0
##           sample station depth_m date_sample      time project parameter
## 168706 1024942994     A1    1.5 1994-10-24 9:10:00 PST  PLOO     PH
## 168716 1024942995     A1    3.0 1994-10-24 9:10:00 PST  PLOO     PH
## 168726 1024942996     A1    6.1 1994-10-24 9:10:00 PST  PLOO     PH
## 168737 1024942997     A1   12.2 1994-10-24 9:10:00 PST  PLOO     PH
## 168738 1024942998     A1   12.2 1994-10-24 9:10:00 PST  PLOO     PH
## 168751 1024942999     A1   18.3 1994-10-24 9:10:00 PST  PLOO     PH
## 332755 923992590      A1    1.5 1999-09-23 7:40:00 PST  PLOO     PH
##           qualifier value units
## 168706      <NA>    NA pH
## 168716      <NA>    NA pH
## 168726      <NA>    NA pH
## 168737      <NA>    NA pH
## 168738      <NA>    NA pH
## 168751      <NA>    NA pH
## 332755      <NA>    NA pH
## [1] "PH"
##           sample station depth_m date_sample      time project parameter
## Not NA n 107818 107818 107818          107818 816668.0000 107818 107818
## NA n       0        0      0            0 26150.0000 0        0
## Not NA %    1        1      1            1 0.7575 1        1
## NA %       0        0      0            0 0.2425 0        0
##           qualifier value units
## Not NA n      0 107564.0000 107818
## NA n       107818 254.0000 0
## Not NA %      0  0.9976 1
## NA %       1  0.0024 0
##           sample station depth_m date_sample      time project parameter
## 82188 CTD014940     A11   42.7 1993-05-06 10:45:00 PST  PLOO SALINITY
## 168707 1024942994     A1    1.5 1994-10-24 9:10:00 PST  PLOO SALINITY
## 168717 1024942995     A1    3.0 1994-10-24 9:10:00 PST  PLOO SALINITY
## 168727 1024942996     A1    6.1 1994-10-24 9:10:00 PST  PLOO SALINITY
## 168739 1024942997     A1   12.2 1994-10-24 9:10:00 PST  PLOO SALINITY
## 168740 1024942998     A1   12.2 1994-10-24 9:10:00 PST  PLOO SALINITY
## 168752 1024942999     A1   18.3 1994-10-24 9:10:00 PST  PLOO SALINITY
##           qualifier value units
## 82188      <NA>    NA ppt
## 168707      <NA>    NA ppt
## 168717      <NA>    NA ppt

```

```

## 168727      <NA>    NA   ppt
## 168739      <NA>    NA   ppt
## 168740      <NA>    NA   ppt
## 168752      <NA>    NA   ppt
## [1] "SALINITY"
##           sample station depth_m date_sample      time project parameter
## Not NA n 109492  109492  109492      109492 83351.0000 109492  109492
## NA n      0       0       0          0 26141.0000 0       0
## Not NA %   1       1       1          1 0.7613   1       1
## NA %      0       0       0          0 0.2387   0       0
##           qualifier value units
## Not NA n      0 109318.0000 109492
## NA n      109492 174.0000 0
## Not NA %      0 0.9984   1
## NA %      1 0.0016   0
##           sample station depth_m date_sample      time project parameter
## 182188 119951890     B1    61.0 1995-01-19 7:25:00 PST  PL00  SUSO
## 197840 413951394     B9    97.5 1995-04-13 11:32:00 PST  PL00  SUSO
## 236137 821961617     B9    1.5 1996-08-21 8:23:00 PST  PL00  SUSO
## 236146 821961618     B9    42.7 1996-08-21 8:23:00 PST  PL00  SUSO
## 236171 821961619     B9    97.5 1996-08-21 8:23:00 PST  PL00  SUSO
## 236208 821961620     E10   1.5 1996-08-21 10:58:00 PST  PL00  SUSO
## 236217 821961621     E10   42.7 1996-08-21 10:58:00 PST  PL00  SUSO
##           qualifier value units
## 182188      <NA>    NA mg/L
## 197840      <NA>    NA mg/L
## 236137      <NA>    NA mg/L
## 236146      <NA>    NA mg/L
## 236171      <NA>    NA mg/L
## 236208      <NA>    NA mg/L
## 236217      <NA>    NA mg/L
## [1] "SUSO"
##           sample station depth_m date_sample      time project parameter
## Not NA n 27543  27543  27543      27543 27538.0000 27543  27543
## NA n      0       0       0          0 5.0000  0       0
## Not NA %   1       1       1          1 0.9998  1       1
## NA %      0       0       0          0 0.0002  0       0
##           qualifier value units
## Not NA n 1290.0000 27515.000 27543
## NA n      26253.0000 28.000 0
## Not NA %  0.0468  0.999   1
## NA %      0.9532  0.001   0
##           sample station depth_m date_sample      time project parameter
## 81483 CTD013369     K4    18.3 1993-05-03 7:07:00 PST  PL00  TEMP
## 82189 CTD014940     A11   42.7 1993-05-06 10:45:00 PST  PL00  TEMP
## 82454 CTD013374     K4    18.3 1993-05-06 8:52:00 PST  PL00  TEMP
## 82871 CTD013384     K4    18.3 1993-05-12 7:36:00 PST  PL00  TEMP
## 83293 CTD008245     C6    1.5 1993-05-19 12:10:00 PST  PL00  TEMP
## 83297 CTD008246     C6    3.0 1993-05-19 12:10:00 PST  PL00  TEMP
## 83301 CTD008247     C6    6.1 1993-05-19 12:10:00 PST  PL00  TEMP
##           qualifier value units
## 81483      <NA>    NA   C
## 82189      <NA>    NA   C
## 82454      <NA>    NA   C

```

```

## 82871      <NA>    NA     C
## 83293      <NA>    NA     C
## 83297      <NA>    NA     C
## 83301      <NA>    NA     C
## [1] "TEMP"
##           sample station depth_m date_sample      time project parameter
## Not NA n 139066  139066  139066      139066 112709.0000 139066  139066
## NA n      0       0       0          0 26357.0000   0       0
## Not NA %   1       1       1          1 0.8105     1       1
## NA %      0       0       0          0 0.1895     0       0
##           qualifier      value  units
## Not NA n      0 139046.0000 139066
## NA n      139066  20.0000   0
## Not NA %      0 0.9999     1
## NA %      1 0.0001     0
##           sample station depth_m date_sample      time project parameter
## 81652     SH000903   D5     NA 1993-05-04      <NA>  PLOO  TOTAL
## 82672     SH001257   D7     NA 1993-05-11 9:43:00 PST  PLOO  TOTAL
## 101335    1124931032  C6     1.5 1993-11-24 8:23:00 PST  PLOO  TOTAL
## 103637    1208931380  A2     3.0 1993-12-08 8:20:00 PST  PLOO  TOTAL
## 103650    1208931381  A2     6.1 1993-12-08 8:20:00 PST  PLOO  TOTAL
## 103663    1208931382  A2    12.2 1993-12-08 8:20:00 PST  PLOO  TOTAL
## 103676    1208931383  A2    18.3 1993-12-08 8:20:00 PST  PLOO  TOTAL
##           qualifier value  units
## 81652      <NA>  NA CFU/100 mL
## 82672      <NA>  NA CFU/100 mL
## 101335    <NA>  NA CFU/100 mL
## 103637    <NA>  NA CFU/100 mL
## 103650    <NA>  NA CFU/100 mL
## 103663    <NA>  NA CFU/100 mL
## 103676    <NA>  NA CFU/100 mL
## [1] "TOTAL"
##           sample station      depth_m date_sample      time project parameter
## Not NA n 137584  137584 109594.0000      137584 137257.0000 137584  137584
## NA n      0       0 27990.0000          0 327.0000   0       0
## Not NA %   1       1 0.7966          1 0.9976     1       1
## NA %      0       0 0.2034          0 0.0024     0       0
##           qualifier      value  units
## Not NA n 121659.0000 136141.0000 137584
## NA n      15925.0000 1443.0000   0
## Not NA %   0.8843   0.9895     1
## NA %      0.1157   0.0105     0
##           sample station depth_m date_sample      time project parameter
## 81485    CTD013369   K4    18.3 1993-05-03 7:07:00 PST  PLOO  XMS
## 82191    CTD014940   A11   42.7 1993-05-06 10:45:00 PST  PLOO  XMS
## 82456    CTD013374   K4    18.3 1993-05-06 8:52:00 PST  PLOO  XMS
## 82873    CTD013384   K4    18.3 1993-05-12 7:36:00 PST  PLOO  XMS
## 83497    CTD013399   K4    18.3 1993-05-20 7:20:00 PST  PLOO  XMS
## 83564    CTD004913   A7     1.5 1993-05-24 8:31:00 PST  PLOO  XMS
## 83569    CTD004914   A7     3.0 1993-05-24 8:31:00 PST  PLOO  XMS
##           qualifier value  units
## 81485      <NA>  NA   %
## 82191      <NA>  NA   %
## 82456      <NA>  NA   %

```

```

## 82873      <NA>    NA    %
## 83497      <NA>    NA    %
## 83564      <NA>    NA    %
## 83569      <NA>    NA    %
## [1] "XMS"
##           sample station depth_m date_sample          time project parameter
## Not NA n 139002 139002 139002        139002 112648.0000 139002 139002
## NA n      0       0       0            0 26354.0000      0      0
## Not NA %   1       1       1            1 0.8104      1      1
## NA %      0       0       0            0 0.1896      0      0
##           qualifier      value units
## Not NA n      0 138876.0000 139002
## NA n      139002 126.0000      0
## Not NA %      0     0.9991      1
## NA %      1     0.0009      0

# Display Value Summaries Citation:
# Hurst, D. (n.d.). ADS 506 [Course materials].
feature_cats01 <- owt_df02 %>%
  mutate(cat = paste(parameter, qualifier, units)) %>%
  count(cat)
print(feature_cats01)

##           cat      n
## 1 CHLOROPHYLL NA ug/L 88471
## 2 DENSITY NA sigma-t 88317
## 3 DO NA mg/L 109542
## 4 ENTERO < CFU/100 mL 95848
## 5 ENTERO > CFU/100 mL 452
## 6 ENTERO e CFU/100 mL 39766
## 7 ENTERO LA CFU/100 mL 23
## 8 ENTERO NA CFU/100 mL 8090
## 9 ENTERO ND CFU/100 mL 1
## 10 ENTERO NR CFU/100 mL 1
## 11 ENTERO NS CFU/100 mL 160
## 12 FECAL < CFU/100 mL 85819
## 13 FECAL > CFU/100 mL 746
## 14 FECAL e CFU/100 mL 41255
## 15 FECAL LA CFU/100 mL 8
## 16 FECAL NA CFU/100 mL 9655
## 17 FECAL ND CFU/100 mL 1
## 18 FECAL NR CFU/100 mL 4
## 19 FECAL NS CFU/100 mL 161
## 20 OG < mg/L 7673
## 21 OG NA mg/L 271
## 22 PH NA pH 107818
## 23 SALINITY NA ppt 109492
## 24 SUSO < mg/L 1290
## 25 SUSO NA mg/L 26253
## 26 TEMP NA C 139066
## 27 TOTAL < CFU/100 mL 66655
## 28 TOTAL > CFU/100 mL 2844
## 29 TOTAL >= CFU/100 mL 3
## 30 TOTAL e CFU/100 mL 51924

```

```

## 31 TOTAL LA CFU/100 mL      14
## 32 TOTAL NA CFU/100 mL  15925
## 33 TOTAL ND CFU/100 mL     54
## 34 TOTAL NR CFU/100 mL      4
## 35 TOTAL NS CFU/100 mL    161
## 36 XMS NA % 139002

feature_cats02 <- owt_df02 %>%
  mutate(cat = paste(date_sample, time)) %>%
  count(cat)
print(head(feature_cats02,7))

```

```

##                   cat n
## 1 1990-11-15 NA 14
## 2 1991-01-02 7:00:00 PST 25
## 3 1991-01-02 7:18:00 PST 25
## 4 1991-01-02 7:40:00 PST 15
## 5 1991-01-02 7:55:00 PST 15
## 6 1991-01-02 8:10:00 PST 25
## 7 1991-01-02 8:30:00 PST 15

```

## Bin depth\_m variable

```

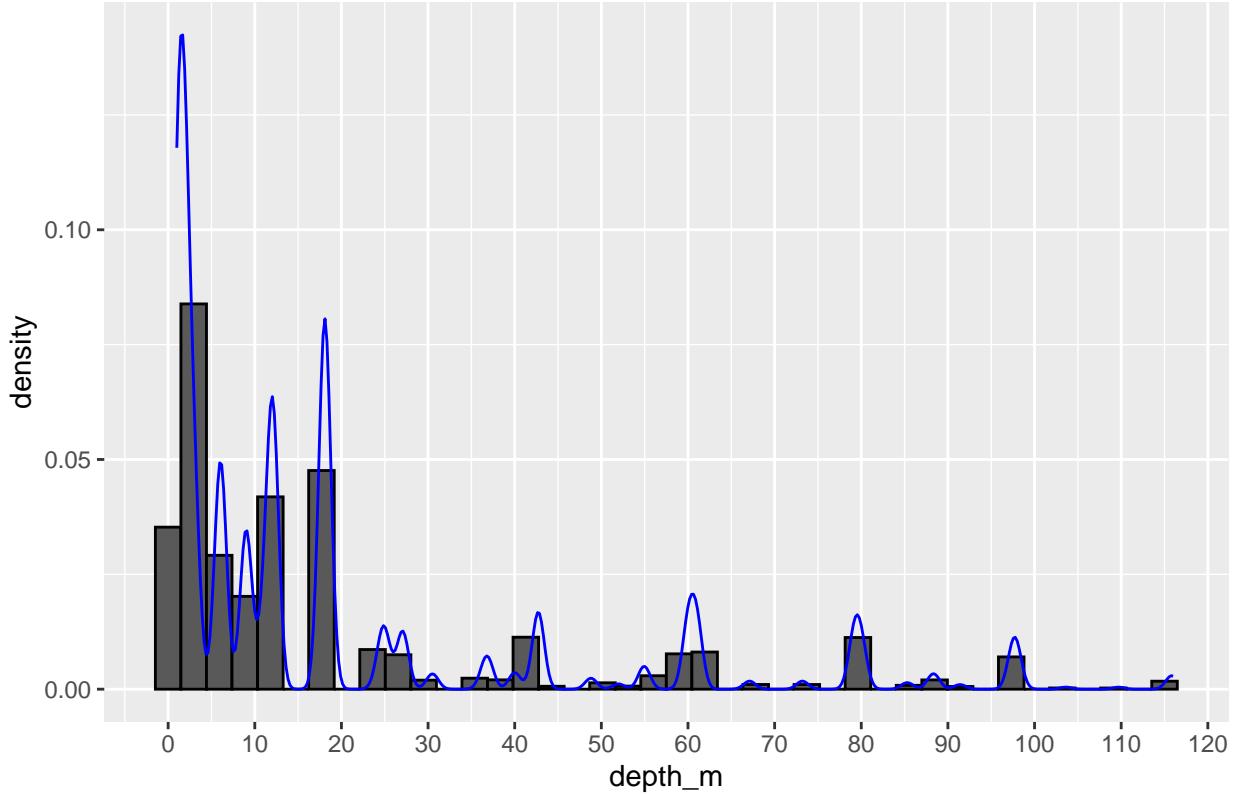
owt_df02$date_sample <- as.Date(owt_df02$date_sample, "%Y-%m-%d")

# Create bins for depth_m values
depth_lvls01 <- c("[0,8)",
                  "[8,33)",
                  "[33,47)",
                  "[47,70)",
                  "[70,90)",
                  "[90,112)",
                  "[112,120]",
                  "Unknown")

# Plot distribution of depth_m values
# Plot Formatting Citation:
#
→ https://community.rstudio.com/t/ggplot-x-axis-y-axis-ticks-labels-breaks-and-limits/119123/2
ggplot(owt_df02, aes(x = depth_m)) +
  geom_histogram(color = "black", bins = 40, aes(y = stat(density))) +
  geom_density(col = "blue") +
  labs(title = "Histogram of `depth_m` Feature") +
  scale_x_continuous(breaks=seq(0,120,10)) +
  theme(plot.title = element_text(hjust = 0.5, size = 12))

```

Histogram of `depth\_m` Feature



```
# Create new column with bins
# Add Columns Using mutate() Citation:
#
# https://www.marsja.se/r-add-column-to-dataframe-based-on-other-columns-conditions-dplyr/
owt_df02 <- mutate(owt_df02, depth_m_bin = case_when(depth_m < 8 ~ "[0,8)",
                                                 depth_m < 33 ~ "[8,33)",
                                                 depth_m < 47 ~ "[33,47)",
                                                 depth_m < 70 ~ "[47,70)",
                                                 depth_m < 90 ~ "[70,90)",
                                                 depth_m < 112 ~ "[90,112)",
                                                 depth_m >= 112 ~ "[112,120]"))

# Replace NAs with "Unknown"
# Citation: https://statisticsglobe.com/r-replace-na-with-0/
owt_df02$depth_m_bin <- replace_na(owt_df02$depth_m_bin, "Unknown")

# Sort Bars Citation:
# https://www.statology.org/order-bars-ggplot2-bar-chart/
owt_df02$depth_m_bin_factr = factor(owt_df02$depth_m_bin, levels = depth_lvls01)
print(head(owt_df02, 7))
```

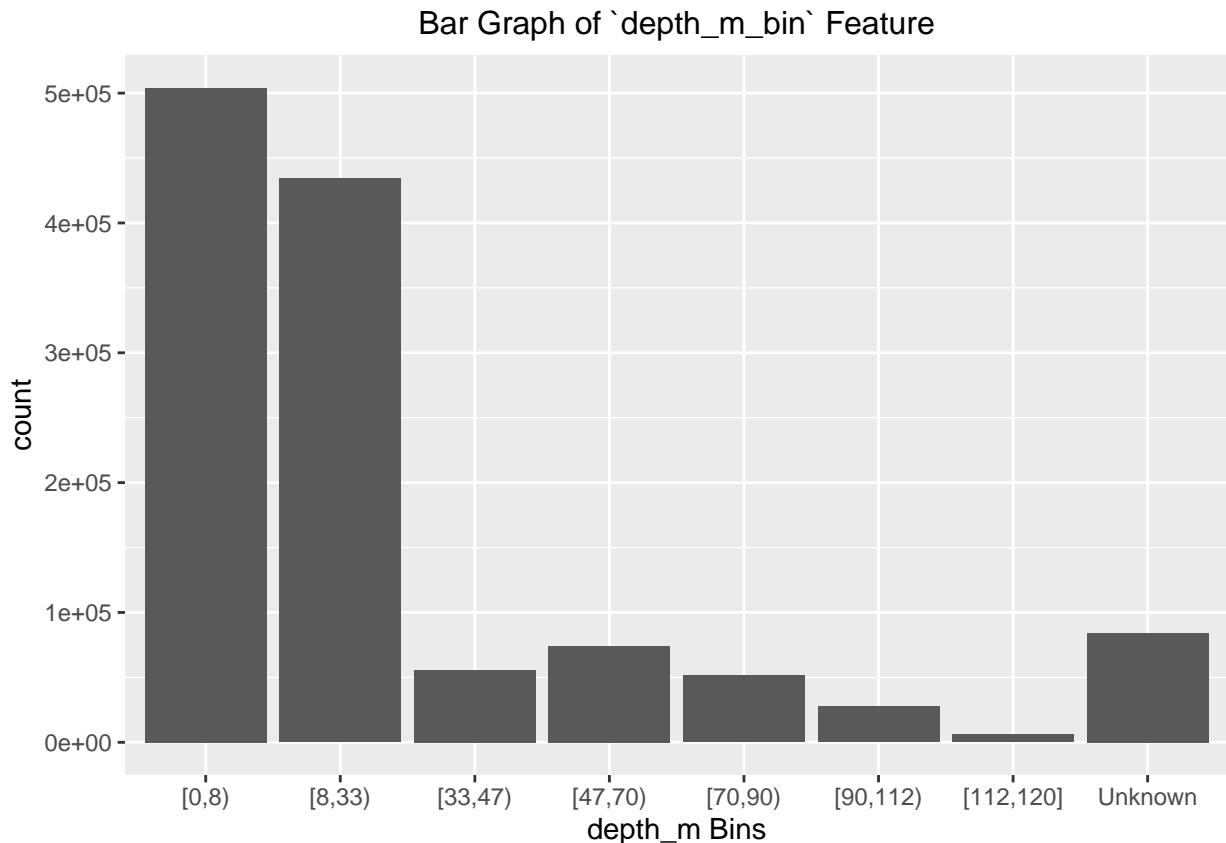
```
##      sample station depth_m date_sample time project parameter qualifier
## 1 9011158743      C5      9 1990-11-15 <NA>     PLOO CHLOROPHYLL      <NA>
## 2 9011158743      C5      9 1990-11-15 <NA>     PLOO    DENSITY      <NA>
## 3 9011158743      C5      9 1990-11-15 <NA>     PLOO        DO      <NA>
## 4 9011158743      C5      9 1990-11-15 <NA>     PLOO        PH      <NA>
```

```

## 5 9011158743      C5      9 1990-11-15 <NA>    PLOO    SALINITY    <NA>
## 6 9011158743      C5      9 1990-11-15 <NA>    PLOO    TEMP       <NA>
## 7 9011158743      C5      9 1990-11-15 <NA>    PLOO    XMS       <NA>
##   value  units depth_m_bin depth_m_bin_factr
## 1 0.870 ug/L   [8,33)      [8,33)
## 2 23.855 sigma-t [8,33)      [8,33)
## 3 6.550 mg/L   [8,33)      [8,33)
## 4 8.080 pH     [8,33)      [8,33)
## 5 33.617 ppt    [8,33)      [8,33)
## 6 19.430 C      [8,33)      [8,33)
## 7 44.850 %      [8,33)      [8,33)

# Display transformed bar chart
ggplot(owt_df02, aes(x = depth_m_bin_factr)) +
  geom_bar() +
  labs(title = "Bar Graph of `depth_m_bin` Feature") +
  xlab("depth_m Bins") +
  theme(plot.title = element_text(hjust = 0.5, size = 12))

```



Perform several aggregations on the data for performing EDA at multiple levels

```

# Display aggregations by different features
owt_df02_gb01 <- owt_df02 %>%
  group_by(station) %>%
  summarise(Count = n())

```

```

print(owt_df02_gb01[owt_df02_gb01$Count == min(owt_df02_gb01$Count), ])

## # A tibble: 2 x 2
##   station Count
##   <fct>    <int>
## 1 A15        30
## 2 A16        30

print(owt_df02_gb01[owt_df02_gb01$Count == max(owt_df02_gb01$Count), ])

## # A tibble: 1 x 2
##   station Count
##   <fct>    <int>
## 1 A1       55217

owt_df02_gb02 <- owt_df02 %>%
  group_by(project) %>%
  summarise(Count = n())

owt_df02_gb03 <- owt_df02 %>%
  group_by(date_sample) %>%
  summarise(Count = n())

# Main DF1
owt_df02_gb04 <- owt_df02 %>%
  group_by(date_sample, parameter) %>%
  summarise(Avg = mean(value, na.remove = TRUE))

owt_df02_gb05 <- owt_df02 %>%
  group_by(parameter) %>%
  summarise(Count = n())

owt_df02_gb06 <- owt_df02 %>%
  group_by(depth_m) %>%
  summarise(Count = n())

# Main DF3
owt_df02_gb07 <- owt_df02 %>%
  group_by(date_sample, project, depth_m_bin, parameter) %>%
  summarise(Avg = mean(value, na.remove = TRUE))

owt_df02_gb08 <- owt_df02 %>%
  group_by(depth_m_bin) %>%
  summarise(Count = n())

# Main DF2
owt_df02_gb09 <- owt_df02 %>%
  group_by(date_sample, project, parameter) %>%
  summarise(Avg = mean(value, na.remove = TRUE))

print(owt_df02_gb01)

## # A tibble: 157 x 2
##   station Count
##   <fct>    <int>
## 1 A15        30
## 2 A16        30
## 3 A17        30
## 4 A18        30
## 5 A19        30
## 6 A20        30
## 7 A21        30
## 8 A22        30
## 9 A23        30
## 10 A24        30
## 11 A25        30
## 12 A26        30
## 13 A27        30
## 14 A28        30
## 15 A29        30
## 16 A30        30
## 17 A31        30
## 18 A32        30
## 19 A33        30
## 20 A34        30
## 21 A35        30
## 22 A36        30
## 23 A37        30
## 24 A38        30
## 25 A39        30
## 26 A40        30
## 27 A41        30
## 28 A42        30
## 29 A43        30
## 30 A44        30
## 31 A45        30
## 32 A46        30
## 33 A47        30
## 34 A48        30
## 35 A49        30
## 36 A50        30
## 37 A51        30
## 38 A52        30
## 39 A53        30
## 40 A54        30
## 41 A55        30
## 42 A56        30
## 43 A57        30
## 44 A58        30
## 45 A59        30
## 46 A60        30
## 47 A61        30
## 48 A62        30
## 49 A63        30
## 50 A64        30
## 51 A65        30
## 52 A66        30
## 53 A67        30
## 54 A68        30
## 55 A69        30
## 56 A70        30
## 57 A71        30
## 58 A72        30
## 59 A73        30
## 60 A74        30
## 61 A75        30
## 62 A76        30
## 63 A77        30
## 64 A78        30
## 65 A79        30
## 66 A80        30
## 67 A81        30
## 68 A82        30
## 69 A83        30
## 70 A84        30
## 71 A85        30
## 72 A86        30
## 73 A87        30
## 74 A88        30
## 75 A89        30
## 76 A90        30
## 77 A91        30
## 78 A92        30
## 79 A93        30
## 80 A94        30
## 81 A95        30
## 82 A96        30
## 83 A97        30
## 84 A98        30
## 85 A99        30
## 86 A100       30
## 87 A101       30
## 88 A102       30
## 89 A103       30
## 90 A104       30
## 91 A105       30
## 92 A106       30
## 93 A107       30
## 94 A108       30
## 95 A109       30
## 96 A110       30
## 97 A111       30
## 98 A112       30
## 99 A113       30
## 100 A114       30
## 101 A115       30
## 102 A116       30
## 103 A117       30
## 104 A118       30
## 105 A119       30
## 106 A120       30
## 107 A121       30
## 108 A122       30
## 109 A123       30
## 110 A124       30
## 111 A125       30
## 112 A126       30
## 113 A127       30
## 114 A128       30
## 115 A129       30
## 116 A130       30
## 117 A131       30
## 118 A132       30
## 119 A133       30
## 120 A134       30
## 121 A135       30
## 122 A136       30
## 123 A137       30
## 124 A138       30
## 125 A139       30
## 126 A140       30
## 127 A141       30
## 128 A142       30
## 129 A143       30
## 130 A144       30
## 131 A145       30
## 132 A146       30
## 133 A147       30
## 134 A148       30
## 135 A149       30
## 136 A150       30
## 137 A151       30
## 138 A152       30
## 139 A153       30
## 140 A154       30
## 141 A155       30
## 142 A156       30
## 143 A157       30

```

```
##      <fct>   <int>
## 1 A1      55217
## 2 A10     5852
## 3 A11     6602
## 4 A12     5812
## 5 A13     6599
## 6 A14     5886
## 7 A15      30
## 8 A16      30
## 9 A17    2961
## 10 A2     7572
## # ... with 147 more rows
print(dim(owt_df02_gb01))
```

```
## [1] 157    2
```

```
print(owt_df02_gb02)
```

```
## # A tibble: 2 x 2
##   project  Count
##   <fct>    <int>
## 1 PL00     805915
## 2 SB00     430854
```

```
print(dim(owt_df02_gb02))
```

```
## [1] 2 2
```

```
print(head(owt_df02_gb03, 7))
```

```
## # A tibble: 7 x 2
##   date_sample  Count
##   <date>        <int>
## 1 1990-11-15     14
## 2 1991-01-02    195
## 3 1991-01-03    195
## 4 1991-01-07    190
## 5 1991-01-08    181
## 6 1991-01-09    577
## 7 1991-01-10    200
```

```
print(dim(owt_df02_gb03))
```

```
## [1] 5580    2
```

```
print(head(owt_df02_gb04, 7))
```

```
## # A tibble: 7 x 3
## # Groups:   date_sample [1]
##   date_sample parameter     Avg
##   <date>      <fct>     <dbl>
## 1 1990-11-15 CHLOROPHYLL  1.07
## 2 1990-11-15 DENSITY     23.9
## 3 1990-11-15 DO          6.98
## 4 1990-11-15 PH          8.13
## 5 1990-11-15 SALINITY    33.6
```

```

## 6 1990-11-15 TEMP      19.4
## 7 1990-11-15 XMS      60.2
print(dim(owt_df02_gb04))

## [1] 36811     3
print(owt_df02_gb05)

## # A tibble: 12 x 2
##   parameter  Count
##   <fct>     <int>
## 1 CHLOROPHYLL 88471
## 2 DENSITY     88317
## 3 DO          109542
## 4 ENTERO      144341
## 5 FECAL       137649
## 6 OG          7944
## 7 PH          107818
## 8 SALINITY    109492
## 9 SUSO         27543
## 10 TEMP        139066
## 11 TOTAL       137584
## 12 XMS         139002
print(dim(owt_df02_gb05))

## [1] 12  2
print(owt_df02_gb06)

## # A tibble: 51 x 2
##   depth_m  Count
##   <dbl>   <int>
## 1 1      119858
## 2 1.5    93937
## 3 2      120007
## 4 3      71058
## 5 6      55762
## 6 6.1    43265
## 7 9      65616
## 8 9.1   3052
## 9 11     23069
## 10 12    80308
## # ... with 41 more rows
print(dim(owt_df02_gb06))

## [1] 51  2
print(head(owt_df02_gb07, 7))

## # A tibble: 7 x 5
## # Groups:   date_sample, project, depth_m_bin [1]
##   date_sample project depth_m_bin parameter      Avg
##   <date>      <fct>    <chr>      <fct>     <dbl>
## 1 1990-11-15 PL00     [8,33]    CHLOROPHYLL  0.87

```

```

## 2 1990-11-15 PL00 [8,33) DENSITY 23.9
## 3 1990-11-15 PL00 [8,33) DO 6.55
## 4 1990-11-15 PL00 [8,33) PH 8.08
## 5 1990-11-15 PL00 [8,33) SALINITY 33.6
## 6 1990-11-15 PL00 [8,33) TEMP 19.4
## 7 1990-11-15 PL00 [8,33) XMS 44.8

print(dim(owt_df02_gb07))

## [1] 121286      5

print(owt_df02_gb08)

## # A tibble: 8 x 2
##   depth_m_bin  Count
##   <chr>        <int>
## 1 [0,8)        503887
## 2 [112,120]    5908
## 3 [33,47)      55629
## 4 [47,70)      74036
## 5 [70,90)      51358
## 6 [8,33)       434169
## 7 [90,112)     27621
## 8 Unknown      84161

print(dim(owt_df02_gb08))

## [1] 8 2

print(head(owt_df02_gb09, 7))

## # A tibble: 7 x 4
## # Groups:   date_sample, project [1]
##   date_sample project parameter     Avg
##   <date>      <fct>   <fct>      <dbl>
## 1 1990-11-15 PL00   CHLOROPHYLL  0.87
## 2 1990-11-15 PL00   DENSITY     23.9
## 3 1990-11-15 PL00   DO          6.55
## 4 1990-11-15 PL00   PH          8.08
## 5 1990-11-15 PL00   SALINITY    33.6
## 6 1990-11-15 PL00   TEMP         19.4
## 7 1990-11-15 PL00   XMS         44.8

print(dim(owt_df02_gb09))

## [1] 48395      4

```

Create custom function to perform df mutation/casting and boxplot display

```

ts_eda <- function(ts_df = NA,
                    form_lead = c(),
                    form_cast = c(),
                    param_lst = c(),
                    l1_col = c(),
                    l1_param = c(),
                    l2_col = c(),

```

```

l2_param = c(),
rtn_met = TRUE,
grph_title = "All",
box = TRUE,
week_agg = FALSE,
out_rm = FALSE) {

# Define function to dcast, print boxplot, and print desc stats for each parameter
dcast_form <- as.formula(paste(form_lead, collapse = "+"),
                           form_cast, sep = "~"))

#print(dcast_form)
#print(head(ts_df))

counter <- 1
# Loop to dcast parameters to cols
for(p in param_lst) {
  param_df <- ts_df[ts_df[, form_cast] == p, ]
  param_df <- param_df %>%
    drop_na()
  #print(param_df)

  #

  # If keyword set to TRUE, convert daily TS data to weekly
  if(week_agg == TRUE) {
    param_df02a <- param_df
    param_df02a$week <- isoweek(param_df02a$date_sample)

    # Date Handling Citation:
    # https://lubridate.tidyverse.org/reference/round_date.html
    param_df02a$week_end <- ceiling_date(param_df02a$date_sample,
                                             unit = "week",
                                             week_start = getOption("lubridate.week.start",
                                         ↳ 1))

    #print(head(param_df02a, 7))
    param_df$date_sample <- param_df02a$week_end
  }

  # Casting Citation:
  # https://www.datasciencemadesimple.com/melting-casting-r/
  param_df_cast <- dcast(param_df, dcast_form, mean)
  #print(head(param_df_cast, 7))

  #

  # If keyword set to TRUE, remove outliers
  if(out_rm == TRUE) {
    #print(head(ts_df_mrgd01c, 7))
    #print(dim(ts_df_mrgd01c))
    ts_df_mrgd01c_s1 <- subset(x = param_df_cast, select = p)
    ts_df_mrgd01c_s1_fit <- preProcess(ts_df_mrgd01c_s1,
                                         method = c("center", "scale"))
    ts_df_mrgd01c_s1_trans <- predict(ts_df_mrgd01c_s1_fit,
                                         ts_df_mrgd01c_s1)

    # Subset non-outlier data
  }
}

```

```

print(dim(param_df_cast))
param_df_cast <- subset(param_df_cast,
                        (abs(ts_df_mrgd01c_s1_trans) <= 3))
dfs1b <- param_df_cast[, p]
#print(head(param_df_cast, 7))
}

# For first item in vector, no merge is needed
if(counter == 1) {
  ts_df_mrgd <- param_df_cast
}
# For 2-n items in vector, merge dataframes iteratively
else {
  # Merge individual casted parameter df's into 1 df
  # DF Merge Citation:
  # https://www.geeksforgeeks.org/joining-of-dataframes-in-r-programming/
  ts_df_mrgd <- merge(x = ts_df_mrgd,
                        y = param_df_cast,
                        by = form_lead,
                        all = TRUE)
}

# Run custom function to ID outliers and generate boxplot
ts_df_mrgd01a <- na.omit(param_df_cast)
#print(head(ts_df_mrgd01a, 7))
#print(dim(ts_df_mrgd01a))
dfs1 <- subset(x = ts_df_mrgd01a, select = p)
dfs1a <- dfs1
#print(head(dfs1a, 7))

dfs1a$Groups <- as.factor(grph_title)
box_comp(xcol = p,
          df = dfs1,
          rtn_met = rtn_met,
          box = box)
#print(dfs_lst)

#
# -----
# Create subplots based on additional agg layers
#print(paste0("L2 length = ", length(l2_param)))
if(length(l2_param) == 0) {
  for(l1 in l1_param) {
    ts_df_mrgd_chl_dmb1 <- ts_df_mrgd01a[(ts_df_mrgd01a[, l1_col] == l1), ]

    # Run custom function to ID outliers and generate boxplot
    #print(head(ts_df_mrgd_chl_dmb1))
    # Error Handling Citation:
    # https://www.geeksforgeeks.org/handling-errors-in-r-programming/
    dfs2 <- subset(x = ts_df_mrgd_chl_dmb1, select = p)
    dfs2a <- dfs2
    try(dfs2a$Groups <- as.factor(l1))
    try(box_comp(xcol = p,
                 df = dfs2,

```

```

        rtn_met = rtn_met,
        grph_title = l1,
        box = box),
    silent = TRUE)
  dfs1a <- rbind(dfs1a, dfs2a)
}
}
else {
  for(l1 in l1_param) {
    for(l2 in l2_param) {
      ts_df_mrgd_chl_dmb1 <- ts_df_mrgd01a[(ts_df_mrgd01a[, l1_col] == l1) &
→ (ts_df_mrgd01a[, l2_col] == l2), ]

      # Run custom function to ID outliers and generate boxplot
      #print(head(ts_df_mrgd_chl_dmb1))
      dfs3 <- subset(x = ts_df_mrgd_chl_dmb1, select = p)
      dfs3a <- dfs3

      try(dfs3a$Groups <- as.factor(paste0(l1, ":", l2)))
      try(box_comp(xcol = p,
                    df = dfs3,
                    rtn_met = rtn_met,
                    grph_title = paste0(l1, ":", l2),
                    box = box),
          silent = TRUE)
      dfs1a <- rbind(dfs1a, dfs3a)
    }
  }
}

#-----
#print(dim(dfs1a))
#print(head(dfs1a, 7))
bx_form <- as.formula(paste(p, "Groups", sep = "~"))
#print(bx_form)
#print(head(dfs1a, 7))

boxplot(bx_form,
        dfs1a,
        main = "Boxplot(s)")

counter <- counter + 1
}
print(head(ts_df_mrgd, 7))
print(describe(ts_df_mrgd))

# Display summary of NA count
ts_df_na <- sapply(ts_df, function(x) sum(is.na(x)))
ts_df_notna <- sapply(ts_df, function(x) sum(!is.na(x)))
ts_df_tbl01 <- rbind(ts_df_notna, ts_df_na)
ts_df_tbl02 <- rbind(ts_df_tbl01, round(prop.table(ts_df_tbl01, margin = 2), 4))
rownames(ts_df_tbl02) <- c("Not NA n", "NA n", "Not NA %", "NA %")

```

```

print(ts_df_tbl02) # This table w/ null counts and proportions for each feature not
  ↵ displayed for space purposes
return(ts_df_mrgd)
}

```

Run custom function on data aggregated by date\_sample and parameter

```

param_lst02 <- c("CHLOROPHYLL",
                 "DENSITY",
                 "DO",
                 "ENTERO",
                 "FECAL",
                 "OG",
                 "PH",
                 "SALINITY",
                 "SUSO",
                 "TEMP",
                 "XMS")

owt_df02_gb04_mrgd = ts_eda(ts_df = owt_df02_gb04,
                             form_lead = "date_sample",
                             form_cast = "parameter",
                             param_lst = param_lst02,
                             rtn_met = TRUE,
                             box = FALSE,
                             week_agg = FALSE
                             )

```

```

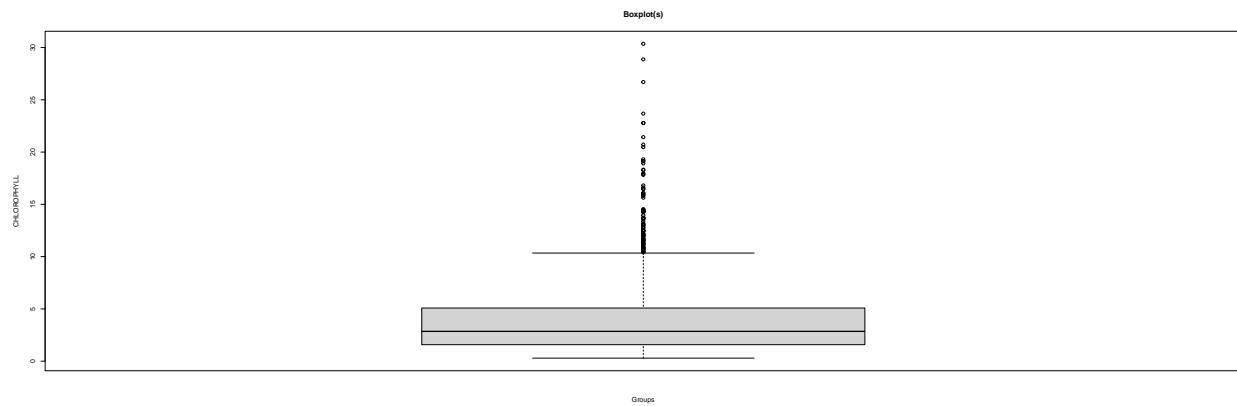
##               metric          V2
## 1             Variable: CHLOROPHYLL
## 2       Total N:
## 3           Count      2092
## 4        NA Count       0
## 5           Mean      3.91
## 6           Median     2.853
## 7 Standard Deviation    3.411
## 8           Variance    11.633
## 9           Range      30.064
## 10          Min       0.29
## 11          Max      30.353
## 12      25th Percentile    1.576
## 13      75th Percentile    5.083
## 14 Subset w/o Outliers:
## 15           Count      2050
## 16             %      98%
## 17        Outlier %       2%
## 18        NA Count       0
## 19           Mean      3.626
## 20           Median     2.791
## 21 Standard Deviation    2.74
## 22           Variance    7.507
## 23           Range      13.676
## 24           Min       0.29

```

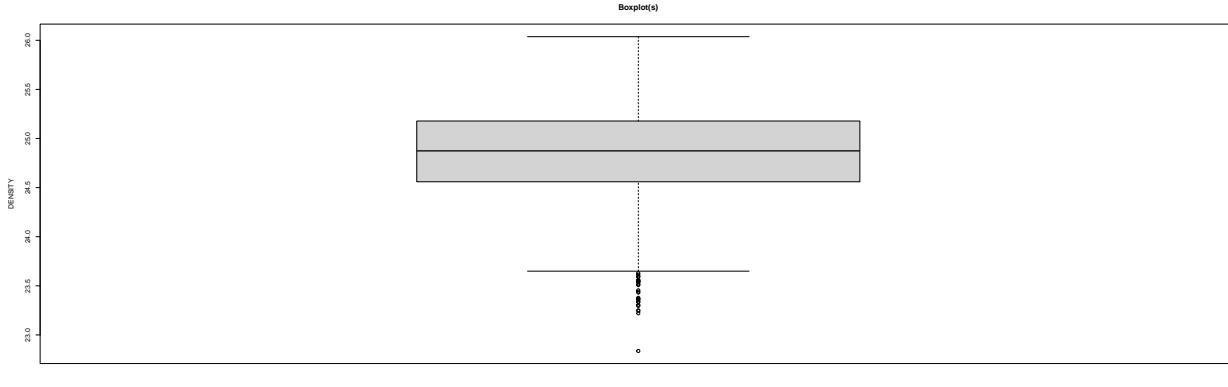
```
## 25
```

```
Max
```

```
13.965
```



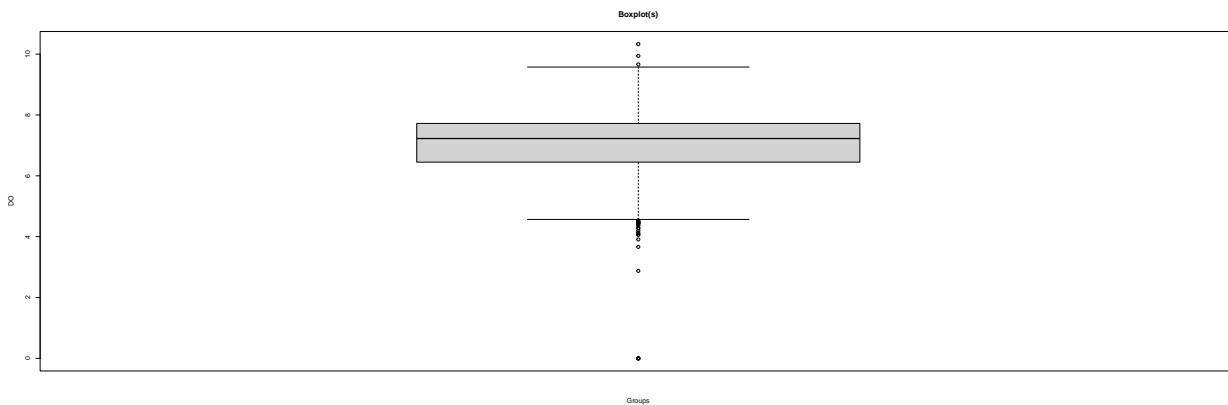
```
##          metric      V2
## 1        Variable: DENSITY
## 2        Total N:
## 3            Count     2246
## 4            NA Count    0
## 5            Mean      24.85
## 6            Median     24.874
## 7  Standard Deviation   0.466
## 8            Variance    0.217
## 9            Range       3.2
## 10           Min      22.837
## 11           Max      26.037
## 12      25th Percentile   24.56
## 13      75th Percentile   25.178
## 14 Subset w/o Outliers:
## 15            Count     2232
## 16            %      99.4%
## 17            Outlier %   0.6%
## 18            NA Count    0
## 19            Mean      24.86
## 20            Median     24.877
## 21  Standard Deviation   0.451
## 22            Variance    0.203
## 23            Range       2.583
## 24           Min      23.454
## 25           Max      26.037
```



```

##           metric      V2
## 1          Variable: D0
## 2          Total N:
## 3          Count     2504
## 4          NA Count    0
## 5          Mean      7.041
## 6          Median     7.226
## 7          Standard Deviation   0.99
## 8          Variance     0.98
## 9          Range      10.329
## 10         Min        0
## 11         Max      10.329
## 12         25th Percentile 6.451
## 13         75th Percentile 7.722
## 14 Subset w/o Outliers:
## 15         Count     2494
## 16         %       99.6%
## 17         Outlier % 0.4%
## 18         NA Count    0
## 19         Mean      7.057
## 20         Median     7.232
## 21         Standard Deviation   0.937
## 22         Variance     0.877
## 23         Range      5.822
## 24         Min        4.12
## 25         Max      9.942

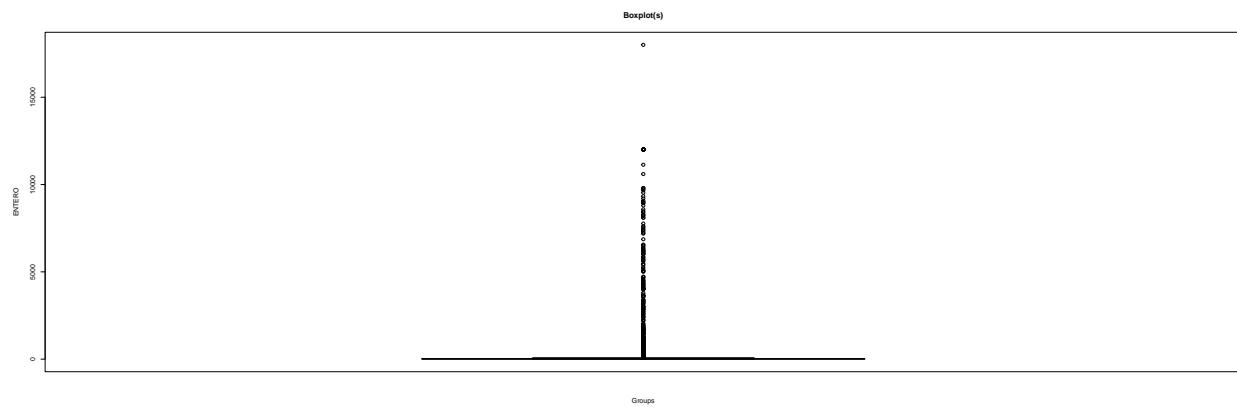
```



```

##               metric      V2
## 1          Variable: ENTERO
## 2          Total N:
## 3             Count      5197
## 4        NA Count       0
## 5            Mean     284.213
## 6            Median     7.333
## 7 Standard Deviation 1325.881
## 8            Variance 1757960.571
## 9            Range    18000
## 10           Min       0
## 11           Max    18000
## 12 25th Percentile     2.75
## 13 75th Percentile    35.455
## 14 Subset w/o Outliers:
## 15            Count      5090
## 16            %      97.9%
## 17        Outlier %     2.1%
## 18        NA Count       0
## 19            Mean    112.006
## 20            Median      7
## 21 Standard Deviation 417.536
## 22            Variance 174336.299
## 23            Range    4233.333
## 24           Min       0
## 25           Max    4233.333

```



```

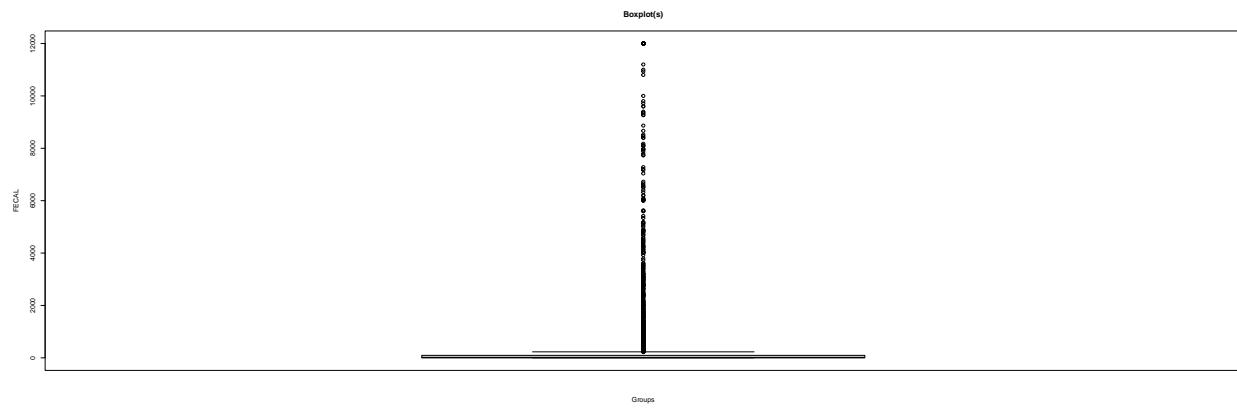
##               metric      V2
## 1          Variable: FECAL
## 2          Total N:
## 3             Count      5078
## 4        NA Count       0
## 5            Mean    409.934
## 6            Median    10.564
## 7 Standard Deviation 1513.552
## 8            Variance 2290838.653
## 9            Range    12000
## 10           Min       0
## 11           Max    12000
## 12 25th Percentile     3.404
## 13 75th Percentile    94.095

```

```

## 14 Subset w/o Outliers:
## 15             Count      4965
## 16             %       97.8%
## 17             Outlier %     2.2%
## 18             NA Count      0
## 19             Mean      208.248
## 20             Median      10
## 21 Standard Deviation   600.094
## 22             Variance  360113.198
## 23             Range      4900
## 24             Min        0
## 25             Max      4900

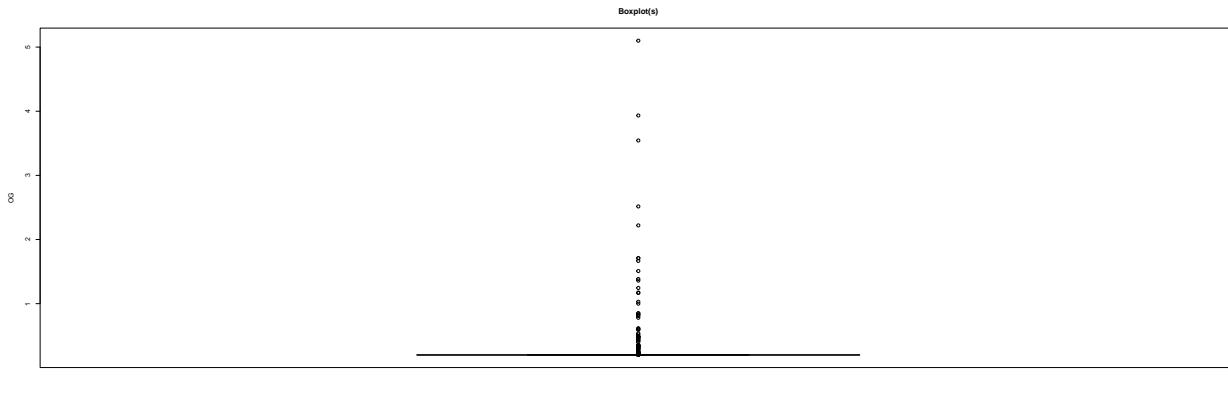
```



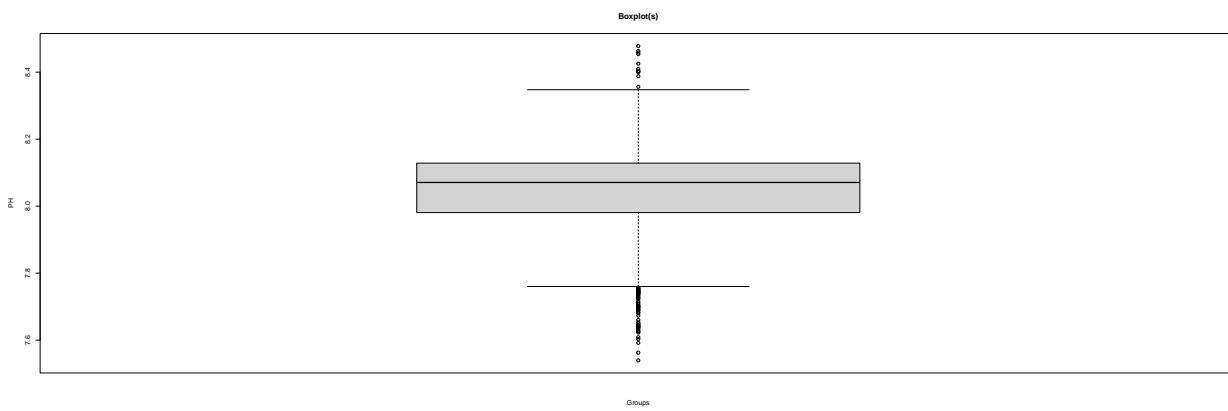
```

##               metric      V2
## 1             Variable: OG
## 2             Total N: 937
## 3             Count      937
## 4             NA Count      0
## 5             Mean      0.244
## 6             Median      0.2
## 7 Standard Deviation   0.286
## 8             Variance   0.082
## 9             Range      4.9
## 10            Min        0.2
## 11            Max       5.1
## 12            25th Percentile 0.2
## 13            75th Percentile 0.2
## 14 Subset w/o Outliers:
## 15             Count      923
## 16             %       98.5%
## 17             Outlier %     1.5%
## 18             NA Count      0
## 19             Mean      0.215
## 20             Median      0.2
## 21 Standard Deviation   0.078
## 22             Variance   0.006
## 23             Range      0.83
## 24             Min        0.2
## 25             Max       1.03

```



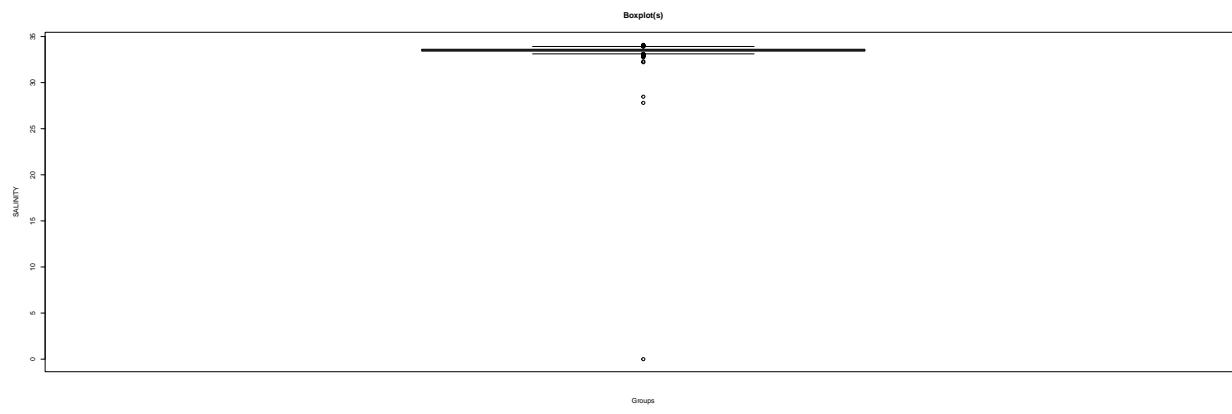
```
##               metric      V2
## 1             Variable: PH
## 2             Total N:
## 3             Count     2469
## 4             NA Count    0
## 5             Mean      8.05
## 6             Median     8.071
## 7             Standard Deviation 0.117
## 8             Variance    0.014
## 9             Range      0.938
## 10            Min       7.54
## 11            Max       8.478
## 12            25th Percentile 7.981
## 13            75th Percentile 8.128
## 14 Subset w/o Outliers:
## 15            Count     2435
## 16            %        98.6%
## 17            Outlier %   1.4%
## 18            NA Count    0
## 19            Mean      8.053
## 20            Median     8.071
## 21            Standard Deviation 0.108
## 22            Variance    0.012
## 23            Range      0.702
## 24            Min       7.7
## 25            Max       8.402
```



```

##               metric      V2
## 1          Variable: SALINITY
## 2          Total N:
## 3             Count     2505
## 4            NA Count     0
## 5              Mean    33.502
## 6              Median   33.527
## 7 Standard Deviation   0.706
## 8             Variance   0.499
## 9              Range    34.098
## 10             Min       0
## 11             Max    34.098
## 12        25th Percentile 33.418
## 13        75th Percentile 33.62
## 14 Subset w/o Outliers:
## 15             Count     2502
## 16             %    99.9%
## 17            Outlier %   0.1%
## 18            NA Count     0
## 19              Mean    33.519
## 20              Median   33.527
## 21 Standard Deviation   0.165
## 22             Variance   0.027
## 23              Range    1.888
## 24             Min     32.21
## 25             Max    34.098

```



```

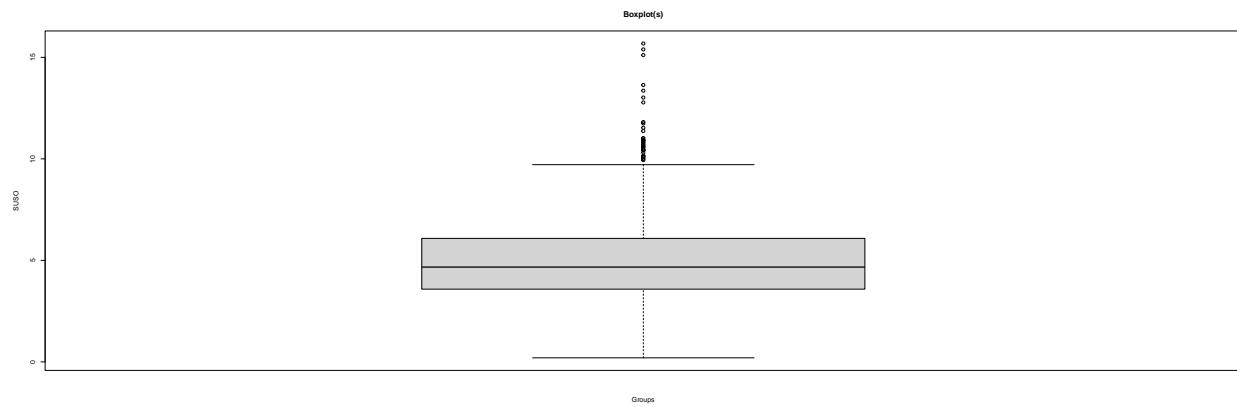
##               metric      V2
## 1          Variable: SUSO
## 2          Total N:
## 3             Count     976
## 4            NA Count     0
## 5              Mean    4.993
## 6              Median   4.67
## 7 Standard Deviation   2.164
## 8             Variance   4.681
## 9              Range    15.48
## 10             Min       0.2
## 11             Max    15.68
## 12        25th Percentile 3.583
## 13        75th Percentile 6.083

```

```

## 14 Subset w/o Outliers:
## 15             Count      966
## 16             %       99%
## 17        Outlier %      1%
## 18       NA Count       0
## 19             Mean     4.906
## 20             Median    4.639
## 21 Standard Deviation   1.991
## 22       Variance     3.966
## 23             Range    11.172
## 24             Min      0.2
## 25             Max     11.372

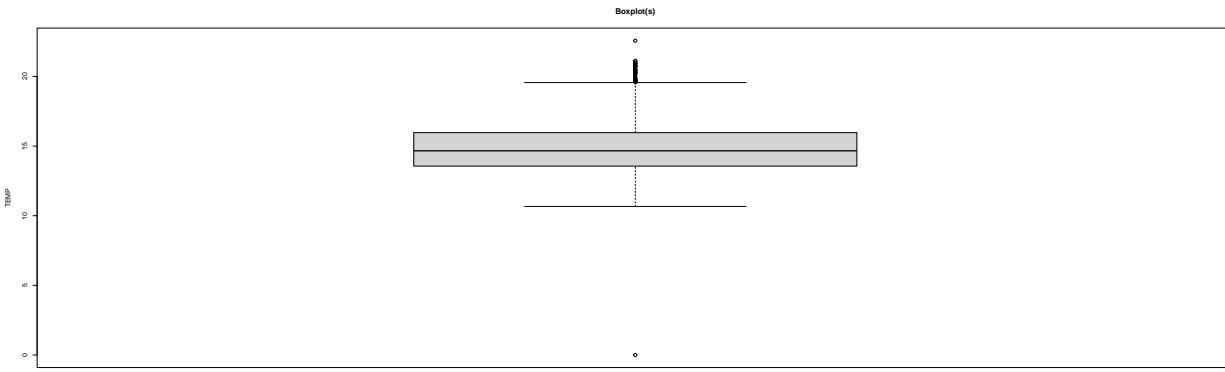
```



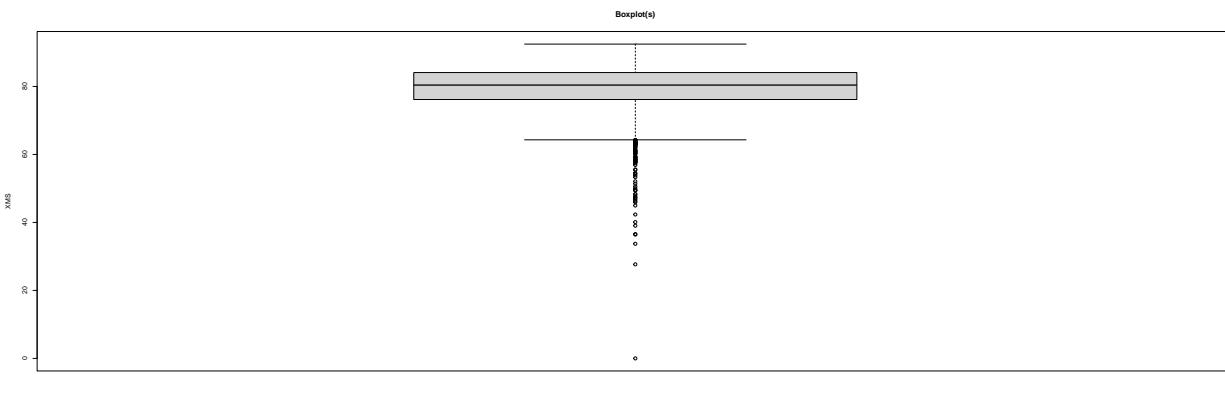
```

##               metric      V2
## 1           Variable: TEMP
## 2        Total N: 3373
## 3             Count      0
## 4       NA Count     14.843
## 5             Mean     14.661
## 6             Median   1.879
## 7 Standard Deviation   3.53
## 8       Variance     22.568
## 9             Range    13.561
## 10            Min      15.964
## 11            Max     20.46
## 12      25th Percentile
## 13      75th Percentile
## 14 Subset w/o Outliers:
## 15             Count      3357
## 16             %       99.5%
## 17        Outlier %      0.5%
## 18       NA Count       0
## 19             Mean     14.82
## 20             Median    14.65
## 21 Standard Deviation   1.821
## 22       Variance     3.315
## 23             Range    10.666
## 24             Min      20.46

```



```
##           metric      V2
## 1          Total N: Variable: XMS
## 2          Count      3344
## 3         NA Count       0
## 4          Mean     79.402
## 5          Median     80.4
## 6 Standard Deviation     6.979
## 7          Variance    48.713
## 8            Range    92.456
## 9            Min        0
## 10           Max    92.456
## 12 25th Percentile    76.156
## 13 75th Percentile    84.084
## 14 Subset w/o Outliers:
## 15          Count    3302
## 16            %     98.7%
## 17        Outlier %     1.3%
## 18         NA Count       0
## 19          Mean     79.791
## 20          Median    80.486
## 21 Standard Deviation    5.988
## 22          Variance   35.857
## 23            Range    33.88
## 24            Min    58.577
## 25            Max    92.456
```



```

##   date_sample CHLOROPHYLL DENSITY      DO      ENTERO      FECAL OG      PH SALINITY
## 1 1990-11-15          1.07 23.854 6.98000        NA        NA NA 8.130 33.59550
## 2 1991-01-02          NA       NA       NA 32.05128 125.64103 NA       NA NA
## 3 1991-01-03          NA       NA       NA 18.71795 51.28205 NA       NA NA
## 4 1991-01-07          NA       NA       NA 106.15385 80.76923 NA       NA NA
## 5 1991-01-08          NA       NA       NA 40.00000 40.55556 NA       NA NA
## 6 1991-01-09          NA       NA 5.47625 20.33898 40.50847 NA 8.195 33.51938
## 7 1991-01-10          NA       NA 5.50000 40.22727 78.18182 NA       NA 33.49300
##   SUSO      TEMP      XMS
## 1 NA 19.37000 60.22500
## 2 NA 14.50769 80.02564
## 3 NA 14.39231 83.89744
## 4 NA 14.54103 78.97436
## 5 NA 13.43000 80.20000
## 6 NA 14.26889 86.21111
## 7 NA 13.75000 80.45833
##             vars     n    mean      sd median trimmed   mad   min     max
## date_sample     1 5450    NaN      NA     NA  NaN  NA Inf -Inf
## CHLOROPHYLL   2 2092    3.91    3.41    2.85    3.33  2.28  0.29  30.35
## DENSITY        3 2246    24.85    0.47   24.87   24.87  0.46 22.84  26.04
## DO            4 2504    7.04    0.99    7.23    7.11  0.86  0.00 10.33
## ENTERO         5 5197 284.21 1325.88    7.33   25.74  7.91  0.00 18000.00
## FECAL          6 5078 409.93 1513.55   10.56   69.45 12.57  0.00 12000.00
## OG            7  937    0.24    0.29    0.20    0.20  0.20  0.00  0.20  5.10
## PH            8 2469    8.05    0.12    8.07    8.06  0.10  7.54  8.48
## SALINITY       9 2505    33.50    0.71   33.53   33.52  0.15  0.00 34.10
## SUSO          10  976    4.99    2.16    4.67    4.80  1.80  0.20 15.68
## TEMP          11 3373   14.84    1.88   14.66   14.75  1.78  0.00 22.57
## XMS           12 3344   79.40    6.98   80.40   80.08  5.76  0.00 92.46
##             range   skew kurtosis     se
## date_sample   -Inf    NA     NA  NA
## CHLOROPHYLL 30.06   2.25    7.84  0.07
## DENSITY      3.20  -0.42    0.25  0.01
## DO          10.33 -1.05    3.72  0.02
## ENTERO      18000.00  6.95   53.47 18.39
## FECAL       12000.00  5.81   36.94 21.24
## OG          4.90  10.89  144.21  0.01
## PH          0.94  -0.66   1.32  0.00
## SALINITY    34.10 -42.97 2021.03  0.01
## SUSO        15.48   1.09   2.23  0.07
## TEMP        22.57   0.35   1.15  0.03
## XMS         92.46 -1.86   9.43  0.12
##             date_sample parameter      Avg
## Not NA n      36811    36811 35669.000
## NA n          0        0 1142.000
## Not NA %      1        1  0.969
## NA %          0        0  0.031
owt_df02_gb04_wkly = ts_eda(ts_df = owt_df02_gb04,
                             form_lead = "date_sample",
                             form_cast = "parameter",
                             param_lst = param_lst02,
                             rtn_met = TRUE,
                             box = FALSE,

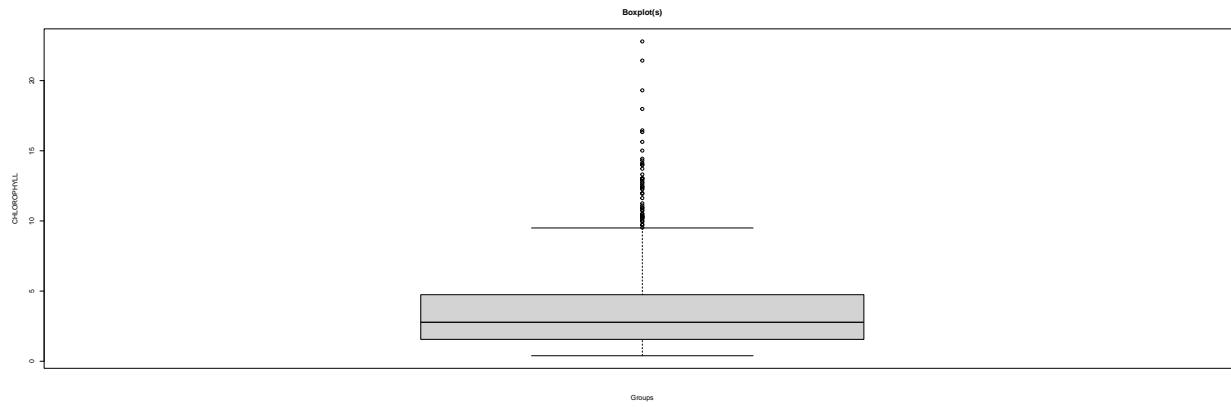
```

```

            week_agg = TRUE
        )

##          metric      V2
## 1      Variable: CHLOROPHYLL
## 2      Total N:
## 3          Count     1071
## 4          NA Count     0
## 5          Mean     3.664
## 6          Median    2.778
## 7      Standard Deviation    2.98
## 8          Variance   8.879
## 9          Range    22.399
## 10         Min     0.393
## 11         Max    22.792
## 12      25th Percentile   1.56
## 13      75th Percentile   4.744
## 14 Subset w/o Outliers:
## 15          Count     1049
## 16          %     97.9%
## 17      Outlier %     2.1%
## 18          NA Count     0
## 19          Mean     3.423
## 20          Median    2.726
## 21      Standard Deviation   2.465
## 22          Variance   6.074
## 23          Range    12.205
## 24         Min     0.393
## 25         Max    12.599

```



```

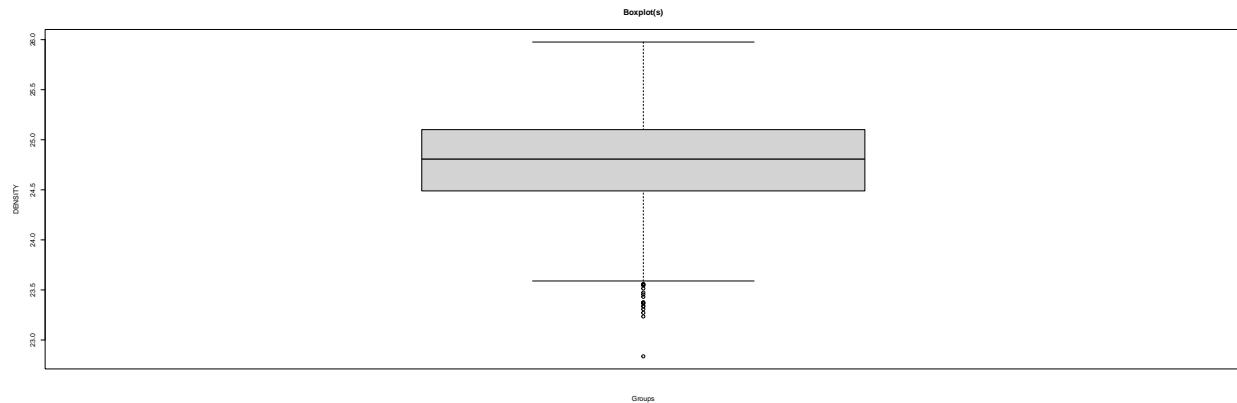
##          metric      V2
## 1      Variable: DENSITY
## 2      Total N:
## 3          Count     1098
## 4          NA Count     0
## 5          Mean     24.78
## 6          Median    24.807
## 7      Standard Deviation   0.467
## 8          Variance   0.218
## 9          Range    3.139

```

```

## 10             Min      22.837
## 11             Max      25.976
## 12    25th Percentile 24.489
## 13   75th Percentile  25.1
## 14 Subset w/o Outliers:
## 15             Count 1089
## 16             %     99.2%
## 17        Outlier %  0.8%
## 18       NA Count    0
## 19             Mean 24.793
## 20             Median 24.812
## 21 Standard Deviation 0.448
## 22            Variance 0.201
## 23             Range 2.545
## 24             Min   23.431
## 25             Max   25.976

```



```

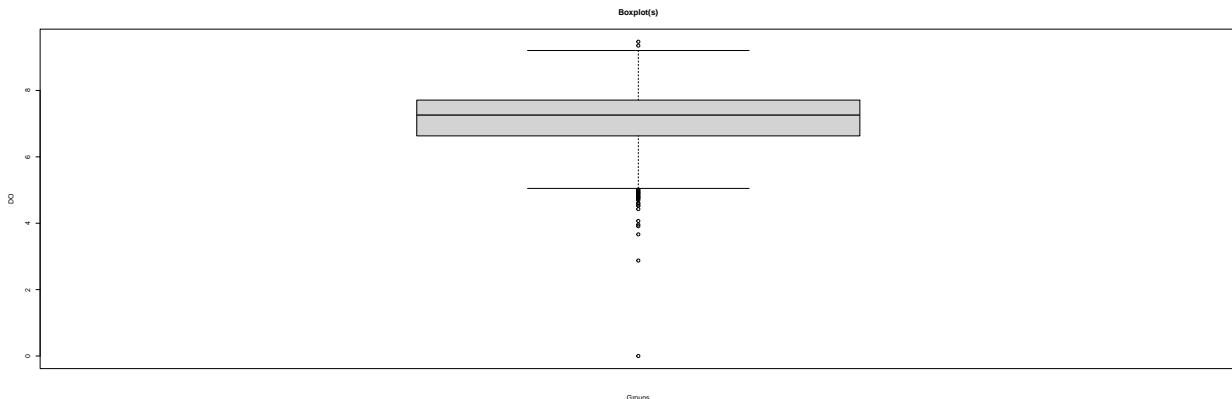
##           metric      V2
## 1 Variable: D0
## 2 Total N:
## 3   Count    1203
## 4   NA Count    0
## 5   Mean     7.102
## 6   Median    7.259
## 7 Standard Deviation 0.876
## 8   Variance   0.767
## 9   Range     9.468
## 10   Min      0
## 11   Max     9.468
## 12  25th Percentile 6.632
## 13  75th Percentile  7.71
## 14 Subset w/o Outliers:
## 15   Count    1196
## 16   %     99.4%
## 17  Outlier %  0.6%
## 18   NA Count    0
## 19   Mean     7.125
## 20   Median    7.265
## 21 Standard Deviation 0.821
## 22   Variance   0.674
## 23   Range     4.942

```

```

## 24          Min       4.527
## 25          Max      9.468

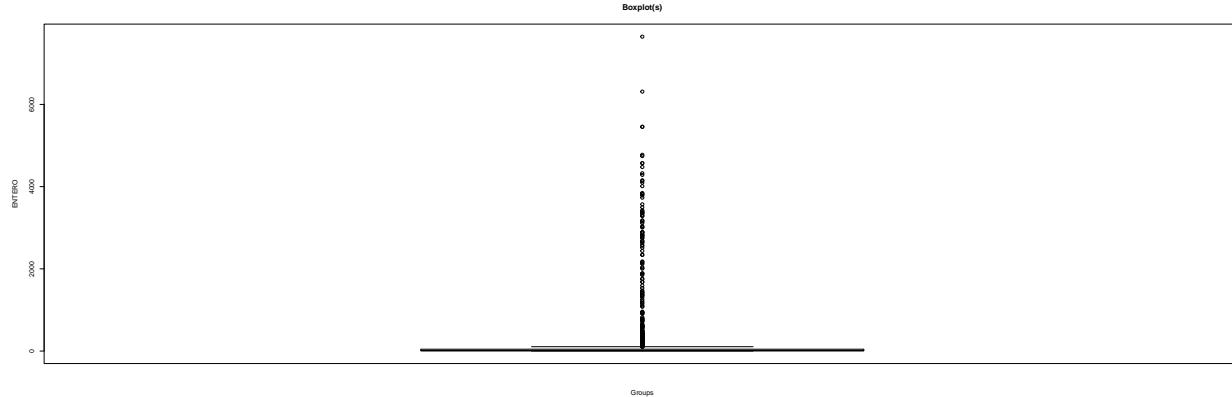
```



```

##           metric        V2
## 1 Variable: ENTERO
## 2 Total N:
## 3     Count      1614
## 4    NA Count       0
## 5     Mean     214.198
## 6     Median     12.258
## 7 Standard Deviation   718.919
## 8     Variance   516845.04
## 9     Range     7646.278
## 10    Min         2
## 11    Max     7648.278
## 12 25th Percentile   5.434
## 13 75th Percentile   45.567
## 14 Subset w/o Outliers:
## 15     Count      1557
## 16     %       96.5%
## 17 Outlier %      3.5%
## 18    NA Count       0
## 19     Mean     91.784
## 20     Median     11.698
## 21 Standard Deviation   275.13
## 22     Variance   75696.459
## 23     Range     2344.566
## 24    Min         2
## 25    Max     2346.566

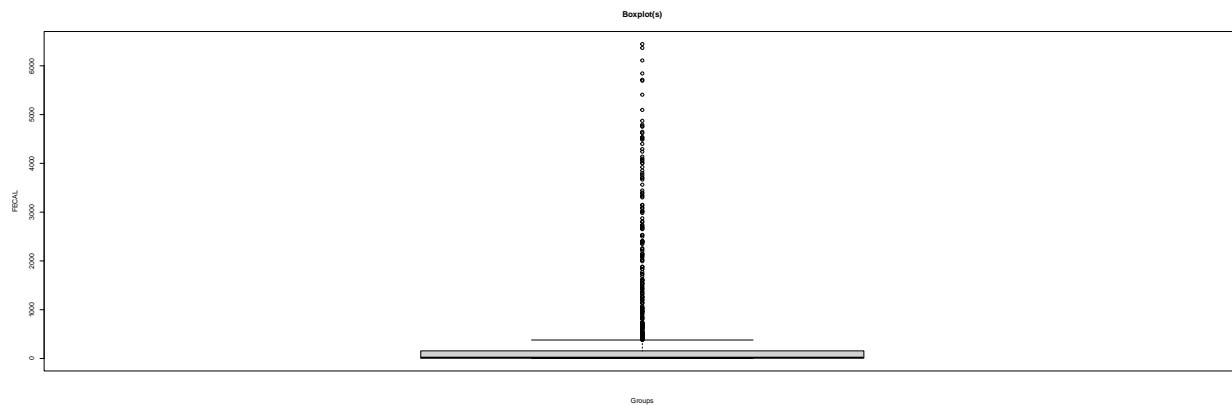
```



```

##           metric      V2
## 1          Total N: Variable: FECAL
## 2          Total N: 1614
## 3            Count      0
## 4        NA Count      0
## 5            Mean 304.597
## 6            Median 23.303
## 7 Standard Deviation 826.25
## 8            Variance 682689.747
## 9            Range 6443.07
## 10           Min      2
## 11           Max 6445.07
## 12      25th Percentile 6.236
## 13      75th Percentile 156.176
## 14 Subset w/o Outliers:
## 15            Count 1562
## 16            % 96.8%
## 17        Outlier % 3.2%
## 18        NA Count      0
## 19            Mean 177.977
## 20            Median 20.506
## 21 Standard Deviation 421.323
## 22            Variance 177512.97
## 23            Range 2737.584
## 24           Min      2
## 25           Max 2739.584

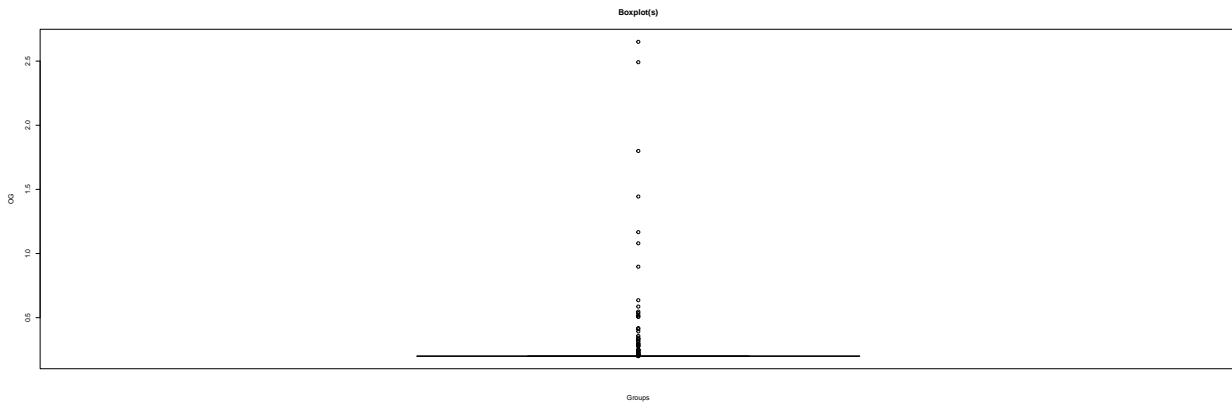
```



```

##               metric      V2
## 1             Variable: OG
## 2       Total N:
## 3           Count     351
## 4       NA Count      0
## 5           Mean    0.244
## 6           Median   0.2
## 7   Standard Deviation 0.227
## 8           Variance  0.052
## 9           Range    2.45
## 10          Min     0.2
## 11          Max    2.65
## 12   25th Percentile  0.2
## 13   75th Percentile  0.2
## 14 Subset w/o Outliers:
## 15          Count    345
## 16          %    98.3%
## 17   Outlier %    1.7%
## 18       NA Count      0
## 19           Mean    0.218
## 20           Median   0.2
## 21   Standard Deviation 0.068
## 22           Variance  0.005
## 23           Range    0.697
## 24          Min     0.2
## 25          Max    0.897

```



```

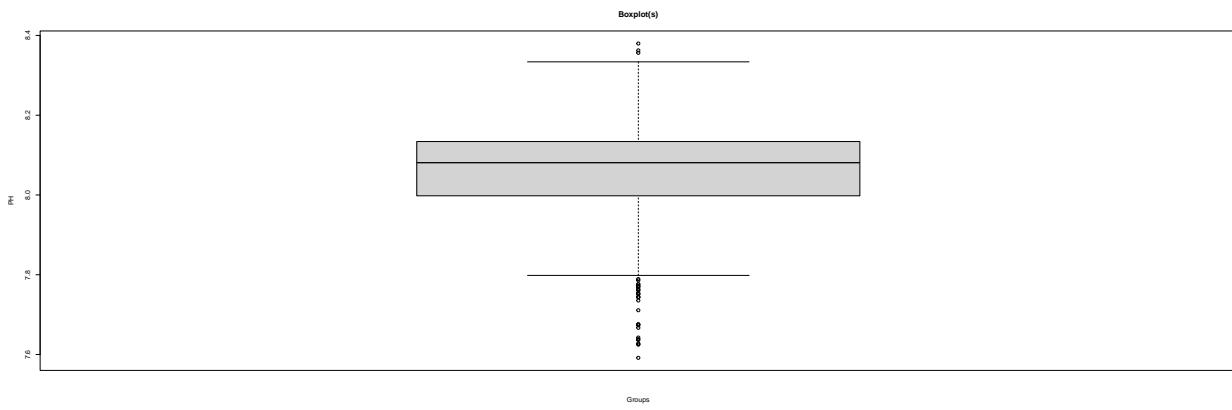
##               metric      V2
## 1             Variable: PH
## 2       Total N:
## 3           Count    1205
## 4       NA Count      0
## 5           Mean    8.062
## 6           Median   8.081
## 7   Standard Deviation 0.11
## 8           Variance  0.012
## 9           Range    0.788
## 10          Min    7.592
## 11          Max    8.38
## 12   25th Percentile  7.998
## 13   75th Percentile  8.134

```

```

## 14 Subset w/o Outliers:
## 15             Count      1193
## 16             %        99%
## 17       Outlier %       1%
## 18       NA Count       0
## 19             Mean     8.066
## 20             Median    8.082
## 21 Standard Deviation   0.102
## 22       Variance      0.01
## 23             Range    0.644
## 24             Min      7.735
## 25             Max      8.38

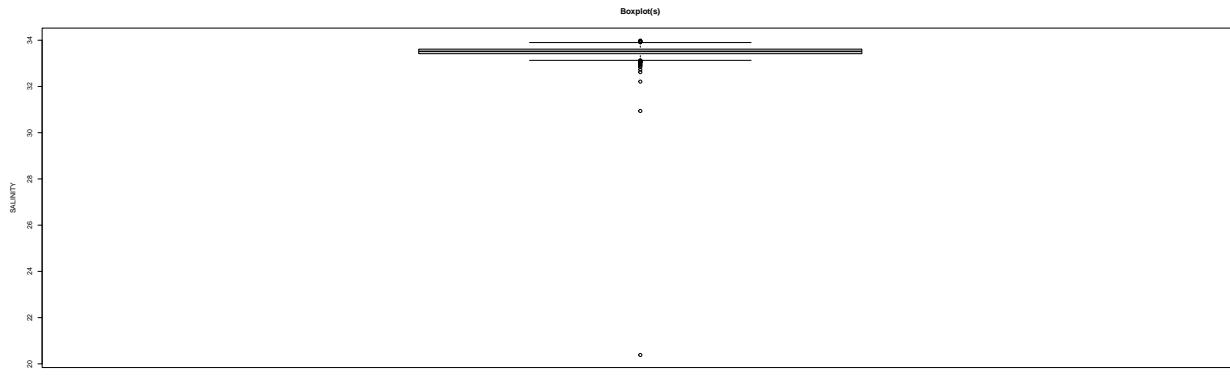
```



```

##               metric      V2
## 1          Variable: SALINITY
## 2       Total N:      1198
## 3             Count       0
## 4       NA Count      33.501
## 5             Mean      33.521
## 6             Median     0.42
## 7 Standard Deviation   0.177
## 8       Variance      13.596
## 9             Range     20.385
## 10            Min      33.981
## 11            Max      33.418
## 12  25th Percentile   33.615
## 13  75th Percentile   33.418
## 14 Subset w/o Outliers:
## 15             Count      1195
## 16             %        99.7%
## 17       Outlier %       0.3%
## 18       NA Count       0
## 19             Mean     33.516
## 20             Median    33.522
## 21 Standard Deviation   0.161
## 22       Variance      0.026
## 23             Range    1.36
## 24             Min      32.621
## 25             Max      33.981

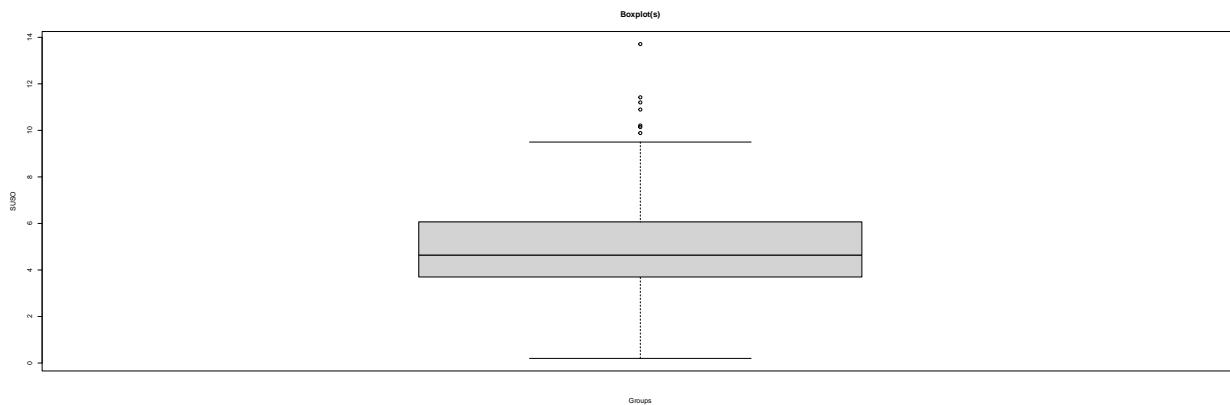
```



```

##           metric      V2
## 1          Variable: SUSO
## 2          Total N:
## 3          Count      367
## 4          NA Count     0
## 5          Mean       4.914
## 6          Median      4.637
## 7          Standard Deviation   1.85
## 8          Variance      3.424
## 9          Range        13.509
## 10         Min         0.2
## 11         Max        13.709
## 12         25th Percentile 3.699
## 13         75th Percentile 6.067
## 14 Subset w/o Outliers:
## 15         Count      363
## 16         %         98.9%
## 17         Outlier %    1.1%
## 18         NA Count     0
## 19         Mean       4.838
## 20         Median      4.611
## 21         Standard Deviation   1.708
## 22         Variance      2.918
## 23         Range        10.009
## 24         Min         0.2
## 25         Max        10.209

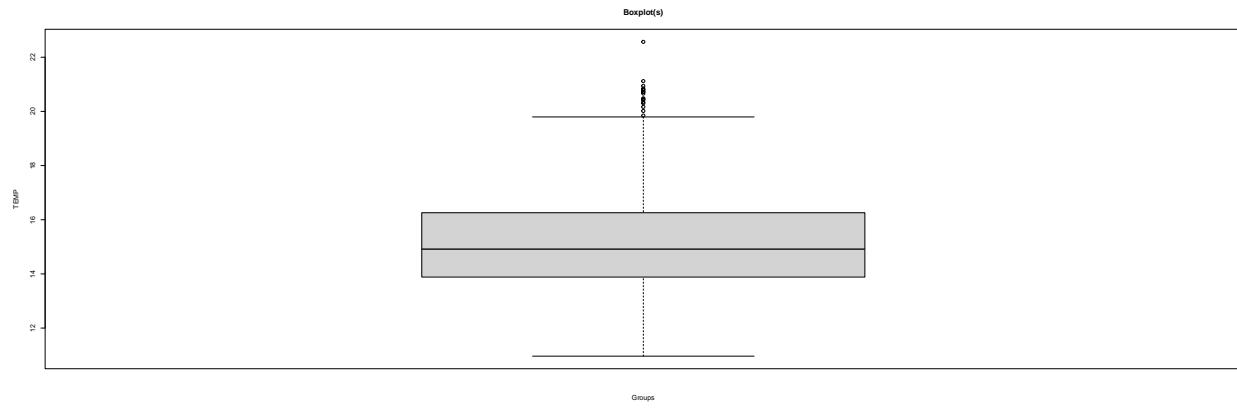
```



```

##               metric      V2
## 1          Variable: TEMP
## 2          Total N:
## 3             Count     1547
## 4        NA Count      0
## 5            Mean    15.145
## 6            Median   14.915
## 7 Standard Deviation    1.783
## 8            Variance   3.179
## 9            Range    11.605
## 10           Min    10.963
## 11           Max    22.568
## 12      25th Percentile 13.883
## 13      75th Percentile 16.258
## 14 Subset w/o Outliers:
## 15            Count     1538
## 16            %    99.4%
## 17        Outlier %    0.6%
## 18        NA Count      0
## 19            Mean    15.11
## 20            Median   14.897
## 21 Standard Deviation    1.73
## 22            Variance  2.992
## 23            Range    9.52
## 24           Min    10.963
## 25           Max    20.483

```



```

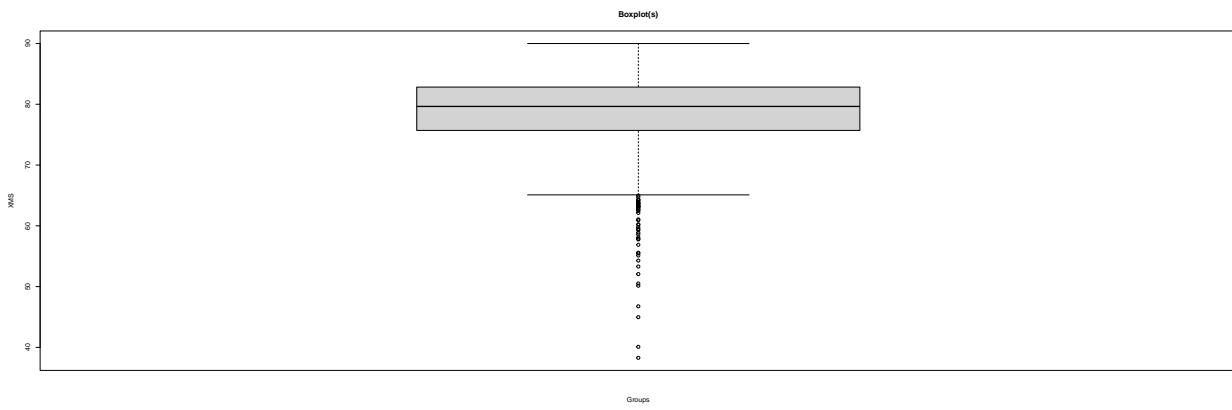
##               metric      V2
## 1          Variable: XMS
## 2          Total N:
## 3             Count     1540
## 4        NA Count      0
## 5            Mean    78.614
## 6            Median   79.642
## 7 Standard Deviation    6.152
## 8            Variance  37.845
## 9            Range    51.708
## 10           Min    38.282
## 11           Max    89.99
## 12      25th Percentile 75.699
## 13      75th Percentile 82.824

```

```

## 14 Subset w/o Outliers:
## 15          Count      1519
## 16          %       98.6%
## 17     Outlier %      1.4%
## 18     NA Count        0
## 19          Mean    78.961
## 20          Median   79.742
## 21 Standard Deviation 5.384
## 22          Variance 28.987
## 23          Range   29.778
## 24          Min    60.212
## 25          Max    89.99

```



```

##   date_sample CHLOROPHYLL DENSITY      DO      ENTERO      FECAL OG     PH
## 1 1990-11-19      1.07 23.854 6.980000      NA      NA NA 8.130
## 2 1991-01-07      NA     NA      NA 25.38462 88.46154 NA     NA
## 3 1991-01-14      NA     NA 5.445417 58.12973 137.21730 NA 8.195
## 4 1991-01-21      NA     NA      NA 23.20513 59.61538 NA     NA
## 5 1991-01-28      NA     NA      NA 31.81891 69.78365 NA     NA
## 6 1991-02-04      NA     NA      NA 154.23077 428.58974 NA     NA
## 7 1991-02-11      NA     NA      NA 16.83814 14.63141 NA     NA
##   SALINITY SUSO      TEMP      XMS
## 1 33.59550  NA 19.37000 60.22500
## 2      NA  NA 14.45000 81.96154
## 3 33.50113  NA 14.07478 82.04876
## 4      NA  NA 14.54487 70.19231
## 5      NA  NA 14.28846 77.61167
## 6      NA  NA 14.23462 81.83333
## 7      NA  NA 14.46154 70.83333
##   vars     n   mean      sd median trimmed   mad   min   max range
##   date_sample  1 1616    NaN     NA     NA  NaN  NA Inf -Inf -Inf
##   CHLOROPHYLL 2 1071    3.66    2.98    2.78   3.16  2.07  0.39  22.79 22.40
##   DENSITY     3 1098    24.78    0.47   24.81  24.80  0.45  22.84  25.98  3.14
##   DO          4 1203    7.10    0.88    7.26   7.18  0.74  0.00  9.47  9.47
##   ENTERO      5 1614   214.20  718.92   12.26  35.21 13.56  2.00 7648.28 7646.28
##   FECAL       6 1614   304.60  826.25   23.30  86.48 29.92  2.00 6445.07 6443.07
##   OG          7  351     0.24    0.23    0.20   0.20  0.00  0.20  2.65  2.45
##   PH          8 1205     8.06    0.11    8.08   8.07  0.10  7.59  8.38  0.79
##   SALINITY    9 1198    33.50    0.42   33.52  33.52  0.15  20.38  33.98 13.60
##   SUSO        10  367     4.91    1.85    4.64   4.81  1.61  0.20 13.71 13.51
##   TEMP        11 1547    15.14    1.78   14.92  15.04  1.75 10.96 22.57 11.61

```

```

## XMS          12 1540 78.61   6.15 79.64 79.25 5.14 38.28 89.99 51.71
##              skew kurtosis    se
## date_sample    NA        NA      NA
## CHLOROPHYLL  1.97      5.38  0.09
## DENSITY       -0.45     0.37  0.01
## DO            -1.19     4.14  0.03
## ENTERO        4.84     26.56 17.89
## FECAL         4.13     18.61 20.57
## OG            7.92     70.11  0.01
## PH            -0.84     1.63  0.00
## SALINITY      -25.63    791.34 0.01
## SUSO          0.79      1.80  0.10
## TEMP          0.59      0.20  0.05
## XMS           -1.47     4.30  0.16
##              date_sample parameter      Avg
## Not NA n     36811     36811 35669.000
## NA n          0          0     1142.000
## Not NA %      1          1     0.969
## NA %          0          0     0.031

owt_df02_gb04_wkly02 = ts_eda(ts_df = owt_df02_gb04,
                               form_lead = "date_sample",
                               form_cast = "parameter",
                               param_lst = param_lst02,
                               rtn_met = TRUE,
                               box = FALSE,
                               week_agg = TRUE,
                               out_rm = TRUE
)

```

```

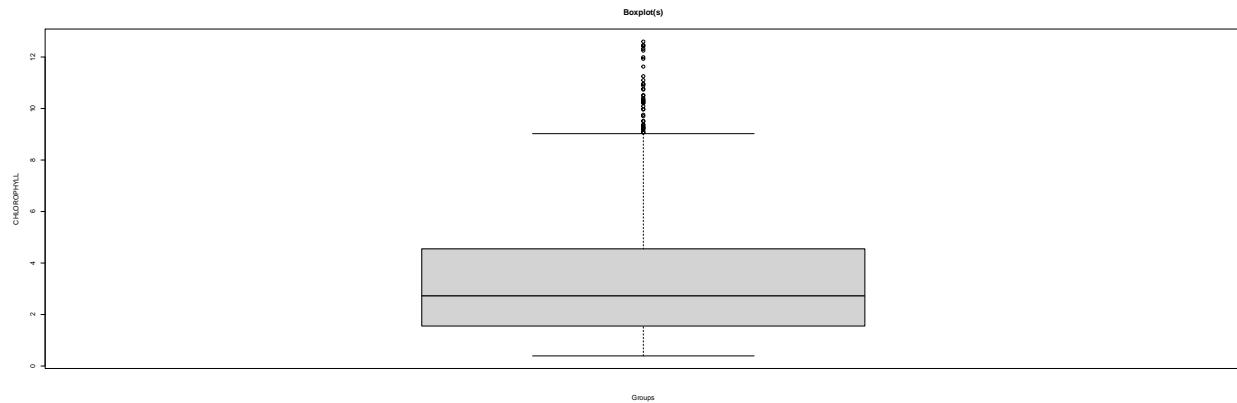
## [1] 1071    2
##              metric          V2
## 1                  Variable: CHLOROPHYLL
## 2                  Total N:
## 3                  Count          1049
## 4                  NA Count       0
## 5                  Mean          3.423
## 6                  Median         2.726
## 7      Standard Deviation      2.465
## 8                  Variance        6.074
## 9                  Range          12.205
## 10                 Min          0.393
## 11                 Max          12.599
## 12      25th Percentile       1.552
## 13      75th Percentile        4.55
## 14 Subset w/o Outliers:
## 15                  Count       1035
## 16                  %         98.7%
## 17      Outlier %          1.3%
## 18                  NA Count       0
## 19                  Mean          3.31
## 20                  Median         2.699
## 21      Standard Deviation      2.278
## 22                  Variance        5.188

```

```

## 23          Range      10.373
## 24          Min       0.393
## 25          Max      10.767

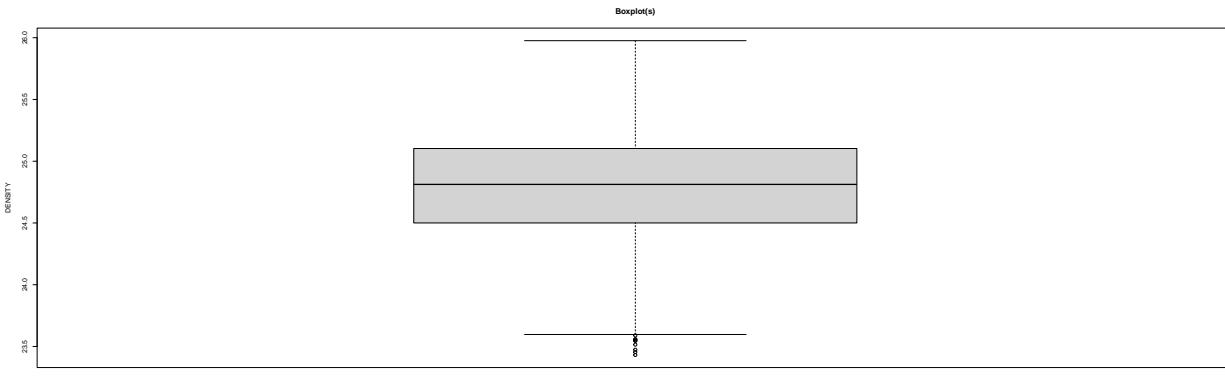
```



```

## [1] 1098    2
##               metric      V2
## 1                   Variable: DENSITY
## 2                   Total N:
## 3                   Count     1089
## 4                   NA Count   0
## 5                   Mean      24.793
## 6                   Median     24.812
## 7   Standard Deviation   0.448
## 8           Variance      0.201
## 9           Range        2.545
## 10          Min         23.431
## 11          Max         25.976
## 12   25th Percentile    24.5
## 13   75th Percentile    25.103
## 14 Subset w/o Outliers:
## 15          Count     1088
## 16          %        99.9%
## 17 Outlier %
## 18          NA Count   0
## 19          Mean      24.794
## 20          Median     24.813
## 21 Standard Deviation   0.446
## 22           Variance   0.199
## 23           Range      2.522
## 24          Min         23.454
## 25          Max         25.976

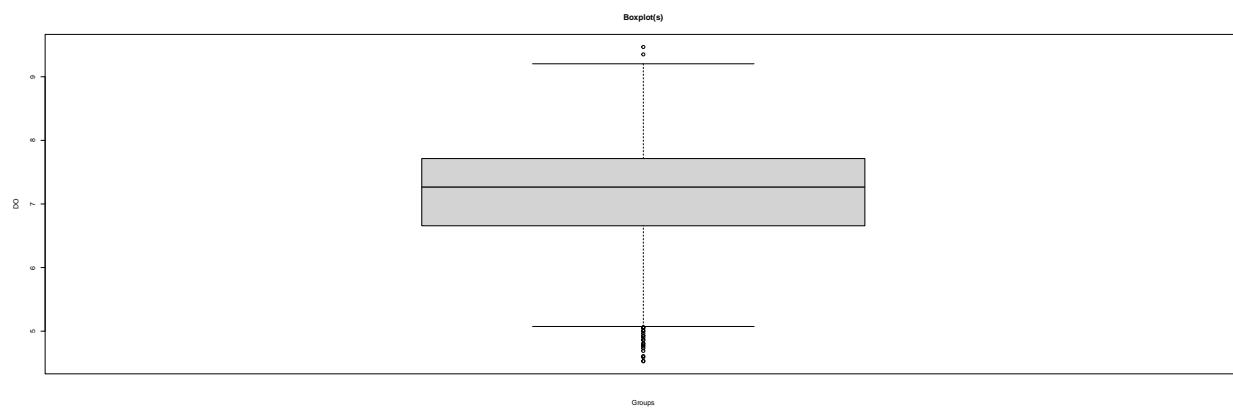
```



```

## [1] 1203      2
##           metric          V2
## 1             Variable: D0
## 2             Total N:
## 3             Count       1196
## 4             NA Count     0
## 5             Mean        7.125
## 6             Median       7.265
## 7             Standard Deviation 0.821
## 8             Variance      0.674
## 9             Range         4.942
## 10            Min          4.527
## 11            Max          9.468
## 12            25th Percentile 6.657
## 13            75th Percentile 7.714
## 14 Subset w/o Outliers:
## 15            Count       1192
## 16            %          99.7%
## 17            Outlier %    0.3%
## 18            NA Count     0
## 19            Mean        7.133
## 20            Median       7.267
## 21            Standard Deviation 0.809
## 22            Variance      0.654
## 23            Range         4.778
## 24            Min          4.69
## 25            Max          9.468

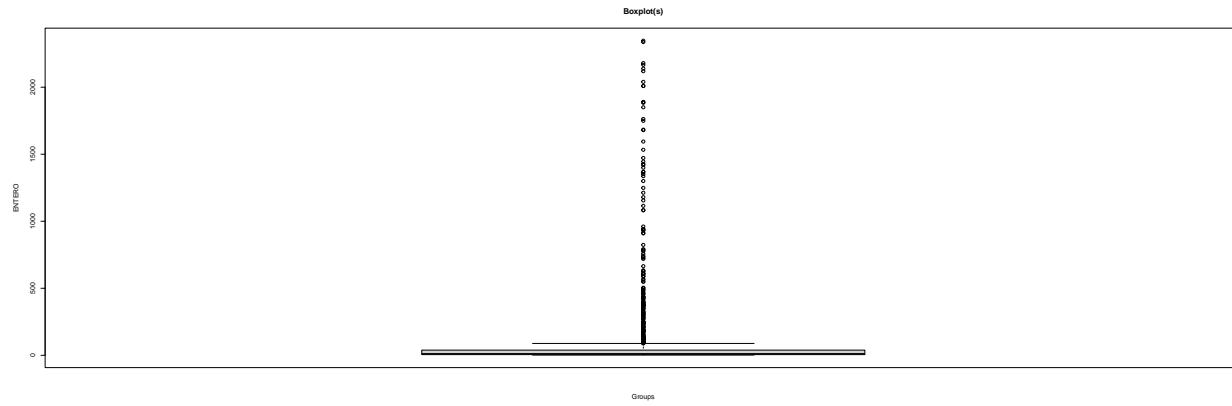
```



```

## [1] 1614    2
##               metric          V2
## 1                      Variable: ENTERO
## 2      Total N:
## 3          Count       1557
## 4          NA Count      0
## 5          Mean        91.784
## 6          Median       11.698
## 7  Standard Deviation     275.13
## 8          Variance     75696.459
## 9          Range       2344.566
## 10         Min          2
## 11         Max       2346.566
## 12  25th Percentile      5.128
## 13  75th Percentile      38.694
## 14 Subset w/o Outliers:
## 15         Count       1516
## 16         %        97.4%
## 17  Outlier %        2.6%
## 18          NA Count      0
## 19          Mean        52.359
## 20          Median       11.146
## 21  Standard Deviation   118.074
## 22          Variance     13941.503
## 23          Range       909.627
## 24         Min          2
## 25         Max       911.627

```



```

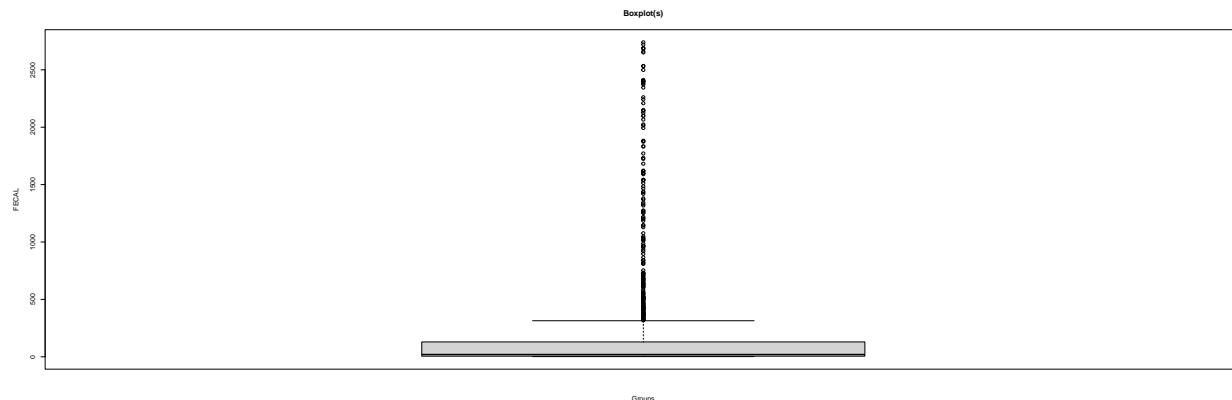
## [1] 1614    2
##               metric          V2
## 1                      Variable: FECAL
## 2      Total N:
## 3          Count       1562
## 4          NA Count      0
## 5          Mean        177.977
## 6          Median       20.506
## 7  Standard Deviation     421.323
## 8          Variance     177512.97
## 9          Range       2737.584
## 10         Min          2
## 11         Max       2739.584

```

```

## 12      25th Percentile       6.048
## 13      75th Percentile     129.582
## 14 Subset w/o Outliers:
## 15          Count      1509
## 16          %        96.6%
## 17      Outlier %       3.4%
## 18      NA Count        0
## 19          Mean     111.629
## 20          Median    18.395
## 21 Standard Deviation   219.97
## 22          Variance  48386.762
## 23          Range    1436.388
## 24          Min      2
## 25          Max    1438.388

```

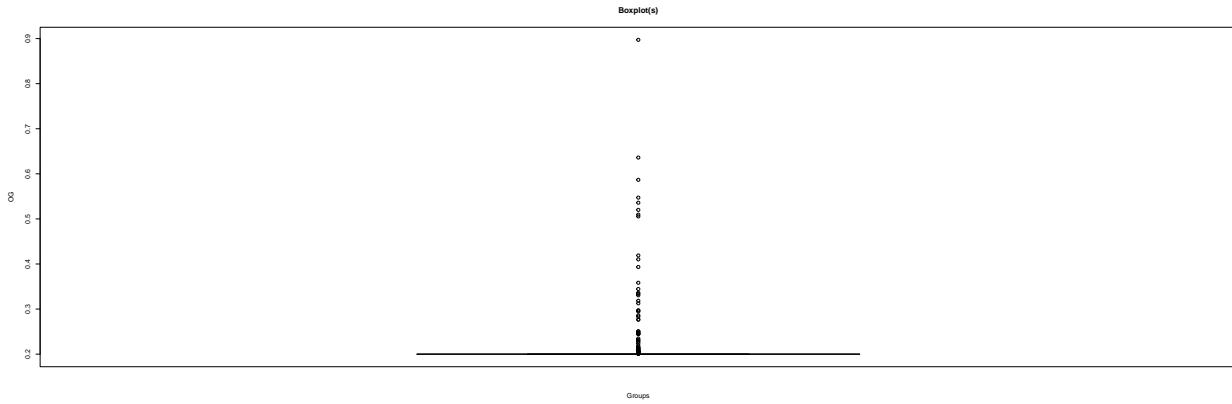


```

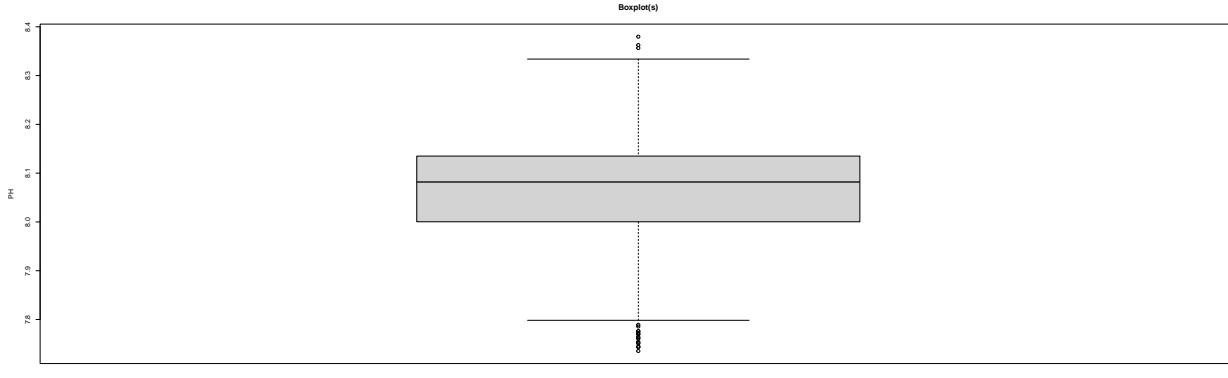
## [1] 351  2
##               metric      V2
## 1                   Variable: OG
## 2      Total N:
## 3          Count      345
## 4          NA Count        0
## 5          Mean     0.218
## 6          Median    0.2
## 7 Standard Deviation  0.068
## 8          Variance  0.005
## 9          Range    0.697
## 10         Min      0.2
## 11         Max     0.897
## 12      25th Percentile    0.2
## 13      75th Percentile    0.2
## 14 Subset w/o Outliers:
## 15          Count      337
## 16          %        97.7%
## 17      Outlier %       2.3%
## 18      NA Count        0
## 19          Mean     0.209
## 20          Median    0.2
## 21 Standard Deviation  0.03
## 22          Variance  0.001
## 23          Range    0.219
## 24         Min      0.2

```

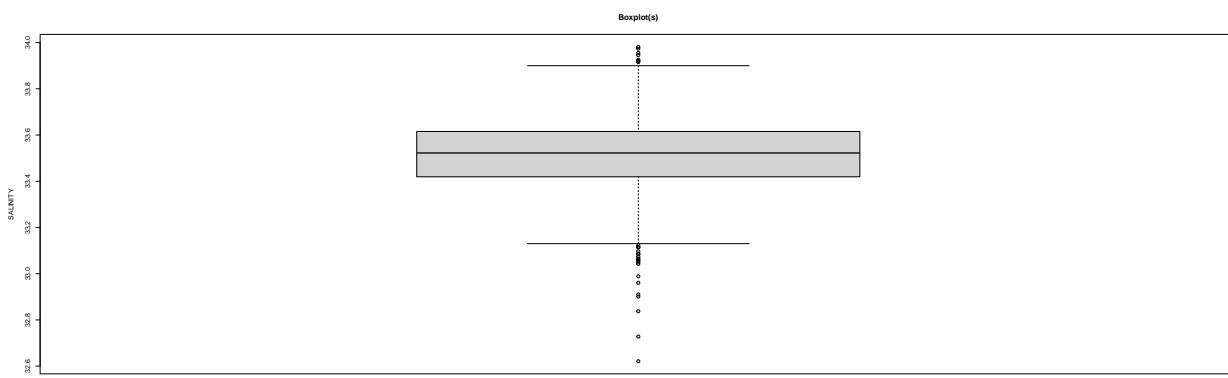
```
## 25          Max      0.419
```



```
## [1] 1205    2
##           metric      V2
## 1                      Variable: PH
## 2           Total N:
## 3           Count     1193
## 4       NA Count      0
## 5           Mean     8.066
## 6           Median    8.082
## 7 Standard Deviation   0.102
## 8           Variance   0.01
## 9           Range     0.644
## 10          Min      7.735
## 11          Max      8.38
## 12 25th Percentile     8
## 13 75th Percentile    8.135
## 14 Subset w/o Outliers:
## 15          Count     1185
## 16          %      99.3%
## 17 Outlier %      0.7%
## 18       NA Count      0
## 19           Mean     8.068
## 20           Median    8.082
## 21 Standard Deviation   0.099
## 22           Variance   0.01
## 23           Range     0.602
## 24          Min      7.761
## 25          Max      8.363
```



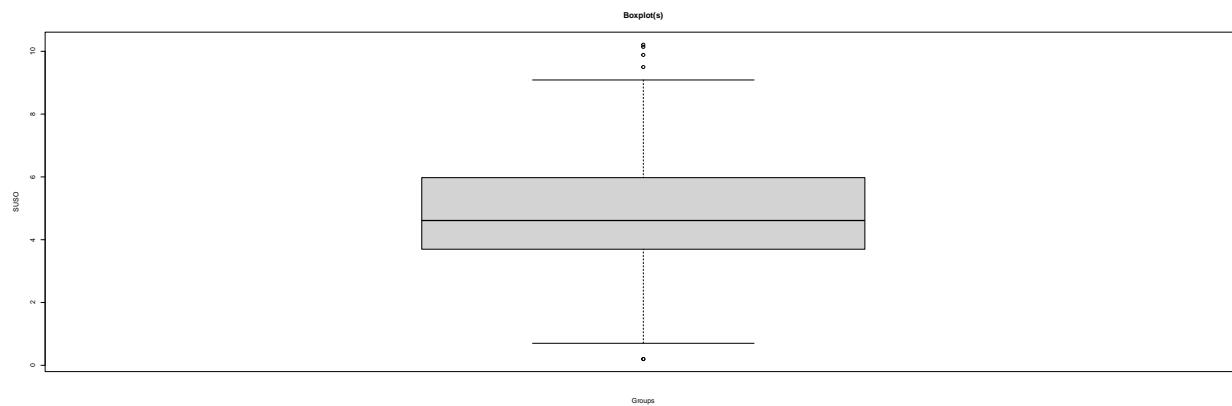
```
## [1] 1198    2
##           metric          V2
## 1             Variable: SALINITY
## 2             Total N:
## 3             Count        1195
## 4             NA Count      0
## 5             Mean       33.516
## 6             Median      33.522
## 7             Standard Deviation 0.161
## 8             Variance     0.026
## 9             Range        1.36
## 10            Min         32.621
## 11            Max         33.981
## 12            25th Percentile 33.419
## 13            75th Percentile 33.615
## 14 Subset w/o Outliers:
## 15            Count        1188
## 16            %        99.4%
## 17            Outlier %      0.6%
## 18            NA Count      0
## 19            Mean       33.52
## 20            Median      33.523
## 21            Standard Deviation 0.152
## 22            Variance     0.023
## 23            Range        0.939
## 24            Min         33.042
## 25            Max         33.981
```



```

## [1] 367    2
##               metric          V2
## 1                   Variable: SUSO
## 2           Total N:
## 3             Count      363
## 4            NA Count     0
## 5             Mean      4.838
## 6             Median     4.611
## 7 Standard Deviation     1.708
## 8            Variance    2.918
## 9             Range     10.009
## 10            Min       0.2
## 11            Max      10.209
## 12   25th Percentile    3.697
## 13   75th Percentile    5.977
## 14 Subset w/o Outliers:
## 15            Count      361
## 16            %      99.4%
## 17        Outlier %     0.6%
## 18            NA Count     0
## 19             Mean      4.808
## 20             Median     4.607
## 21 Standard Deviation     1.666
## 22            Variance    2.775
## 23             Range     9.685
## 24            Min       0.2
## 25            Max      9.885

```



```

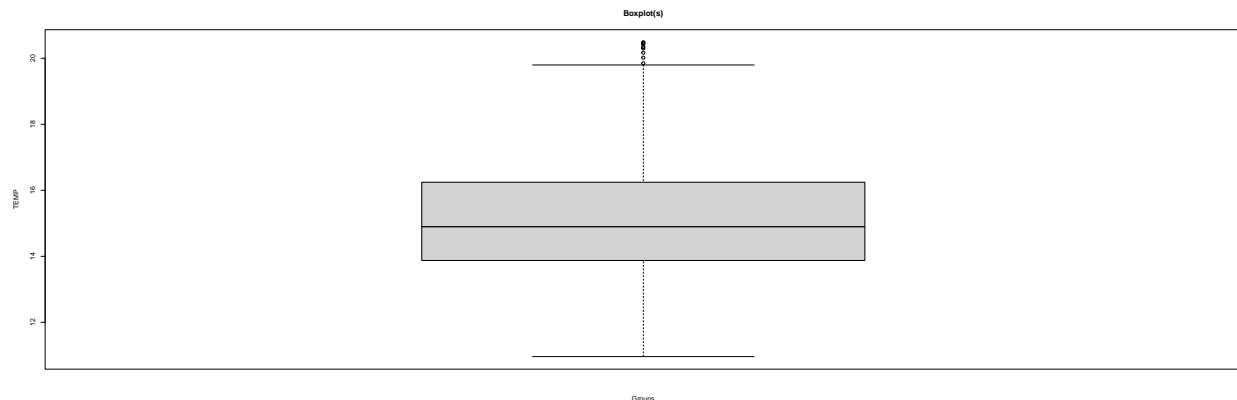
## [1] 1547    2
##               metric          V2
## 1                   Variable: TEMP
## 2           Total N:
## 3             Count      1538
## 4            NA Count     0
## 5             Mean      15.11
## 6             Median     14.897
## 7 Standard Deviation     1.73
## 8            Variance    2.992
## 9             Range      9.52
## 10            Min      10.963
## 11            Max      20.483

```

```

## 12      25th Percentile      13.876
## 13      75th Percentile      16.244
## 14 Subset w/o Outliers:
## 15          Count      1534
## 16          %      99.7%
## 17      Outlier %      0.3%
## 18      NA Count      0
## 19          Mean      15.097
## 20          Median      14.893
## 21 Standard Deviation      1.711
## 22          Variance      2.926
## 23          Range      9.335
## 24          Min      10.963
## 25          Max      20.298

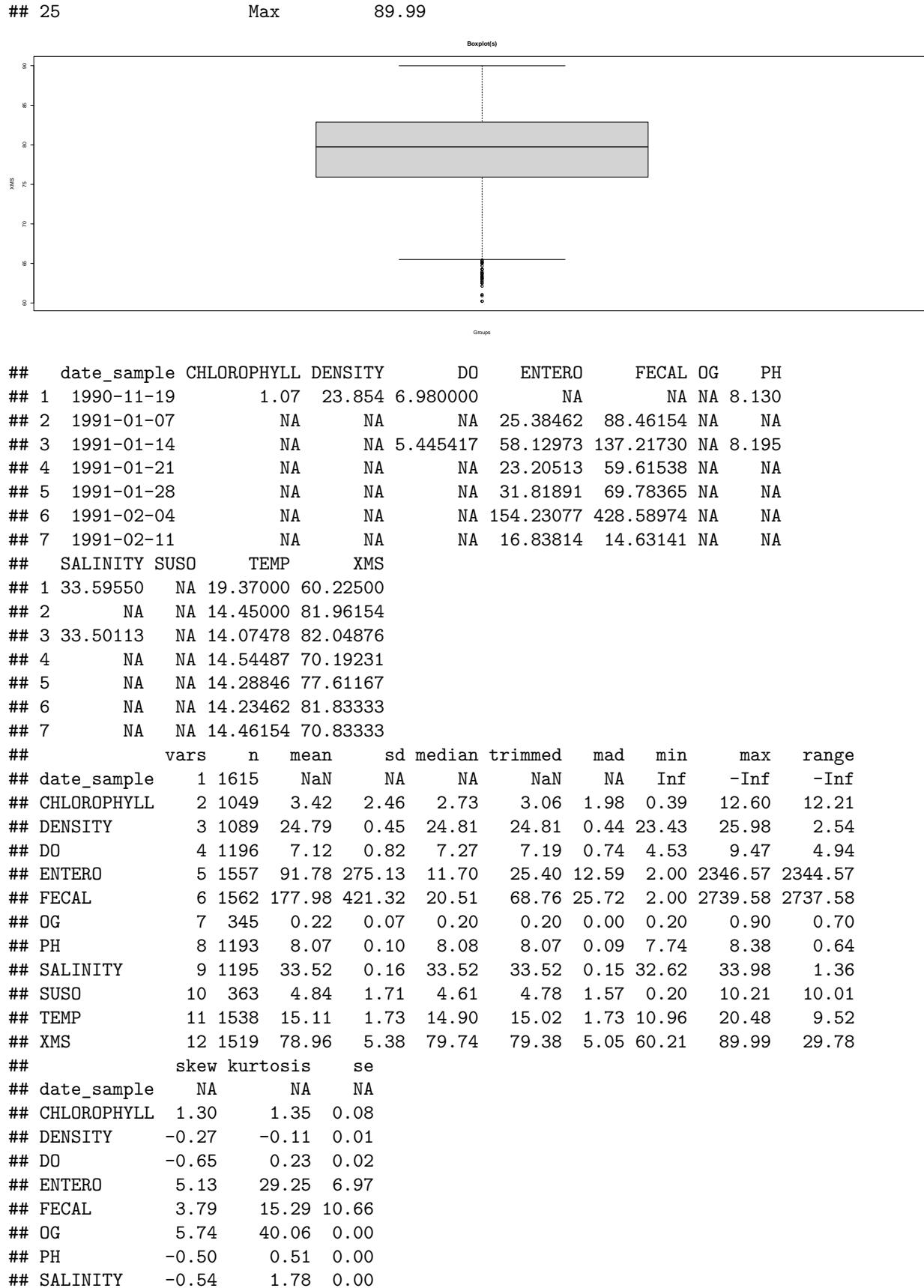
```



```

## [1] 1540    2
##               metric      V2
## 1                   Variable: XMS
## 2           Total N:
## 3           Count      1519
## 4           NA Count      0
## 5           Mean      78.961
## 6           Median      79.742
## 7 Standard Deviation      5.384
## 8           Variance      28.987
## 9           Range      29.778
## 10          Min      60.212
## 11          Max      89.99
## 12      25th Percentile      75.922
## 13      75th Percentile      82.87
## 14 Subset w/o Outliers:
## 15          Count      1511
## 16          %      99.5%
## 17      Outlier %      0.5%
## 18      NA Count      0
## 19          Mean      79.053
## 20          Median      79.78
## 21 Standard Deviation      5.246
## 22          Variance      27.52
## 23          Range      27.089
## 24          Min      62.901

```



```

## SUSO      0.37    0.29  0.09
## TEMP      0.48   -0.16  0.04
## XMS     -0.73    0.33  0.14
##          date_sample parameter      Avg
## Not NA n    36811     36811 35669.000
## NA n        0         0    1142.000
## Not NA %     1         1    0.969
## NA %        0         0    0.031

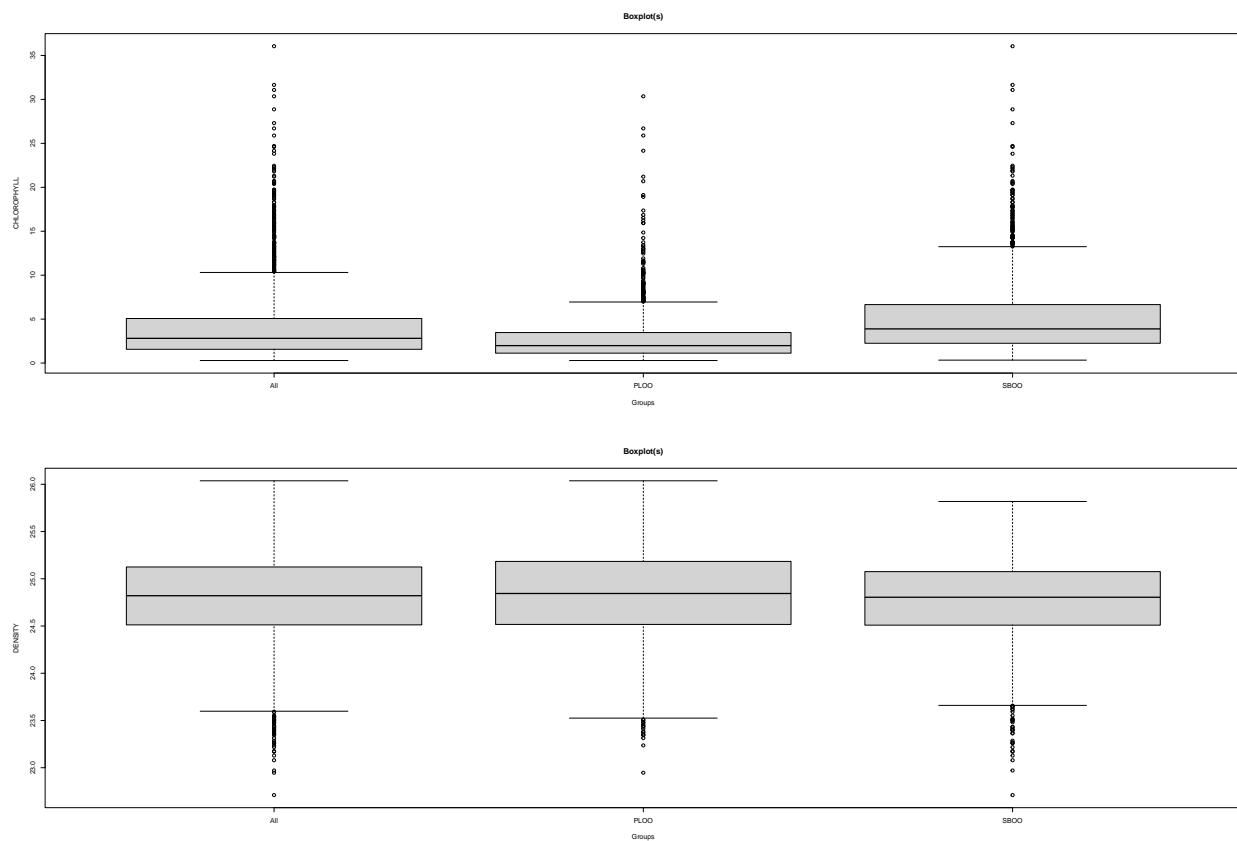
```

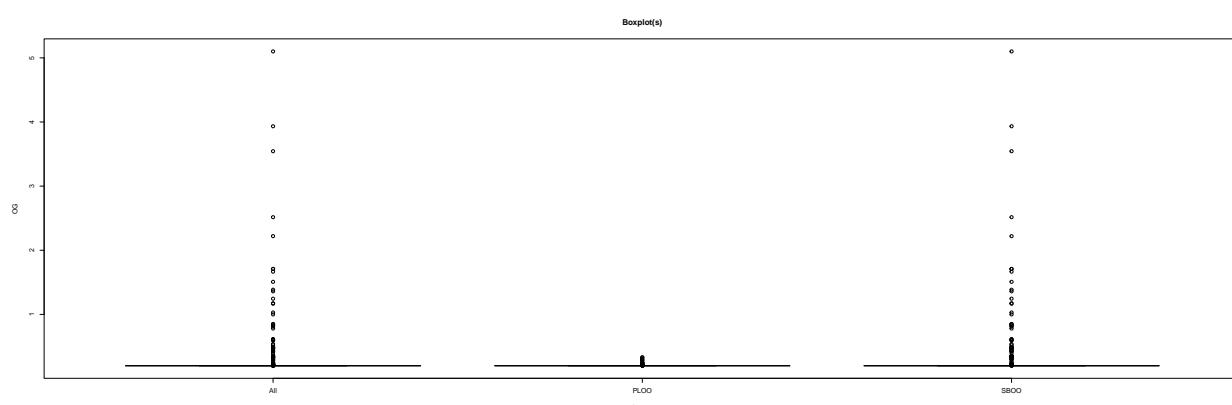
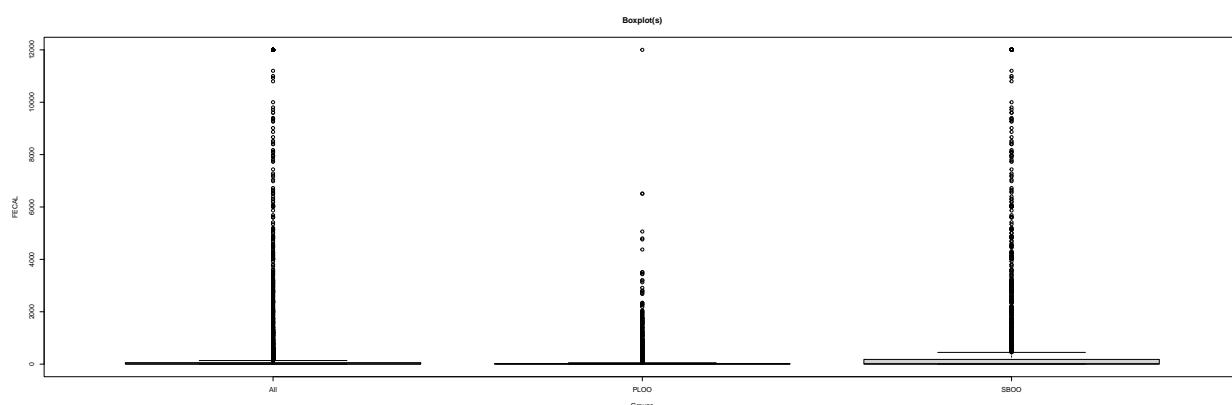
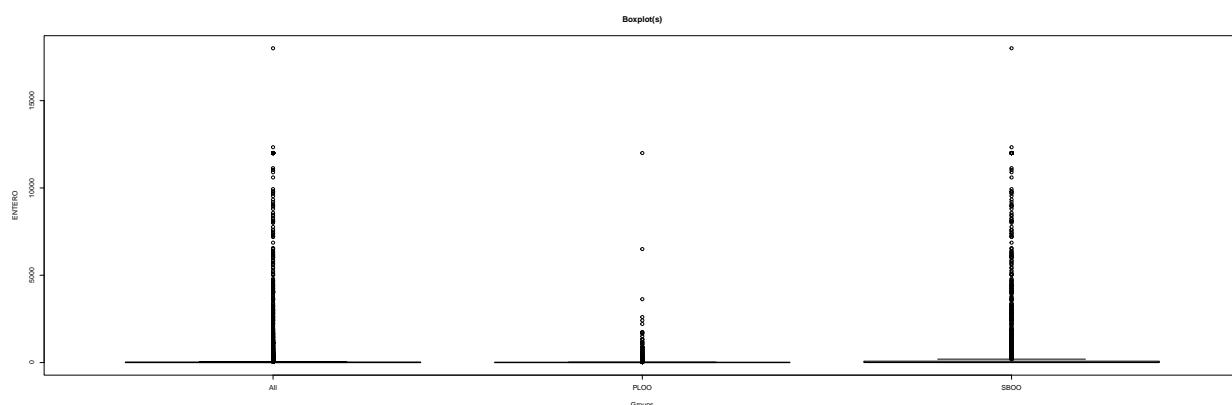
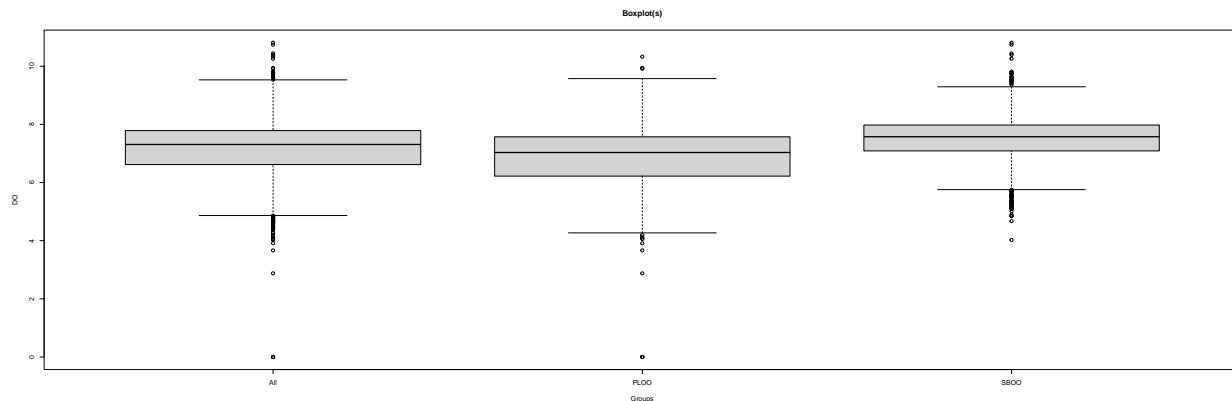
Run custom function on data aggregated by `date_sample`, `project` and `parameter`

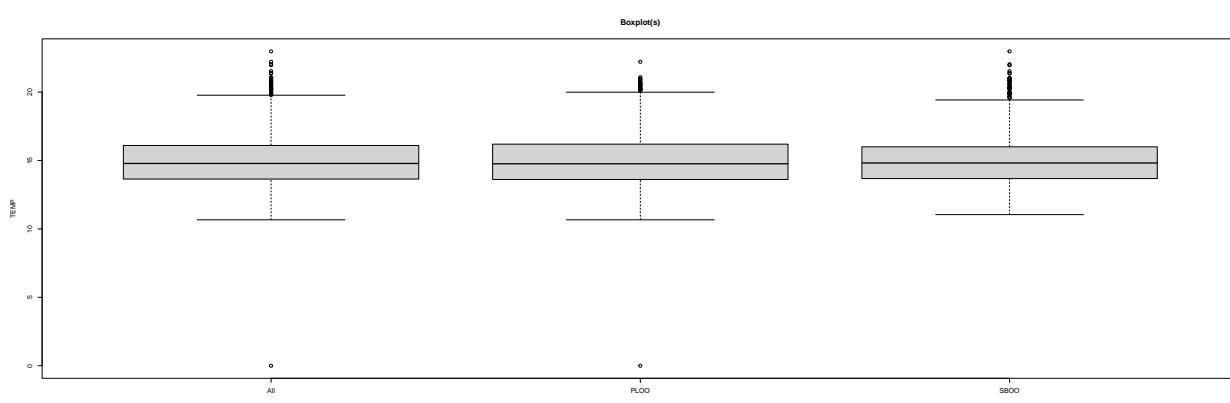
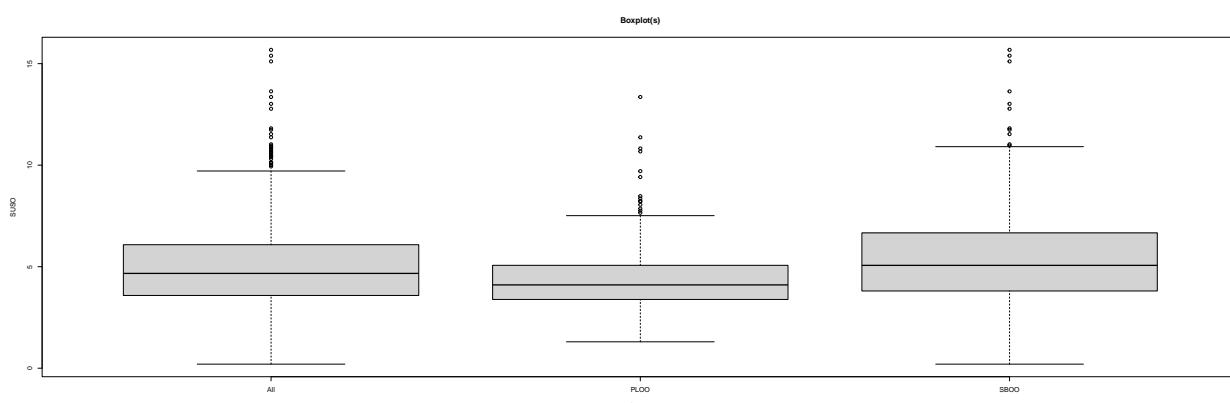
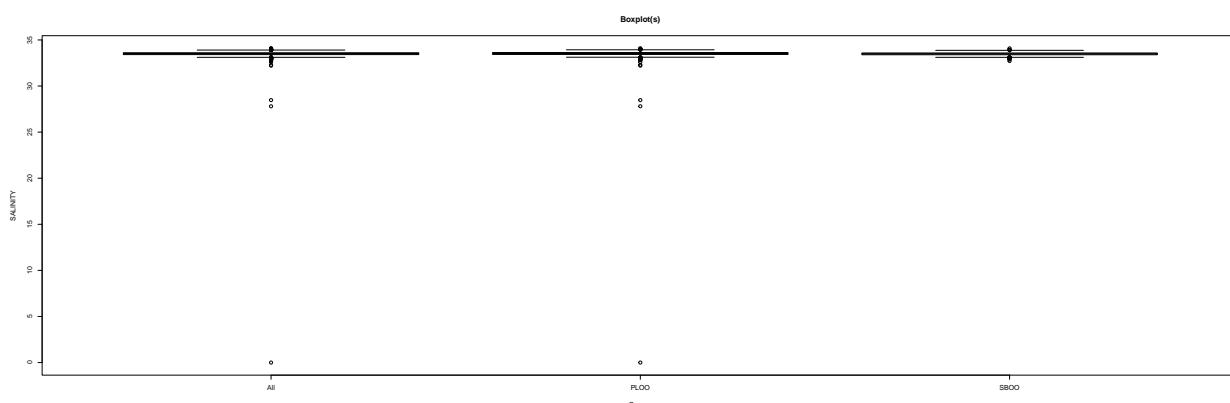
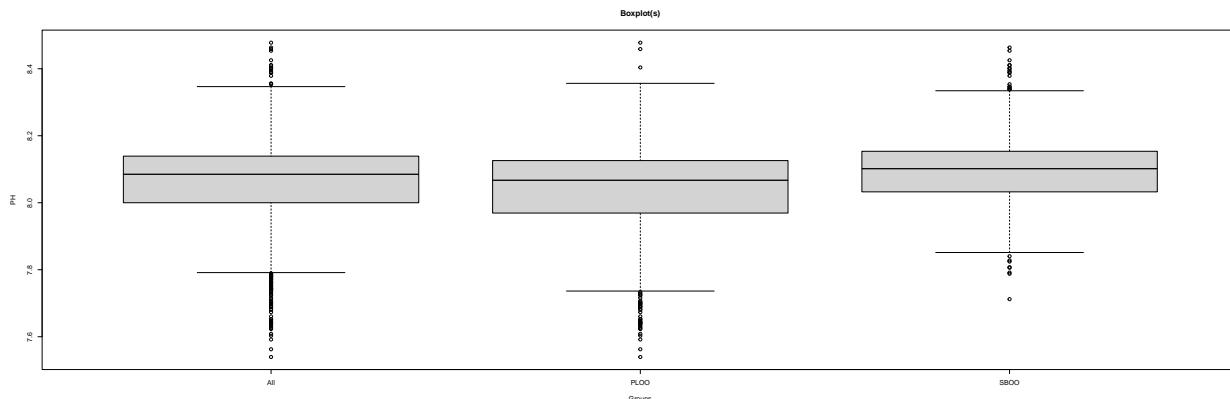
```

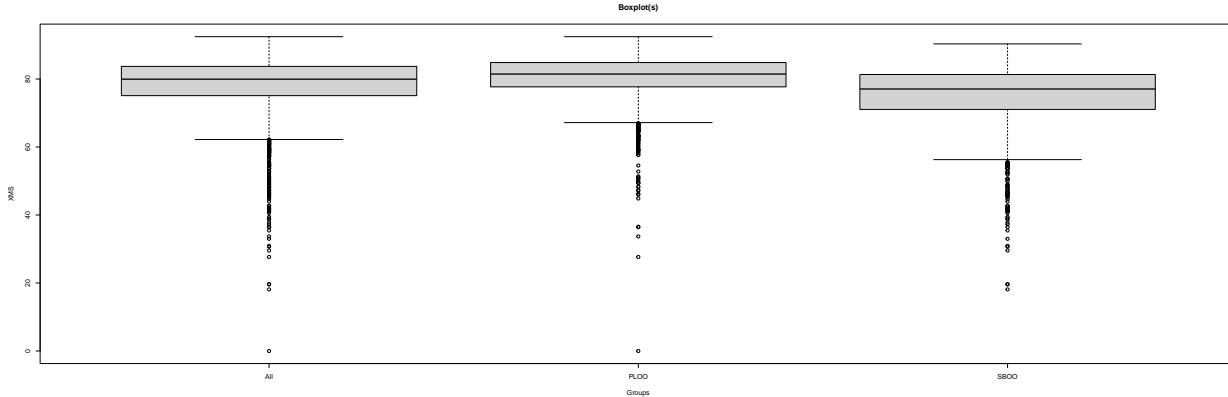
owt_df02_gb09_mrgd = ts_eda(ts_df = owt_df02_gb09,
                             form_lead = c("date_sample", "project"),
                             form_cast = "parameter",
                             param_lst = param_lst02,
                             l1_col = c("project"),
                             l1_param = c("PLOO", "SBOO"),
                             rtn_met = FALSE,
                             box = FALSE,
                             week_agg = FALSE
)

```









```

##   date_sample project CHLOROPHYLL DENSITY      DO      ENTERO      FECAL OG     PH
## 1 1990-11-15    PL00       0.87 23.855 6.55000      NA      NA NA 8.080
## 2 1990-11-15    SB00       1.27 23.853 7.41000      NA      NA NA 8.180
## 3 1991-01-02    PL00       NA     NA     NA 32.05128 125.64103 NA  NA
## 4 1991-01-03    PL00       NA     NA     NA 18.71795 51.28205 NA  NA
## 5 1991-01-07    PL00       NA     NA     NA 106.15385 80.76923 NA  NA
## 6 1991-01-08    PL00       NA     NA     NA 40.00000 40.55556 NA  NA
## 7 1991-01-09    PL00       NA     NA 5.47625 20.33898 40.50847 NA 8.195
##   SALINITY SUSO      TEMP      XMS
## 1 33.61700    NA 19.43000 44.85000
## 2 33.57400    NA 19.31000 75.60000
## 3    NA        NA 14.50769 80.02564
## 4    NA        NA 14.39231 83.89744
## 5    NA        NA 14.54103 78.97436
## 6    NA        NA 13.43000 80.20000
## 7 33.51938    NA 14.26889 86.21111
##   vars      n      mean       sd median trimmed  mad      min      max
##   date_sample  1    7037      NaN       NA     NA  NaN  NA Inf -Inf
##   project*     2    7037     1.43      0.50     1.00  1.42  0.00  1.00  2.00
##   CHLOROPHYLL 3    3023     4.01      3.81     2.81  3.31  2.27  0.29 36.05
##   DENSITY      4    3177    24.79      0.47    24.82  24.81  0.45 22.71 26.04
##   DO           5    3434     7.15      0.97     7.31  7.22  0.82  0.00 10.81
##   ENTERO       6    6776   253.64  1249.91    5.27 18.53  4.84  0.00 18000.00
##   FECAL        7    6594   355.65  1401.82    7.07 48.93  7.51  0.00 12000.00
##   OG           8     937     0.24      0.29     0.20  0.20  0.00  0.20  5.10
##   PH           9    3396     8.07      0.11     8.08  8.07  0.10  7.54  8.48
##   SALINITY     10   3434    33.50      0.61    33.52  33.51  0.15  0.00 34.10
##   SUSO         11    977     4.99      2.16     4.67  4.80  1.80  0.20 15.68
##   TEMP          12   4524    14.97      1.91    14.78  14.87  1.80  0.00 22.97
##   XMS          13   4494    78.31      8.29    79.96  79.37  6.18  0.00 92.46
##   range      skew kurtosis      se
##   date_sample -Inf      NA      NA  NA
##   project*      1.00    0.26   -1.93  0.01
##   CHLOROPHYLL  35.76    2.56    9.61  0.07
##   DENSITY       3.33   -0.46    0.38  0.01
##   DO            10.81   -0.89    3.49  0.02
##   ENTERO        18000.00   7.41   61.01 15.18
##   FECAL         12000.00   6.25   43.27 17.26
##   OG            4.90   10.89  144.21  0.01
##   PH            0.94   -0.67    1.45  0.00

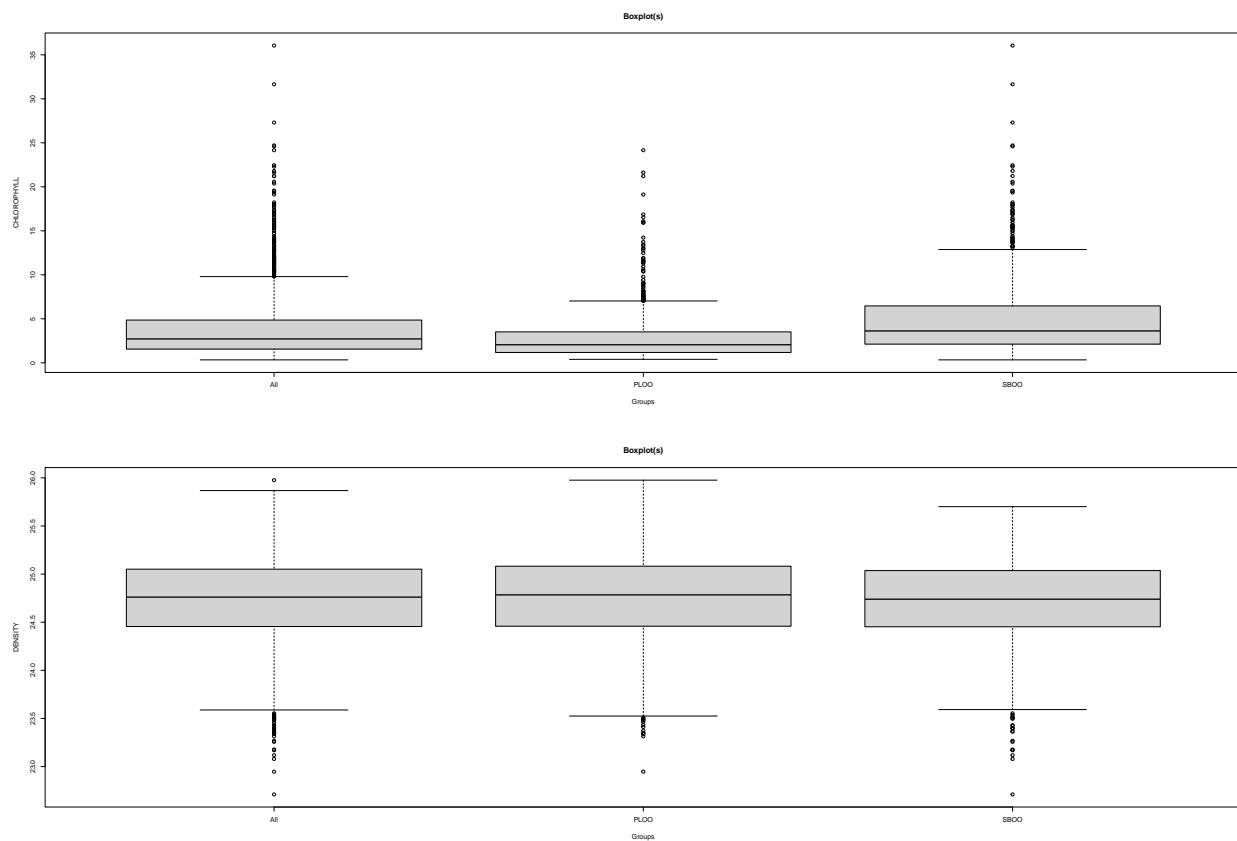
```

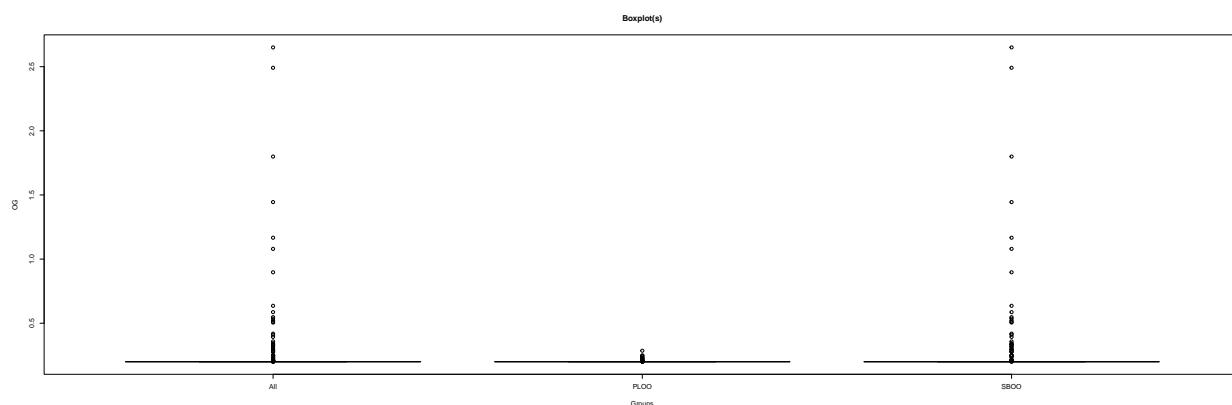
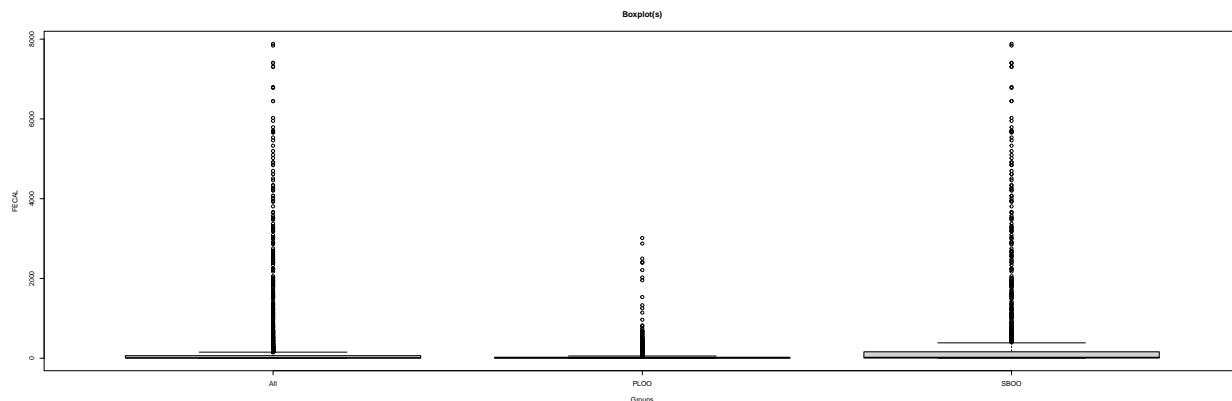
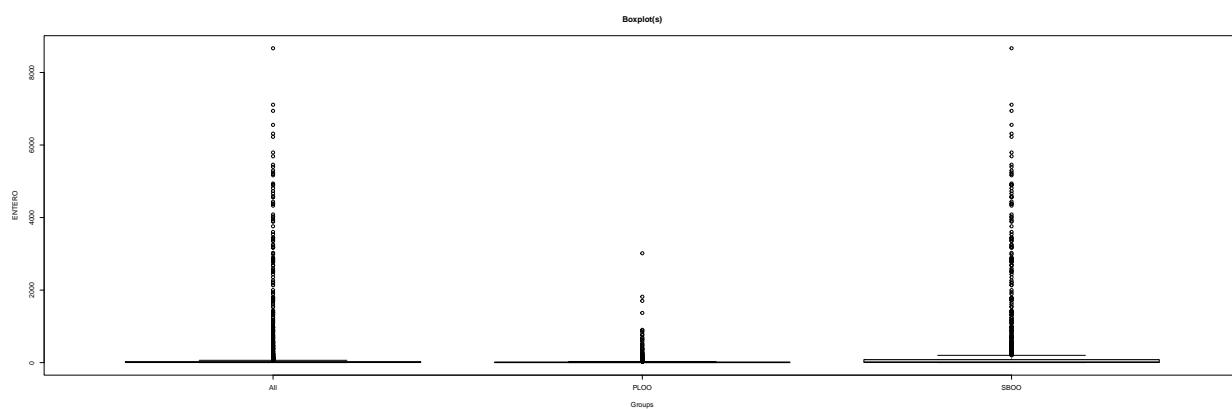
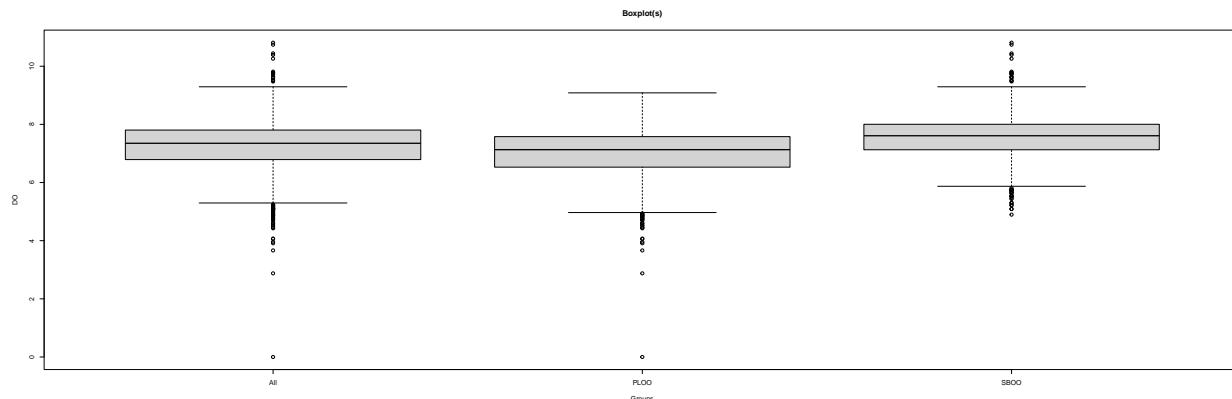
```

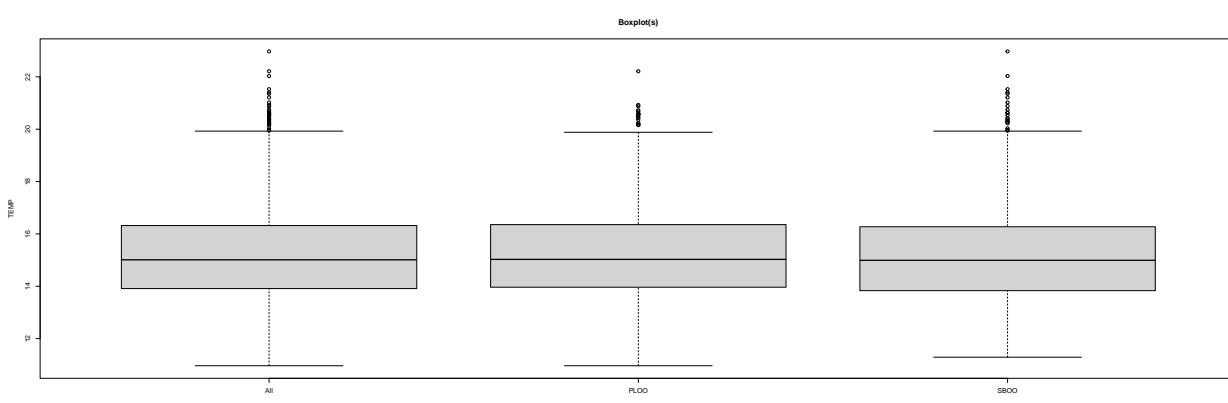
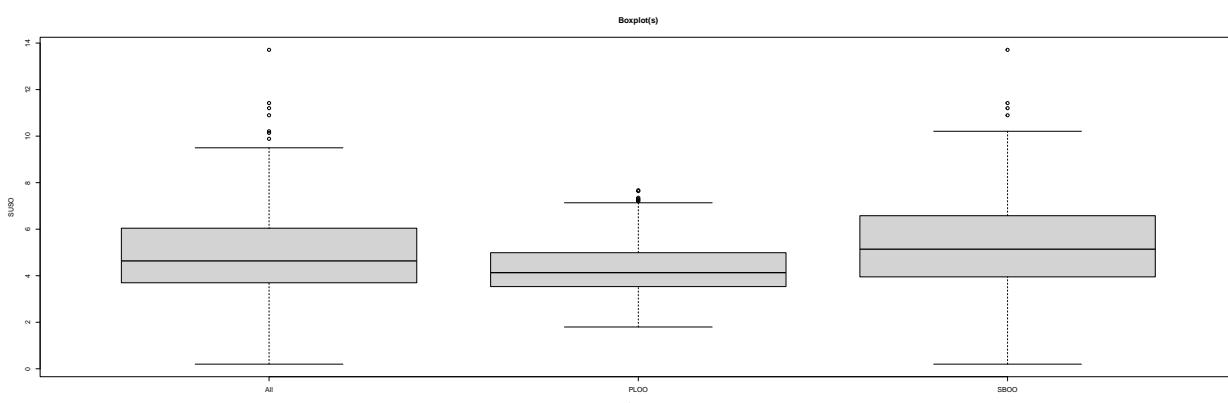
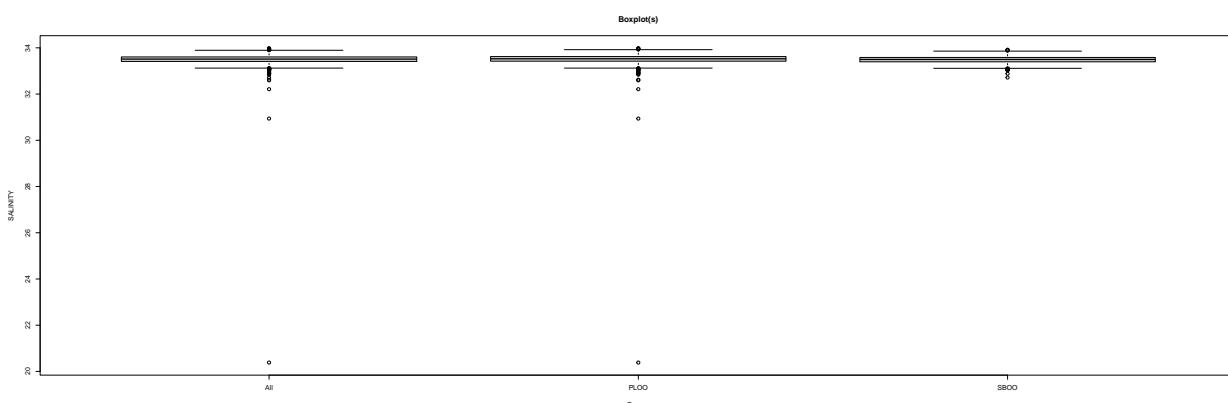
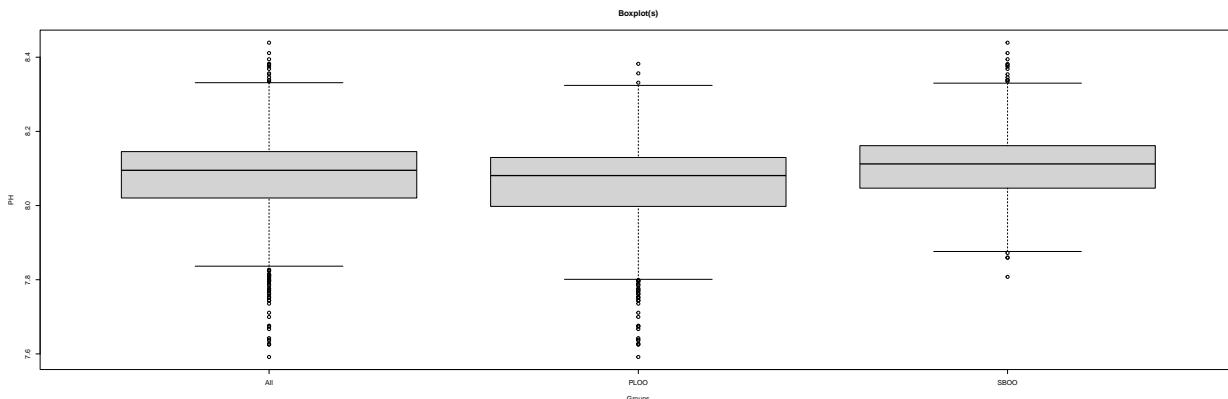
## SALINITY      34.10 -48.98  2674.00  0.01
## SUSO         15.48   1.09     2.23  0.07
## TEMP         22.97   0.43     0.95  0.03
## XMS          92.46  -2.00     7.54  0.12
##           date_sample project parameter      Avg
## Not NA n    48395    48395     48395 47222.0000
## NA n        0        0        0    1173.0000
## Not NA %    1        1        1    0.9758
## NA %        0        0        0    0.0242

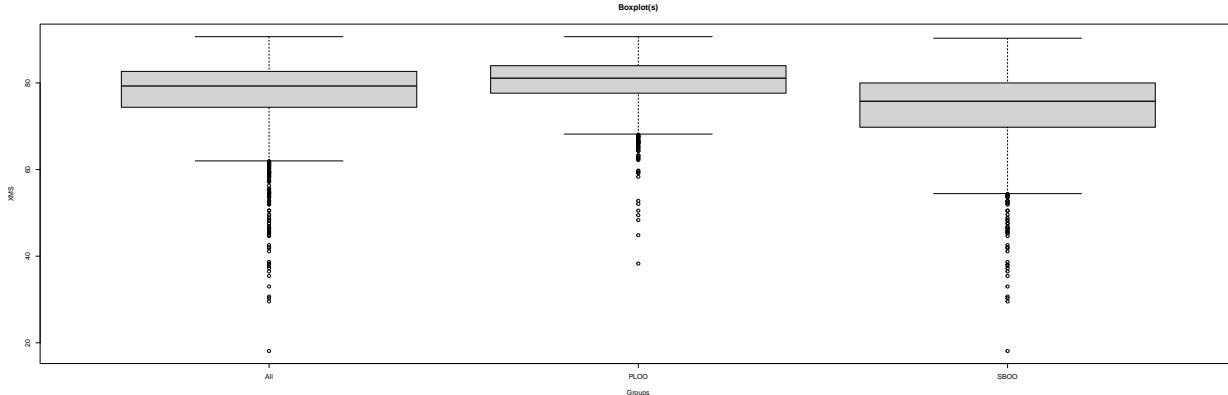
owt_df02_gb09_wkly = ts_eda(ts_df = owt_df02_gb09,
                             form_lead = c("date_sample", "project"),
                             form_cast = "parameter",
                             param_lst = param_lst02,
                             l1_col = c("project"),
                             l1_param = c("PLOO", "SBOO"),
                             rtn_met = FALSE,
                             box = FALSE,
                             week_agg = TRUE
)

```









```

##   date_sample project CHLOROPHYLL DENSITY      DO     ENTERO     FECAL OG     PH
## 1 1990-11-19    PLOO       0.87 23.855 6.550000      NA      NA NA 8.080
## 2 1990-11-19    SB00       1.27 23.853 7.410000      NA      NA NA 8.180
## 3 1991-01-07    PLOO       NA     NA     NA 25.38462 88.46154 NA     NA
## 4 1991-01-14    PLOO       NA     NA     NA 5.445417 58.12973 137.21730 NA 8.195
## 5 1991-01-21    PLOO       NA     NA     NA 23.20513 59.61538 NA     NA
## 6 1991-01-28    PLOO       NA     NA     NA 31.81891 69.78365 NA     NA
## 7 1991-02-04    PLOO       NA     NA     NA 154.23077 428.58974 NA     NA
##   SALINITY SUSO      TEMP     XMS
## 1 33.61700    NA 19.43000 44.85000
## 2 33.57400    NA 19.31000 75.60000
## 3     NA     NA 14.45000 81.96154
## 4 33.50113    NA 14.07478 82.04876
## 5     NA     NA 14.54487 70.19231
## 6     NA     NA 14.28846 77.61167
## 7     NA     NA 14.23462 81.83333
##   vars     n   mean      sd median trimmed   mad   min   max range
##   date_sample 1 2802    NaN     NA     NA    NaN    NA Inf -Inf -Inf
##   project*    2 2802    1.43    0.49    1.00   1.41   0.00  1.00  2.00  1.00
##   CHLOROPHYLL 3 1967    3.89    3.68    2.71   3.19   2.09  0.33 36.05 35.72
##   DENSITY     4 2000    24.73    0.47   24.76  24.75   0.44 22.71 25.98  3.27
##   DO          5 2101    7.24    0.87    7.35   7.29   0.75  0.00 10.81 10.81
##   ENTERO      6 2786   169.27  699.74   7.58  17.88  7.65  2.00 8668.00 8666.00
##   FECAL       7 2786   233.75  815.20   9.45  42.01 10.37  2.00 7881.92 7879.92
##   OG          8  351     0.24    0.23    0.20   0.20   0.00  0.20  2.65  2.45
##   PH          9 2105     8.08    0.10    8.10   8.09   0.09  7.59  8.44  0.85
##   SALINITY    10 2097    33.50    0.33   33.51  33.51   0.14 20.38 33.98 13.60
##   SUSO        11  369     4.91    1.85    4.64   4.80   1.61  0.20 13.71 13.51
##   TEMP         12 2616    15.22    1.83   15.01  15.11   1.77 10.96 22.97 12.01
##   XMS         13 2606    77.43    8.03   79.29  78.55   5.84 18.11 90.68 72.57
##   skew kurtosis se
##   date_sample    NA      NA  NA
##   project*      0.30    -1.91 0.01
##   CHLOROPHYLL  2.63    10.24 0.08
##   DENSITY      -0.47     0.46 0.01
##   DO          -0.76     3.34 0.02
##   ENTERO       6.11    42.36 13.26
##   FECAL        5.43    33.41 15.44
##   OG           7.92    70.11 0.01
##   PH          -0.71     1.79 0.00

```

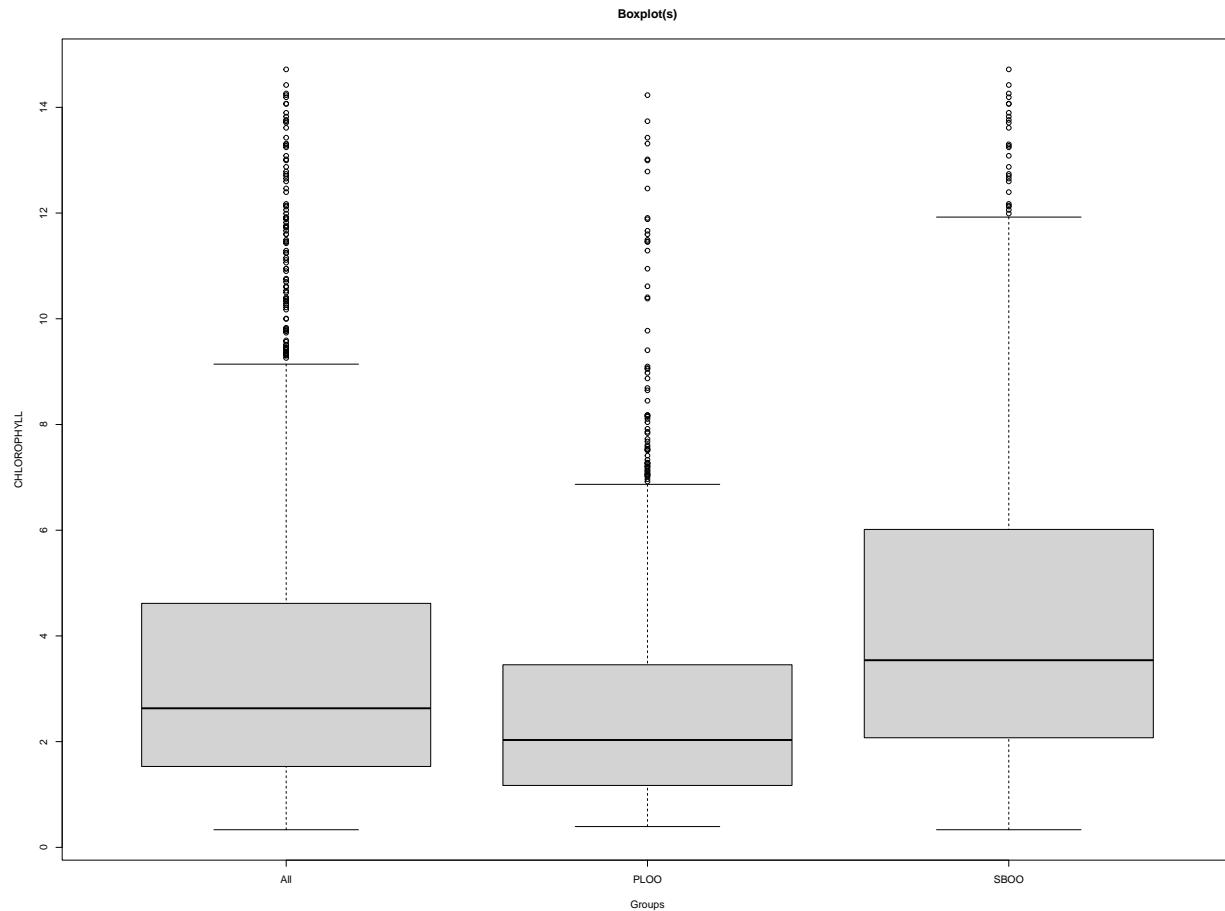
```

## SALINITY      -29.25  1137.46  0.01
## SUSO          0.79     1.80   0.10
## TEMP          0.61     0.27   0.04
## XMS           -1.91    5.85   0.16
##               date_sample project parameter      Avg
## Not NA n      48395    48395    48395 47222.0000
## NA n          0         0         0     1173.0000
## Not NA %      1         1         1     0.9758
## NA %          0         0         0     0.0242

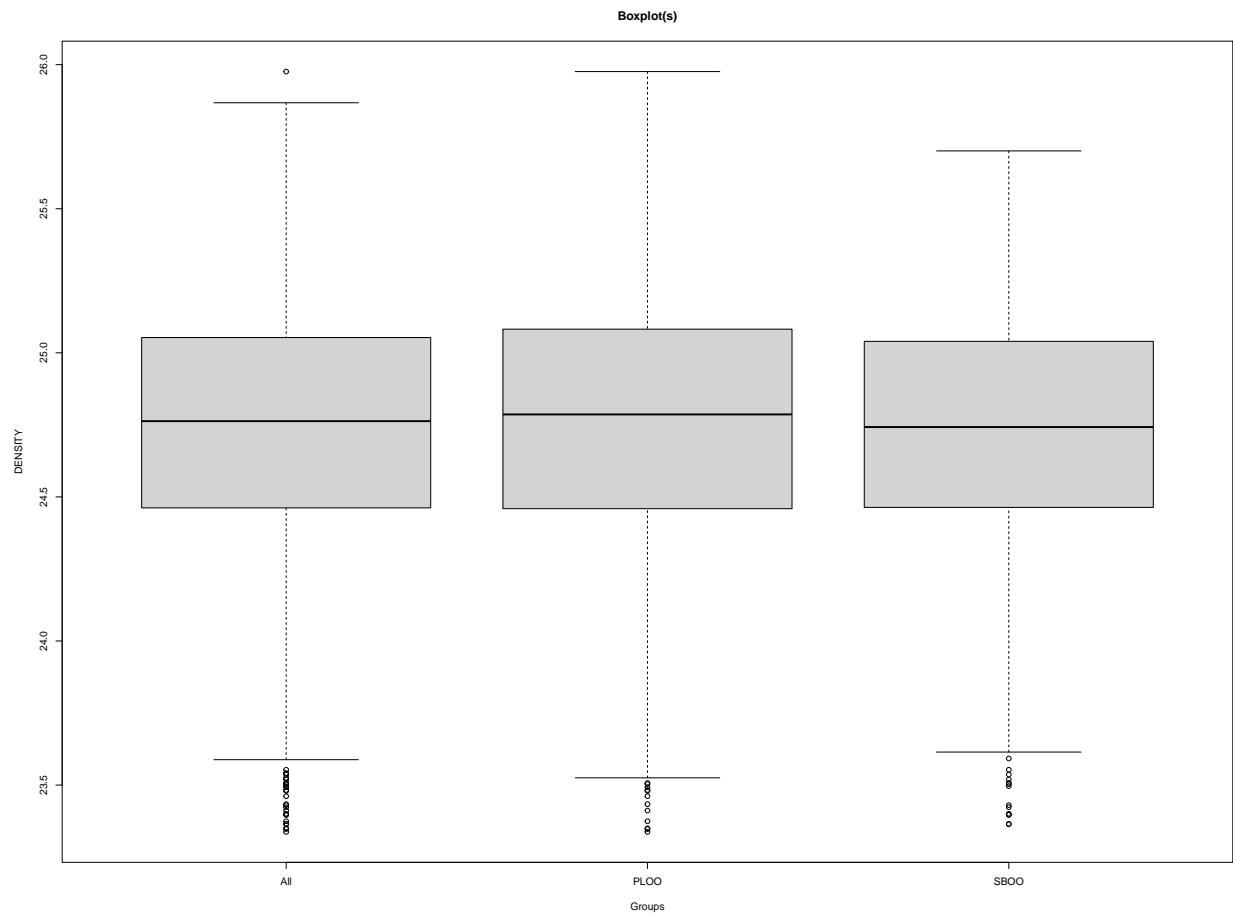
owt_df02_gb09_wkly02 = ts_eda(ts_df = owt_df02_gb09,
                               form_lead = c("date_sample", "project"),
                               form_cast = "parameter",
                               param_lst = param_lst02,
                               l1_col = c("project"),
                               l1_param = c("PLOO", "SBOO"),
                               rtn_met = FALSE,
                               box = FALSE,
                               week_agg = TRUE,
                               out_rm = TRUE
)

```

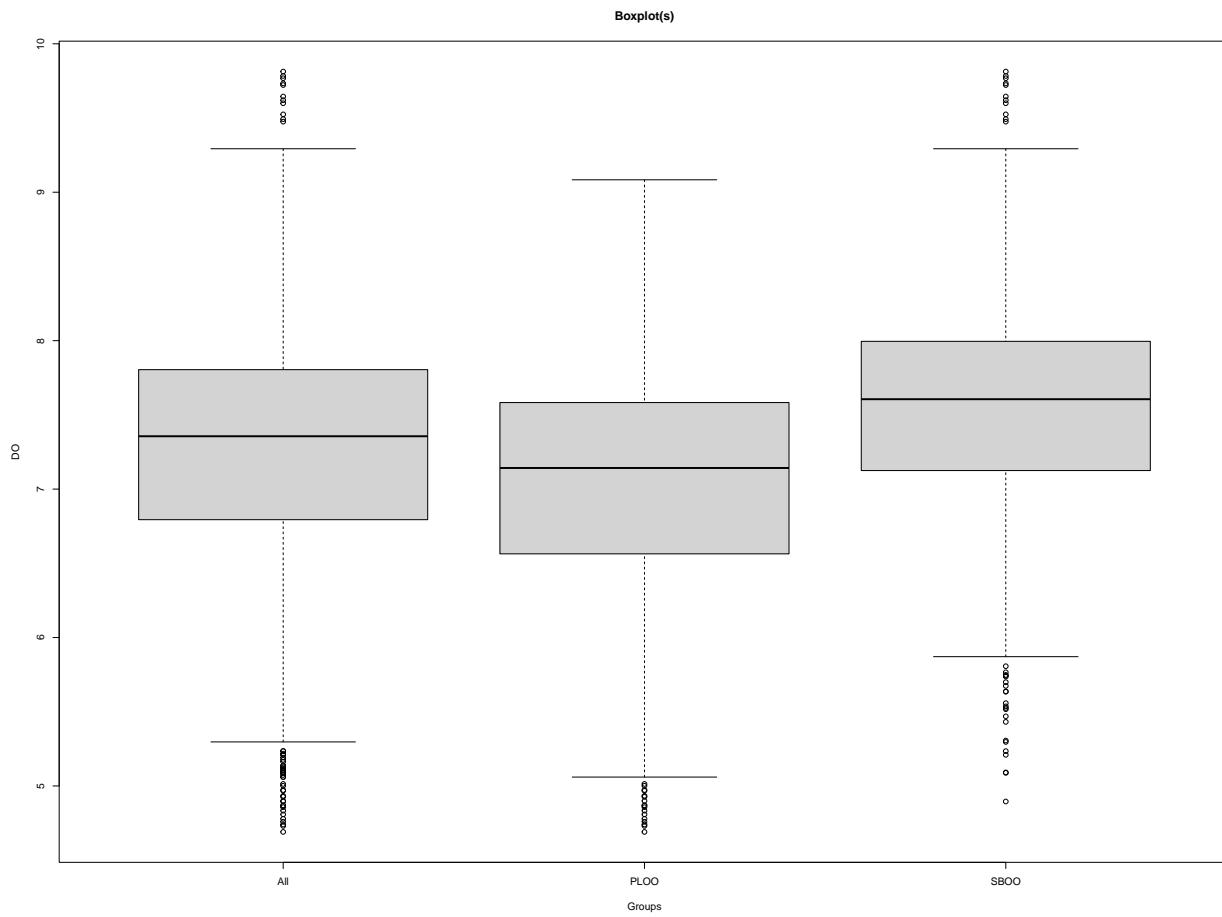
```
## [1] 1967      3
```



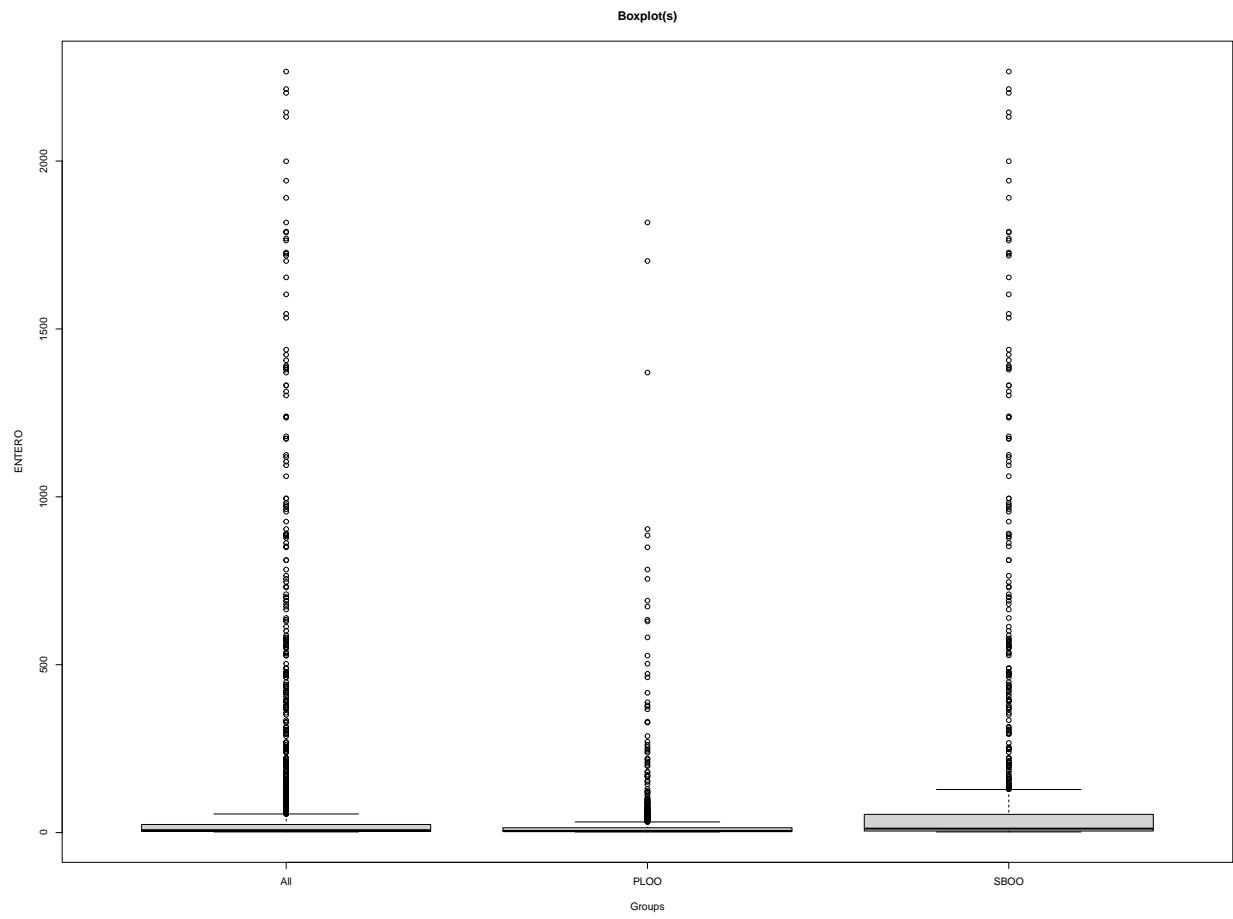
```
## [1] 2000      3
```



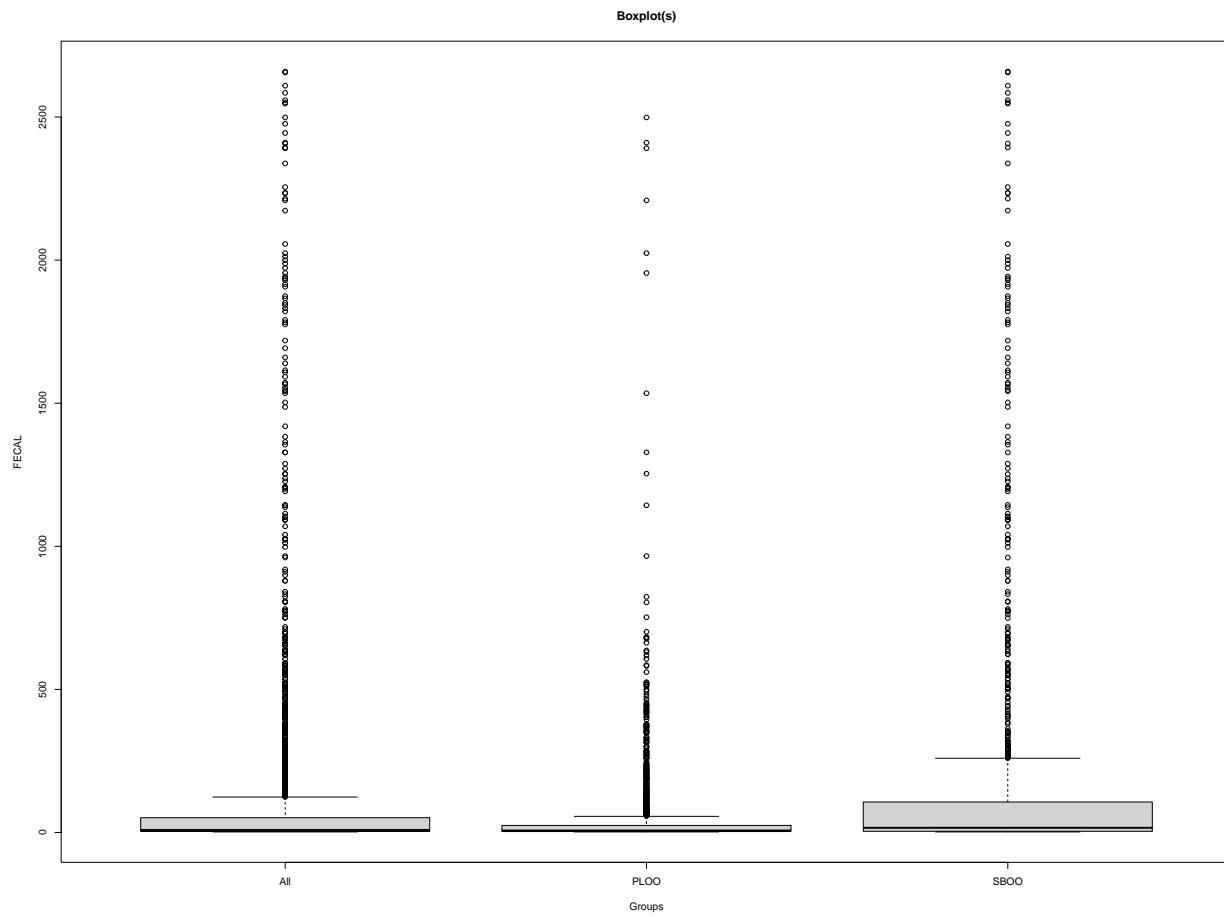
```
## [1] 2101      3
```



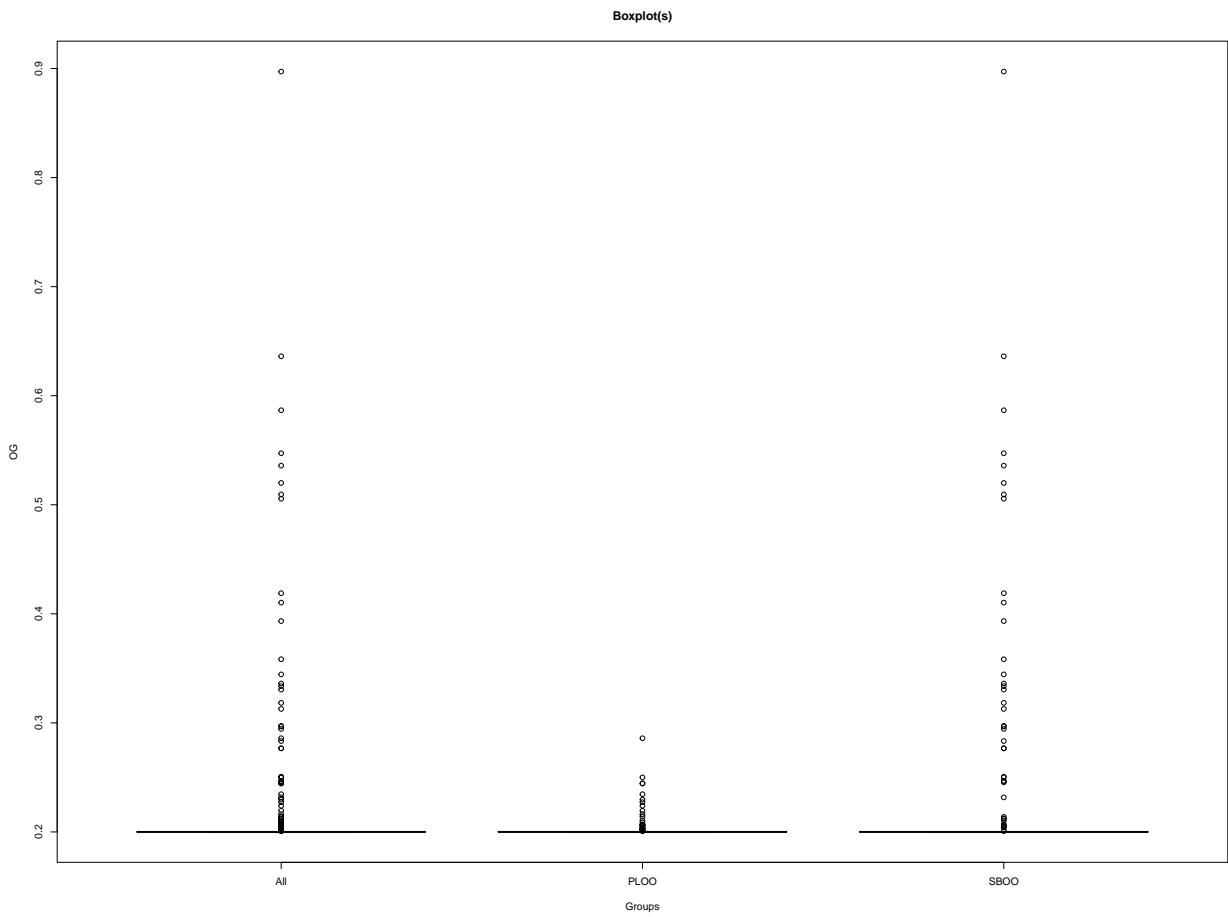
```
## [1] 2786      3
```



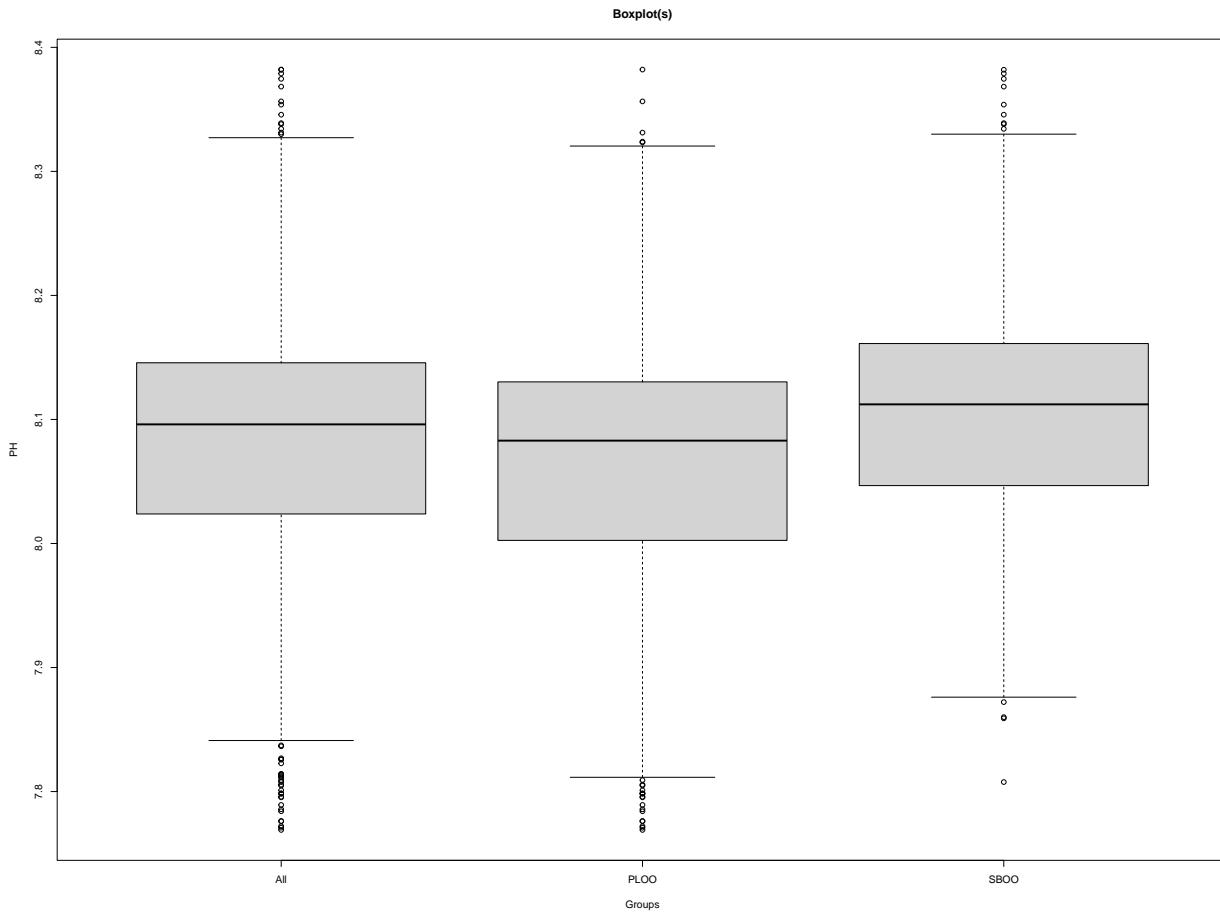
```
## [1] 2786      3
```



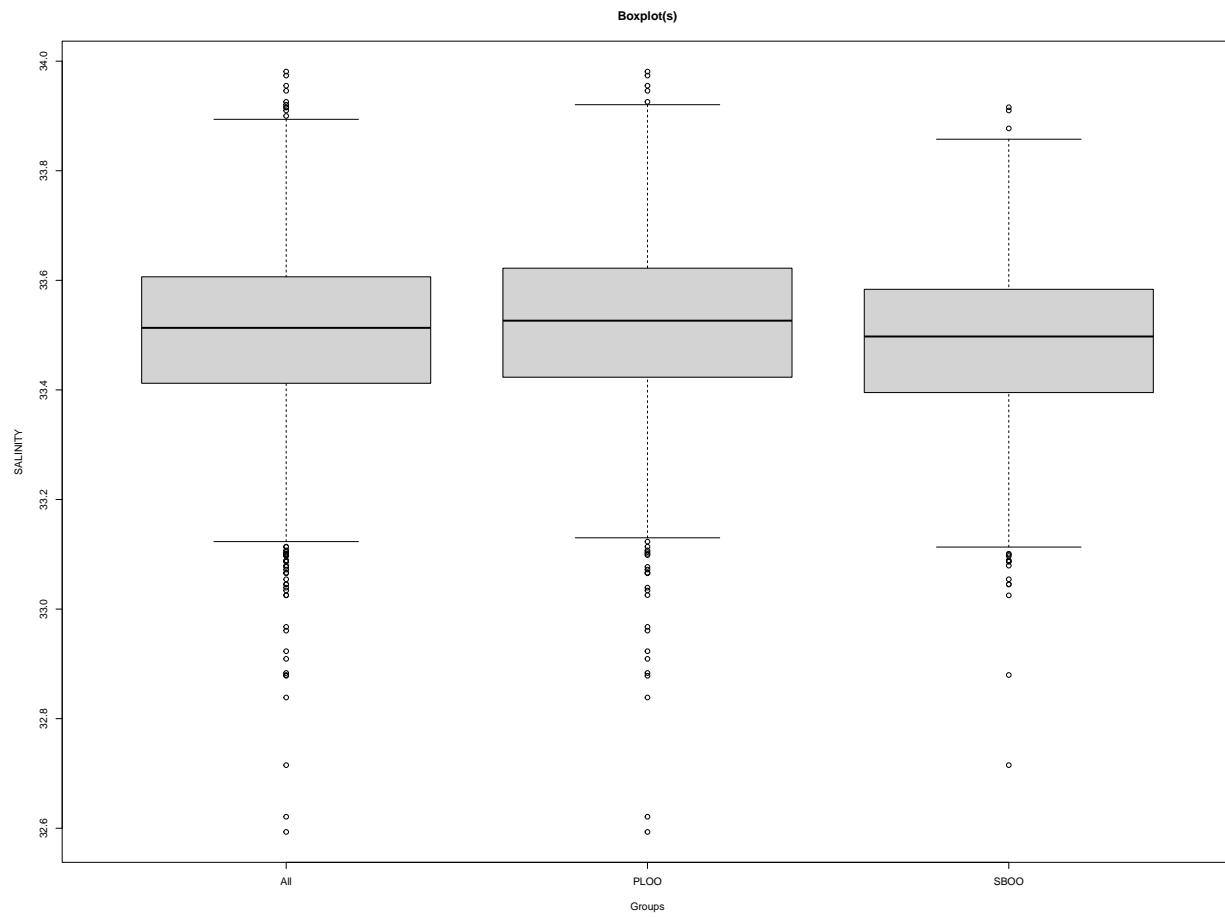
```
## [1] 351    3
```



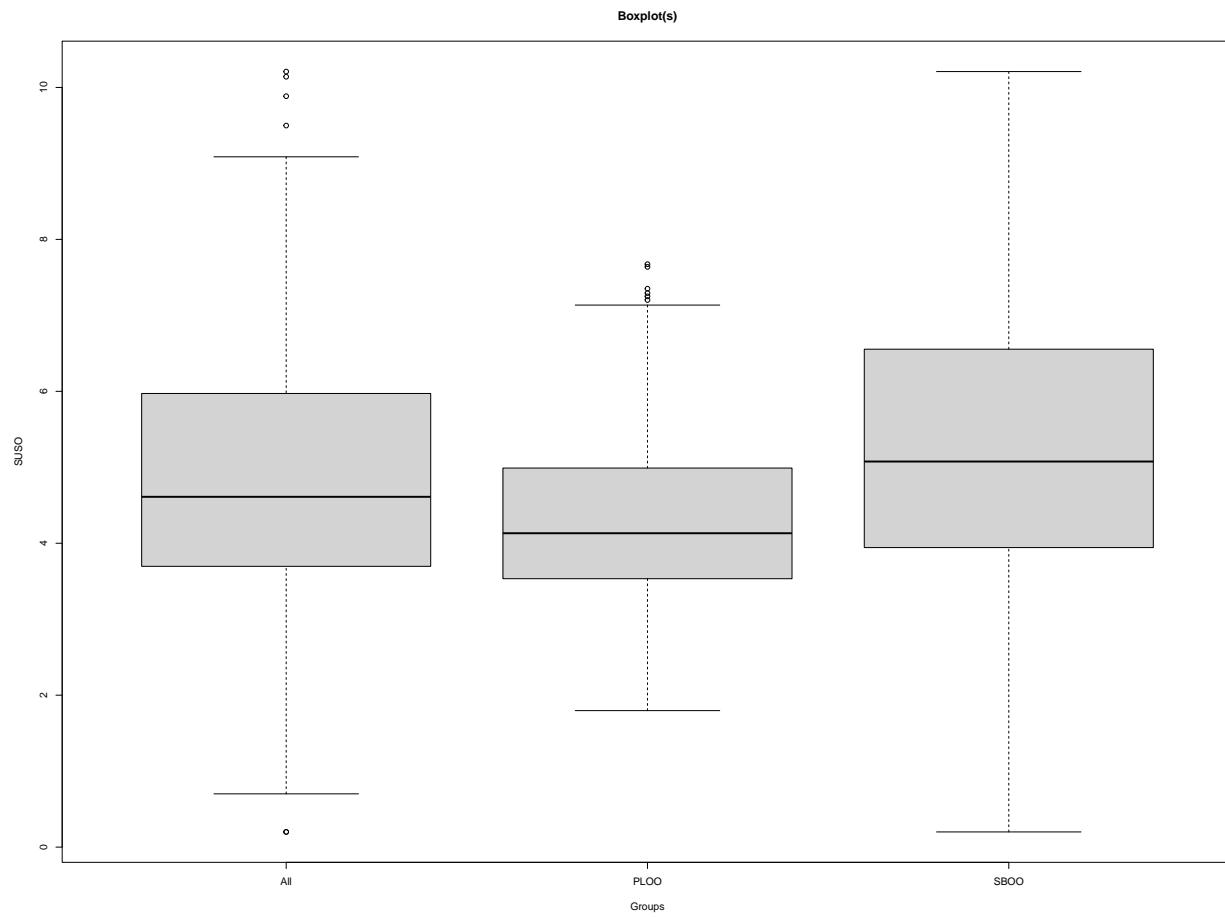
```
## [1] 2105      3
```



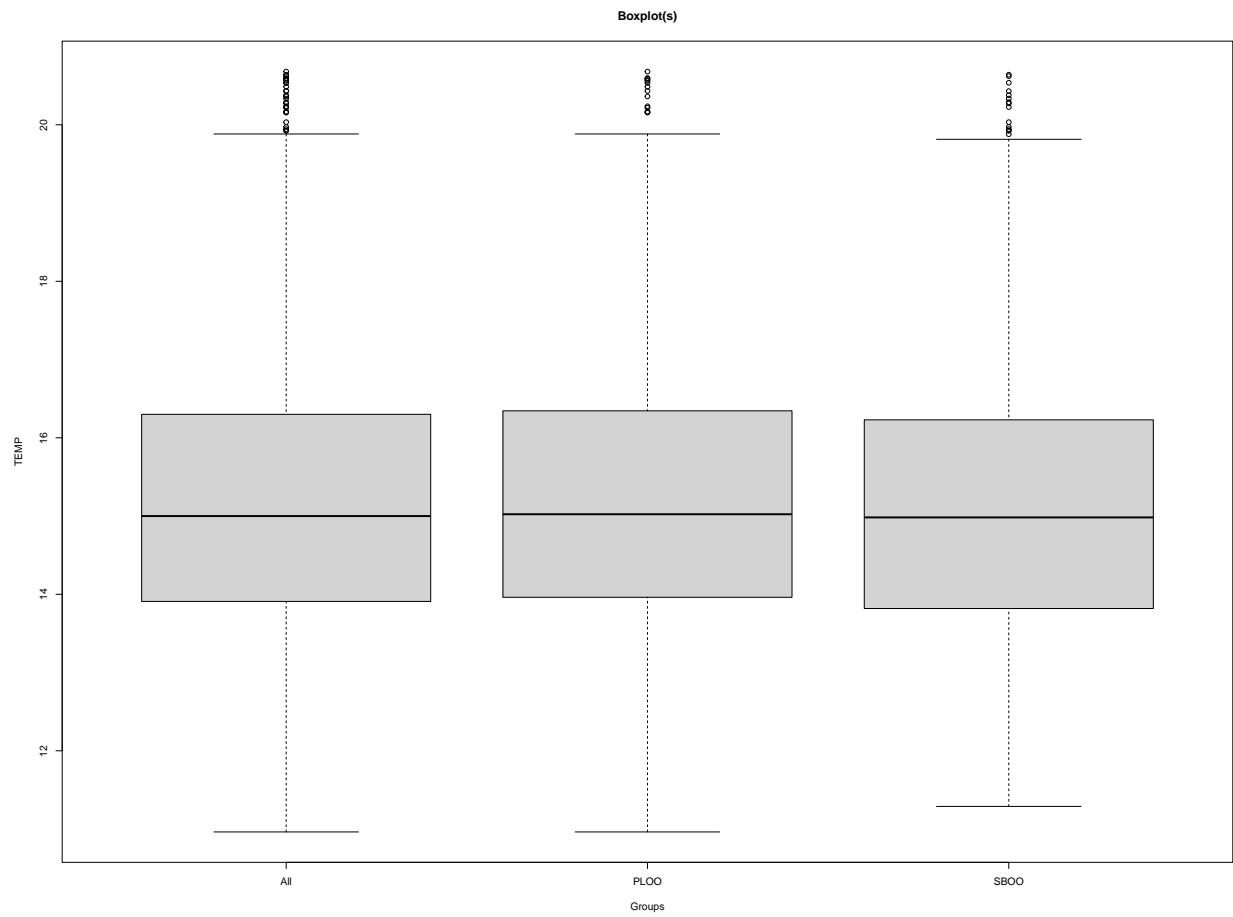
```
## [1] 2097      3
```



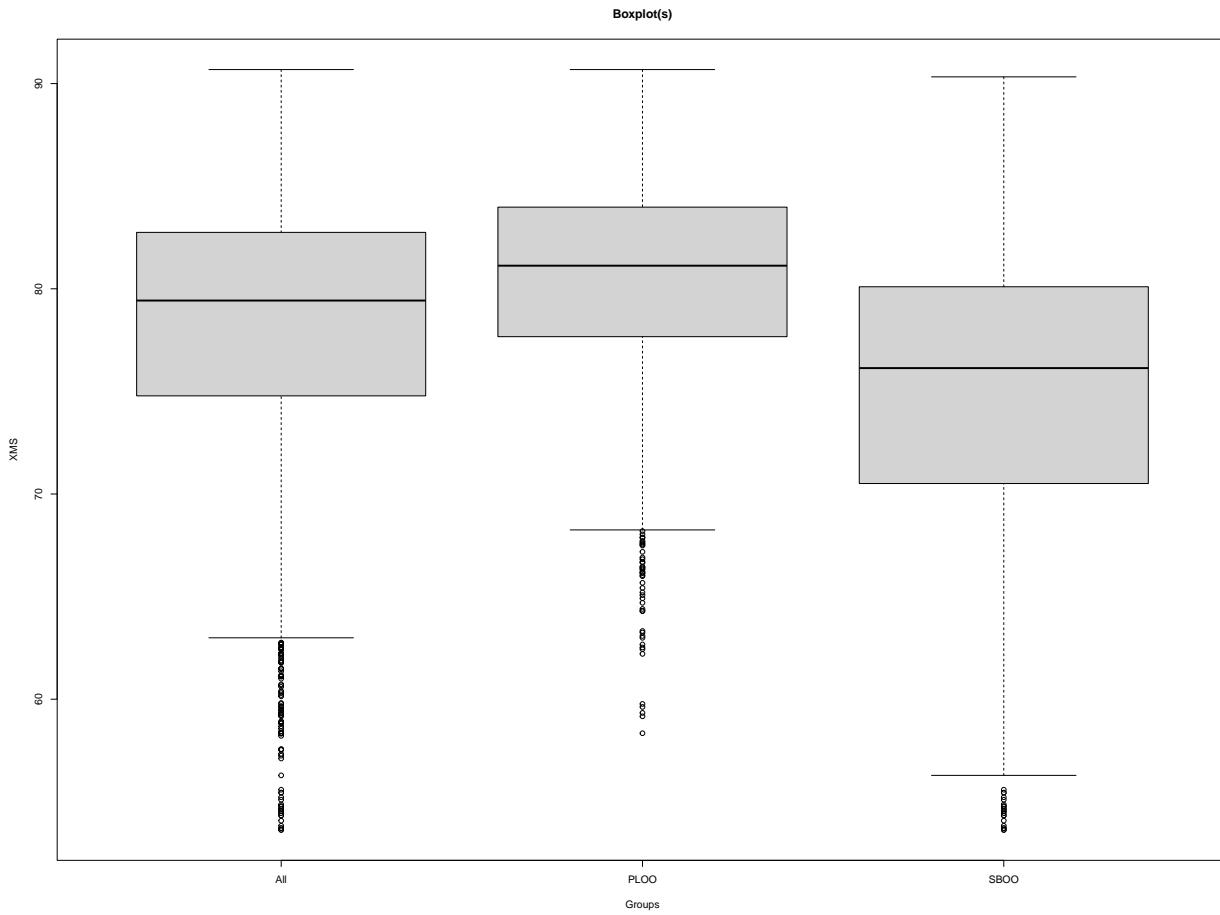
```
## [1] 369    3
```



```
## [1] 2616     3
```



```
## [1] 2606      3
```



```

##   date_sample project CHLOROPHYLL DENSITY      DO      ENTERO      FECAL OG     PH
## 1 1990-11-19    PLOO       0.87 23.855 6.550000      NA      NA NA 8.080
## 2 1990-11-19    SB00       1.27 23.853 7.410000      NA      NA NA 8.180
## 3 1991-01-07    PLOO       NA      NA      NA 25.38462 88.46154 NA     NA
## 4 1991-01-14    PLOO       NA      NA      NA 5.445417 58.12973 137.21730 NA 8.195
## 5 1991-01-21    PLOO       NA      NA      NA 23.20513 59.61538 NA     NA
## 6 1991-01-28    PLOO       NA      NA      NA 31.81891 69.78365 NA     NA
## 7 1991-02-04    PLOO       NA      NA      NA 154.23077 428.58974 NA     NA
##   SALINITY SUSO      TEMP      XMS
## 1 33.61700  NA 19.43000      NA
## 2 33.57400  NA 19.31000 75.60000
## 3      NA  NA 14.45000 81.96154
## 4 33.50113  NA 14.07478 82.04876
## 5      NA  NA 14.54487 70.19231
## 6      NA  NA 14.28846 77.61167
## 7      NA  NA 14.23462 81.83333
##           vars   n   mean      sd median trimmed   mad   min   max range
## date_sample    1 2799   NaN     NA     NA   NaN   NA Inf -Inf -Inf
## project*      2 2799   1.43   0.49   1.00   1.41  0.00  1.00  2.00  1.00
## CHLOROPHYLL  3 1919   3.51   2.75   2.63   3.06  1.98  0.33 14.72 14.38
## DENSITY       4 1990   24.74   0.46  24.76  24.76  0.44 23.34  25.98  2.64
## DO            5 2082   7.26   0.81   7.36   7.30  0.74  4.69  9.81  5.12
## ENTERO        6 2713  66.28 228.34   7.25  14.79  7.15  2.00 2266.55 2264.55
## FECAL         7 2711 115.89 335.46   8.89  33.22  9.50  2.00 2658.87 2656.87

```

```

## OG          8  345   0.22   0.07   0.20    0.20  0.00   0.20    0.90   0.70
## PH          9 2079   8.08   0.10   8.10    8.09  0.09   7.77    8.38   0.61
## SALINITY    10 2094  33.50   0.16  33.51   33.51  0.14  32.59   33.98   1.39
## SUSO         11  365   4.83   1.71   4.61    4.77  1.57   0.20   10.21  10.01
## TEMP         12 2603  15.19   1.78  15.00   15.10  1.76  10.96   20.68   9.72
## XMS          13 2560  78.03   6.67  79.43   78.77  5.69  53.63   90.68  37.05
##              skew kurtosis   se
## date_sample   NA       NA     NA
## project*      0.30    -1.91  0.01
## CHLOROPHYLL  1.53     2.20  0.06
## DENSITY       -0.34    0.08  0.01
## DO            -0.46    0.44  0.02
## ENTERO        5.78    37.71 4.38
## FECAL         4.74    24.82 6.44
## OG            5.74    40.06 0.00
## PH            -0.36    0.45  0.00
## SALINITY      -0.53    1.74  0.00
## SUSO          0.37     0.30  0.09
## TEMP          0.50    -0.07  0.03
## XMS          -1.07    1.10  0.13
##              date_sample project parameter      Avg
## Not NA n     48395   48395   48395 47222.0000
## NA n          0       0       0     1173.0000
## Not NA %      1       1       1     0.9758
## NA %          0       0       0     0.0242

owt_df02_gb09_wkly03 <- owt_df02_gb09_wkly
print(head(owt_df02_gb09_wkly03, 7))

```

```

##   date_sample project CHLOROPHYLL DENSITY      DO      ENTERO      FECAL OG      PH
## 1 1990-11-19    PLOO      0.87 23.855 6.550000      NA      NA NA 8.080
## 2 1990-11-19    SBOO      1.27 23.853 7.410000      NA      NA NA 8.180
## 3 1991-01-07    PLOO      NA     NA      NA 25.38462 88.46154 NA      NA
## 4 1991-01-14    PLOO      NA     NA 5.445417 58.12973 137.21730 NA 8.195
## 5 1991-01-21    PLOO      NA     NA      NA 23.20513 59.61538 NA      NA
## 6 1991-01-28    PLOO      NA     NA      NA 31.81891 69.78365 NA      NA
## 7 1991-02-04    PLOO      NA     NA      NA 154.23077 428.58974 NA      NA
##   SALINITY SUSO      TEMP      XMS
## 1 33.61700   NA 19.43000 44.85000
## 2 33.57400   NA 19.31000 75.60000
## 3      NA     NA 14.45000 81.96154
## 4 33.50113   NA 14.07478 82.04876
## 5      NA     NA 14.54487 70.19231
## 6      NA     NA 14.28846 77.61167
## 7      NA     NA 14.23462 81.83333

```

## Displaying (Visually in Histograms) the Data per Project (Overarching Location)

```

# owt_df02_gb09_wkly03
# plotting histograms per project (no depth)

# chlorophyll
hist_chloro <- ggplot(owt_df02_gb09_wkly03, aes(x= CHLOROPHYLL)) +
  geom_histogram(aes(color= project, fill= project),

```

```

            position= "identity", bins=7, alpha=.4) +
labs(title= "CHLOROPHYLL") +
theme_classic()

# density
hist_density <- ggplot(owt_df02_gb09_wkly03, aes(x= DENSITY)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "DENSITY")+
  theme_classic()

# DO
hist_do <- ggplot(owt_df02_gb09_wkly03, aes(x= DO)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "DO")+
  theme_classic()

# ENTERO
hist_entero <- ggplot(owt_df02_gb09_wkly03, aes(x= ENTERO)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "ENTERO")+
  theme_classic()

# FECAL
hist_fecal <- ggplot(owt_df02_gb09_wkly03, aes(x= FECAL)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "FECAL")+
  theme_classic()

# OG
hist_og <- ggplot(owt_df02_gb09_wkly03, aes(x= OG)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "OG")+
  theme_classic()

# PH
hist_ph <- ggplot(owt_df02_gb09_wkly03, aes(x= PH)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "pH")+
  theme_classic()

# SALINITY
hist_salinity <- ggplot(owt_df02_gb09_wkly03, aes(x= SALINITY)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "SALINITY")+
  theme_classic()

```

```

# SUSO
hist_suso <- ggplot(owt_df02_gb09_wkly03, aes(x= SUSO)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "SUSO")+
  theme_classic()

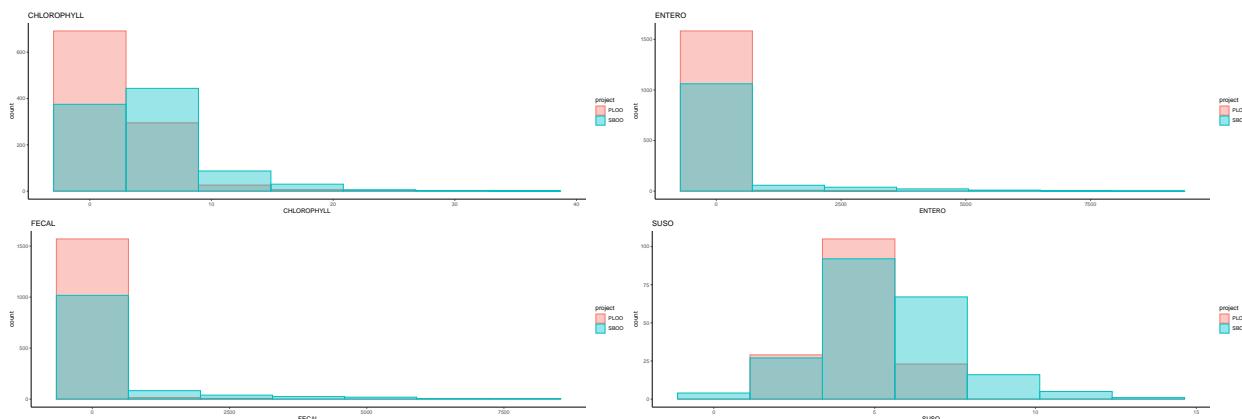
# TEMP
hist_temp <- ggplot(owt_df02_gb09_wkly03, aes(x= TEMP)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "TEMP (C)")+
  theme_classic()

# XMS
hist_xms <- ggplot(owt_df02_gb09_wkly03, aes(x= XMS)) +
  geom_histogram(aes(color= project, fill= project),
                 position= "identity", bins=7, alpha=.4) +
  labs(title= "XMS")+
  theme_classic()

# plotting groups:

# bacteriological basis (chlorophyll, entero, fecal, suso (dissolved solids))
grid.arrange(hist_chloro, hist_entero, hist_fecal,hist_suso,
             ncol=2, nrow=2) +
  theme(legend.key.size = unit(0.5, "cm"),
        legend.title = element_text(size=10),
        legend.text = element_text(size=8),
        text = element_text(size=10))

```

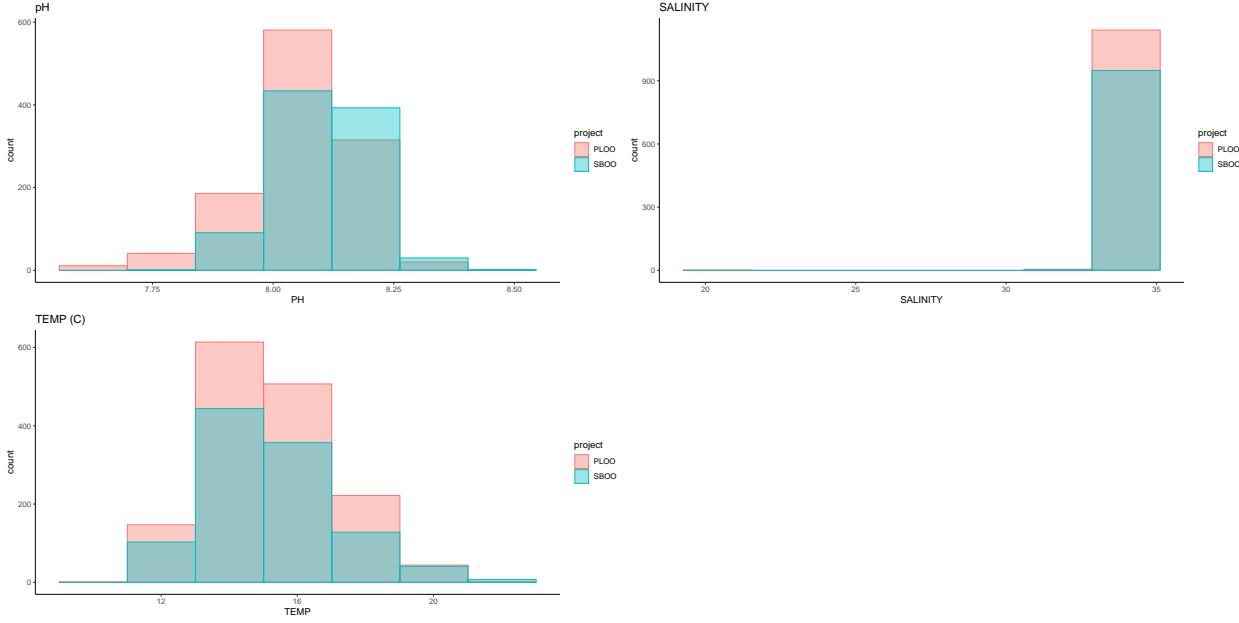


```

## NULL

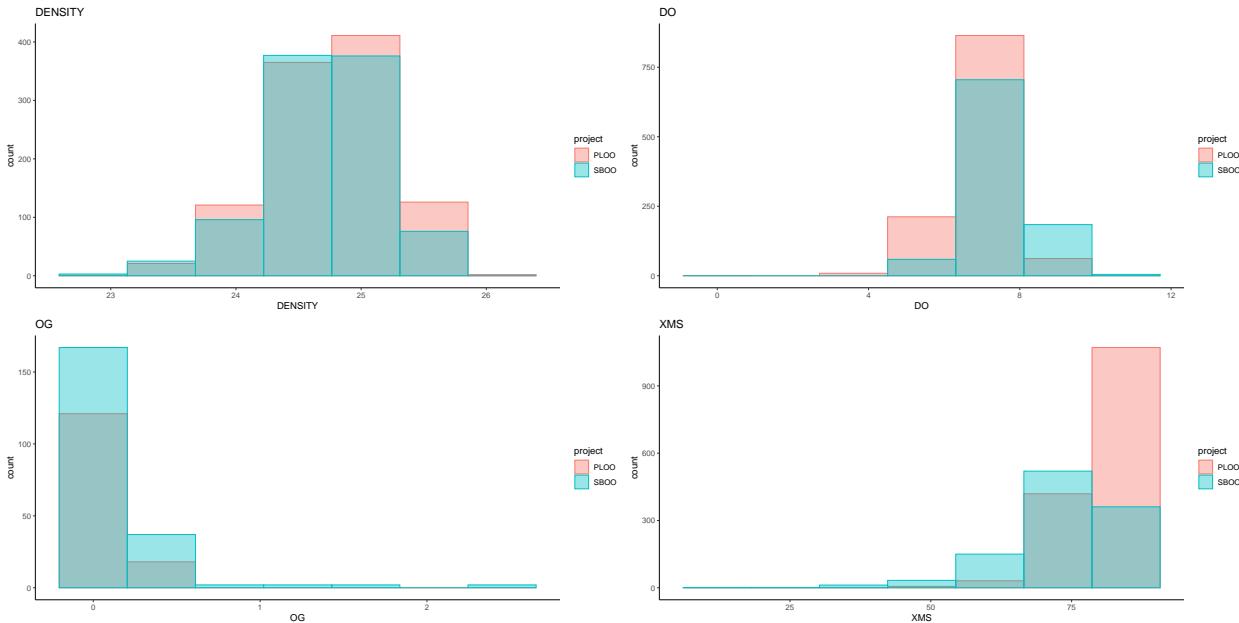
# plotting chemical types (pH, salinity, temp)
grid.arrange(hist_ph, hist_salinity, hist_temp,
             ncol=2, nrow=2) +
  theme(legend.key.size = unit(0.5, "cm"),
        legend.title = element_text(size=10),
        legend.text = element_text(size=8),
        text = element_text(size=10))

```



```
## NULL
```

```
# plotting optical-chemical type (density, DO, OG, xms)
grid.arrange(hist_density, hist_do, hist_og, hist_xms,
             ncol=2, nrow=2) +
  theme(legend.key.size = unit(0.5, "cm"),
        legend.title = element_text(size=10),
        legend.text = element_text(size=8),
        text = element_text(size=10))
```



```
## NULL
```

## Setting up for Descriptive Statistics and Looking at Non-Time Series Correlations

```
# descriptive stats (no depth) for numeric columns for whole time frame
owt_df02_gb09_wkly03_nums <- subset(owt_df02_gb09_wkly03, select= -c(date_sample))
summary(owt_df02_gb09_wkly03_nums)

##   project      CHLOROPHYLL       DENSITY        DO
## PL00:1606   Min.    : 0.3333   Min.    :22.71   Min.    : 0.000
## SB00:1196   1st Qu.: 1.5610   1st Qu.:24.46   1st Qu.: 6.789
##                               Median : 2.7145   Median :24.76   Median : 7.350
##                               Mean   : 3.8885   Mean   :24.73   Mean   : 7.243
##                               3rd Qu.: 4.8582   3rd Qu.:25.05   3rd Qu.: 7.805
##                               Max.   :36.0533   Max.   :25.98   Max.   :10.810
##                               NA's    :835     NA's    :802     NA's    :701
##   ENTERO        FECAL          OG          PH
##   Min.    : 2.000   Min.    : 2.000   Min.    :0.2000   Min.    :7.592
##   1st Qu.: 3.279   1st Qu.: 3.709   1st Qu.:0.2000   1st Qu.:8.020
##   Median : 7.579   Median : 9.445   Median :0.2000   Median :8.095
##   Mean   :169.274   Mean   :233.754   Mean   :0.2441   Mean   :8.080
##   3rd Qu.: 27.682   3rd Qu.: 63.223   3rd Qu.:0.2000   3rd Qu.:8.145
##   Max.   :8668.000   Max.   :7881.917   Max.   :2.6500   Max.   :8.439
##   NA's    :16       NA's    :16       NA's    :2451     NA's    :697
##   SALINITY      SUSO          TEMP         XMS
##   Min.    :20.38   Min.    : 0.200   Min.    :10.96   Min.    :18.11
##   1st Qu.:33.41   1st Qu.: 3.697   1st Qu.:13.91   1st Qu.:74.39
##   Median :33.51   Median : 4.637   Median :15.01   Median :79.29
##   Mean   :33.50   Mean   : 4.909   Mean   :15.22   Mean   :77.43
##   3rd Qu.:33.61   3rd Qu.: 6.043   3rd Qu.:16.32   3rd Qu.:82.67
##   Max.   :33.98   Max.   :13.709   Max.   :22.97   Max.   :90.68
##   NA's    :705     NA's    :2433     NA's    :186     NA's    :196
```

If we remove the NA's of the owt\_df02\_gb09\_wkly03 full time frame

```
chlornum <- data.frame("CHLOROPHYLL" = owt_df02_gb09_wkly03_nums$CHLOROPHYLL)
chlornum <- chlornum %>% drop_na()
summary(chlornum)
```

```
##   CHLOROPHYLL
##   Min.    : 0.3333
##   1st Qu.: 1.5610
##   Median : 2.7146
##   Mean   : 3.8885
##   3rd Qu.: 4.8582
##   Max.   :36.0533

densnum <- data.frame("DENSITY" = owt_df02_gb09_wkly03_nums$DENSITY)
densnum <- densnum %>% drop_na()
summary(densnum)
```

```
##   DENSITY
##   Min.    :22.71
##   1st Qu.:24.46
##   Median :24.76
##   Mean   :24.73
```

```

## 3rd Qu.:25.05
## Max. :25.98

donum <- data.frame("DO" = owt_df02_gb09_wkly03_nums$DO)
donum <- donum %>% drop_na()
summary(donum)

##          DO
##  Min.   : 0.000
##  1st Qu.: 6.789
##  Median : 7.350
##  Mean   : 7.243
##  3rd Qu.: 7.805
##  Max.   :10.810

enteronum <- data.frame("ENTERO" = owt_df02_gb09_wkly03_nums$ENTERO)
enteronum <- enteronum %>% drop_na()
summary(enteronum)

##          ENTERO
##  Min.   : 2.000
##  1st Qu.: 3.279
##  Median : 7.579
##  Mean   : 169.274
##  3rd Qu.: 27.682
##  Max.   :8668.000

fecalnum <- data.frame("FECAL" = owt_df02_gb09_wkly03_nums$FECAL)
fecalnum <- fecalnum %>% drop_na()
summary(fecalnum)

##          FECAL
##  Min.   : 2.000
##  1st Qu.: 3.709
##  Median : 9.445
##  Mean   : 233.754
##  3rd Qu.: 63.223
##  Max.   :7881.917

ognum <- data.frame("OG" = owt_df02_gb09_wkly03_nums$OG)
ognum <- ognum %>% drop_na()
summary(ognum)

##          OG
##  Min.   :0.2000
##  1st Qu.:0.2000
##  Median :0.2000
##  Mean   :0.2441
##  3rd Qu.:0.2000
##  Max.   :2.6500

phnum <- data.frame("PH" = owt_df02_gb09_wkly03_nums$PH)
phnum <- phnum %>% drop_na()
summary(phnum)

##          PH
```

```

##   Min.    :7.592
##   1st Qu.:8.020
##   Median :8.095
##   Mean   :8.080
##   3rd Qu.:8.145
##   Max.    :8.439

salinnum <- data.frame("SALINITY" = owt_df02_gb09_wkly03_nums$SALINITY)
salinnum <- salinnum %>% drop_na()
summary(salinnum)

##      SALINITY
##   Min.    :20.38
##   1st Qu.:33.41
##   Median :33.51
##   Mean   :33.50
##   3rd Qu.:33.61
##   Max.    :33.98

susunum <- data.frame("SUSO" = owt_df02_gb09_wkly03_nums$SUSO)
susunum <- susunum %>% drop_na()
summary(susunum)

##      SUSO
##   Min.    : 0.200
##   1st Qu.: 3.697
##   Median : 4.637
##   Mean   : 4.909
##   3rd Qu.: 6.043
##   Max.    :13.709

tempnum <- data.frame("TEMP" = owt_df02_gb09_wkly03_nums$TEMP)
tempnum <- tempnum %>% drop_na()
summary(tempnum)

##      TEMP
##   Min.    :10.96
##   1st Qu.:13.91
##   Median :15.01
##   Mean   :15.22
##   3rd Qu.:16.32
##   Max.    :22.97

xmsnum <- data.frame("XMS" = owt_df02_gb09_wkly03_nums$XMS)
xmsnum <- xmsnum %>% drop_na()
summary(xmsnum)

##      XMS
##   Min.    :18.11
##   1st Qu.:74.39
##   Median :79.29
##   Mean   :77.43
##   3rd Qu.:82.67
##   Max.    :90.68

```

Looking at each column if we remove NA's (for 1/1/2000 onward)

```
# descriptive stats (no depth) for numeric columns for arbitrary after 1/1/2000
owt_df02_gb09_wkly03_nums_2000s <- owt_df02_gb09_wkly03 %>% filter(date_sample >=
  ~ "2000-01-01")
owt_df02_gb09_wkly03_nums_2000s <- subset(owt_df02_gb09_wkly03_nums_2000s, select =
  -c(date_sample))
summary(owt_df02_gb09_wkly03_nums_2000s)

##   project      CHLOROPHYLL       DENSITY        DO
## PL00:1141    Min.    : 0.3333    Min.    :22.71    Min.    : 2.876
## SB00:1146    1st Qu.: 1.5956    1st Qu.:24.45    1st Qu.: 6.852
##                      Median : 2.7296    Median :24.75    Median : 7.388
##                      Mean   : 3.9388    Mean   :24.72    Mean   : 7.305
##                      3rd Qu.: 4.9511    3rd Qu.:25.04    3rd Qu.: 7.819
##                      Max.   :36.0533    Max.   :25.98    Max.   :10.810
##                      NA's   :386       NA's   :368      NA's   :373
##   ENTERO        FECAL          OG          PH
##   Min.    : 2.000    Min.    : 2.000    Min.    :0.2000    Min.    :7.628
##   1st Qu.: 3.141    1st Qu.: 3.480    1st Qu.:0.2000    1st Qu.:8.031
##   Median : 6.909    Median : 8.333    Median :0.2000    Median :8.100
##   Mean   : 197.919   Mean   :255.213   Mean   :0.2652    Mean   :8.088
##   3rd Qu.: 26.498    3rd Qu.: 47.318   3rd Qu.:0.2000    3rd Qu.:8.147
##   Max.   :8668.000   Max.   :7881.917   Max.   :2.6500    Max.   :8.439
##   NA's   :12         NA's   :13       NA's   :2057      NA's   :369
##   SALINITY        SUSO          TEMP         XMS
##   Min.    :32.21    Min.    : 0.200    Min.    :10.96    Min.    :18.11
##   1st Qu.:33.41    1st Qu.: 3.804    1st Qu.:13.92    1st Qu.:73.89
##   Median :33.51    Median : 4.954    Median :15.05    Median :79.06
##   Mean   :33.50    Mean   : 5.173    Mean   :15.25    Mean   :77.02
##   3rd Qu.:33.60    3rd Qu.: 6.423    3rd Qu.:16.33    3rd Qu.:82.45
##   Max.   :33.92    Max.   :13.709    Max.   :22.97    Max.   :90.68
##   NA's   :377      NA's   :2041     NA's   :167      NA's   :177
```

Dropping NA's

```
chlornum2000s <- data.frame("CHLOROPHYLL" = owt_df02_gb09_wkly03_nums_2000s$CHLOROPHYLL)
chlornum2000s <- chlornum2000s %>% drop_na()
summary(chlornum2000s)

##   CHLOROPHYLL
##   Min.    : 0.3333
##   1st Qu.: 1.5956
##   Median : 2.7296
##   Mean   : 3.9388
##   3rd Qu.: 4.9511
##   Max.   :36.0533

densnum2000s <- data.frame("DENSITY" = owt_df02_gb09_wkly03_nums_2000s$DENSITY)
densnum2000s <- densnum2000s %>% drop_na()
summary(densnum2000s)

##   DENSITY
##   Min.    :22.71
```

```

## 1st Qu.:24.45
## Median :24.75
## Mean   :24.72
## 3rd Qu.:25.04
## Max.   :25.98

donum2000s <- data.frame("D0" = owt_df02_gb09_wkly03_nums_2000s$D0)
donum2000s <- donum2000s %>% drop_na()
summary(donum2000s)

##          D0
## Min.   : 2.876
## 1st Qu.: 6.852
## Median : 7.389
## Mean   : 7.305
## 3rd Qu.: 7.819
## Max.   :10.810

enteronum2000s <- data.frame("ENTERO" = owt_df02_gb09_wkly03_nums_2000s$ENTERO)
enteronum2000s <- enteronum2000s %>% drop_na()
summary(enteronum2000s)

##          ENTERO
## Min.   : 2.000
## 1st Qu.: 3.141
## Median : 6.909
## Mean   : 197.919
## 3rd Qu.: 26.498
## Max.   :8668.000

fecalnum2000s <- data.frame("FECAL" = owt_df02_gb09_wkly03_nums_2000s$FECAL)
fecalnum2000s <- fecalnum2000s %>% drop_na()
summary(fecalnum2000s)

##          FECAL
## Min.   : 2.000
## 1st Qu.: 3.480
## Median : 8.333
## Mean   : 255.213
## 3rd Qu.: 47.318
## Max.   :7881.917

ognum2000s <- data.frame("OG" = owt_df02_gb09_wkly03_nums_2000s$OG)
ognum2000s <- ognum2000s %>% drop_na()
summary(ognum2000s)

##          OG
## Min.   :0.2000
## 1st Qu.:0.2000
## Median :0.2000
## Mean   :0.2652
## 3rd Qu.:0.2000
## Max.   :2.6500

phnum2000s <- data.frame("PH" = owt_df02_gb09_wkly03_nums_2000s$PH)
phnum2000s <- phnum2000s %>% drop_na()

```

```

summary(phnum2000s)

##      PH
##  Min.   :7.628
##  1st Qu.:8.031
##  Median :8.100
##  Mean   :8.088
##  3rd Qu.:8.147
##  Max.   :8.439

salinnum2000s <- data.frame("SALINITY" = owt_df02_gb09_wkly03_nums_2000s$SALINITY)
salinnum2000s <- salinnum2000s %>% drop_na()
summary(salinnum2000s)

##      SALINITY
##  Min.   :32.21
##  1st Qu.:33.41
##  Median :33.51
##  Mean   :33.50
##  3rd Qu.:33.60
##  Max.   :33.92

susunum2000s <- data.frame("SUSO" = owt_df02_gb09_wkly03_nums_2000s$SUSO)
susunum2000s <- susunum2000s %>% drop_na()
summary(susunum2000s)

##      SUSO
##  Min.   : 0.200
##  1st Qu.: 3.804
##  Median : 4.954
##  Mean   : 5.173
##  3rd Qu.: 6.423
##  Max.   :13.709

tempnum2000s <- data.frame("TEMP" = owt_df02_gb09_wkly03_nums_2000s$TEMP)
tempnum2000s <- tempnum2000s %>% drop_na()
summary(tempnum2000s)

##      TEMP
##  Min.   :10.96
##  1st Qu.:13.92
##  Median :15.05
##  Mean   :15.25
##  3rd Qu.:16.33
##  Max.   :22.97

xmsnum2000s <- data.frame("XMS" = owt_df02_gb09_wkly03_nums_2000s$XMS)
xmsnum2000s <- xmsnum2000s %>% drop_na()
summary(xmsnum2000s)

##      XMS
##  Min.   :18.11
##  1st Qu.:73.89
##  Median :79.06
##  Mean   :77.02

```

```
## 3rd Qu.:82.45
## Max. :90.68
```

## looking at non time series correlations out of curiosuty

```
print(paste("chlorophyll", nrow(chlornum), ", density", nrow(densnum), ", DO",
           "nrow(donum),",
           "entero", nrow(enteronum), ", fecal", nrow(fecalnum), ", OG", nrow(ognum),
           ", pH", nrow(phnum), ", salinity", nrow(salinnum), ", Suso", nrow(susunum),
           ", Temp", nrow(tempnum), ", XMS", nrow(xmsnum)))
```

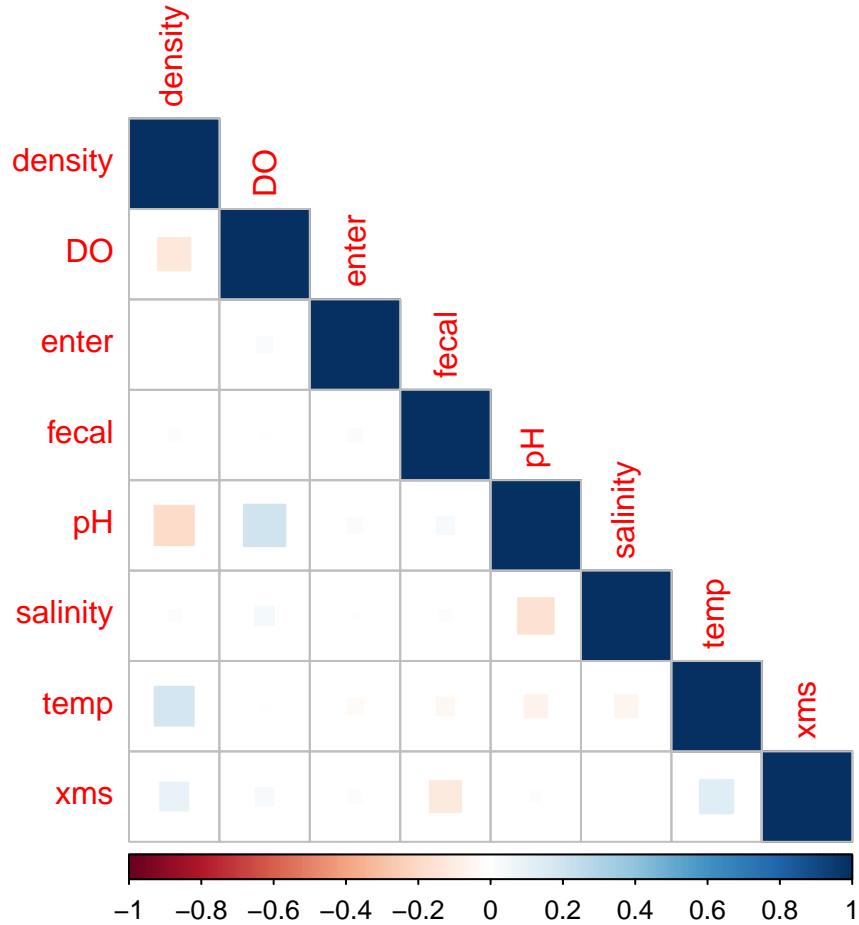
```
## [1] "chlorophyll 1967 , density 2000 , DO 2101 , entero 2786 , fecal 2786 , OG 351 , pH 2105 , salin"
```

```
# least populated in OG at 351 and SUSO at 369.
# focusing on others, the limit will be Chlorophyll at 1967
```

```
densnum_sub <- densnum[1:1967,]
donum_sub <- donum[1:1967,]
enteronum_sub <- enteronum[1:1967,]
fecalnum_sub <- fecalnum[1:1967,]
phnum_sub <- phnum[1:1967,]
salinnum_sub <- salinnum[1:1967,]
tempnum_sub <- tempnum[1:1967,]
xmsnum_sub <- xmsnum[1:1967,]

splitnum_sub <- data.frame("density" = densnum_sub, "DO" = donum_sub,
                           "enter" = enteronum_sub, "fecal" = fecalnum_sub,
                           "pH" = phnum_sub, "salinity" = salinnum_sub,
                           "temp" = tempnum_sub, "xms" = xmsnum_sub)

corrplot(
  cor(splitnum_sub),
  method = "square",
  type= "lower")
```



```
round(cor(splitnum_sub), 2)
```

```
##      density    DO enter  fecal     pH salinity   temp    xms
## density  1.00 -0.13  0.00  0.02 -0.19 -0.02  0.18  0.10
## DO       -0.13  1.00  0.03 -0.01  0.21  0.04 -0.01  0.04
## enter     0.00  0.03  1.00  0.02  0.03 -0.01 -0.03 -0.02
## fecal     0.02 -0.01  0.02  1.00  0.04 -0.02 -0.04 -0.12
## pH        -0.19  0.21  0.03  0.04  1.00 -0.15 -0.06  0.01
## salinity   -0.02  0.04 -0.01 -0.02 -0.15  1.00 -0.06  0.00
## temp      0.18 -0.01 -0.03 -0.04 -0.06 -0.06  1.00  0.13
## xms       0.10  0.04 -0.02 -0.12  0.01  0.00  0.13  1.00
```

Run custom function on data aggregated by `date_sample`, `project`, `depth_m_bin` and `parameter`

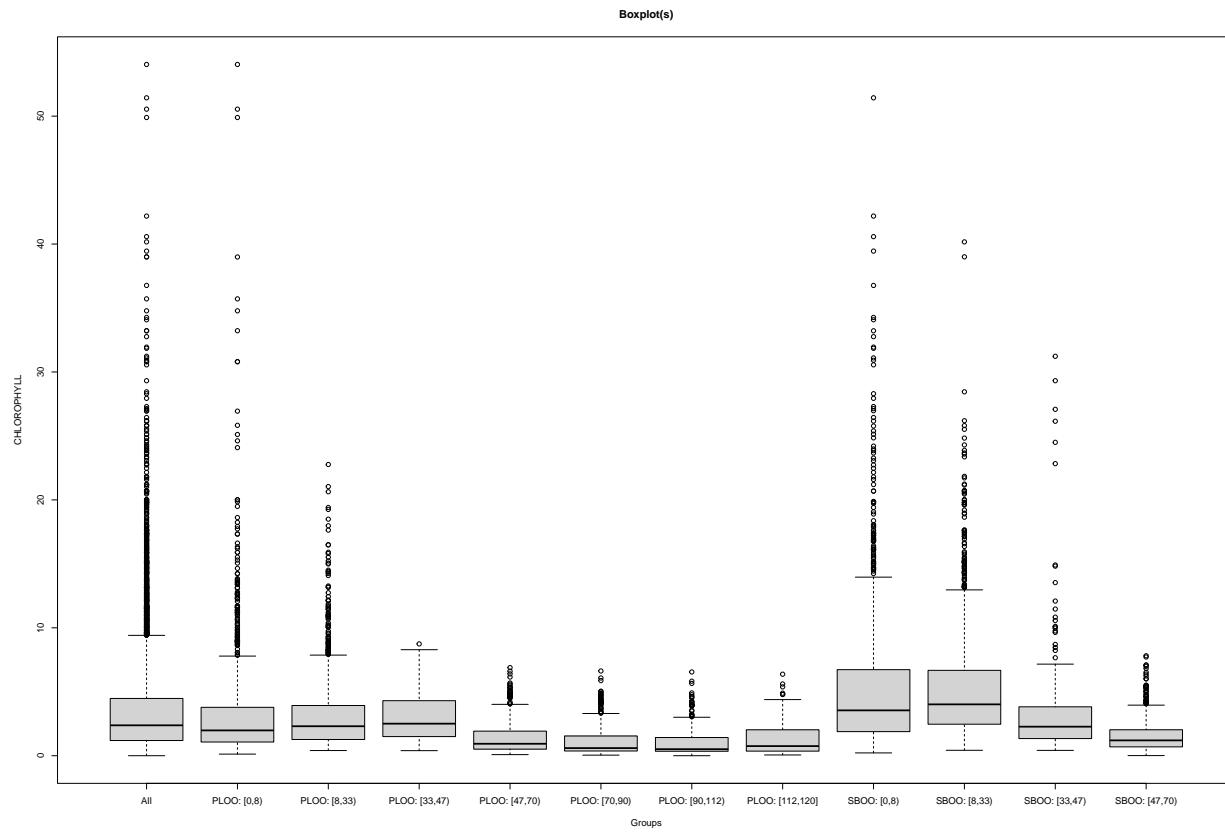
```
owt_df02_gb07_mrgd = ts_eda(ts_df = owt_df02_gb07,
                           form_lead = c("date_sample", "project", "depth_m_bin"),
                           form_cast = "parameter",
                           param_lst = param_lst02,
                           l1_col = c("project"),
                           l1_param = c("PL00", "SB00"),
                           l2_col = c("depth_m_bin"),
```

```

    l2_param = depth_lvls01,
    rtn_met = FALSE,
    box = FALSE
  )

## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "SBOO: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "SBOO: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

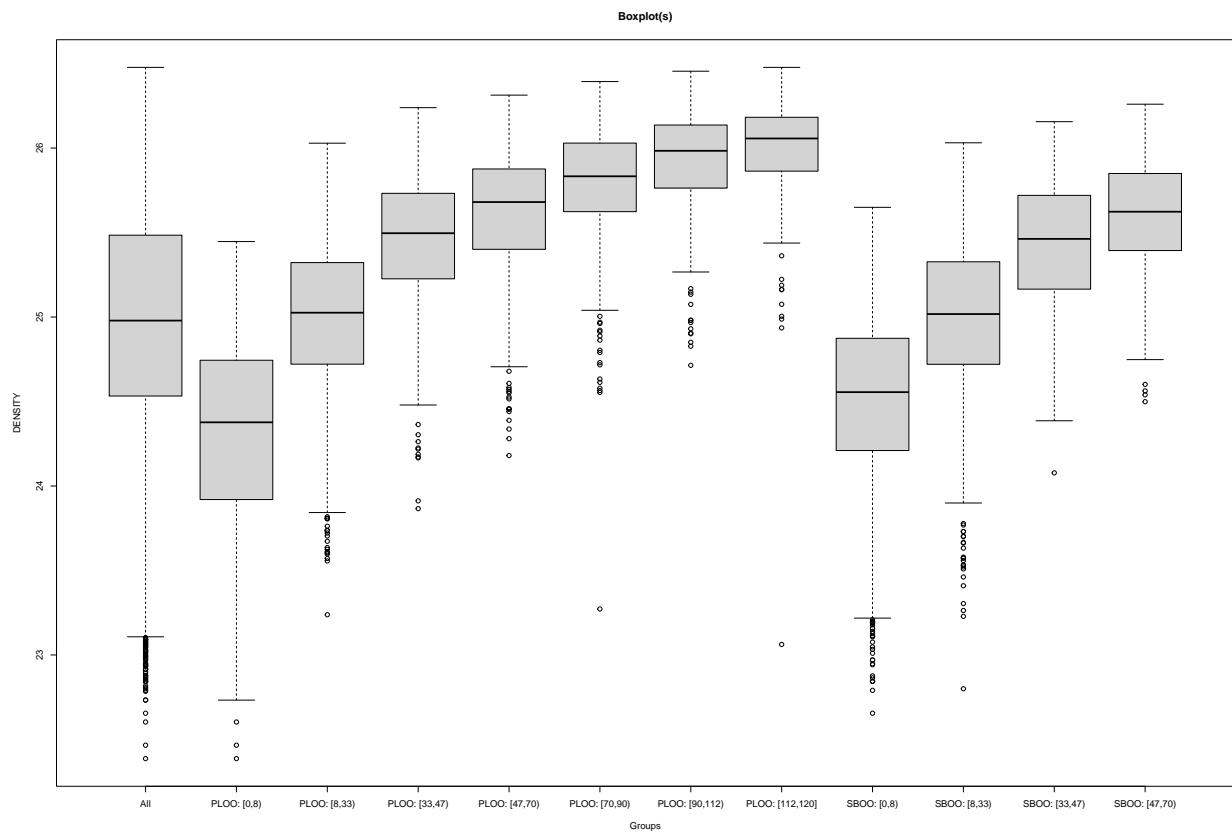
```



```

## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "SBOO: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "SBOO: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$.data.frame`(`*tmp`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

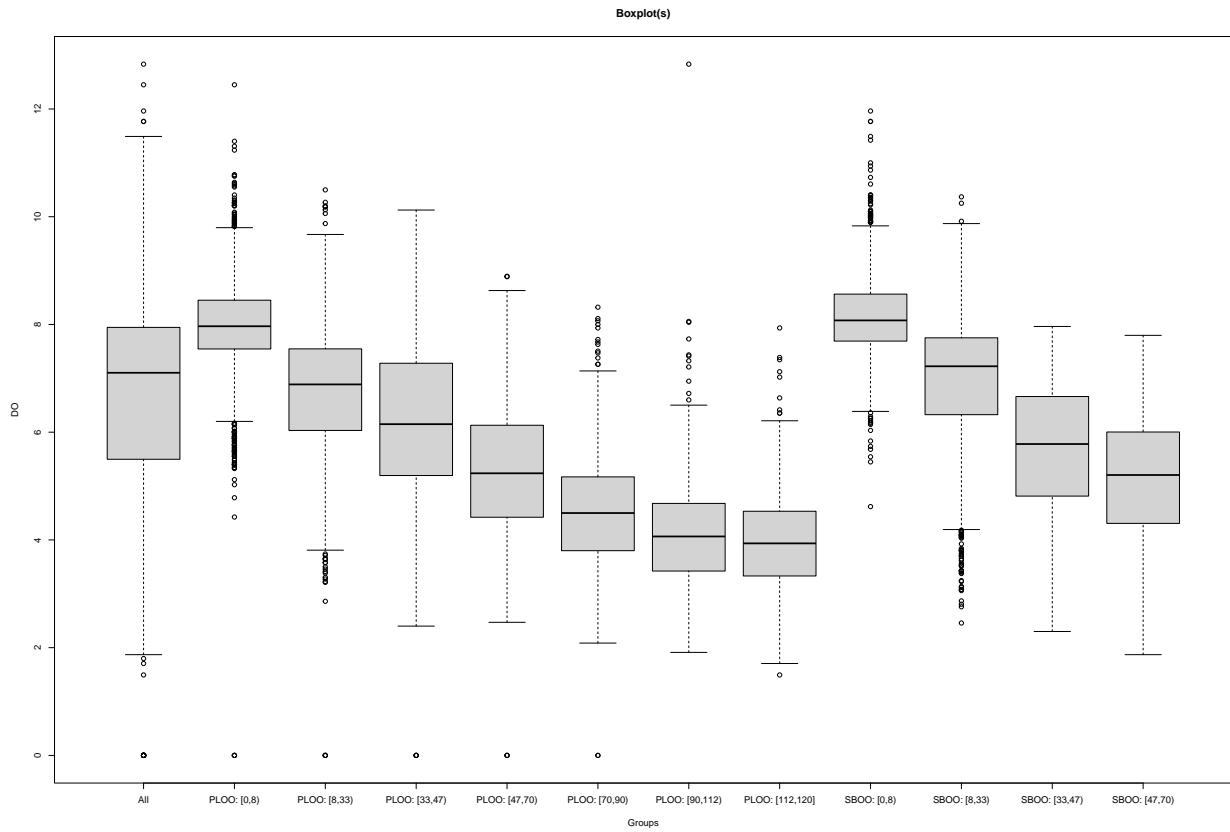
```



```

## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

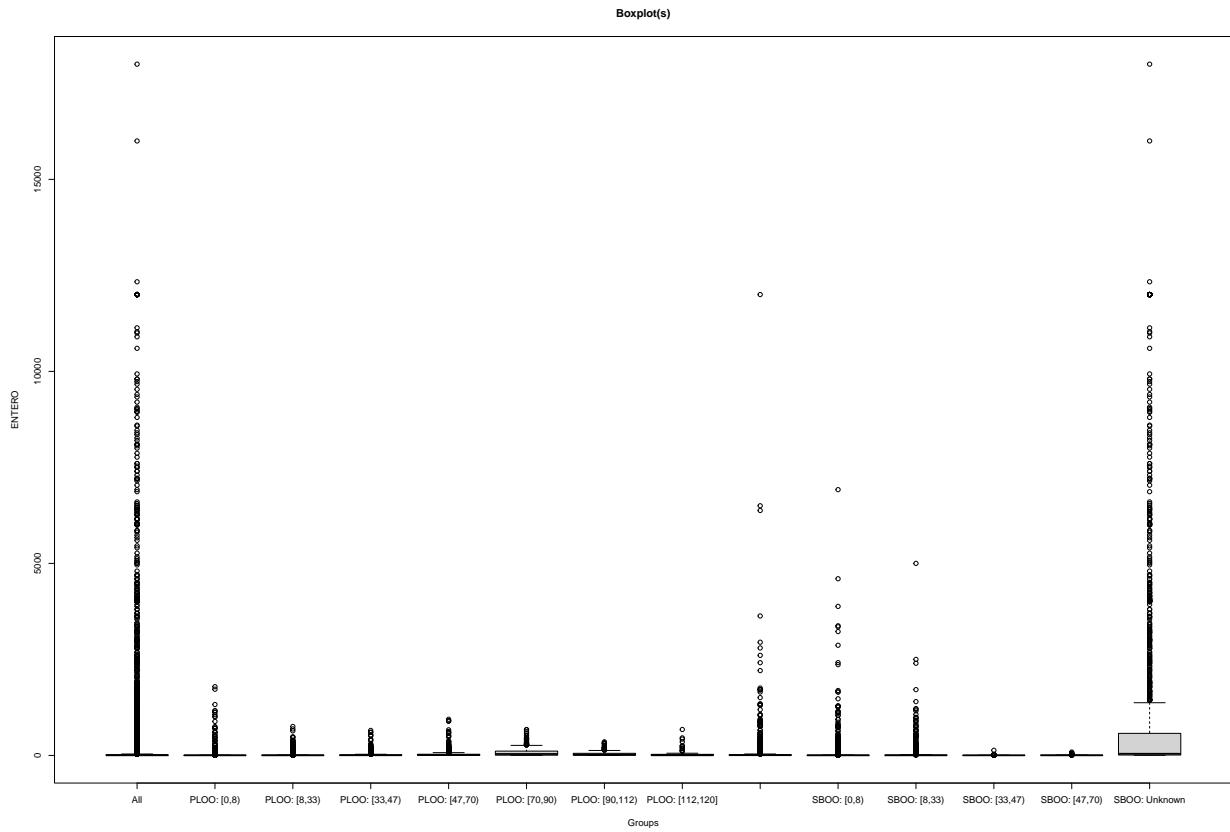
```



```

## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0

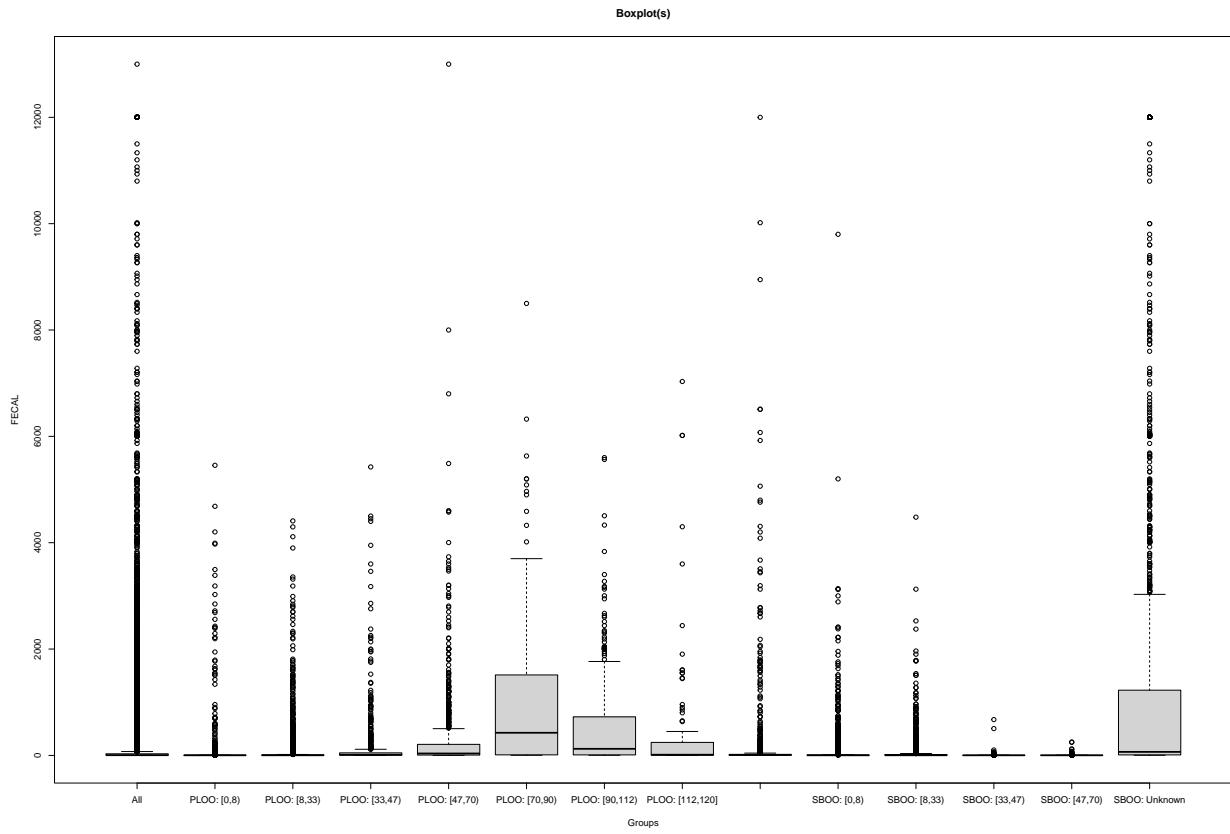
```



```

## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0

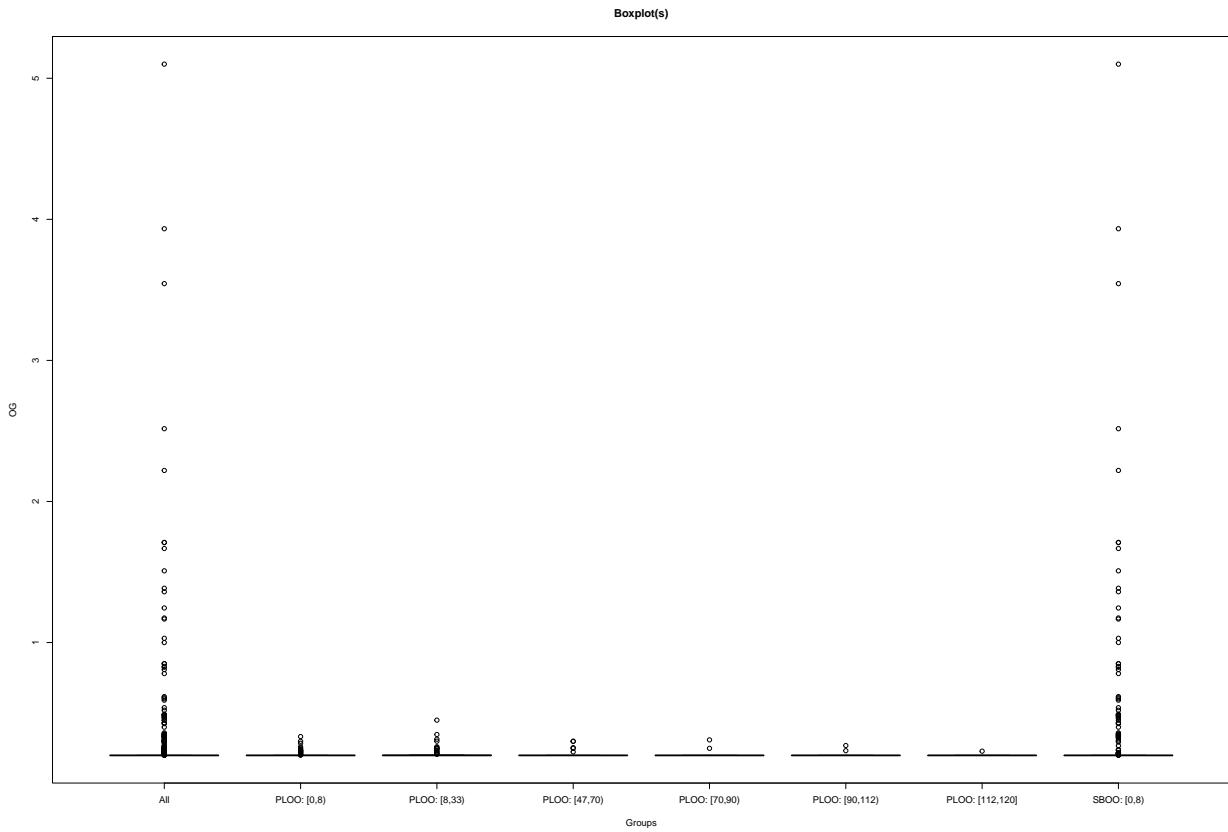
```



```

## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: [33,47]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [8,33]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [33,47]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [47,70]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

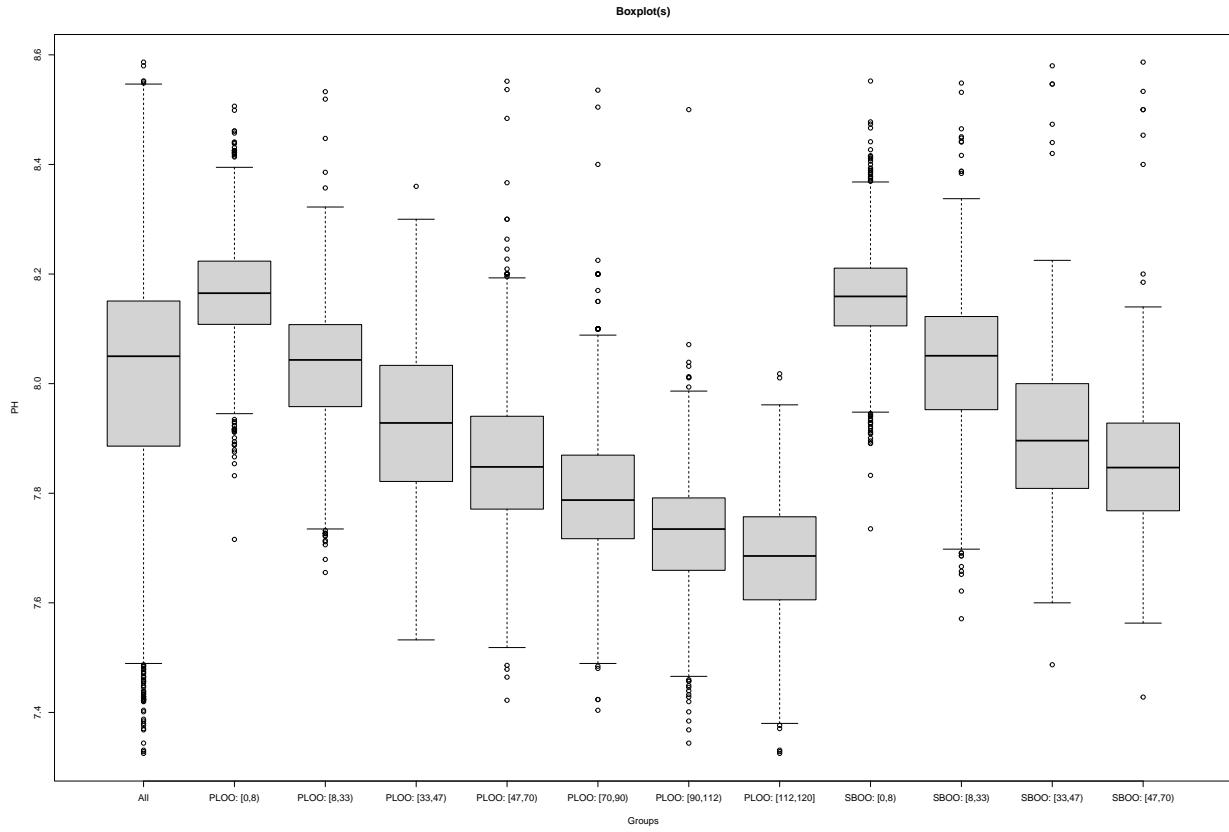
```



```

## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

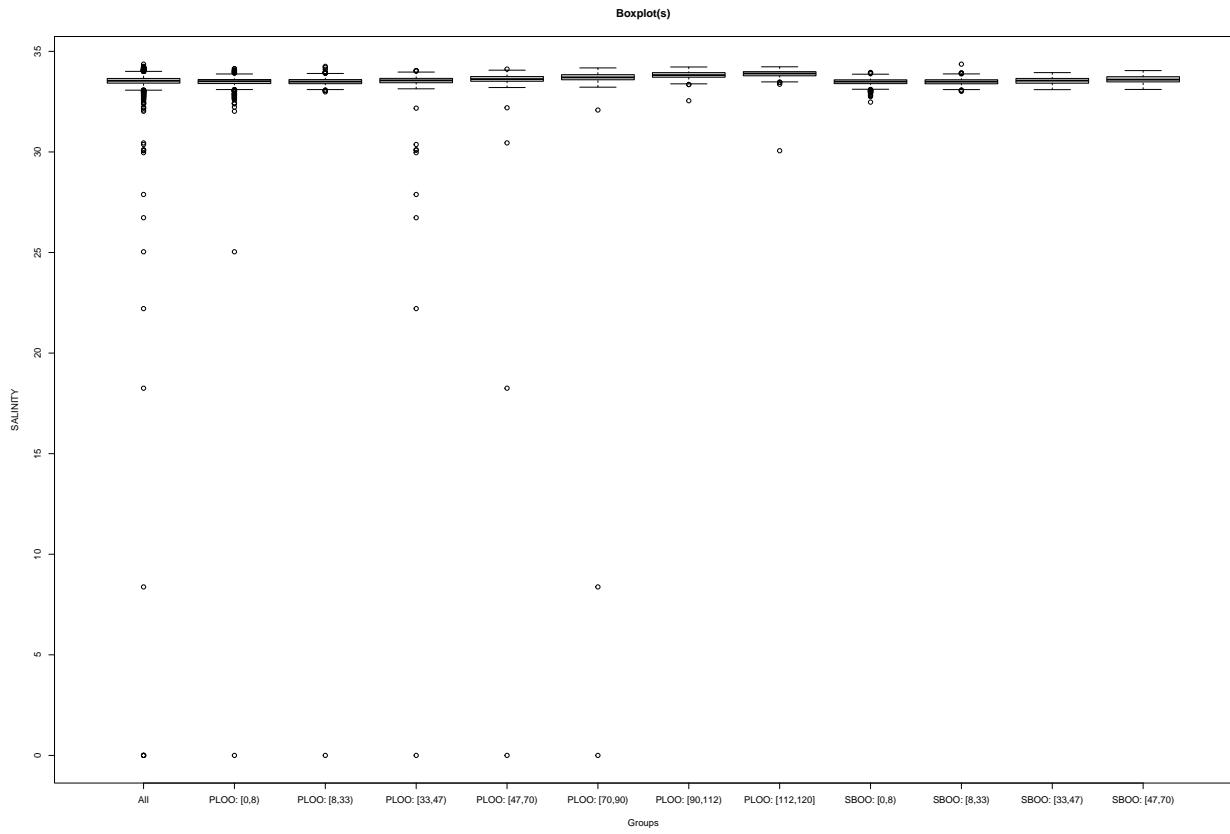
```



```

## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

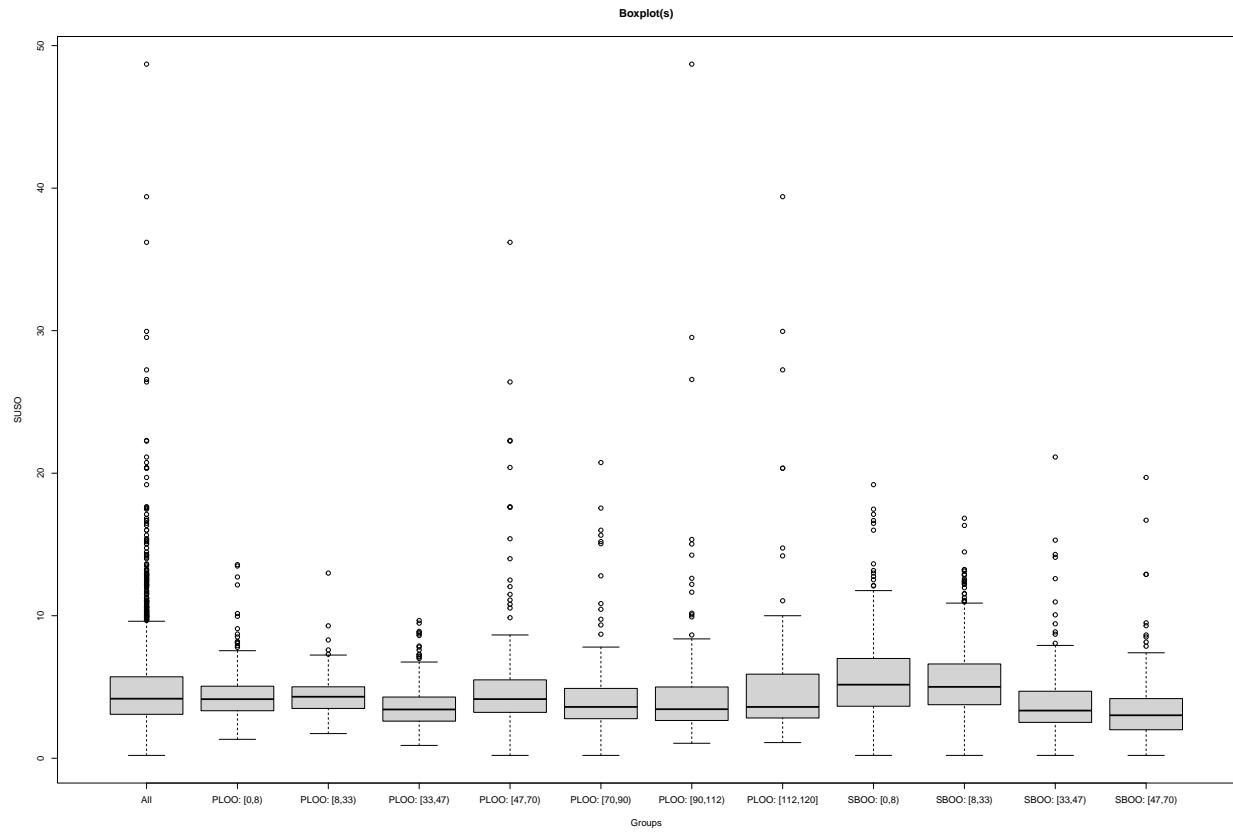
```



```

## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

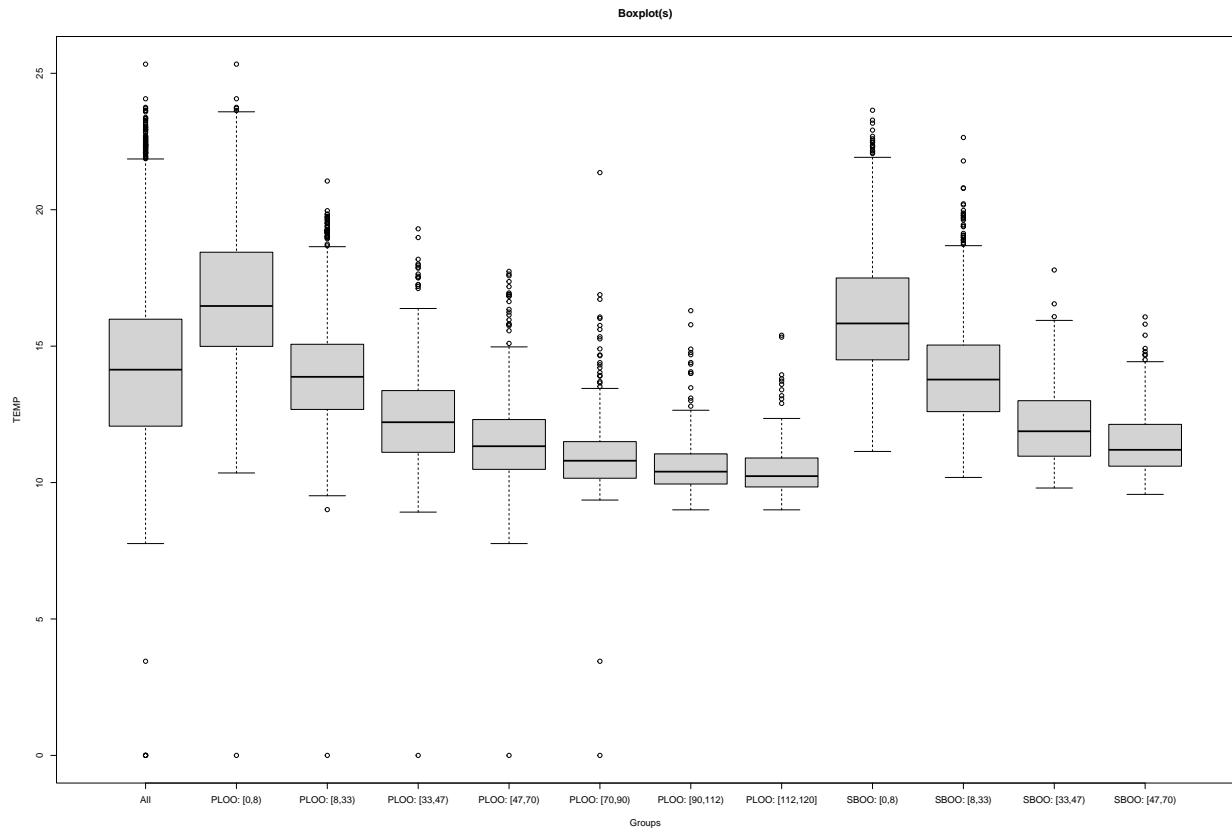
```



```

## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

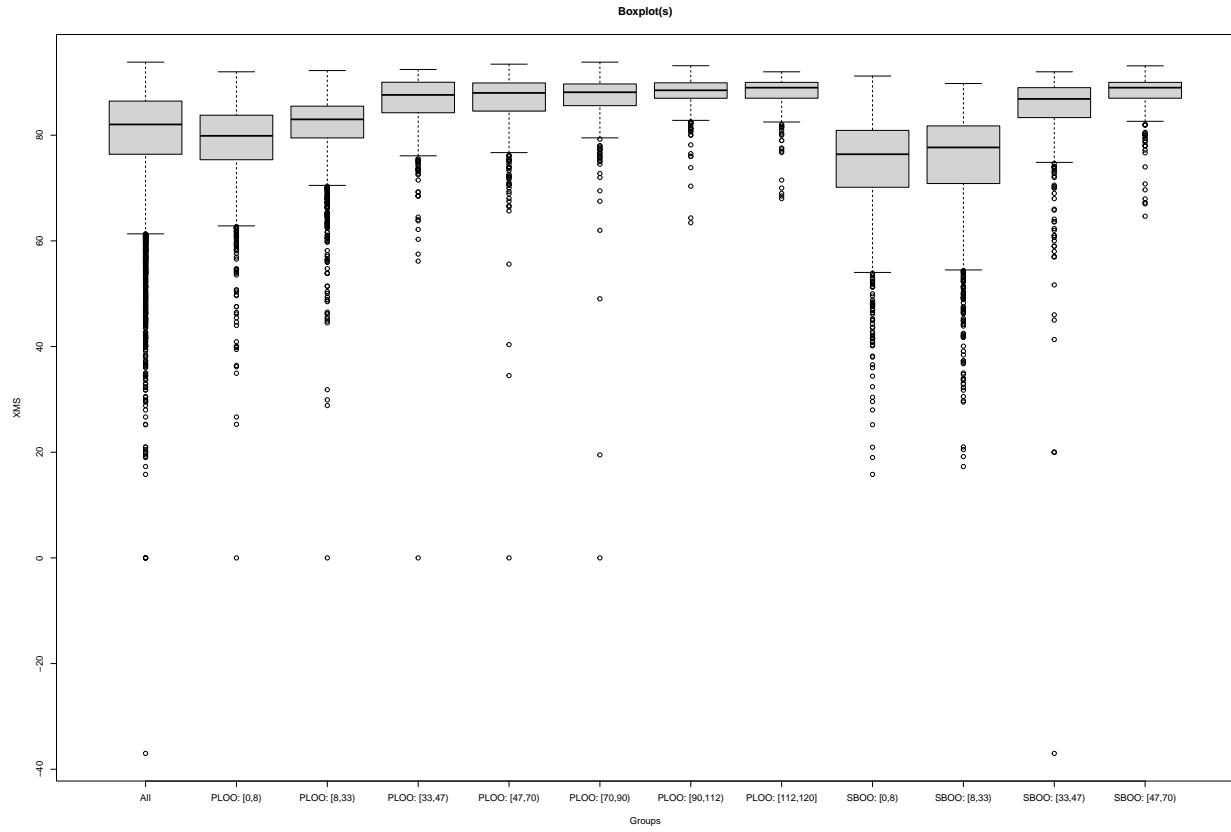
```



```

## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<- .data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

```



```

##   date_sample project depth_m_bin CHLOROPHYLL DENSITY DO ENTERO FECAL
## 1 1990-11-15     PL00      [8,33)      0.87 23.855 6.55    NA    NA
## 2 1990-11-15     SB00      [0,8)       1.27 23.853 7.41    NA    NA
## 3 1991-01-02     PL00      [0,8)        NA      NA 34.07407 134.81481
## 4 1991-01-02     PL00      [8,33)        NA      NA 27.50000 105.00000
## 5 1991-01-03     PL00      [0,8)        NA      NA 17.40741 45.55556
## 6 1991-01-03     PL00      [8,33)        NA      NA 21.66667 64.16667
## 7 1991-01-07     PL00      [0,8)        NA      NA 77.40741 44.07407
##   OG PH SALINITY SUSO TEMP XMS
## 1 NA 8.08 33.617  NA 19.43000 44.85000
## 2 NA 8.18 33.574  NA 19.31000 75.60000
## 3 NA  NA  NA 14.56667 77.03704
## 4 NA  NA  NA 14.37500 86.75000
## 5 NA  NA  NA 14.48519 83.55556
## 6 NA  NA  NA 14.18333 84.66667
## 7 NA  NA  NA 14.61852 77.62963
##           vars   n   mean      sd median trimmed  mad   min   max
## date_sample      1 17003   NaN     NA     NaN    NA Inf -Inf
## project*        2 17003 1.37    0.48   1.00  1.34  0.00  1.00  2.00
## depth_m_bin*    3 17003 4.49    2.61   5.00  4.48  2.97  1.00  8.00
## CHLOROPHYLL    4  8386  3.60    4.09   2.38  2.82  2.13  0.00 54.04
## DENSITY         5  8627 24.96    0.69  24.98 24.99  0.70 22.39 26.48
## DO              6  9842  6.70    1.69   7.10  6.80  1.58  0.00 12.83
## ENTERO          7 15533 150.11 925.42  2.80 10.66 1.19  0.00 18000.00
## FECAL           8 14874 269.82 1129.98  3.85 28.41 2.74  0.00 13000.00
## OG              9  1115  0.24    0.26   0.20  0.20  0.00  0.20  5.10
## PH              10  9695  8.01    0.18   8.05  8.02  0.18  7.33  8.59

```

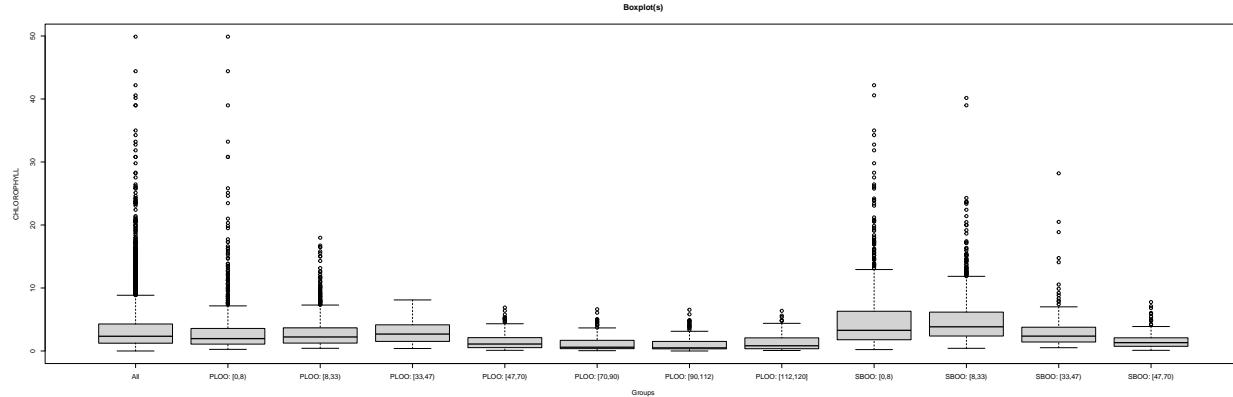
```

## SALINITY      11  9844  33.52     0.86  33.54   33.54 0.17    0.00   34.36
## SUSO         12  3023   4.77     2.99   4.18    4.40 1.89    0.20   48.70
## TEMP         13 12010  14.27     2.80  14.14   14.11 2.90    0.00   25.34
## XMS          14 11969  80.22     9.07  82.04   81.41 7.25   -37.00  93.83
##              range skew kurtosis se
## date_sample  -Inf   NA      NA  NA
## project*     1.00  0.54   -1.71 0.00
## depth_m_bin* 7.00 -0.11   -1.42 0.02
## CHLOROPHYLL 54.04  3.70   22.87 0.04
## DENSITY      4.09 -0.36   -0.15 0.01
## DO           12.83 -0.55   -0.16 0.02
## ENTERO        18000.00 9.88  111.40 7.43
## FECAL         13000.00 7.12  59.92 9.27
## OG            4.90 11.87  171.74 0.01
## PH            1.26 -0.50   -0.10 0.00
## SALINITY     34.36 -34.13  1283.78 0.01
## SUSO          48.50  3.91   33.72 0.05
## TEMP          25.34  0.42   0.06 0.03
## XMS          130.83 -2.14   9.79 0.08
##              date_sample project depth_m_bin parameter      Avg
## Not NA n     121286  121286    121286   121286 119635.0000
## NA n          0       0       0       0     1651.0000
## Not NA %      1       1       1       1     0.9864
## NA %          0       0       0       0     0.0136

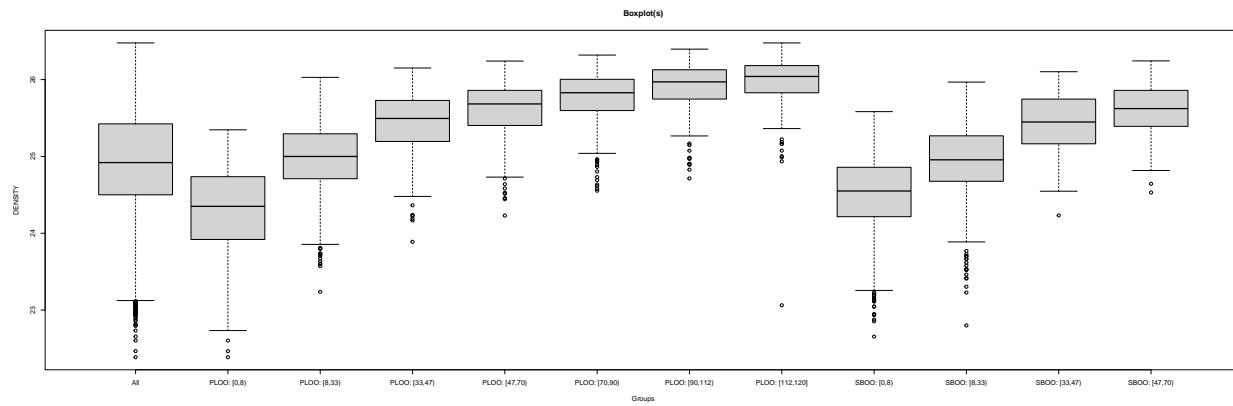
owt_df02_gb07_wkly = ts_eda(ts_df = owt_df02_gb07,
                             form_lead = c("date_sample", "project", "depth_m_bin"),
                             form_cast = "parameter",
                             param_lst = param_lst02,
                             l1_col = c("project"),
                             l1_param = c("PL00", "SB00"),
                             l2_col = c("depth_m_bin"),
                             l2_param = depth_lvls01,
                             rtn_met = FALSE,
                             box = FALSE,
                             week_agg = TRUE
                           )

## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PL00: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: Unknown", class =
##   replacement has 1 row, data has 0

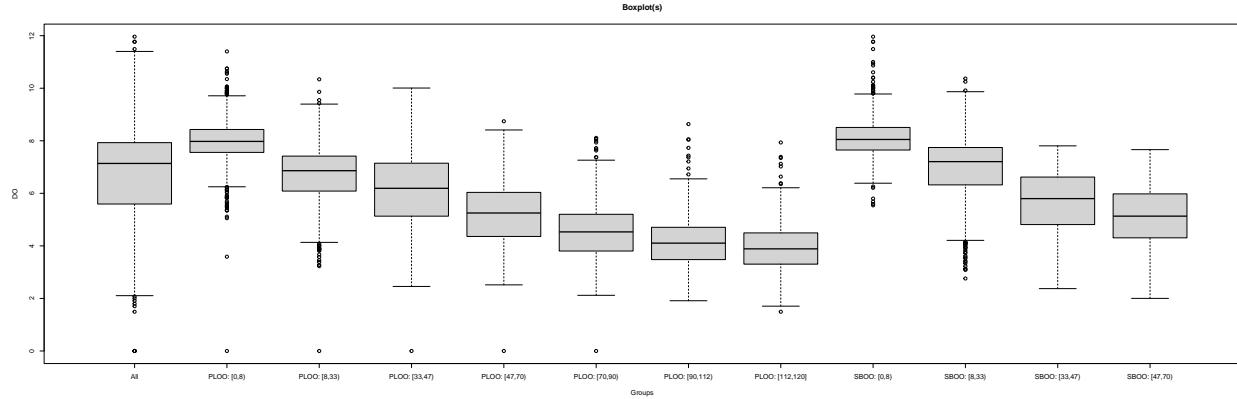
```



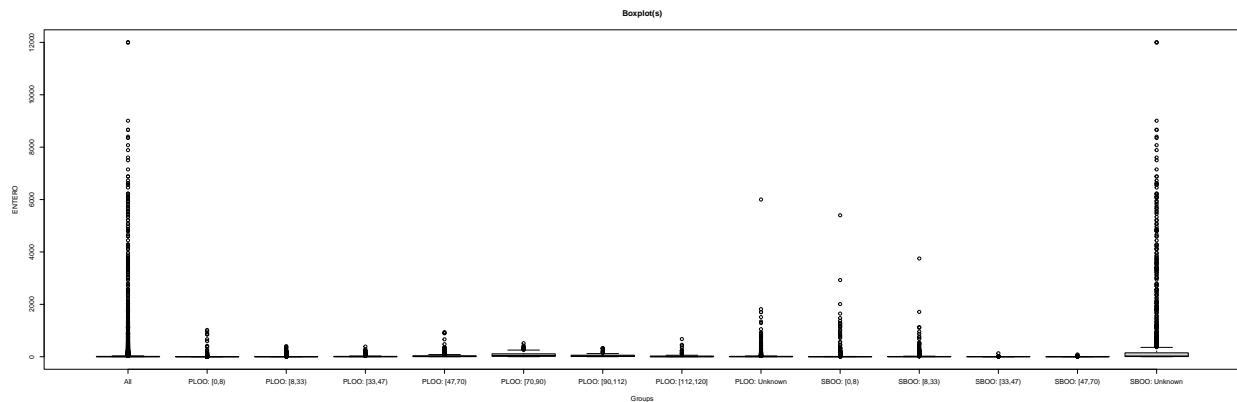
```
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: Unknown", class =
##   replacement has 1 row, data has 0
```



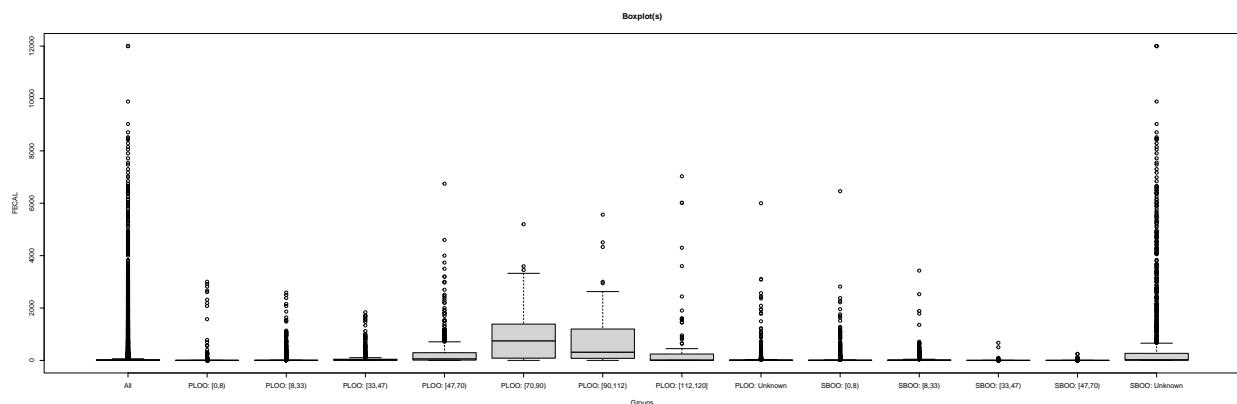
```
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: Unknown", class =
##   replacement has 1 row, data has 0
```



```
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
```



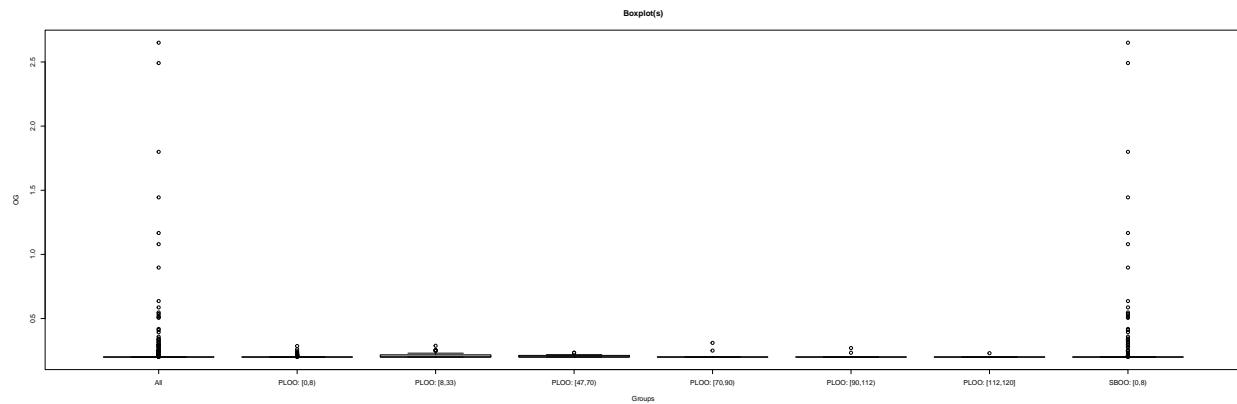
```
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
```



```

## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: [33,47)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [8,33)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [33,47)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [47,70)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

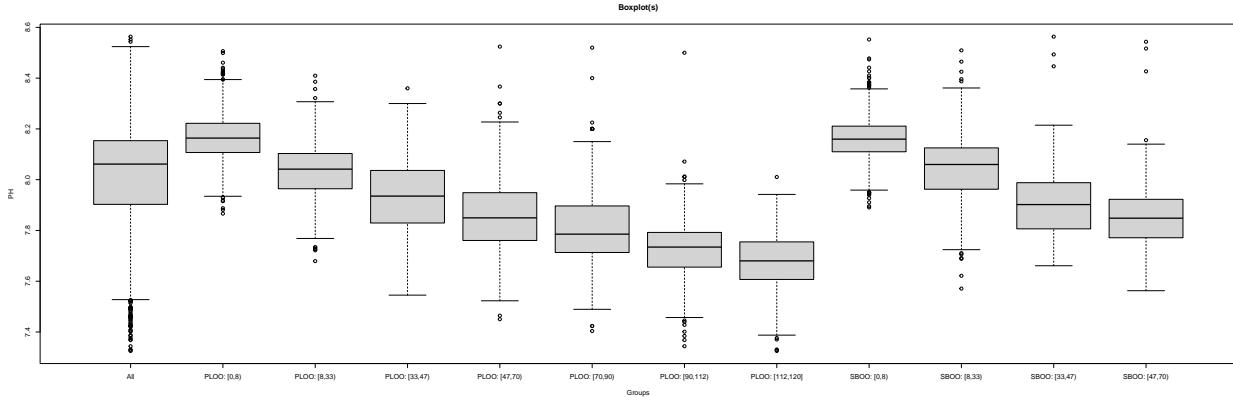
```



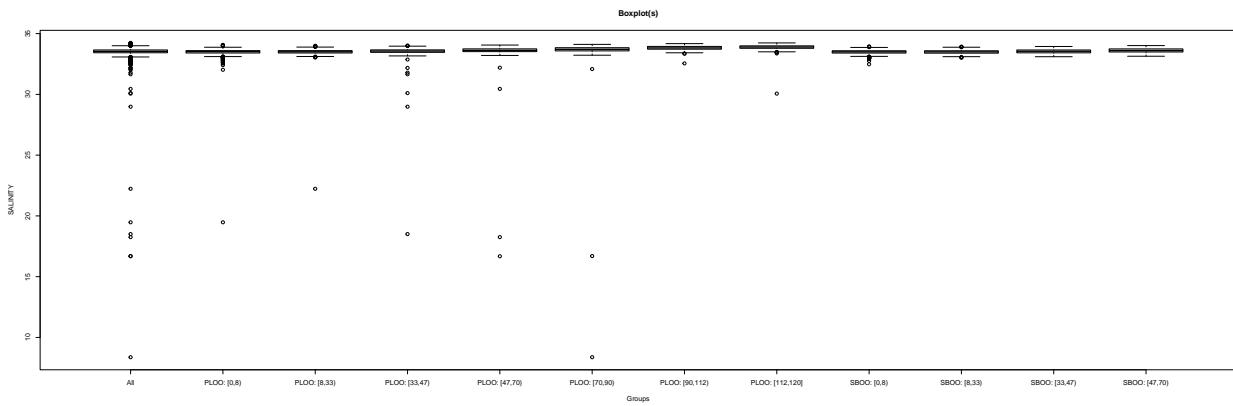
```

## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112)", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0

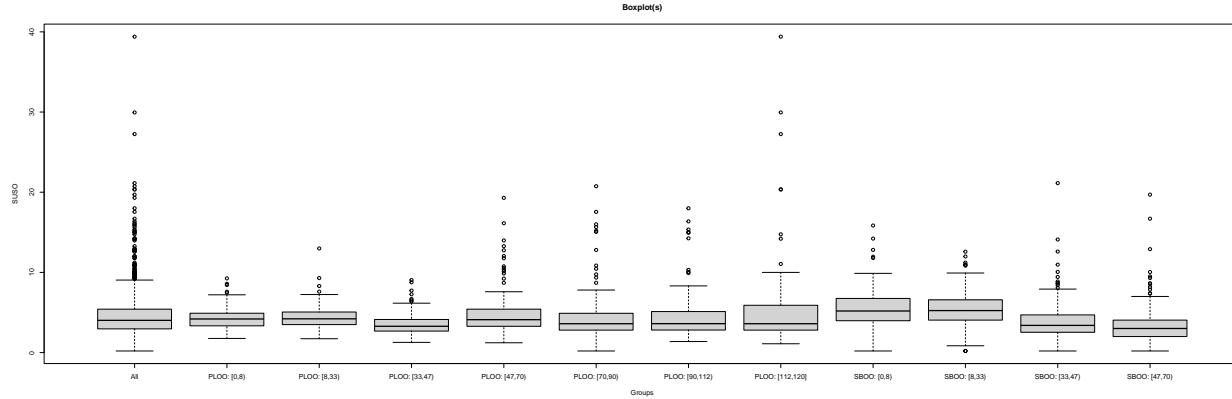
```



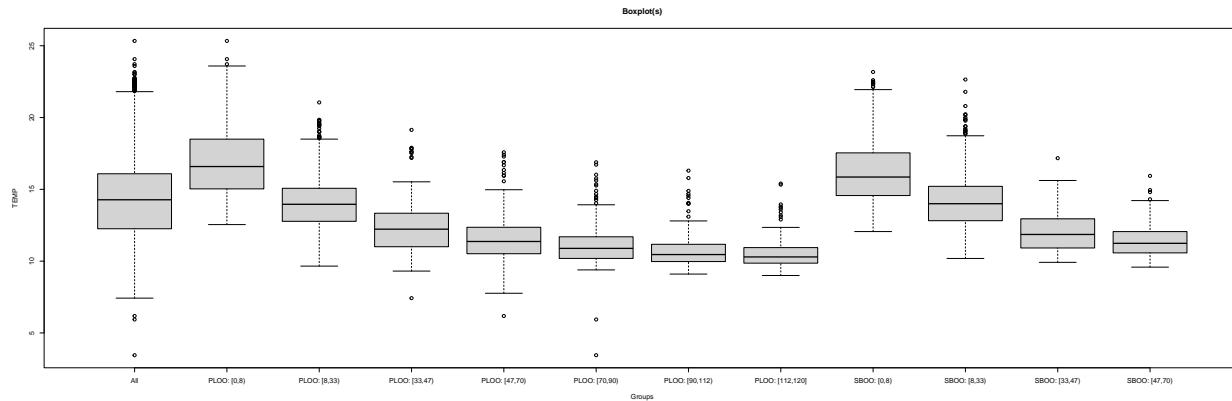
```
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0
```



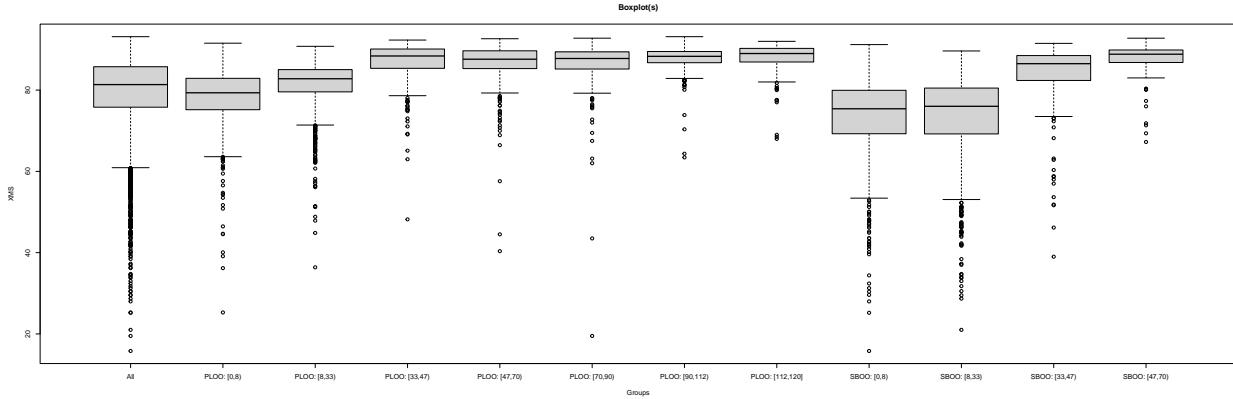
```
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SBOO: Unknown", class =
##   replacement has 1 row, data has 0
```



```
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: Unknown", class =
##   replacement has 1 row, data has 0
```



```
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "PLOO: Unknown", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [70,90]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [90,112]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: [112,120]", class =
##   replacement has 1 row, data has 0
## Error in `$<-.data.frame`(`*tmp*`, "Groups", value = structure(1L, levels = "SB00: Unknown", class =
##   replacement has 1 row, data has 0
```



```

##   date_sample project depth_m_bin CHLOROPHYLL DENSITY      DO      ENTERO
## 1 1990-11-19    PL00      [8,33)       0.87 23.855 6.550000     NA
## 2 1990-11-19    SB00      [0,8)        1.27 23.853 7.410000     NA
## 3 1991-01-07    PL00      [0,8)        NA     NA     NA 25.74074
## 4 1991-01-07    PL00      [8,33)       NA     NA     NA 24.58333
## 5 1991-01-14    PL00      [0,8)        NA     NA 5.550000 36.09512
## 6 1991-01-14    PL00      [33,47)      NA     NA 5.347222 66.25000
## 7 1991-01-14    PL00      [47,70)      NA     NA 5.300000 13.33333
##          FECAL OG      PH SALINITY SUSO      TEMP      XMS
## 1         NA NA 8.080000 33.61700     NA 19.43000 44.85000
## 2         NA NA 8.180000 33.57400     NA 19.31000 75.60000
## 3 90.18519 NA         NA        NA 14.52593 80.29630
## 4 84.58333 NA         NA        NA 14.27917 85.70833
## 5 33.47643 NA 8.200000 33.49806     NA 14.19729 82.40221
## 6 352.50000 NA 8.200000 33.50861     NA 14.15278 82.25000
## 7 31.66667 NA 8.192857 33.52500     NA 13.70000 85.50000
##             vars     n   mean      sd median trimmed  mad   min     max
## date_sample      1 10371    NaN     NA    NaN    NA Inf -Inf
## project*        2 10371  1.36    0.48   1.00  1.33  0.00  1.00  2.00
## depth_m_bin*     3 10371  4.69    2.66   6.00  4.74  2.97  1.00  8.00
## CHLOROPHYLL     4  5198   3.50    3.91   2.34  2.76  1.97  0.00 49.89
## DENSITY          5  5282  24.93    0.69  24.92  24.95  0.68 22.39 26.48
## DO               6  5851   6.72    1.66   7.14  6.84  1.49  0.00 11.96
## ENTERO           7  9986  92.65  572.67   3.16  9.41  1.72  1.93 12000.00
## FECAL            8  9842 175.67  733.02   4.00 21.43  2.97  1.00 12000.00
## OG               9   458   0.24    0.20   0.20  0.20  0.00  0.20  2.65
## PH              10  5856   8.02    0.18   8.06  8.03  0.17  7.33  8.56
## SALINITY         11  5851  33.52    0.62  33.54  33.54  0.17  8.38 34.23
## SUSO            12  1709   4.54    2.80   4.02  4.19  1.74  0.20 39.40
## TEMP            13  6958  14.37    2.78  14.27  14.23  2.84  3.45 25.34
## XMS             14  6937  79.59    8.90  81.36  80.71  7.23 15.80 93.15
##             range   skew kurtosis   se
## date_sample    -Inf    NA     NA  NA
## project*       1.00   0.56  -1.68  0.00
## depth_m_bin*    7.00  -0.21  -1.42  0.03
## CHLOROPHYLL  49.89   3.74  22.93  0.05
## DENSITY        4.09  -0.29  -0.15  0.01
## DO            11.96  -0.59  -0.20  0.02
## ENTERO        11998.07 10.78 141.08  5.73
## FECAL         11999.00   7.39  68.78  7.39

```

```

## OG          2.45   9.07   92.51 0.01
## PH          1.24  -0.62    0.11 0.00
## SALINITY    25.86 -26.02   816.01 0.01
## SUSO         39.20   3.44   24.87 0.07
## TEMP         21.89   0.42   -0.15 0.03
## XMS          77.35  -1.69    4.81 0.11
##           date_sample project depth_m_bin parameter      Avg
## Not NA n     121286   121286    121286   121286 119635.0000
## NA n          0        0        0        0       1651.0000
## Not NA %      1        1        1        1       0.9864
## NA %          0        0        0        0       0.0136

# Define function that imputes the missing values to parameter dataframe using linear
# interpolation
impute_missing_values <- function(df_data) {

  params <- c("CHLOROPHYLL",
             "DENSITY",
             "DO",
             "ENTERO",
             "FECAL",
             "OG",
             "PH",
             "SALINITY",
             "SUSO",
             "TEMP",
             "XMS")

  for (param in params) {
    print(head(df_data, 7))
    print(param)
    print(date_sample)

    x <- zoo(df_data$param, df_data$date_sample)
    df_data$param <- na.interpolation(x, option = "linear")
    return(df_data)
  }
}

# remove NAs
# Linear Interpolation

# owt_df02_gb04_mrgd
x <- zoo(owt_df02_gb04_mrgd$CHLOROPHYLL, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$CHLOROPHYLL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$DENSITY, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$DENSITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$DO, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$DO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$ENTERO, owt_df02_gb04_mrgd$date_sample)

```

```

owt_df02_gb04_mrgd$ENTERO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$FECAL, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$FECAL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$OG, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$OG <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$PH, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$PH <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$SALINITY, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$SALINITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$SUSO, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$SUSO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$TEMP, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$TEMP <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_mrgd$XMS, owt_df02_gb04_mrgd$date_sample)
owt_df02_gb04_mrgd$XMS <- na.interpolation(x, option = "linear")

# owt_df02_gb04_wkly
x <- zoo(owt_df02_gb04_wkly$CHLOROPHYLL, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$CHLOROPHYLL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$DENSITY, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$DENSITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$DO, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$DO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$ENTERO, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$ENTERO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$FECAL, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$FECAL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$OG, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$OG <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$PH, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$PH <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$SALINITY, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$SALINITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$SUSO, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$SUSO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$TEMP, owt_df02_gb04_wkly$date_sample)

```

```

owt_df02_gb04_wkly$TEMP <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb04_wkly$XMS, owt_df02_gb04_wkly$date_sample)
owt_df02_gb04_wkly$XMS <- na.interpolation(x, option = "linear")

# owt_df02_gb09_mrgd
x <- zoo(owt_df02_gb09_mrgd$CHLOROPHYLL, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$CHLOROPHYLL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$DENSITY, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$DENSITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$D0, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$D0 <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$ENTERO, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$ENTERO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$FECAL, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$FECAL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$OG, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$OG <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$PH, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$PH <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$SALINITY, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$SALINITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$SUSO, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$SUSO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$TEMP, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$TEMP <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_mrgd$XMS, owt_df02_gb09_mrgd$date_sample)
owt_df02_gb09_mrgd$XMS <- na.interpolation(x, option = "linear")

# owt_df02_gb09_wkly <- impute_missing_values(owt_df02_gb09_wkly)
x <- zoo(owt_df02_gb09_wkly$CHLOROPHYLL, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$CHLOROPHYLL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_wkly$DENSITY, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$DENSITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_wkly$D0, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$D0 <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_wkly$ENTERO, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$ENTERO <- na.interpolation(x, option = "linear")

```

```

x <- zoo(owt_df02_gb09_wkly$FECAL, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$FECAL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_wkly$OG, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$OG <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_wkly$PH, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$PH <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_wkly$SALINITY, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$SALINITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_wkly$SUSO, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$SUSO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_wkly$TEMP, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$TEMP <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb09_wkly$XMS, owt_df02_gb09_wkly$date_sample)
owt_df02_gb09_wkly$XMS <- na.interpolation(x, option = "linear")

# owt_df02_gb07_mrgd
x <- zoo(owt_df02_gb07_mrgd$CHLOROPHYLL, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$CHLOROPHYLL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_mrgd$DENSITY, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$DENSITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_mrgd$DO, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$DO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_mrgd$ENTERO, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$ENTERO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_mrgd$FECAL, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$FECAL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_mrgd$OG, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$OG <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_mrgd$PH, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$PH <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_mrgd$SALINITY, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$SALINITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_mrgd$SUSO, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$SUSO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_mrgd$TEMP, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$TEMP <- na.interpolation(x, option = "linear")

```

```

x <- zoo(owt_df02_gb07_mrgd$XMS, owt_df02_gb07_mrgd$date_sample)
owt_df02_gb07_mrgd$XMS <- na.interpolation(x, option = "linear")

# owt_df02_gb07_mrgd
x <- zoo(owt_df02_gb07_wkly$CHLOROPHYLL, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$CHLOROPHYLL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$DENSITY, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$DENSITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$DO, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$DO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$ENTERO, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$ENTERO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$FECAL, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$FECAL <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$OG, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$OG <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$PH, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$PH <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$SALINITY, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$SALINITY <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$SUSO, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$SUSO <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$TEMP, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$TEMP <- na.interpolation(x, option = "linear")

x <- zoo(owt_df02_gb07_wkly$XMS, owt_df02_gb07_wkly$date_sample)
owt_df02_gb07_wkly$XMS <- na.interpolation(x, option = "linear")

# https://cran.r-project.org/web/packages/padr/vignettes/padr.html
#print(head(owt_df02_gb04_mrgd, 7))
#print(tail(owt_df02_gb04_mrgd, 7))

owt_df02_gb04_mrgd %>%
  pad()

##      date_sample CHLOROPHYLL    DENSITY        DO      ENTERO      FECAL
## 1 1990-11-15     1.0700000  23.85400  6.9800000  32.051282 125.641026
## 2 1990-11-16     1.0690476  23.85410  6.6792500  32.051282 125.641026
## 3 1990-11-17     1.0680952  23.85420  6.3785000  18.717949  51.282051
## 4 1990-11-18     1.0671429  23.85431  6.0777500 106.153846  80.769231
## 5 1990-11-19     1.0661905  23.85441  5.7770000  40.000000  40.555556
## 6 1990-11-20     1.0652381  23.85451  5.4762500  20.338983  40.508475

```

## 7	1990-11-21	1.0642857	23.85461	5.5000000	40.227273	78.181818
## 8	1990-11-22	1.0633333	23.85471	5.3600000	83.928571	446.071429
## 9	1990-11-23	1.0623810	23.85482	5.3561364	33.846154	95.641026
## 10	1990-11-24	1.0614286	23.85492	5.3522727	12.564103	23.589744
## 11	1990-11-25	1.0604762	23.85502	5.3484091	20.512821	31.025641
## 12	1990-11-26	1.0595238	23.85512	5.3445455	43.125000	108.541667
## 13	1990-11-27	1.0585714	23.85522	5.3406818	183.076923	427.692308
## 14	1990-11-28	1.0576190	23.85533	5.3368182	125.384615	429.487179
## 15	1990-11-29	1.0566667	23.85543	5.3329545	16.291667	16.750000
## 16	1990-11-30	1.0557143	23.85553	5.3290909	17.384615	12.512821
## 17	1990-12-01	1.0547619	23.85563	5.3252273	51.897436	55.435897
## 18	1990-12-02	1.0538095	23.85573	5.3213636	45.666667	49.925926
## 19	1990-12-03	1.0528571	23.85584	5.3175000	6.700000	33.900000
## 20	1990-12-04	1.0519048	23.85594	5.8800000	36.204082	120.571429
## 21	1990-12-05	1.0509524	23.85604	5.5950000	86.121212	301.818182
## 22	1990-12-06	1.0500000	23.85614	5.4528571	15.500000	27.291667
## 23	1990-12-07	1.0490476	23.85624	5.3107143	2.666667	4.923077
## 24	1990-12-08	1.0480952	23.85635	5.1685714	26.666667	18.410256
## 25	1990-12-09	1.0471429	23.85645	5.0264286	6.358974	11.692308
## 26	1990-12-10	1.0461905	23.85655	4.8842857	122.923077	575.230769
## 27	1990-12-11	1.0452381	23.85665	4.7421429	7.746032	11.841270
## 28	1990-12-12	1.0442857	23.85676	4.6000000	49.240000	374.160000
## 29	1990-12-13	1.0433333	23.85686	4.8700000	3.692308	5.743590
## 30	1990-12-14	1.0423810	23.85696	4.9550000	33.878788	272.787879
## 31	1990-12-15	1.0414286	23.85706	4.9370313	72.717949	406.666667
## 32	1990-12-16	1.0404762	23.85716	4.9190625	18.242424	98.303030
## 33	1990-12-17	1.0395238	23.85727	4.9010938	6.666667	35.000000
## 34	1990-12-18	1.0385714	23.85737	4.8831250	6.974359	10.512821
## 35	1990-12-19	1.0376190	23.85747	4.8651563	173.333333	125.777778
## 36	1990-12-20	1.0366667	23.85757	4.8471875	138.000000	1650.000000
## 37	1990-12-21	1.0357143	23.85767	4.8292187	6500.000000	725.000000
## 38	1990-12-22	1.0347619	23.85778	4.8112500	32.250000	75.950000
## 39	1990-12-23	1.0338095	23.85788	4.7932813	7.333333	5.076923
## 40	1990-12-24	1.0328571	23.85798	4.7753125	22.717949	61.230769
## 41	1990-12-25	1.0319048	23.85808	4.7573438	48.923077	240.923077
## 42	1990-12-26	1.0309524	23.85818	4.7393750	2.000000	2.000000
## 43	1990-12-27	1.0300000	23.85829	4.7214063	65.589744	167.794872
## 44	1990-12-28	1.0290476	23.85839	4.7034375	17.897436	10.820513
## 45	1990-12-29	1.0280952	23.85849	4.6854688	15.074074	21.407407
## 46	1990-12-30	1.0271429	23.85859	4.6675000	168.440000	856.560000
## 47	1990-12-31	1.0261905	23.85869	4.7400000	2.444444	16.518519
## 48	1991-01-01	1.0252381	23.85880	4.7850000	15.866667	46.444444
## 49	1991-01-02	1.0242857	23.85890	4.7770833	41.076923	127.076923
## 50	1991-01-03	1.0233333	23.85900	4.7691667	5.555556	3.555556
## 51	1991-01-04	1.0223810	23.85910	4.7612500	26.307692	101.692308
## 52	1991-01-05	1.0214286	23.85920	4.7533333	4.974359	6.051282
## 53	1991-01-06	1.0204762	23.85931	4.7454167	15.692308	15.230769
## 54	1991-01-07	1.0195238	23.85941	4.7375000	13.025641	42.358974
## 55	1991-01-08	1.0185714	23.85951	4.7295833	3.111111	4.222222
## 56	1991-01-09	1.0176190	23.85961	4.7216667	7.846154	35.435897
## 57	1991-01-10	1.0166667	23.85971	4.7137500	7.435897	7.333333
## 58	1991-01-11	1.0157143	23.85982	4.7058333	15.125000	28.208333
## 59	1991-01-12	1.0147619	23.85992	4.6979167	12.051282	0.000000
## 60	1991-01-13	1.0138095	23.86002	4.6900000	36.476190	152.571429

## 61	1991-01-14	1.0128571	23.86012	4.1200000	27.600000	162.520000
## 62	1991-01-15	1.0119048	23.86022	4.6400000	21.076923	39.589744
## 63	1991-01-16	1.0109524	23.86033	4.6750000	275.272727	1842.242424
## 64	1991-01-17	1.0100000	23.86043	4.7220000	101.179487	124.307692
## 65	1991-01-18	1.0090476	23.86053	4.7690000	52.250000	119.083333
## 66	1991-01-19	1.0080952	23.86063	4.8160000	46.051282	205.384615
## 67	1991-01-20	1.0071429	23.86073	4.8630000	45.250000	362.708333
## 68	1991-01-21	1.0061905	23.86084	4.9100000	6.205128	8.820513
## 69	1991-01-22	1.0052381	23.86094	4.9570000	2.444444	2.000000
## 70	1991-01-23	1.0042857	23.86104	5.0040000	13.179487	69.538462
## 71	1991-01-24	1.0033333	23.86114	5.0510000	16.512821	19.692308
## 72	1991-01-25	1.0023810	23.86124	5.0980000	34.380952	178.126984
## 73	1991-01-26	1.0014286	23.86135	5.1450000	103.800000	849.960000
## 74	1991-01-27	1.0004762	23.86145	6.0500000	27.948718	162.102564
## 75	1991-01-28	0.9995238	23.86155	6.5700000	21.575758	292.000000
## 76	1991-01-29	0.9985714	23.86165	6.5060648	4.666667	18.923077
## 77	1991-01-30	0.9976190	23.86176	6.4421296	3.333333	7.555556
## 78	1991-01-31	0.9966667	23.86186	6.3781944	11.641026	16.256410
## 79	1991-02-01	0.9957143	23.86196	6.3142593	61.076923	189.897436
## 80	1991-02-02	0.9947619	23.86206	6.2503241	8.222222	18.000000
## 81	1991-02-03	0.9938095	23.86216	6.1863889	12.256410	73.384615
## 82	1991-02-04	0.9928571	23.86227	6.1224537	18.564103	48.923077
## 83	1991-02-05	0.9919048	23.86237	6.0585185	2.666667	2.000000
## 84	1991-02-06	0.9909524	23.86247	5.9945833	13.230769	10.717949
## 85	1991-02-07	0.9900000	23.86257	5.9306481	73.743590	1348.564103
## 86	1991-02-08	0.9890476	23.86267	5.8667130	113.904762	798.190476
## 87	1991-02-09	0.9880952	23.86278	5.8027778	61.200000	424.080000
## 88	1991-02-10	0.9871429	23.86288	6.3300000	55.487179	530.051282
## 89	1991-02-11	0.9861905	23.86298	6.6700000	125.757576	1728.000000
## 90	1991-02-12	0.9852381	23.86308	6.6078824	16.102564	65.897436
## 91	1991-02-13	0.9842857	23.86318	6.5457647	24.888889	50.444444
## 92	1991-02-14	0.9833333	23.86329	6.4836471	35.076923	172.205128
## 93	1991-02-15	0.9823810	23.86339	6.4215294	157.897436	1172.666667
## 94	1991-02-16	0.9814286	23.86349	6.3594118	122.820513	925.333333
## 95	1991-02-17	0.9804762	23.86359	6.2972941	19.333333	5.777778
## 96	1991-02-18	0.9795238	23.86369	6.2351765	5.333333	14.222222
## 97	1991-02-19	0.9785714	23.86380	6.1730588	17.128205	298.615385
## 98	1991-02-20	0.9776190	23.86390	6.1109412	16.461538	367.384615
## 99	1991-02-21	0.9766667	23.86400	6.0488235	24.615385	26.794872
## 100	1991-02-22	0.9757143	23.86410	5.9867059	16.444444	7.111111
## 101	1991-02-23	0.9747619	23.86420	5.9245882	38.820513	566.051282
## 102	1991-02-24	0.9738095	23.86431	5.8624706	12.820513	34.615385
## 103	1991-02-25	0.9728571	23.86441	5.8003529	32.444444	480.476190
## 104	1991-02-26	0.9719048	23.86451	5.7382353	11.160000	227.000000
## 105	1991-02-27	0.9709524	23.86461	5.8200000	5.025641	221.538462
## 106	1991-02-28	0.9700000	23.86471	5.8800000	97.515152	1627.818182
## 107	1991-03-01	0.9690476	23.86482	5.8840271	9.666667	172.875000
## 108	1991-03-02	0.9680952	23.86492	5.8880543	69.076923	725.846154
## 109	1991-03-03	0.9671429	23.86502	5.8920814	167.589744	1607.897436
## 110	1991-03-04	0.9661905	23.86512	5.8961086	5.166667	38.916667
## 111	1991-03-05	0.9652381	23.86522	5.9001357	6.666667	41.487179
## 112	1991-03-06	0.9642857	23.86533	5.9041629	6.444444	2.222222
## 113	1991-03-07	0.9633333	23.86543	5.9081900	9.743590	2.358974
## 114	1991-03-08	0.9623810	23.86553	5.9122172	4.410256	19.230769

## 115	1991-03-09	0.9614286	23.86563	5.9162443	8.444444	8.888889
## 116	1991-03-10	0.9604762	23.86573	5.9202715	6.871795	23.179487
## 117	1991-03-11	0.9595238	23.86584	5.9242986	3.897436	8.307692
## 118	1991-03-12	0.9585714	23.86594	5.9283258	19.592593	188.703704
## 119	1991-03-13	0.9576190	23.86604	5.9323529	3.830508	4.677966
## 120	1991-03-14	0.9566667	23.86614	6.3000000	7.076923	3.384615
## 121	1991-03-15	0.9557143	23.86624	6.7650000	2.484848	30.242424
## 122	1991-03-16	0.9547619	23.86635	6.6540196	16.666667	30.000000
## 123	1991-03-17	0.9538095	23.86645	6.5430392	41.128205	518.205128
## 124	1991-03-18	0.9528571	23.86655	6.4320588	12.358974	97.897436
## 125	1991-03-19	0.9519048	23.86665	6.3210784	3.025641	25.743590
## 126	1991-03-20	0.9509524	23.86676	6.2100980	4.000000	7.777778
## 127	1991-03-21	0.9500000	23.86686	6.0991176	2.512821	15.743590
## 128	1991-03-22	0.9490476	23.86696	5.9881373	14.615385	97.282051
## 129	1991-03-23	0.9480952	23.86706	5.8771569	9.619048	31.714286
## 130	1991-03-24	0.9471429	23.86716	5.7661765	15.322344	603.200000
## 131	1991-03-25	0.9461905	23.86727	5.8900000	21.025641	1116.461538
## 132	1991-03-26	0.9452381	23.86737	6.2100000	2.000000	4.424242
## 133	1991-03-27	0.9442857	23.86747	6.1741176	10.256410	23.641026
## 134	1991-03-28	0.9433333	23.86757	6.1382353	7.333333	95.555556
## 135	1991-03-29	0.9423810	23.86767	6.1023529	4.153846	14.923077
## 136	1991-03-30	0.9414286	23.86778	6.0664706	6.974359	139.076923
## 137	1991-03-31	0.9404762	23.86788	6.0305882	15.777778	8.888889
## 138	1991-04-01	0.9395238	23.86798	5.9947059	17.794872	300.358974
## 139	1991-04-02	0.9385714	23.86808	5.9588235	12.717949	11.538462
## 140	1991-04-03	0.9376190	23.86818	5.9229412	141.555556	380.888889
## 141	1991-04-04	0.9366667	23.86829	5.8870588	17.743590	124.000000
## 142	1991-04-05	0.9357143	23.86839	5.8511765	13.743590	79.333333
## 143	1991-04-06	0.9347619	23.86849	5.8152941	21.074074	15.629630
## 144	1991-04-07	0.9338095	23.86859	5.7794118	51.560000	196.920000
## 145	1991-04-08	0.9328571	23.86869	6.0066667	2.000000	3.638889
## 146	1991-04-09	0.9319048	23.86880	6.1711111	44.333333	179.625000
## 147	1991-04-10	0.9309524	23.86890	6.3355556	2.933333	9.066667
## 148	1991-04-11	0.9300000	23.86900	6.5000000	18.222222	142.888889
## 149	1991-04-12	0.9299043	23.86905	6.4151471	20.880000	127.520000
## 150	1991-04-13	0.9298086	23.86911	6.3302941	16.428571	14.285714
## 151	1991-04-14	0.9297129	23.86916	6.2454412	15.025641	71.948718
## 152	1991-04-15	0.9296172	23.86921	6.1605882	25.948718	217.743590
## 153	1991-04-16	0.9295215	23.86926	6.0757353	6.416667	27.541667
## 154	1991-04-17	0.9294258	23.86932	5.9908824	6.615385	26.256410
## 155	1991-04-18	0.9293301	23.86937	5.9060294	24.923077	188.410256
## 156	1991-04-19	0.9292344	23.86942	5.8211765	27.529412	111.235294
## 157	1991-04-20	0.9291388	23.86947	5.7363235	123.904762	1099.238095
## 158	1991-04-21	0.9290431	23.86953	5.6514706	10.640000	280.080000
## 159	1991-04-22	0.9289474	23.86958	5.3600000	5.589744	40.102564
## 160	1991-04-23	0.9288517	23.86963	5.3300000	72.000000	791.142857
## 161	1991-04-24	0.9287560	23.86968	5.3730719	2.058824	6.823529
## 162	1991-04-25	0.9286603	23.86974	5.4161438	5.285714	13.647059
## 163	1991-04-26	0.9285646	23.86979	5.4592157	74.235294	8.352941
## 164	1991-04-27	0.9284689	23.86984	5.5022876	36.232558	6.093023
## 165	1991-04-28	0.9283732	23.86989	5.5453595	87.764706	258.000000
## 166	1991-04-29	0.9282775	23.86995	5.5884314	19.705882	15.823529
## 167	1991-04-30	0.9281818	23.87000	5.6315033	113.466667	623.133333
## 168	1991-05-01	0.9280861	23.87005	5.6745752	26.476190	16.222222

## 169	1991-05-02	0.9279904	23.87011	5.7176471	88.290909	317.864407
## 170	1991-05-03	0.9278947	23.87016	5.6766667	18.833333	172.055556
## 171	1991-05-04	0.9277990	23.87021	5.2036111	497.333333	1991.487179
## 172	1991-05-05	0.9277033	23.87026	4.7305556	33.230769	29.692308
## 173	1991-05-06	0.9276077	23.87032	4.2575000	9.435897	28.256410
## 174	1991-05-07	0.9275120	23.87037	3.7844444	16.153846	39.282051
## 175	1991-05-08	0.9274163	23.87042	3.3113889	3.111111	10.888889
## 176	1991-05-09	0.9273206	23.87047	2.8383333	7.948718	16.631579
## 177	1991-05-10	0.9272249	23.87053	2.3652778	6.717949	13.487179
## 178	1991-05-11	0.9271292	23.87058	1.8922222	68.000000	272.717949
## 179	1991-05-12	0.9270335	23.87063	1.4191667	231.538462	1394.871795
## 180	1991-05-13	0.9269378	23.87068	0.9461111	12.000000	13.272727
## 181	1991-05-14	0.9268421	23.87074	0.4730556	70.000000	427.916667
## 182	1991-05-15	0.9267464	23.87079	0.0000000	78.177215	793.478261
## 183	1991-05-16	0.9266507	23.87084	0.0000000	315.928571	2185.142857
## 184	1991-05-17	0.9265550	23.87089	0.0000000	1151.456790	3205.111111
## 185	1991-05-18	0.9264593	23.87095	0.2476716	504.222222	915.111111
## 186	1991-05-19	0.9263636	23.87100	0.4953431	179.555556	462.000000
## 187	1991-05-20	0.9262679	23.87105	0.7430147	674.604651	4376.000000
## 188	1991-05-21	0.9261722	23.87111	0.9906863	884.444444	2718.666667
## 189	1991-05-22	0.9260766	23.87116	1.2383578	351.125000	1597.208333
## 190	1991-05-23	0.9259809	23.87121	1.4860294	848.222222	3453.555556
## 191	1991-05-24	0.9258852	23.87126	1.7337010	415.625000	1085.291667
## 192	1991-05-25	0.9257895	23.87132	1.9813725	473.555556	732.888889
## 193	1991-05-26	0.9256938	23.87137	2.2290441	754.222222	2772.888889
## 194	1991-05-27	0.9255981	23.87142	2.4767157	241.111111	1648.000000
## 195	1991-05-28	0.9255024	23.87147	2.7243873	122.375000	1143.833333
## 196	1991-05-29	0.9254067	23.87153	2.9720588	413.333333	1564.625000
## 197	1991-05-30	0.9253110	23.87158	3.2197304	75.777778	382.222222
## 198	1991-05-31	0.9252153	23.87163	3.4674020	200.500000	1596.375000
## 199	1991-06-01	0.9251196	23.87168	3.7150735	352.666667	3126.000000
## 200	1991-06-02	0.9250239	23.87174	3.9627451	327.777778	1284.000000
## 201	1991-06-03	0.9249282	23.87179	4.2104167	700.416667	2808.833333
## 202	1991-06-04	0.9248325	23.87184	4.4580882	209.555556	1689.333333
## 203	1991-06-05	0.9247368	23.87189	4.7057598	483.000000	1747.458333
## 204	1991-06-06	0.9246411	23.87195	4.9534314	797.333333	4762.000000
## 205	1991-06-07	0.9245455	23.87200	5.2011029	435.500000	1515.583333
## 206	1991-06-08	0.9244498	23.87205	5.4487745	160.888889	1094.666667
## 207	1991-06-09	0.9243541	23.87211	5.6964461	1650.000000	6506.888889
## 208	1991-06-10	0.9242584	23.87216	5.9441176	35.755102	88.857143
## 209	1991-06-11	0.9241627	23.87221	6.0045588	887.000000	2295.583333
## 210	1991-06-12	0.9240670	23.87226	6.0650000	301.956044	1697.708333
## 211	1991-06-13	0.9239713	23.87232	5.8900000	238.222222	1099.833333
## 212	1991-06-14	0.9238756	23.87237	5.8630607	460.458333	1874.208333
## 213	1991-06-15	0.9237799	23.87242	5.8361213	256.666667	842.222222
## 214	1991-06-16	0.9236842	23.87247	5.8091820	391.555556	1769.777778
## 215	1991-06-17	0.9235885	23.87253	5.7822426	636.666667	1993.000000
## 216	1991-06-18	0.9234928	23.87258	5.7553033	34.888889	57.111111
## 217	1991-06-19	0.9233971	23.87263	5.7283640	213.083333	1354.916667
## 218	1991-06-20	0.9233014	23.87268	5.7014246	370.222222	3435.111111
## 219	1991-06-21	0.9232057	23.87274	5.6744853	674.291667	1548.083333
## 220	1991-06-22	0.9231100	23.87279	5.6475460	44.222222	162.000000
## 221	1991-06-23	0.9230144	23.87284	5.6206066	39.333333	227.333333
## 222	1991-06-24	0.9229187	23.87289	5.5936673	264.041667	1163.791667

## 223	1991-06-25	0.9228230	23.87295	5.5667279	262.666667	1796.000000
## 224	1991-06-26	0.9227273	23.87300	5.5397886	582.958333	2253.333333
## 225	1991-06-27	0.9226316	23.87305	5.5128493	145.333333	352.000000
## 226	1991-06-28	0.9225359	23.87311	5.4859099	652.625000	2266.750000
## 227	1991-06-29	0.9224402	23.87316	5.4589706	2605.777778	6511.777778
## 228	1991-06-30	0.9223445	23.87321	5.4320313	775.777778	1118.000000
## 229	1991-07-01	0.9222488	23.87326	5.4050919	1166.500000	3512.916667
## 230	1991-07-02	0.9221531	23.87332	5.3781526	80.000000	98.888889
## 231	1991-07-03	0.9220574	23.87337	5.3512132	84.708333	598.166667
## 232	1991-07-04	0.9219617	23.87342	5.3242739	750.500000	2913.500000
## 233	1991-07-05	0.9218660	23.87347	5.2973346	256.888889	1587.333333
## 234	1991-07-06	0.9217703	23.87353	5.2703952	534.888889	2781.111111
## 235	1991-07-07	0.9216746	23.87358	5.2434559	436.000000	2678.000000
## 236	1991-07-08	0.9215789	23.87363	5.2165165	288.958333	2054.833333
## 237	1991-07-09	0.9214833	23.87368	5.1895772	1191.777778	5062.888889
## 238	1991-07-10	0.9213876	23.87374	5.1626379	173.458333	1310.666667
## 239	1991-07-11	0.9212919	23.87379	5.1356985	230.444444	3508.444444
## 240	1991-07-12	0.9211962	23.87384	5.1087592	389.291667	2344.833333
## 241	1991-07-13	0.9211005	23.87389	5.0818199	343.777778	3192.000000
## 242	1991-07-14	0.9210048	23.87395	5.0548805	8.222222	16.888889
## 243	1991-07-15	0.9209091	23.87400	5.0279412	51.536232	391.362319
## 244	1991-07-16	0.9208134	23.87405	5.1497386	6.875000	4.960000
## 245	1991-07-17	0.9207177	23.87411	5.2715359	39.458333	107.583333
## 246	1991-07-18	0.9206220	23.87416	5.3933333	51.916667	141.805556
## 247	1991-07-19	0.9205263	23.87421	5.3425408	18.888889	2.851852
## 248	1991-07-20	0.9204306	23.87426	5.2917484	25.897436	86.564103
## 249	1991-07-21	0.9203349	23.87432	5.2409559	50.461538	129.076923
## 250	1991-07-22	0.9202392	23.87437	5.1901634	141.846154	640.000000
## 251	1991-07-23	0.9201435	23.87442	5.1393709	2.444444	3.111111
## 252	1991-07-24	0.9200478	23.87447	5.0885784	6.871795	11.487179
## 253	1991-07-25	0.9199522	23.87453	5.0377859	3.435897	2.871795
## 254	1991-07-26	0.9198565	23.87458	4.9869935	2.102564	3.641026
## 255	1991-07-27	0.9197608	23.87463	4.9362010	2.000000	6.358974
## 256	1991-07-28	0.9196651	23.87468	4.8854085	21.794872	303.102564
## 257	1991-07-29	0.9195694	23.87474	4.8346160	14.539683	95.142857
## 258	1991-07-30	0.9194737	23.87479	4.7838235	51.345455	486.036364
## 259	1991-07-31	0.9193780	23.87484	4.8685784	4.666667	13.555556
## 260	1991-08-01	0.9192823	23.87489	4.9533333	70.296296	306.740741
## 261	1991-08-02	0.9191866	23.87495	4.9768441	2.666667	33.692308
## 262	1991-08-03	0.9190909	23.87500	5.0003548	11.777778	4.222222
## 263	1991-08-04	0.9189952	23.87505	5.0238655	2.051282	2.153846
## 264	1991-08-05	0.9188995	23.87511	5.0473763	44.820513	335.641026
## 265	1991-08-06	0.9188038	23.87516	5.0708870	74.717949	404.512821
## 266	1991-08-07	0.9187081	23.87521	5.0943978	4.888889	10.666667
## 267	1991-08-08	0.9186124	23.87526	5.1179085	167.948718	1503.692308
## 268	1991-08-09	0.9185167	23.87532	5.1414192	9.333333	16.461538
## 269	1991-08-10	0.9184211	23.87537	5.1649300	8.307692	7.538462
## 270	1991-08-11	0.9183254	23.87542	5.1884407	4.000000	7.777778
## 271	1991-08-12	0.9182297	23.87547	5.2119514	36.358974	162.512821
## 272	1991-08-13	0.9181340	23.87553	5.2354622	123.948718	1446.615385
## 273	1991-08-14	0.9180383	23.87558	5.2589729	58.000000	27.333333
## 274	1991-08-15	0.9179426	23.87563	5.2824837	173.076923	972.153846
## 275	1991-08-16	0.9178469	23.87568	5.3059944	22.307692	261.692308
## 276	1991-08-17	0.9177512	23.87574	5.3295051	44.102564	203.384615

## 277	1991-08-18	0.9176555	23.87579	5.3530159	16.000000	4.666667
## 278	1991-08-19	0.9175598	23.87584	5.3765266	10.307692	64.923077
## 279	1991-08-20	0.9174641	23.87589	5.4000373	17.487179	11.025641
## 280	1991-08-21	0.9173684	23.87595	5.4235481	2.380952	26.031746
## 281	1991-08-22	0.9172727	23.87600	5.4470588	57.520000	427.280000
## 282	1991-08-23	0.9171770	23.87605	5.6500000	5.846154	14.307692
## 283	1991-08-24	0.9170813	23.87611	5.7300000	47.636364	306.969697
## 284	1991-08-25	0.9169856	23.87616	5.7832773	44.051282	185.948718
## 285	1991-08-26	0.9168900	23.87621	5.8365546	31.333333	108.500000
## 286	1991-08-27	0.9167943	23.87626	5.8898319	91.589744	796.256410
## 287	1991-08-28	0.9166986	23.87632	5.9431092	53.875000	202.166667
## 288	1991-08-29	0.9166029	23.87637	5.9963866	115.897436	1366.051282
## 289	1991-08-30	0.9165072	23.87642	6.0496639	55.460317	208.126984
## 290	1991-08-31	0.9164115	23.87647	6.1029412	131.280000	1031.920000
## 291	1991-09-01	0.9163158	23.87653	6.7900000	19.128205	553.230769
## 292	1991-09-02	0.9162201	23.87658	6.9800000	4.727273	20.848485
## 293	1991-09-03	0.9161244	23.87663	6.9014916	13.538462	145.641026
## 294	1991-09-04	0.9160287	23.87668	6.8229832	4.222222	9.333333
## 295	1991-09-05	0.9159330	23.87674	6.7444748	22.512821	123.487179
## 296	1991-09-06	0.9158373	23.87679	6.6659664	84.615385	809.743590
## 297	1991-09-07	0.9157416	23.87684	6.5874580	25.025641	165.538462
## 298	1991-09-08	0.9156459	23.87689	6.5089496	2.666667	10.222222
## 299	1991-09-09	0.9155502	23.87695	6.4304412	9.794872	77.179487
## 300	1991-09-10	0.9154545	23.87700	6.3519328	12.512821	109.948718
## 301	1991-09-11	0.9153589	23.87705	6.2734244	140.888889	73.777778
## 302	1991-09-12	0.9152632	23.87711	6.1949160	61.897436	965.230769
## 303	1991-09-13	0.9151675	23.87716	6.1164076	35.894737	363.105263
## 304	1991-09-14	0.9150718	23.87721	6.0378992	161.487179	860.512821
## 305	1991-09-15	0.9149761	23.87726	5.9593908	18.031746	196.222222
## 306	1991-09-16	0.9148804	23.87732	5.8808824	87.680000	816.200000
## 307	1991-09-17	0.9147847	23.87737	6.0900000	23.333333	191.384615
## 308	1991-09-18	0.9146890	23.87742	6.2050000	50.242424	200.909091
## 309	1991-09-19	0.9145933	23.87747	6.1626316	10.358974	106.820513
## 310	1991-09-20	0.9144976	23.87753	6.1202632	23.555556	1227.555556
## 311	1991-09-21	0.9144019	23.87758	6.0778947	81.743590	617.538462
## 312	1991-09-22	0.9143062	23.87763	6.0355263	8.615385	26.051282
## 313	1991-09-23	0.9142105	23.87768	5.9931579	20.820513	114.153846
## 314	1991-09-24	0.9141148	23.87774	5.9507895	4.222222	76.666667
## 315	1991-09-25	0.9140191	23.87779	5.9084211	6.205128	25.846154
## 316	1991-09-26	0.9139234	23.87784	5.8660526	2.958333	20.833333
## 317	1991-09-27	0.9138278	23.87789	5.8236842	13.333333	178.256410
## 318	1991-09-28	0.9137321	23.87795	5.7813158	7.487179	13.179487
## 319	1991-09-29	0.9136364	23.87800	5.7389474	5.777778	36.444444
## 320	1991-09-30	0.9135407	23.87805	5.6965789	44.769231	564.871795
## 321	1991-10-01	0.9134450	23.87811	5.6542105	69.230769	469.384615
## 322	1991-10-02	0.9133493	23.87816	5.6118421	4.205128	21.025641
## 323	1991-10-03	0.9132536	23.87821	5.5694737	7.777778	228.666667
## 324	1991-10-04	0.9131579	23.87826	5.5271053	39.128205	396.153846
## 325	1991-10-05	0.9130622	23.87832	5.4847368	40.769231	271.846154
## 326	1991-10-06	0.9129665	23.87837	5.4423684	23.301587	506.666667
## 327	1991-10-07	0.9128708	23.87842	5.4000000	18.560000	351.240000
## 328	1991-10-08	0.9127751	23.87847	5.8366667	24.138889	353.305556
## 329	1991-10-09	0.9126794	23.87853	5.8085730	5.794872	3.333333
## 330	1991-10-10	0.9125837	23.87858	5.7804793	17.333333	78.888889

## 331	1991-10-11	0.9124880	23.87863	5.7523856	3.384615	6.717949
## 332	1991-10-12	0.9123923	23.87868	5.7242919	8.564103	19.897436
## 333	1991-10-13	0.9122967	23.87874	5.6961983	7.555556	19.333333
## 334	1991-10-14	0.9122010	23.87879	5.6681046	7.641026	3.692308
## 335	1991-10-15	0.9121053	23.87884	5.6400109	54.153846	348.358974
## 336	1991-10-16	0.9120096	23.87889	5.6119172	16.476190	46.539683
## 337	1991-10-17	0.9119139	23.87895	5.5838235	29.640000	371.640000
## 338	1991-10-18	0.9118182	23.87900	5.9700000	56.769231	466.205128
## 339	1991-10-19	0.9117225	23.87905	5.7450000	102.363636	625.212121
## 340	1991-10-20	0.9116268	23.87911	5.7212896	2.717949	17.692308
## 341	1991-10-21	0.9115311	23.87916	5.6975792	6.222222	16.222222
## 342	1991-10-22	0.9114354	23.87921	5.6738688	13.384615	110.666667
## 343	1991-10-23	0.9113397	23.87926	5.6501584	4.512821	35.230769
## 344	1991-10-24	0.9112440	23.87932	5.6264480	2.541667	27.958333
## 345	1991-10-25	0.9111483	23.87937	5.6027376	3.692308	8.358974
## 346	1991-10-26	0.9110526	23.87942	5.5790271	3.589744	21.384615
## 347	1991-10-27	0.9109569	23.87947	5.5553167	4.444444	13.111111
## 348	1991-10-28	0.9108612	23.87953	5.5316063	31.025641	316.461538
## 349	1991-10-29	0.9107656	23.87958	5.5078959	28.256410	253.076923
## 350	1991-10-30	0.9106699	23.87963	5.4841855	97.435897	47.333333
## 351	1991-10-31	0.9105742	23.87968	5.4604751	8.571429	6.793651
## 352	1991-11-01	0.9104785	23.87974	5.4367647	100.000000	153.520000
## 353	1991-11-02	0.9103828	23.87979	5.6833333	29.555556	570.388889
## 354	1991-11-03	0.9102871	23.87984	5.8850000	2.051282	2.256410
## 355	1991-11-04	0.9101914	23.87989	6.0866667	8.871795	41.897436
## 356	1991-11-05	0.9100957	23.87995	6.2883333	7.282051	3.333333
## 357	1991-11-06	0.9100000	23.88000	6.4900000	5.666667	3.794872
## 358	1991-11-07	0.9098333	23.88002	6.4202451	4.051282	4.256410
## 359	1991-11-08	0.9096667	23.88004	6.3504902	3.333333	120.222222
## 360	1991-11-09	0.9095000	23.88007	6.2807353	6.358974	55.692308
## 361	1991-11-10	0.9093333	23.88009	6.2109804	7.794872	17.589744
## 362	1991-11-11	0.9091667	23.88011	6.1412255	26.000000	132.615385
## 363	1991-11-12	0.9090000	23.88013	6.0714706	33.487179	110.000000
## 364	1991-11-13	0.9088333	23.88016	6.0017157	2.222222	16.666667
## 365	1991-11-14	0.9086667	23.88018	5.9319608	73.897436	336.923077
## 366	1991-11-15	0.9085000	23.88020	5.8622059	9.538462	100.307692
## 367	1991-11-16	0.9083333	23.88022	5.7924510	10.333333	2.000000
## 368	1991-11-17	0.9081667	23.88024	5.7226961	29.222222	73.407407
## 369	1991-11-18	0.9080000	23.88027	5.6529412	16.960000	101.160000
## 370	1991-11-19	0.9078333	23.88029	5.7600000	5.384615	35.384615
## 371	1991-11-20	0.9076667	23.88031	5.5250000	41.212121	396.484848
## 372	1991-11-21	0.9075000	23.88033	5.5273529	2.000000	2.421053
## 373	1991-11-22	0.9073333	23.88036	5.5297059	3.333333	6.444444
## 374	1991-11-23	0.9071667	23.88038	5.5320588	25.794872	182.666667
## 375	1991-11-24	0.9070000	23.88040	5.5344118	18.307692	18.102564
## 376	1991-11-25	0.9068333	23.88042	5.5367647	78.153846	409.025641
## 377	1991-11-26	0.9066667	23.88044	5.5391176	85.250000	86.041667
## 378	1991-11-27	0.9065000	23.88047	5.5414706	8.871795	15.692308
## 379	1991-11-28	0.9063333	23.88049	5.5438235	2.000000	2.205128
## 380	1991-11-29	0.9061667	23.88051	5.5461765	2.000000	2.037037
## 381	1991-11-30	0.9060000	23.88053	5.5485294	6.840000	19.440000
## 382	1991-12-01	0.9058333	23.88056	5.5933333	34.333333	157.777778
## 383	1991-12-02	0.9056667	23.88058	5.6251120	62.307692	24.205128
## 384	1991-12-03	0.9055000	23.88060	5.6568908	290.000000	163.333333

## 385	1991-12-04	0.9053333	23.88062	5.6886695	24.153846	8.769231
## 386	1991-12-05	0.9051667	23.88064	5.7204482	348.564103	893.333333
## 387	1991-12-06	0.9050000	23.88067	5.7522269	590.000000	956.733333
## 388	1991-12-07	0.9048333	23.88069	5.7840056	101.555556	159.111111
## 389	1991-12-08	0.9046667	23.88071	5.8157843	37.846154	20.717949
## 390	1991-12-09	0.9045000	23.88073	5.8475630	59.897436	174.974359
## 391	1991-12-10	0.9043333	23.88076	5.8793417	16.222222	26.444444
## 392	1991-12-11	0.9041667	23.88078	5.9111204	8.358974	16.102564
## 393	1991-12-12	0.9040000	23.88080	5.9428992	12.205128	16.102564
## 394	1991-12-13	0.9038333	23.88082	5.9746779	18.000000	17.076923
## 395	1991-12-14	0.9036667	23.88084	6.0064566	18.451613	111.015873
## 396	1991-12-15	0.9035000	23.88087	6.0382353	154.720000	273.660714
## 397	1991-12-16	0.9033333	23.88089	6.1266667	121.888889	436.305556
## 398	1991-12-17	0.9031667	23.88091	6.0608734	35.179487	240.820513
## 399	1991-12-18	0.9030000	23.88093	5.9950802	60.717949	103.538462
## 400	1991-12-19	0.9028333	23.88096	5.9292870	20.974359	27.076923
## 401	1991-12-20	0.9026667	23.88098	5.8634938	57.384615	99.435897
## 402	1991-12-21	0.9025000	23.88100	5.7977005	27.375000	187.875000
## 403	1991-12-22	0.9023333	23.88102	5.7319073	41.333333	46.205128
## 404	1991-12-23	0.9021667	23.88104	5.6661141	74.000000	278.051282
## 405	1991-12-24	0.9020000	23.88107	5.6003209	110.615385	328.102564
## 406	1991-12-25	0.9018333	23.88109	5.5345276	28.820513	39.846154
## 407	1991-12-26	0.9016667	23.88111	5.4687344	69.111111	111.873016
## 408	1991-12-27	0.9015000	23.88113	5.4029412	81.080000	160.440000
## 409	1991-12-28	0.9013333	23.88116	5.7200000	18.194444	32.972222
## 410	1991-12-29	0.9011667	23.88118	5.6653922	12.461538	6.410256
## 411	1991-12-30	0.9010000	23.88120	5.6107843	11.384615	47.435897
## 412	1991-12-31	0.9008333	23.88122	5.5561765	25.333333	97.487179
## 413	1992-01-01	0.9006667	23.88124	5.5015686	2.222222	3.777778
## 414	1992-01-02	0.9005000	23.88127	5.4469608	3.025641	4.256410
## 415	1992-01-03	0.9003333	23.88129	5.3923529	63.333333	130.410256
## 416	1992-01-04	0.9001667	23.88131	5.3377451	152.256410	917.025641
## 417	1992-01-05	0.9000000	23.88133	5.2831373	14.769231	40.871795
## 418	1992-01-06	0.8998333	23.88136	5.2285294	5.166667	4.291667
## 419	1992-01-07	0.8996667	23.88138	5.1739216	39.641026	56.564103
## 420	1992-01-08	0.8995000	23.88140	5.1193137	46.296296	108.481481
## 421	1992-01-09	0.8993333	23.88142	5.0647059	67.320000	238.440000
## 422	1992-01-10	0.8991667	23.88144	5.6933333	73.361111	348.416667
## 423	1992-01-11	0.8990000	23.88147	5.6214480	5.076923	6.769231
## 424	1992-01-12	0.8988333	23.88149	5.5495626	2.222222	2.000000
## 425	1992-01-13	0.8986667	23.88151	5.4776772	21.846154	74.615385
## 426	1992-01-14	0.8985000	23.88153	5.4057919	5.794872	14.871795
## 427	1992-01-15	0.8983333	23.88156	5.3339065	50.256410	288.717949
## 428	1992-01-16	0.8981667	23.88158	5.2620211	7.641026	17.794872
## 429	1992-01-17	0.8980000	23.88160	5.1901357	2.923077	5.384615
## 430	1992-01-18	0.8978333	23.88162	5.1182504	2.222222	10.000000
## 431	1992-01-19	0.8976667	23.88164	5.0463650	8.358974	45.384615
## 432	1992-01-20	0.8975000	23.88167	4.9744796	6.205128	12.871795
## 433	1992-01-21	0.8973333	23.88169	4.9025943	24.769231	6.564103
## 434	1992-01-22	0.8971667	23.88171	4.8307089	51.384615	256.307051
## 435	1992-01-23	0.8970000	23.88173	4.7588235	78.000000	506.050000
## 436	1992-01-24	0.8968333	23.88176	4.7669853	103.965517	546.655172
## 437	1992-01-25	0.8966667	23.88178	4.7751471	70.769231	541.435897
## 438	1992-01-26	0.8965000	23.88180	4.7833088	891.333333	300.435897

## 439	1992-01-27	0.8963333	23.88182	4.7914706	22.410256	59.435897
## 440	1992-01-28	0.8961667	23.88184	4.7996324	96.512821	121.487179
## 441	1992-01-29	0.8960000	23.88187	4.8077941	8.717949	59.948718
## 442	1992-01-30	0.8958333	23.88189	4.8159559	7.111111	61.777778
## 443	1992-01-31	0.8956667	23.88191	4.8241176	2.000000	2.000000
## 444	1992-02-01	0.8955000	23.88193	4.8322794	27.897436	148.717949
## 445	1992-02-02	0.8953333	23.88196	4.8404412	604.666667	8.000000
## 446	1992-02-03	0.8951667	23.88198	4.8486029	45.846154	221.487179
## 447	1992-02-04	0.8950000	23.88200	4.8567647	3.555556	101.777778
## 448	1992-02-05	0.8948333	23.88202	4.8649265	50.564103	192.974359
## 449	1992-02-06	0.8946667	23.88204	4.8730882	28.564103	147.282051
## 450	1992-02-07	0.8945000	23.88207	4.8812500	141.948718	476.307692
## 451	1992-02-08	0.8943333	23.88209	4.8894118	12.444444	4.666667
## 452	1992-02-09	0.8941667	23.88211	4.8975735	11.076923	84.205128
## 453	1992-02-10	0.8940000	23.88213	4.9057353	106.153846	769.435897
## 454	1992-02-11	0.8938333	23.88216	4.9138971	12.465116	118.511628
## 455	1992-02-12	0.8936667	23.88218	4.9220588	72.150000	725.850000
## 456	1992-02-13	0.8935000	23.88220	5.0800000	45.137931	502.482759
## 457	1992-02-14	0.8933333	23.88222	5.1016544	2.000000	2.000000
## 458	1992-02-15	0.8931667	23.88224	5.1233088	37.125000	257.583333
## 459	1992-02-16	0.8930000	23.88227	5.1449632	2.000000	4.000000
## 460	1992-02-17	0.8928333	23.88229	5.1666176	2.102564	2.717949
## 461	1992-02-18	0.8926667	23.88231	5.1882721	83.791667	625.208333
## 462	1992-02-19	0.8925000	23.88233	5.2099265	22.000000	20.000000
## 463	1992-02-20	0.8923333	23.88236	5.2315809	30.000000	398.923077
## 464	1992-02-21	0.8921667	23.88238	5.2532353	2.102564	2.666667
## 465	1992-02-22	0.8920000	23.88240	5.2748897	3.777778	27.333333
## 466	1992-02-23	0.8918333	23.88242	5.2965441	27.076923	64.051282
## 467	1992-02-24	0.8916667	23.88244	5.3181985	3.435897	9.641026
## 468	1992-02-25	0.8915000	23.88247	5.3398529	8.888889	17.111111
## 469	1992-02-26	0.8913333	23.88249	5.3615074	4.450000	3.450000
## 470	1992-02-27	0.8911667	23.88251	5.3831618	2.512821	2.871795
## 471	1992-02-28	0.8910000	23.88253	5.4048162	42.634921	96.920635
## 472	1992-02-29	0.8908333	23.88256	5.4264706	7.098039	96.392157
## 473	1992-03-01	0.8906667	23.88258	5.4333333	8.166667	3.222222
## 474	1992-03-02	0.8905000	23.88260	5.4197415	3.589744	8.871795
## 475	1992-03-03	0.8903333	23.88262	5.4061497	23.333333	180.222222
## 476	1992-03-04	0.8901667	23.88264	5.3925579	19.300000	180.100000
## 477	1992-03-05	0.8900000	23.88267	5.3789661	42.923077	271.230769
## 478	1992-03-06	0.8898333	23.88269	5.3653743	4.153846	5.589744
## 479	1992-03-07	0.8896667	23.88271	5.3517825	2.222222	12.888889
## 480	1992-03-08	0.8895000	23.88273	5.3381907	3.750000	8.250000
## 481	1992-03-09	0.8893333	23.88276	5.3245989	8.461538	30.974359
## 482	1992-03-10	0.8891667	23.88278	5.3110071	14.051282	17.025641
## 483	1992-03-11	0.8890000	23.88280	5.2974153	29.396825	222.857143
## 484	1992-03-12	0.8888333	23.88282	5.2838235	8.392157	123.568627
## 485	1992-03-13	0.8886667	23.88284	5.9233333	28.916667	182.231884
## 486	1992-03-14	0.8885000	23.88287	5.9471919	9.897436	33.435897
## 487	1992-03-15	0.8883333	23.88289	5.9710504	4.666667	12.666667
## 488	1992-03-16	0.8881667	23.88291	5.9949090	26.358974	72.923077
## 489	1992-03-17	0.8880000	23.88293	6.0187675	0.000000	44.820513
## 490	1992-03-18	0.8878333	23.88296	6.0426261	26.666667	616.888889
## 491	1992-03-19	0.8876667	23.88298	6.0664846	49.000000	237.050000
## 492	1992-03-20	0.8875000	23.88300	6.0903431	110.051282	915.333333

## 493	1992-03-21	0.8873333	23.88302	6.1142017	80.708333	732.458333
## 494	1992-03-22	0.8871667	23.88304	6.1380602	34.153846	394.769231
## 495	1992-03-23	0.8870000	23.88307	6.1619188	4.871795	69.743590
## 496	1992-03-24	0.8868333	23.88309	6.1857773	3.282051	13.897436
## 497	1992-03-25	0.8866667	23.88311	6.2096359	16.000000	6.222222
## 498	1992-03-26	0.8865000	23.88313	6.2334944	6.592593	23.333333
## 499	1992-03-27	0.8863333	23.88316	6.2573529	139.160000	931.320000
## 500	1992-03-28	0.8861667	23.88318	6.3666667	2.138889	2.222222
## 501	1992-03-29	0.8860000	23.88320	6.3727839	20.083333	5.541667
## 502	1992-03-30	0.8858333	23.88322	6.3789011	6.000000	12.000000
## 503	1992-03-31	0.8856667	23.88324	6.3850183	13.076923	58.820513
## 504	1992-04-01	0.8855000	23.88327	6.3911355	3.487179	12.307692
## 505	1992-04-02	0.8853333	23.88329	6.3972527	90.000000	108.666667
## 506	1992-04-03	0.8851667	23.88331	6.4033700	2.100000	4.800000
## 507	1992-04-04	0.8850000	23.88333	6.4094872	7.538462	53.948718
## 508	1992-04-05	0.8848333	23.88336	6.4156044	4.410256	12.615385
## 509	1992-04-06	0.8846667	23.88338	6.4217216	6.444444	23.111111
## 510	1992-04-07	0.8845000	23.88340	6.4278388	9.550000	31.450000
## 511	1992-04-08	0.8843333	23.88342	6.4339560	2.000000	2.871795
## 512	1992-04-09	0.8841667	23.88344	6.4400733	5.541667	37.291667
## 513	1992-04-10	0.8840000	23.88347	6.4461905	8.727273	154.109091
## 514	1992-04-11	0.8838333	23.88349	6.4523077	24.840000	521.920000
## 515	1992-04-12	0.8836667	23.88351	5.4300000	2.285714	2.363636
## 516	1992-04-13	0.8835000	23.88353	0.0000000	11.642857	14.181818
## 517	1992-04-14	0.8833333	23.88356	0.3625000	21.000000	26.000000
## 518	1992-04-15	0.8831667	23.88358	0.7250000	2.051282	2.000000
## 519	1992-04-16	0.8830000	23.88360	1.0875000	146.000000	177.555556
## 520	1992-04-17	0.8828333	23.88362	1.4500000	7.047619	23.428571
## 521	1992-04-18	0.8826667	23.88364	1.8125000	28.000000	56.000000
## 522	1992-04-19	0.8825000	23.88367	2.1750000	24.769231	180.615385
## 523	1992-04-20	0.8823333	23.88369	2.5375000	8.666667	77.538462
## 524	1992-04-21	0.8821667	23.88371	2.9000000	7.833333	74.333333
## 525	1992-04-22	0.8820000	23.88373	3.2625000	16.000000	8.000000
## 526	1992-04-23	0.8818333	23.88376	3.6250000	19.230769	58.820513
## 527	1992-04-24	0.8816667	23.88378	3.9875000	18.564103	67.897436
## 528	1992-04-25	0.8815000	23.88380	4.3500000	16.583333	63.875000
## 529	1992-04-26	0.8813333	23.88382	4.7125000	10.000000	54.000000
## 530	1992-04-27	0.8811667	23.88384	5.0750000	7.384615	53.230769
## 531	1992-04-28	0.8810000	23.88387	5.4375000	5.074074	12.777778
## 532	1992-04-29	0.8808333	23.88389	5.8000000	10.000000	106.392157
## 533	1992-04-30	0.8806667	23.88391	5.2433333	5.722222	35.805556
## 534	1992-05-01	0.8805000	23.88393	5.5550000	7.555556	2.888889
## 535	1992-05-02	0.8803333	23.88396	5.8666667	46.871795	273.743590
## 536	1992-05-03	0.8801667	23.88398	6.1783333	16.256410	62.410256
## 537	1992-05-04	0.8800000	23.88400	6.4900000	28.512821	202.564103
## 538	1992-05-05	0.8798830	23.88402	6.4663284	36.153846	134.410256
## 539	1992-05-06	0.8797661	23.88405	6.4426568	6.000000	12.888889
## 540	1992-05-07	0.8796491	23.88407	6.4189853	6.358974	6.358974
## 541	1992-05-08	0.8795322	23.88409	6.3953137	21.435897	14.820513
## 542	1992-05-09	0.8794152	23.88412	6.3716421	2.000000	2.615385
## 543	1992-05-10	0.8792982	23.88414	6.3479705	2.102564	2.102564
## 544	1992-05-11	0.8791813	23.88416	6.3242990	6.153846	21.076923
## 545	1992-05-12	0.8790643	23.88419	6.3006274	108.000000	7.555556
## 546	1992-05-13	0.8789474	23.88421	6.2769558	3.384615	2.307692

## 547	1992-05-14	0.8788304	23.88423	6.2532842	11.631083	27.153846
## 548	1992-05-15	0.8787135	23.88426	7.4965367	19.877551	52.000000
## 549	1992-05-16	0.8785965	23.88428	6.6097509	9.784615	12.800000
## 550	1992-05-17	0.8784795	23.88430	6.8048389	4.769231	3.076923
## 551	1992-05-18	0.8783626	23.88433	6.9999269	4.051282	3.179487
## 552	1992-05-19	0.8782456	23.88435	7.1239043	3.333333	3.282051
## 553	1992-05-20	0.8781287	23.88437	7.2261491	2.615385	3.384615
## 554	1992-05-21	0.8780117	23.88440	7.3283940	2.068966	3.218391
## 555	1992-05-22	0.87778947	23.88442	7.4306388	3.230769	3.230769
## 556	1992-05-23	0.87777778	23.88444	7.5328836	5.897436	2.461538
## 557	1992-05-24	0.8776608	23.88447	7.6351284	2.512821	3.128205
## 558	1992-05-25	0.8775439	23.88449	7.7373732	3.692308	5.333333
## 559	1992-05-26	0.8774269	23.88451	7.8396180	2.444444	3.555556
## 560	1992-05-27	0.8773099	23.88454	7.9418629	2.512821	2.871795
## 561	1992-05-28	0.8771930	23.88456	8.0441077	2.000000	2.871795
## 562	1992-05-29	0.8770760	23.88458	8.1463525	5.272727	4.545455
## 563	1992-05-30	0.8769591	23.88461	7.7147970	4.032915	8.858934
## 564	1992-05-31	0.8768421	23.88463	7.9296952	2.793103	13.172414
## 565	1992-06-01	0.8767251	23.88465	7.6750258	2.000000	7.282051
## 566	1992-06-02	0.8766082	23.88468	7.4203564	7.777778	9.333333
## 567	1992-06-03	0.8764912	23.88470	7.4175935	2.000000	3.230769
## 568	1992-06-04	0.8763743	23.88473	7.4148306	2.000000	2.641026
## 569	1992-06-05	0.8762573	23.88475	7.4831195	2.000000	2.051282
## 570	1992-06-06	0.8761404	23.88477	7.5514083	2.051282	9.692308
## 571	1992-06-07	0.8760234	23.88480	7.6196971	3.538462	2.461538
## 572	1992-06-08	0.8759064	23.88482	7.6879860	16.717949	6.410256
## 573	1992-06-09	0.8757895	23.88484	7.7562748	2.000000	2.000000
## 574	1992-06-10	0.8756725	23.88487	7.8245637	7.375000	3.708333
## 575	1992-06-11	0.8755556	23.88489	7.8928525	6.767241	6.702107
## 576	1992-06-12	0.8754386	23.88491	7.8851421	6.159483	9.695881
## 577	1992-06-13	0.8753216	23.88494	7.9787590	5.551724	12.689655
## 578	1992-06-14	0.8752047	23.88496	7.6818610	4.051282	3.538462
## 579	1992-06-15	0.8750877	23.88498	7.3849631	7.076923	3.589744
## 580	1992-06-16	0.8749708	23.88501	7.0880651	5.256410	2.794872
## 581	1992-06-17	0.8748538	23.88503	5.9766136	3.435897	2.000000
## 582	1992-06-18	0.8747368	23.88505	4.8651622	10.606838	10.333333
## 583	1992-06-19	0.8746199	23.88508	6.9143915	17.777778	18.666667
## 584	1992-06-20	0.8745029	23.88510	7.1184833	16.000000	22.000000
## 585	1992-06-21	0.8743860	23.88512	7.3225752	2.051282	4.512821
## 586	1992-06-22	0.8742690	23.88515	7.5266670	2.256410	2.410256
## 587	1992-06-23	0.8741520	23.88517	7.7307589	2.102564	3.333333
## 588	1992-06-24	0.8740351	23.88519	7.9348507	2.102564	2.051282
## 589	1992-06-25	0.8739181	23.88522	8.1389426	2.000000	2.205128
## 590	1992-06-26	0.8738012	23.88524	8.3430344	2.102564	2.307692
## 591	1992-06-27	0.8736842	23.88526	8.5471263	3.333333	16.666667
## 592	1992-06-28	0.8735673	23.88529	8.7512181	3.550000	14.650000
## 593	1992-06-29	0.8734503	23.88531	8.9553100	103.090909	3.045455
## 594	1992-06-30	0.8733333	23.88533	8.2420666	65.045455	5.591693
## 595	1992-07-01	0.8732164	23.88536	8.0308553	27.000000	8.137931
## 596	1992-07-02	0.8730994	23.88538	7.8346420	7.333333	9.641026
## 597	1992-07-03	0.8729825	23.88540	7.6384287	3.846154	2.102564
## 598	1992-07-04	0.8728655	23.88543	7.4422154	170.888889	1066.222222
## 599	1992-07-05	0.8727485	23.88545	7.2460021	2.093023	2.093023
## 600	1992-07-06	0.8726316	23.88547	7.0497888	8.379845	4.841383

## 601	1992-07-07	0.8725146	23.88550	6.8615583	14.666667	7.589744
## 602	1992-07-08	0.8723977	23.88552	6.6733278	9.358974	6.153846
## 603	1992-07-09	0.8722807	23.88554	6.8996152	4.051282	4.717949
## 604	1992-07-10	0.8721637	23.88557	7.1259026	7.230769	4.000000
## 605	1992-07-11	0.8720468	23.88559	7.3521899	3.500000	6.458333
## 606	1992-07-12	0.8719298	23.88561	7.5784773	2.863636	2.363636
## 607	1992-07-13	0.8718129	23.88564	6.9972805	7.880094	3.612853
## 608	1992-07-14	0.8716959	23.88566	8.3055789	12.896552	4.862069
## 609	1992-07-15	0.8715789	23.88568	7.8916610	3.230769	4.000000
## 610	1992-07-16	0.8714620	23.88571	7.4777430	2.820513	3.692308
## 611	1992-07-17	0.8713450	23.88573	7.0638250	2.410256	8.358974
## 612	1992-07-18	0.8712281	23.88575	6.6499070	3.333333	3.384615
## 613	1992-07-19	0.8711111	23.88578	6.2359890	2.666667	3.111111
## 614	1992-07-20	0.8709942	23.88580	6.0396410	2.000000	2.410256
## 615	1992-07-21	0.8708772	23.88582	5.8432930	2.230769	2.589744
## 616	1992-07-22	0.8707602	23.88585	6.0974162	2.461538	2.769231
## 617	1992-07-23	0.8706433	23.88587	6.3515394	2.000000	2.410256
## 618	1992-07-24	0.8705263	23.88589	6.6056626	2.102564	3.025641
## 619	1992-07-25	0.8704094	23.88592	6.8597859	2.000000	3.282051
## 620	1992-07-26	0.8702924	23.88594	7.1139091	6.045455	4.227273
## 621	1992-07-27	0.8701754	23.88596	6.5139756	4.022727	3.217085
## 622	1992-07-28	0.8700585	23.88599	7.7331207	2.000000	2.206897
## 623	1992-07-29	0.8699415	23.88601	7.6034085	4.461538	2.102564
## 624	1992-07-30	0.8698246	23.88604	7.4736964	2.000000	2.051282
## 625	1992-07-31	0.8697076	23.88606	7.3439843	17.777778	118.444444
## 626	1992-08-01	0.8695906	23.88608	7.2142721	10.000000	86.000000
## 627	1992-08-02	0.8694737	23.88611	7.0845600	5.692308	2.307692
## 628	1992-08-03	0.8693567	23.88613	6.9548478	3.846154	2.153846
## 629	1992-08-04	0.8692398	23.88615	6.8915440	2.000000	2.000000
## 630	1992-08-05	0.8691228	23.88618	6.8282401	6.333333	2.222222
## 631	1992-08-06	0.8690058	23.88620	6.9021026	10.666667	2.444444
## 632	1992-08-07	0.8688889	23.88622	6.9759651	10.256410	5.384615
## 633	1992-08-08	0.8687719	23.88625	7.0498276	18.974359	3.025641
## 634	1992-08-09	0.8686550	23.88627	7.1236901	2.000000	2.051282
## 635	1992-08-10	0.8685380	23.88629	7.1975526	2.222222	5.555556
## 636	1992-08-11	0.8684211	23.88632	7.2714151	4.102564	3.333333
## 637	1992-08-12	0.8683041	23.88634	7.3452775	8.358974	2.256410
## 638	1992-08-13	0.8681871	23.88636	7.4191400	2.222222	2.000000
## 639	1992-08-14	0.8680702	23.88639	7.4930025	2.153846	5.435897
## 640	1992-08-15	0.8679532	23.88641	7.5668650	5.794872	3.538462
## 641	1992-08-16	0.8678363	23.88643	7.6407275	123.875000	7.416667
## 642	1992-08-17	0.8677193	23.88646	7.7145900	24.136364	7.136364
## 643	1992-08-18	0.8676023	23.88648	7.5864465	20.688871	5.016458
## 644	1992-08-19	0.8674854	23.88650	8.7135324	17.241379	2.896552
## 645	1992-08-20	0.8673684	23.88653	7.9235537	4.410256	2.461538
## 646	1992-08-21	0.8672515	23.88655	7.1335750	18.444444	7.777778
## 647	1992-08-22	0.8671345	23.88657	7.0367289	2.102564	2.461538
## 648	1992-08-23	0.8670175	23.88660	6.9398829	2.666667	4.102564
## 649	1992-08-24	0.8669006	23.88662	7.1831561	3.230769	5.743590
## 650	1992-08-25	0.8667836	23.88664	7.4264293	3.041667	6.708333
## 651	1992-08-26	0.8666667	23.88667	7.6697024	4.461538	2.000000
## 652	1992-08-27	0.8665497	23.88669	7.9129756	3.344406	3.886364
## 653	1992-08-28	0.8664327	23.88671	6.6736892	2.227273	5.772727
## 654	1992-08-29	0.8663158	23.88674	6.8077935	2.000000	4.000000

## 655	1992-08-30	0.8661988	23.88676	7.7734655	46.413793	438.379310
## 656	1992-08-31	0.8660819	23.88678	7.7350211	2.000000	2.102564
## 657	1992-09-01	0.8659649	23.88681	7.6965768	7.777778	10.444444
## 658	1992-09-02	0.8658480	23.88683	7.6581324	4.000000	6.000000
## 659	1992-09-03	0.8657310	23.88685	7.6196880	12.205128	2.000000
## 660	1992-09-04	0.8656140	23.88688	7.5812436	3.230769	2.000000
## 661	1992-09-05	0.8654971	23.88690	7.5427993	3.333333	3.111111
## 662	1992-09-06	0.8653801	23.88692	7.5043549	3.230769	3.333333
## 663	1992-09-07	0.8652632	23.88695	7.4659105	2.000000	2.666667
## 664	1992-09-08	0.8651462	23.88697	7.4274661	2.564103	3.333333
## 665	1992-09-09	0.8650292	23.88699	7.3890217	8.079772	5.111111
## 666	1992-09-10	0.8649123	23.88702	7.1496872	13.595442	6.888889
## 667	1992-09-11	0.8647953	23.88704	7.5241233	19.111111	8.666667
## 668	1992-09-12	0.8646784	23.88706	7.8985595	12.000000	5.230769
## 669	1992-09-13	0.8645614	23.88709	8.2729957	115.333333	233.333333
## 670	1992-09-14	0.8644444	23.88711	8.6474318	2.266667	3.244444
## 671	1992-09-15	0.8643275	23.88713	8.4449146	4.667816	2.742912
## 672	1992-09-16	0.8642105	23.88716	8.3231034	7.068966	2.241379
## 673	1992-09-17	0.8640936	23.88718	8.3353146	3.538462	4.717949
## 674	1992-09-18	0.8639766	23.88720	8.3475257	4.444444	7.777778
## 675	1992-09-19	0.8638596	23.88723	8.3597368	4.461538	2.000000
## 676	1992-09-20	0.8637427	23.88725	8.3719480	5.111111	2.000000
## 677	1992-09-21	0.8636257	23.88727	8.3841591	4.272727	6.363636
## 678	1992-09-22	0.8635088	23.88730	8.2770690	2.066667	5.400000
## 679	1992-09-23	0.8633918	23.88732	8.3028780	5.654955	4.051351
## 680	1992-09-24	0.8632749	23.88735	8.9337143	9.243243	2.702703
## 681	1992-09-25	0.8631579	23.88737	8.7626736	2.000000	2.000000
## 682	1992-09-26	0.8630409	23.88739	8.5916328	3.384615	2.000000
## 683	1992-09-27	0.8629240	23.88742	8.4205921	18.888889	11.111111
## 684	1992-09-28	0.8628070	23.88744	8.2495514	11.222222	7.444444
## 685	1992-09-29	0.8626901	23.88746	8.0785107	3.555556	3.777778
## 686	1992-09-30	0.8625731	23.88749	7.9074699	9.726496	2.914530
## 687	1992-10-01	0.8624561	23.88751	7.8810145	15.897436	2.051282
## 688	1992-10-02	0.8623392	23.88753	7.8545590	11.118529	5.742622
## 689	1992-10-03	0.8622222	23.88756	8.4362727	6.339623	9.433962
## 690	1992-10-04	0.8621053	23.88758	8.2676071	3.714286	3.714286
## 691	1992-10-05	0.8619883	23.88760	8.5352222	4.457143	3.990476
## 692	1992-10-06	0.8618713	23.88763	8.6629667	5.200000	4.266667
## 693	1992-10-07	0.8617544	23.88765	8.3262306	12.461538	4.102564
## 694	1992-10-08	0.8616374	23.88767	7.9894945	2.444444	2.666667
## 695	1992-10-09	0.8615205	23.88770	7.6527584	2.222222	2.461538
## 696	1992-10-10	0.8614035	23.88772	7.8057921	2.000000	2.256410
## 697	1992-10-11	0.8612865	23.88774	7.9588258	23.333333	2.222222
## 698	1992-10-12	0.8611696	23.88777	8.1118596	13.333333	2.393162
## 699	1992-10-13	0.8610526	23.88779	8.0879876	3.333333	2.564103
## 700	1992-10-14	0.8609357	23.88781	8.0641157	3.333333	2.222222
## 701	1992-10-15	0.8608187	23.88784	8.0402438	3.282051	4.512821
## 702	1992-10-16	0.8607018	23.88786	8.0163719	6.000000	8.000000
## 703	1992-10-17	0.8605848	23.88788	7.9925000	7.681818	16.545455
## 704	1992-10-18	0.8604678	23.88791	7.7699444	3.888889	59.222222
## 705	1992-10-19	0.8603509	23.88793	7.8848171	3.276353	40.216524
## 706	1992-10-20	0.8602339	23.88795	7.9091935	2.663818	21.210826
## 707	1992-10-21	0.8601170	23.88798	7.5769019	2.051282	2.205128
## 708	1992-10-22	0.8600000	23.88800	7.2446102	3.515670	50.507123

## 709	1992-10-23	0.8602098	23.88803	7.6376099	4.980057	98.809117
## 710	1992-10-24	0.8604196	23.88806	7.6771246	6.444444	147.111111
## 711	1992-10-25	0.8606294	23.88808	7.7166392	3.024390	6.439024
## 712	1992-10-26	0.8608392	23.88811	7.7561539	3.794872	2.205128
## 713	1992-10-27	0.8610490	23.88814	7.7956686	2.974359	10.923077
## 714	1992-10-28	0.8612587	23.88817	7.8351833	15.333333	67.777778
## 715	1992-10-29	0.8614685	23.88820	7.8746979	9.666667	34.888889
## 716	1992-10-30	0.8616783	23.88822	7.9142126	4.000000	2.000000
## 717	1992-10-31	0.8618881	23.88825	7.9537273	6.636364	3.272727
## 718	1992-11-01	0.8620979	23.88828	7.1947561	5.518182	4.003030
## 719	1992-11-02	0.8623077	23.88831	7.7671333	4.400000	4.733333
## 720	1992-11-03	0.8625175	23.88834	7.9194615	3.714286	2.214286
## 721	1992-11-04	0.8627273	23.88836	6.7083880	3.549451	2.132784
## 722	1992-11-05	0.8629371	23.88839	6.5872258	3.384615	2.051282
## 723	1992-11-06	0.8631469	23.88842	6.4660636	2.000000	2.256410
## 724	1992-11-07	0.8633566	23.88845	6.3449014	2.025641	2.384615
## 725	1992-11-08	0.8635664	23.88848	6.5445146	2.051282	2.512821
## 726	1992-11-09	0.8637762	23.88850	6.7441278	19.777778	7.333333
## 727	1992-11-10	0.8639860	23.88853	6.9437410	14.452991	7.743590
## 728	1992-11-11	0.8641958	23.88856	7.1433542	9.128205	8.153846
## 729	1992-11-12	0.8644056	23.88859	7.3429674	39.609557	50.849650
## 730	1992-11-13	0.8646154	23.88862	7.5181136	70.090909	93.545455
## 731	1992-11-14	0.8648252	23.88864	5.8326104	40.183386	48.945141
## 732	1992-11-15	0.8650350	23.88867	6.3540862	10.275862	4.344828
## 733	1992-11-16	0.8652448	23.88870	5.7453821	8.371942	4.298261
## 734	1992-11-17	0.8654545	23.88873	5.9861944	6.468022	4.251695
## 735	1992-11-18	0.8656643	23.88876	6.2270067	4.564103	4.205128
## 736	1992-11-19	0.8658741	23.88878	6.4678190	8.871795	3.025641
## 737	1992-11-20	0.8660839	23.88881	6.7086313	6.461538	6.102564
## 738	1992-11-21	0.8662937	23.88884	6.9494436	37.555556	19.333333
## 739	1992-11-22	0.8665035	23.88887	7.1902559	42.000000	18.666667
## 740	1992-11-23	0.8667133	23.88890	7.4310682	3.863636	4.136364
## 741	1992-11-24	0.8669231	23.88892	7.5278281	10.086991	3.430251
## 742	1992-11-25	0.8671329	23.88895	8.2166533	16.310345	2.724138
## 743	1992-11-26	0.8673427	23.88898	7.7391229	9.538462	2.102564
## 744	1992-11-27	0.8675524	23.88901	7.2615924	81.766382	64.364672
## 745	1992-11-28	0.8677622	23.88903	7.1009775	153.994302	126.626781
## 746	1992-11-29	0.8679720	23.88906	7.3202780	226.222222	188.888889
## 747	1992-11-30	0.8681818	23.88909	7.5395785	38.000000	30.000000
## 748	1992-12-01	0.8683916	23.88912	7.7588790	10.800000	2.600000
## 749	1992-12-02	0.8686014	23.88915	7.9781794	48.000000	18.000000
## 750	1992-12-03	0.8688112	23.88917	8.1974799	9.846154	5.897436
## 751	1992-12-04	0.8690210	23.88920	8.4167804	4.461538	2.102564
## 752	1992-12-05	0.8692308	23.88923	8.6360809	7.555556	17.111111
## 753	1992-12-06	0.8694406	23.88926	8.8553813	12000.000000	12000.000000
## 754	1992-12-07	0.8696503	23.88929	9.0746818	42.954545	38.818182
## 755	1992-12-08	0.8698601	23.88931	8.5992317	27.063480	23.840125
## 756	1992-12-09	0.8700699	23.88934	8.8388448	11.172414	8.862069
## 757	1992-12-10	0.8702797	23.88937	7.7121010	9.333333	9.333333
## 758	1992-12-11	0.8704895	23.88940	6.5853571	9.358974	8.538462
## 759	1992-12-12	0.8706993	23.88943	6.3172494	9.384615	7.743590
## 760	1992-12-13	0.8709091	23.88945	6.0491417	22.666667	15.555556
## 761	1992-12-14	0.8711189	23.88948	5.7810339	94.000000	52.000000
## 762	1992-12-15	0.8713287	23.88951	5.5129262	71.435897	39.897436

## 763	1992-12-16	0.8715385	23.88954	6.3039715	48.871795	27.794872
## 764	1992-12-17	0.8717483	23.88957	5.9234444	26.307692	15.692308
## 765	1992-12-18	0.8719580	23.88959	5.6949821	3.743590	3.589744
## 766	1992-12-19	0.8721678	23.88962	5.6049423	5.743590	7.589744
## 767	1992-12-20	0.8723776	23.88965	5.5149025	16.888889	5.333333
## 768	1992-12-21	0.8725874	23.88968	5.4248627	2.083333	126.916667
## 769	1992-12-22	0.8727972	23.88971	5.3348229	18.531746	109.087302
## 770	1992-12-23	0.8730070	23.88973	5.2447831	34.980159	91.257937
## 771	1992-12-24	0.8732168	23.88976	5.5375800	51.428571	73.428571
## 772	1992-12-25	0.8734266	23.88979	5.1796905	86.727273	522.545455
## 773	1992-12-26	0.8736364	23.88982	5.7654972	49.113636	263.314394
## 774	1992-12-27	0.8738462	23.88985	6.4830588	11.500000	4.083333
## 775	1992-12-28	0.8740559	23.88987	6.2892311	17.083333	8.833333
## 776	1992-12-29	0.8742657	23.88990	6.0954033	6.888889	36.222222
## 777	1992-12-30	0.8744755	23.88993	5.9015755	49.333333	18.666667
## 778	1992-12-31	0.8746853	23.88996	5.7077478	9.916667	23.583333
## 779	1993-01-01	0.8748951	23.88999	5.5139200	7.000000	36.142857
## 780	1993-01-02	0.8751049	23.89001	8.5644545	2.666667	2.909091
## 781	1993-01-03	0.8753147	23.89004	6.7272683	2.000000	2.200000
## 782	1993-01-04	0.8755245	23.89007	4.7412337	10.767677	6.193939
## 783	1993-01-05	0.8757343	23.89010	4.4753006	19.535354	10.187879
## 784	1993-01-06	0.8759441	23.89013	4.8090555	28.303030	14.181818
## 785	1993-01-07	0.8761538	23.89015	5.1428104	12.000000	14.000000
## 786	1993-01-08	0.8763636	23.89018	5.4765654	2.083333	2.083333
## 787	1993-01-09	0.8765734	23.89021	5.8103203	7.212121	4.181818
## 788	1993-01-10	0.8767832	23.89024	6.1440752	4.606061	6.424242
## 789	1993-01-11	0.8769930	23.89027	6.4778301	86.000000	250.000000
## 790	1993-01-12	0.8772028	23.89029	6.8115851	2.606061	5.757576
## 791	1993-01-13	0.8774126	23.89032	7.1453400	10.000000	28.714286
## 792	1993-01-14	0.8776224	23.89035	7.4751707	2.200000	4.400000
## 793	1993-01-15	0.8778322	23.89038	7.9042059	10.500000	10.333333
## 794	1993-01-16	0.8780420	23.89041	6.6786328	5.636364	8.969697
## 795	1993-01-17	0.8782517	23.89043	5.4530598	6.212121	7.969697
## 796	1993-01-18	0.8784615	23.89046	5.4685327	6.787879	6.969697
## 797	1993-01-19	0.8786713	23.89049	5.4840056	7.424242	8.090909
## 798	1993-01-20	0.8788811	23.89052	5.4976554	8.060606	9.212121
## 799	1993-01-21	0.8790909	23.89055	5.5113052	3.454545	4.484848
## 800	1993-01-22	0.8793007	23.89057	5.5249549	13.996503	446.953963
## 801	1993-01-23	0.8795105	23.89060	5.0785294	24.538462	889.423077
## 802	1993-01-24	0.8797203	23.89063	5.7174076	40.606061	4.727273
## 803	1993-01-25	0.8799301	23.89066	6.3562857	6.000000	15.000000
## 804	1993-01-26	0.8801399	23.89069	5.6736000	2.400000	7.400000
## 805	1993-01-27	0.8803497	23.89071	7.2800417	23.666667	2.333333
## 806	1993-01-28	0.8805594	23.89074	7.1822465	3.757576	28.363636
## 807	1993-01-29	0.8807692	23.89077	7.0844512	2.000000	4.000000
## 808	1993-01-30	0.8809790	23.89080	6.9866560	10.000000	2.181818
## 809	1993-01-31	0.8811888	23.89083	6.8888608	4.000000	12.000000
## 810	1993-02-01	0.8813986	23.89085	6.7910656	2.000000	24.000000
## 811	1993-02-02	0.8816084	23.89088	6.6932704	2.000000	2.000000
## 812	1993-02-03	0.8818182	23.89091	6.5954752	6.181818	3.757576
## 813	1993-02-04	0.8820280	23.89094	6.4976800	60.538462	502.500000
## 814	1993-02-05	0.8822378	23.89097	6.0728627	35.435897	252.333333
## 815	1993-02-06	0.8824476	23.89099	6.9507696	10.333333	2.166667
## 816	1993-02-07	0.8826573	23.89102	7.8286765	25.555556	8.888889

## 817	1993-02-08	0.8828671	23.89105	8.7065833	2.000000	2.000000
## 818	1993-02-09	0.8830769	23.89108	8.4361429	2.133333	3.333333
## 819	1993-02-10	0.8832867	23.89110	8.2450000	2.000000	3.600000
## 820	1993-02-11	0.8834965	23.89113	8.1750238	13.555556	2.222222
## 821	1993-02-12	0.8837063	23.89116	8.1050476	3.000000	3.666667
## 822	1993-02-13	0.8839161	23.89119	8.0350714	68.909091	366.000000
## 823	1993-02-14	0.8841259	23.89122	7.9650952	2.000000	12.000000
## 824	1993-02-15	0.8843357	23.89124	7.8951190	3.575758	6.060606
## 825	1993-02-16	0.8845455	23.89127	7.8251429	25.142857	124.571429
## 826	1993-02-17	0.8847552	23.89130	8.5787917	3.666667	3.833333
## 827	1993-02-18	0.8849650	23.89133	7.4667000	29.200000	231.000000
## 828	1993-02-19	0.8851748	23.89136	6.3657127	8.121212	2.545455
## 829	1993-02-20	0.8853846	23.89138	5.2647255	6.080808	2.272727
## 830	1993-02-21	0.8855944	23.89141	5.5433846	4.040404	2.000000
## 831	1993-02-22	0.8858042	23.89144	5.5791019	2.000000	2.166667
## 832	1993-02-23	0.8860140	23.89147	5.6148193	8.000000	2.000000
## 833	1993-02-24	0.8862238	23.89150	5.6505366	3.636364	2.303030
## 834	1993-02-25	0.8864336	23.89152	5.6862539	2.000000	2.000000
## 835	1993-02-26	0.8866434	23.89155	5.7219713	133.111111	33.777778
## 836	1993-02-27	0.8868531	23.89158	5.7576886	2.000000	3.000000
## 837	1993-02-28	0.8870629	23.89161	5.7934059	92.096154	324.865385
## 838	1993-03-01	0.8872727	23.89164	5.2955577	182.192308	646.730769
## 839	1993-03-02	0.8874825	23.89166	6.0889931	2.121212	2.303030
## 840	1993-03-03	0.8876923	23.89169	6.8824286	9.000000	18.142857
## 841	1993-03-04	0.8879021	23.89172	5.9310000	14.000000	84.800000
## 842	1993-03-05	0.8881119	23.89175	7.3413750	4.060606	4.424242
## 843	1993-03-06	0.8883217	23.89178	7.1245937	589.333333	94.888889
## 844	1993-03-07	0.8885315	23.89180	6.9078125	2.000000	2.083333
## 845	1993-03-08	0.8887413	23.89183	6.6910312	44.000000	26.000000
## 846	1993-03-09	0.8889510	23.89186	6.4742500	2.750000	18.750000
## 847	1993-03-10	0.8891608	23.89189	7.0094103	7.000000	4.900000
## 848	1993-03-11	0.8893706	23.89192	6.5236061	2.000000	2.000000
## 849	1993-03-12	0.8895804	23.89194	6.0378020	11.961538	222.115385
## 850	1993-03-13	0.8897902	23.89197	6.1336863	21.923077	442.230769
## 851	1993-03-14	0.8900000	23.89200	6.3000000	2.000000	2.000000
## 852	1993-03-15	0.8687211	23.89202	6.4004388	4.000000	2.000000
## 853	1993-03-16	0.8474423	23.89204	6.5008776	80.666667	61.333333
## 854	1993-03-17	0.8261634	23.89207	6.6013163	6.000000	2.083333
## 855	1993-03-18	0.8048846	23.89209	6.7017551	10.416667	2.583333
## 856	1993-03-19	0.7836057	23.89211	6.8021939	10.444444	14.000000
## 857	1993-03-20	0.7623269	23.89213	6.9026327	6.500000	6.750000
## 858	1993-03-21	0.7410480	23.89215	7.0030714	5.428571	13.714286
## 859	1993-03-22	0.7197691	23.89218	6.7753333	10.250000	2.166667
## 860	1993-03-23	0.6984903	23.89220	7.3783000	4.600000	27.800000
## 861	1993-03-24	0.6772114	23.89222	6.3182186	9.454545	6.121212
## 862	1993-03-25	0.6559326	23.89224	5.2581373	35.304196	386.829837
## 863	1993-03-26	0.6346537	23.89226	5.6931154	61.153846	767.538462
## 864	1993-03-27	0.6133749	23.89228	5.8748150	2.083333	2.666667
## 865	1993-03-28	0.5920960	23.89231	6.0565147	2.166667	3.000000
## 866	1993-03-29	0.5708171	23.89233	6.2382143	7.652174	29.043478
## 867	1993-03-30	0.5495383	23.89235	7.0215833	18.583333	4.333333
## 868	1993-03-31	0.5282594	23.89237	7.4406000	29.636364	385.818182
## 869	1993-04-01	0.5069806	23.89239	6.7816235	12.250000	4.666667
## 870	1993-04-02	0.4857017	23.89242	6.1226471	144.307692	1073.807692

## 871	1993-04-03	0.4644228	23.89244	6.0051244	20.000000	36.888889
## 872	1993-04-04	0.4431440	23.89246	5.8876018	5.416667	4.583333
## 873	1993-04-05	0.4218651	23.89248	5.7700792	4.611111	4.333333
## 874	1993-04-06	0.4005863	23.89250	6.4255882	3.805556	4.083333
## 875	1993-04-07	0.4062829	23.89253	6.5289940	3.000000	3.833333
## 876	1993-04-08	0.4119795	23.89255	6.6323998	3.833333	6.833333
## 877	1993-04-09	0.4176761	23.89257	6.7358055	65.777778	136.444444
## 878	1993-04-10	0.4233727	23.89259	6.8392113	878.000000	1922.000000
## 879	1993-04-11	0.4290693	23.89261	6.9426170	4.000000	3.250000
## 880	1993-04-12	0.4347659	23.89264	7.0460228	2.000000	4.416667
## 881	1993-04-13	0.4404626	23.89266	7.1494286	6.142857	5.142857
## 882	1993-04-14	0.4461592	23.89268	6.9820000	2.000000	2.000000
## 883	1993-04-15	0.4518558	23.89270	8.4575833	2.000000	2.416667
## 884	1993-04-16	0.4575524	23.89272	7.2417367	12.000000	8.000000
## 885	1993-04-17	0.4632490	23.89274	6.0258900	57.519231	264.038462
## 886	1993-04-18	0.4689456	23.89277	5.7824706	103.038462	520.076923
## 887	1993-04-19	0.4746422	23.89279	5.9162850	2.500000	3.833333
## 888	1993-04-20	0.4803388	23.89281	6.0500994	10.416667	2.000000
## 889	1993-04-21	0.4860354	23.89283	6.1839139	2.888889	11.555556
## 890	1993-04-22	0.4917321	23.89285	6.3177283	2.000000	2.833333
## 891	1993-04-23	0.4974287	23.89288	6.4515427	2.000000	2.500000
## 892	1993-04-24	0.5031253	23.89290	6.5853571	6.000000	3.428571
## 893	1993-04-25	0.5088219	23.89292	7.6523043	2.083333	3.083333
## 894	1993-04-26	0.5145185	23.89294	7.2853333	2.000000	22.600000
## 895	1993-04-27	0.5202151	23.89296	5.5194038	189.076923	593.500000
## 896	1993-04-28	0.5259117	23.89299	5.1077451	102.316239	308.416667
## 897	1993-04-29	0.5316083	23.89301	5.1134338	15.555556	23.333333
## 898	1993-04-30	0.5373050	23.89303	5.1191225	2.916667	4.333333
## 899	1993-05-01	0.5430016	23.89305	5.1248113	11.333333	91.833333
## 900	1993-05-02	0.5486982	23.89307	5.1305000	35.000000	2.000000
## 901	1993-05-03	0.5543948	23.89309	5.1361887	108.000000	10.000000
## 902	1993-05-04	0.5600914	23.89312	5.1418775	4.083333	6.333333
## 903	1993-05-05	0.5657880	23.89314	5.1475662	2.416667	9.750000
## 904	1993-05-06	0.5714846	23.89316	5.1532549	85.615385	1203.423077
## 905	1993-05-07	0.5771812	23.89318	5.0955000	48.029915	611.267094
## 906	1993-05-08	0.5828778	23.89320	6.3639375	10.444444	19.111111
## 907	1993-05-09	0.5885745	23.89323	7.6323750	3.666667	10.916667
## 908	1993-05-10	0.5942711	23.89325	6.0377917	39.500000	12.416667
## 909	1993-05-11	0.5999677	23.89327	5.9931097	6.416667	2.000000
## 910	1993-05-12	0.6056643	23.89329	5.9484278	2.000000	5.000000
## 911	1993-05-13	0.6113609	23.89331	5.9037458	5.777778	3.333333
## 912	1993-05-14	0.6170575	23.89334	5.8590639	10.250000	5.416667
## 913	1993-05-15	0.6227541	23.89336	5.8143819	2.484848	4.727273
## 914	1993-05-16	0.6284507	23.89338	5.7697000	26.200000	45.400000
## 915	1993-05-17	0.6341474	23.89340	6.7875000	6.000000	16.285714
## 916	1993-05-18	0.6398440	23.89342	9.0058750	2.000000	2.250000
## 917	1993-05-19	0.6455406	23.89345	5.1739314	34.229508	93.534836
## 918	1993-05-20	0.6512372	23.89347	5.5310385	66.459016	184.819672
## 919	1993-05-21	0.6569338	23.89349	5.7481736	4.083333	2.000000
## 920	1993-05-22	0.6626304	23.89351	5.9653088	2.888889	2.444444
## 921	1993-05-23	0.6683270	23.89353	6.1824440	2.000000	2.000000
## 922	1993-05-24	0.6740236	23.89355	6.3995791	3.555556	7.111111
## 923	1993-05-25	0.6797202	23.89358	6.6167143	15.428571	2.000000
## 924	1993-05-26	0.6854169	23.89360	7.5704783	4.083333	2.000000

## 925	1993-05-27	0.6911135	23.89362	6.1944000	3.800000	10.000000
## 926	1993-05-28	0.6968101	23.89364	5.9543042	2.888889	5.555556
## 927	1993-05-29	0.7025067	23.89366	5.7142083	2.000000	2.000000
## 928	1993-05-30	0.7082033	23.89369	5.4741125	2.000000	2.000000
## 929	1993-05-31	0.7138999	23.89371	5.2340166	2.222222	2.888889
## 930	1993-06-01	0.7195965	23.89373	4.9939208	45.034188	83.636752
## 931	1993-06-02	0.7252931	23.89375	5.1538269	87.846154	164.384615
## 932	1993-06-03	0.7309897	23.89377	5.3531653	4.000000	2.083333
## 933	1993-06-04	0.7366864	23.89380	5.5525037	4.000000	2.083333
## 934	1993-06-05	0.7423830	23.89382	5.7518420	2.222222	2.444444
## 935	1993-06-06	0.7480796	23.89384	5.9511804	2.083333	3.250000
## 936	1993-06-07	0.7537762	23.89386	6.1505188	7.333333	7.333333
## 937	1993-06-08	0.7594728	23.89388	6.3498571	28.285714	250.142857
## 938	1993-06-09	0.7651694	23.89391	7.9825000	2.000000	4.000000
## 939	1993-06-10	0.7708660	23.89393	5.3586000	8.200000	58.200000
## 940	1993-06-11	0.7765626	23.89395	5.3308779	4.444444	25.111111
## 941	1993-06-12	0.7822593	23.89397	5.3031558	2.000000	2.166667
## 942	1993-06-13	0.7879559	23.89399	5.2754337	2.444444	2.222222
## 943	1993-06-14	0.7936525	23.89401	5.2477115	47.923077	773.807692
## 944	1993-06-15	0.7993491	23.89404	4.8729314	24.961538	388.070513
## 945	1993-06-16	0.8050457	23.89406	5.4461985	2.000000	2.333333
## 946	1993-06-17	0.8107423	23.89408	6.0194657	117.939394	14.060606
## 947	1993-06-18	0.8164389	23.89410	6.5927328	6.000000	2.666667
## 948	1993-06-19	0.8221355	23.89412	7.1660000	10.869565	17.130435
## 949	1993-06-20	0.8278321	23.89415	7.0467000	16.400000	2.400000
## 950	1993-06-21	0.8335288	23.89417	7.9263750	18.500000	2.333333
## 951	1993-06-22	0.8392254	23.89419	7.4381246	7.111111	14.444444
## 952	1993-06-23	0.8449220	23.89421	6.9498742	2.000000	4.250000
## 953	1993-06-24	0.8506186	23.89423	6.4616238	2.000000	3.125000
## 954	1993-06-25	0.8563152	23.89426	6.4944753	2.000000	2.000000
## 955	1993-06-26	0.8620118	23.89428	6.5273269	6.196721	354.524590
## 956	1993-06-27	0.8677084	23.89430	6.8127564	2.166667	5.083333
## 957	1993-06-28	0.8734050	23.89432	7.0981859	8.222222	137.111111
## 958	1993-06-29	0.8791017	23.89434	7.3836154	2.000000	48.000000
## 959	1993-06-30	0.8847983	23.89436	7.6690449	2.000000	2.083333
## 960	1993-07-01	0.8904949	23.89439	7.9544744	2.222222	2.000000
## 961	1993-07-02	0.8961915	23.89441	8.2399038	2.083333	13.666667
## 962	1993-07-03	0.9018881	23.89443	8.5253333	2.083333	4.833333
## 963	1993-07-04	0.9075847	23.89445	7.9400122	2.000000	10.916667
## 964	1993-07-05	0.9132813	23.89447	7.3546911	116.888889	4.888889
## 965	1993-07-06	0.9189779	23.89450	6.7693700	68.502137	155.021368
## 966	1993-07-07	0.9246745	23.89452	6.9927692	20.115385	305.153846
## 967	1993-07-08	0.9303712	23.89454	6.9345410	2.000000	4.000000
## 968	1993-07-09	0.9360678	23.89456	6.8763128	4.000000	13.777778
## 969	1993-07-10	0.9417644	23.89458	6.8180846	4.083333	5.166667
## 970	1993-07-11	0.9474610	23.89461	6.7598564	4.888889	10.222222
## 971	1993-07-12	0.9531576	23.89463	6.7016282	2.000000	4.833333
## 972	1993-07-13	0.9588542	23.89465	6.6434000	11.000000	45.000000
## 973	1993-07-14	0.9645508	23.89467	7.1370714	7.913043	31.478261
## 974	1993-07-15	0.9702474	23.89469	7.5849167	2.250000	2.000000
## 975	1993-07-16	0.9759440	23.89472	7.6180410	175.333333	299.111111
## 976	1993-07-17	0.9816407	23.89474	7.6511654	3.000000	4.000000
## 977	1993-07-18	0.9873373	23.89476	7.6842897	4.166667	2.166667
## 978	1993-07-19	0.9930339	23.89478	7.7174141	3.500000	5.333333

##	979	1993-07-20	0.9987305	23.89480	7.7505385	59.409836	654.196721
##	980	1993-07-21	1.0044271	23.89482	7.4260454	2.000000	2.000000
##	981	1993-07-22	1.0101237	23.89485	7.1015524	5.214286	21.714286
##	982	1993-07-23	1.0158203	23.89487	6.7770594	2.714286	2.714286
##	983	1993-07-24	1.0215169	23.89489	6.2608313	5.272727	23.151515
##	984	1993-07-25	1.0272136	23.89491	5.7446031	35.000000	26.000000
##	985	1993-07-26	1.0329102	23.89493	5.2283750	5.166667	6.416667
##	986	1993-07-27	1.0386068	23.89496	5.4725000	4.000000	2.000000
##	987	1993-07-28	1.0443034	23.89498	5.8312500	4.166667	2.166667
##	988	1993-07-29	1.0500000	23.89500	6.1900000	6.305556	2.194444
##	989	1993-07-30	1.0125319	23.96153	6.3183558	8.444444	2.222222
##	990	1993-07-31	0.9750637	24.02807	6.4467115	57.692308	542.307692
##	991	1993-08-01	0.9375956	24.09460	6.1825686	30.512821	277.862179
##	992	1993-08-02	0.9001275	24.16114	6.3940827	3.333333	13.416667
##	993	1993-08-03	0.8626593	24.22767	6.6055968	4.166667	9.833333
##	994	1993-08-04	0.8251912	24.29420	6.8171109	2.222222	2.888889
##	995	1993-08-05	0.7877230	24.36074	7.0286250	9.166667	38.416667
##	996	1993-08-06	0.7502549	24.42727	7.5027083	13.583333	6.916667
##	997	1993-08-07	0.7127868	24.49380	7.0212286	3.166667	7.000000
##	998	1993-08-08	0.6753186	24.56034	6.5397489	8.363636	2.606061
##	999	1993-08-09	0.6378505	24.62687	6.0582692	23.769231	260.769231
##	1000	1993-08-10	0.6003824	24.69341	6.0639118	14.000000	12.000000
##	1001	1993-08-11	0.5629142	24.75994	6.4192544	2.000000	2.166667
##	1002	1993-08-12	0.5254461	24.82647	6.7745971	2.000000	2.000000
##	1003	1993-08-13	0.4879779	24.89301	7.1299397	4.888889	22.222222
##	1004	1993-08-14	0.4505098	24.95954	7.4852824	2.083333	2.333333
##	1005	1993-08-15	0.4130417	25.02607	7.8406250	4.083333	8.916667
##	1006	1993-08-16	0.4193208	25.28558	6.7653750	75.666667	314.916667
##	1007	1993-08-17	0.4155739	25.30111	6.6974176	1039.777778	479.333333
##	1008	1993-08-18	0.4118270	25.31665	6.6294603	122.400000	74.000000
##	1009	1993-08-19	0.4080801	25.33218	6.5615029	2.000000	4.083333
##	1010	1993-08-20	0.4043332	25.34772	6.4935456	2.416667	6.583333
##	1011	1993-08-21	0.4005863	25.36325	6.4255882	166.769231	818.423077
##	1012	1993-08-22	0.4304683	25.34881	6.4979505	84.551282	411.711538
##	1013	1993-08-23	0.4512429	25.38724	6.6105566	2.333333	5.000000
##	1014	1993-08-24	0.4720175	25.42568	6.7231627	3.111111	8.888889
##	1015	1993-08-25	0.4927921	25.46411	6.8357689	2.083333	10.583333
##	1016	1993-08-26	0.5135667	25.50254	6.9483750	9.000000	16.166667
##	1017	1993-08-27	0.5460417	25.54097	7.6870417	2.500000	3.000000
##	1018	1993-08-28	0.5283656	25.57941	6.9984381	2.000000	2.303030
##	1019	1993-08-29	0.5106895	25.61784	6.3098346	10.666667	5.333333
##	1020	1993-08-30	0.4930134	25.65627	5.6212310	2.500000	6.583333
##	1021	1993-08-31	0.4753373	25.69470	4.9326275	90.038462	349.576923
##	1022	1993-09-01	0.4607545	25.76662	4.8654950	46.019231	177.010684
##	1023	1993-09-02	0.7036043	25.51559	6.3339975	2.000000	4.444444
##	1024	1993-09-03	0.9464542	25.26456	7.8025000	2.583333	3.333333
##	1025	1993-09-04	0.5079958	25.45370	6.2973750	7.583333	23.083333
##	1026	1993-09-05	0.4816964	25.49462	6.0394362	2.000000	2.333333
##	1027	1993-09-06	0.4553969	25.53555	5.7814975	8.060606	3.212121
##	1028	1993-09-07	0.4290975	25.57647	5.5235588	2.000000	2.833333
##	1029	1993-09-08	0.4027980	25.61739	5.2656200	132.192308	1047.500000
##	1030	1993-09-09	0.3999465	25.64865	5.2059596	67.346154	524.958333
##	1031	1993-09-10	0.4153657	25.49573	5.8124314	2.500000	2.416667
##	1032	1993-09-11	0.4307849	25.34282	6.4189032	2.222222	2.000000

##	1033	1993-09-12	0.4462042	25.18991	7.0253750	3.916667	12.666667
##	1034	1993-09-13	0.5586167	24.83966	8.3332083	2.000000	2.833333
##	1035	1993-09-14	0.5279276	25.05520	7.5126191	2.000000	3.666667
##	1036	1993-09-15	0.4972385	25.27073	6.6920299	2.000000	2.000000
##	1037	1993-09-16	0.4665495	25.48627	5.8714407	2.000000	2.000000
##	1038	1993-09-17	0.4358604	25.70181	5.0508515	109.980769	316.326923
##	1039	1993-09-18	0.4178192	25.72990	5.1255769	217.961538	630.653846
##	1040	1993-09-19	0.4635632	25.59637	5.4582516	119.132284	316.357226
##	1041	1993-09-20	0.5093073	25.46284	5.7909263	20.303030	2.060606
##	1042	1993-09-21	0.5550513	25.32931	6.1236010	5.333333	4.222222
##	1043	1993-09-22	0.6007953	25.19578	6.4562756	2.083333	2.250000
##	1044	1993-09-23	0.6465393	25.06225	6.7889503	2.333333	2.333333
##	1045	1993-09-24	0.6922833	24.92873	7.1216250	3.000000	10.166667
##	1046	1993-09-25	2.0893583	24.02102	9.5001667	55.388889	6.305556
##	1047	1993-09-26	1.2729850	24.72270	7.4858186	107.777778	2.444444
##	1048	1993-09-27	0.4566118	25.42439	5.4714706	2.000000	2.000000
##	1049	1993-09-28	0.4467213	25.39292	5.5914757	2.000000	2.250000
##	1050	1993-09-29	0.4368308	25.36145	5.7114808	104.692308	1895.692308
##	1051	1993-09-30	0.4424071	25.26330	5.8185513	13.111111	69.777778
##	1052	1993-10-01	0.4479835	25.16515	5.9256218	12.000000	4.000000
##	1053	1993-10-02	0.4535598	25.06701	6.0326923	2.000000	2.000000
##	1054	1993-10-03	0.4591362	24.96886	6.1397628	3.333333	6.000000
##	1055	1993-10-04	0.4647125	24.87071	6.2468333	25.666667	322.083333
##	1056	1993-10-05	0.7101125	24.11960	7.7550417	2.000000	3.416667
##	1057	1993-10-06	0.6016850	24.59381	6.8422286	17.777778	86.888889
##	1058	1993-10-07	0.4932576	25.06803	5.9294155	3.920000	14.800000
##	1059	1993-10-08	0.3848301	25.54225	5.0166024	4.444444	2.222222
##	1060	1993-10-09	0.4171567	25.46766	5.6738507	39.192308	1048.500000
##	1061	1993-10-10	0.4395077	25.29683	5.9915978	2.000000	2.083333
##	1062	1993-10-11	0.4618586	25.12600	6.3093449	2.121212	4.242424
##	1063	1993-10-12	0.4842096	24.95517	6.6270920	2.000000	2.000000
##	1064	1993-10-13	0.5065606	24.78434	6.9448391	2.000000	3.583333
##	1065	1993-10-14	0.5289115	24.61352	7.2625862	2.444444	3.333333
##	1066	1993-10-15	0.5512625	24.44269	7.5803333	2.583333	4.833333
##	1067	1993-10-16	0.4713417	24.83196	6.5817500	14.916667	325.666667
##	1068	1993-10-17	0.4479519	25.39206	5.3582115	74.423077	1390.192308
##	1069	1993-10-18	0.4384171	25.33597	5.6124612	2.000000	2.666667
##	1070	1993-10-19	0.4288824	25.27989	5.8667109	12.500000	2.333333
##	1071	1993-10-20	0.4193476	25.22380	6.1209606	20.888889	27.111111
##	1072	1993-10-21	0.4098128	25.16772	6.3752103	2.000000	2.000000
##	1073	1993-10-22	0.4002780	25.11163	6.6294600	3.888889	3.000000
##	1074	1993-10-23	0.4236372	24.99504	6.9935222	5.777778	4.000000
##	1075	1993-10-24	0.4469964	24.87845	7.3575844	4.000000	4.916667
##	1076	1993-10-25	0.4703557	24.76186	7.7216467	10.888889	6.000000
##	1077	1993-10-26	0.4937149	24.64527	8.0857089	2.000000	2.083333
##	1078	1993-10-27	0.5170741	24.52868	8.4497711	4.000000	7.555556
##	1079	1993-10-28	0.5404333	24.41209	8.8138333	2.083333	5.250000
##	1080	1993-10-29	0.4534250	24.88048	7.1030385	78.692308	821.076923
##	1081	1993-10-30	0.5917583	23.86565	9.2438750	2.000000	4.000000
##	1082	1993-10-31	0.5543827	24.03935	8.7658060	12.000000	250.666667
##	1083	1993-11-01	0.5170070	24.21305	8.2877370	2.400000	7.280000
##	1084	1993-11-02	0.4796313	24.38674	7.8096680	2.000000	5.416667
##	1085	1993-11-03	0.4422557	24.56044	7.3315990	2.444444	2.444444
##	1086	1993-11-04	0.4048800	24.73414	6.8535300	4.222222	2.222222

##	1087	1993-11-05	0.4300937	24.59941	7.0183792	6.000000	2.000000
##	1088	1993-11-06	0.4553075	24.46468	7.1832283	6.000000	4.444444
##	1089	1993-11-07	0.4805213	24.32995	7.3480775	2.000000	2.250000
##	1090	1993-11-08	0.5057350	24.19522	7.5129267	2.000000	2.000000
##	1091	1993-11-09	0.5309488	24.06049	7.6777758	2.888889	4.444444
##	1092	1993-11-10	0.5561625	23.92576	7.8426250	6.166667	2.333333
##	1093	1993-11-11	0.4762292	24.23198	7.9285000	7.333333	7.000000
##	1094	1993-11-12	0.4416667	24.46900	7.7027843	24.500000	877.230769
##	1095	1993-11-13	0.4412197	24.44481	7.7617522	164.888889	3.555556
##	1096	1993-11-14	0.4407727	24.42063	7.8207201	4.000000	4.666667
##	1097	1993-11-15	0.4403257	24.39644	7.8796880	8.000000	2.166667
##	1098	1993-11-16	0.4398787	24.37226	7.9386559	10.000000	19.777778
##	1099	1993-11-17	0.4394317	24.34807	7.9976238	6.000000	10.888889
##	1100	1993-11-18	0.4353633	24.36616	7.9677074	2.000000	2.000000
##	1101	1993-11-19	0.4312950	24.38424	7.9377910	2.666667	5.111111
##	1102	1993-11-20	0.4272267	24.40233	7.9078747	16.333333	4.166667
##	1103	1993-11-21	0.4231583	24.42041	7.8779583	6.545455	112.060606
##	1104	1993-11-22	0.4197160	24.65221	7.7762800	28.423077	1213.769231
##	1105	1993-11-23	0.5135792	24.02755	7.9774167	15.363054	610.339161
##	1106	1993-11-24	0.4629385	24.21577	7.9445820	2.303030	6.909091
##	1107	1993-11-25	0.4122978	24.40400	7.9117473	3.151515	4.496212
##	1108	1993-11-26	0.4185921	24.27111	7.7067375	4.000000	2.083333
##	1109	1993-11-27	0.4248864	24.13822	7.5017278	74.000000	100.666667
##	1110	1993-11-28	0.4311807	24.00533	7.2967181	4.000000	3.250000
##	1111	1993-11-29	0.4374750	23.87245	7.0917083	8.166667	13.166667
##	1112	1993-11-30	0.4071588	24.26412	7.7582549	41.192308	448.653846
##	1113	1993-12-01	0.4298042	23.83694	7.1936250	20.666667	6.545455
##	1114	1993-12-02	1.2300000	23.89600	6.1600000	15.361111	4.272727
##	1115	1993-12-03	1.0626943	24.01709	6.4593465	10.055556	2.000000
##	1116	1993-12-04	0.8953885	24.13818	6.7586931	4.750000	7.833333
##	1117	1993-12-05	0.7280828	24.25927	7.0580396	10.250000	2.000000
##	1118	1993-12-06	0.5607770	24.38035	7.3573861	2.000000	2.000000
##	1119	1993-12-07	0.3934713	24.50144	7.6567327	6.333333	3.111111
##	1120	1993-12-08	0.4003461	24.41219	7.6938079	10.666667	4.222222
##	1121	1993-12-09	0.4072210	24.32293	7.7308831	10.608696	2.250000
##	1122	1993-12-10	0.4140958	24.23367	7.7679583	63.666667	195.833333
##	1123	1993-12-11	0.3754188	24.52170	7.6150312	18.187500	812.687500
##	1124	1993-12-12	0.3858000	24.43867	7.6079333	7.066667	127.200000
##	1125	1993-12-13	0.4468655	24.43566	7.9288276	46.896552	953.034483
##	1126	1993-12-14	0.7189916	24.47034	7.7911697	10.222222	8.666667
##	1127	1993-12-15	0.9911176	24.50501	7.6535118	4.000000	2.250000
##	1128	1993-12-16	1.2632436	24.53969	7.5158540	2.000000	2.083333
##	1129	1993-12-17	1.5353697	24.57437	7.3781961	43.111111	14.000000
##	1130	1993-12-18	1.8074957	24.58471	4.9187974	2.166667	2.666667
##	1131	1993-12-19	2.0796218	24.59504	2.4593987	26.833333	2.083333
##	1132	1993-12-20	2.3517478	24.60538	0.0000000	41.246855	190.475629
##	1133	1993-12-21	2.6109880	24.64546	7.0857314	55.660377	378.867925
##	1134	1993-12-22	3.3651542	24.60319	7.7145958	5.000000	25.250000
##	1135	1993-12-23	2.9234974	24.71686	7.1853669	14.333333	10.416667
##	1136	1993-12-24	2.4818406	24.83053	6.6561379	8.333333	8.750000
##	1137	1993-12-25	2.6741000	24.78975	6.8565614	2.333333	7.083333
##	1138	1993-12-26	2.8663594	24.74896	7.0569849	58.000000	29.555556
##	1139	1993-12-27	3.0586187	24.70818	7.2574084	49.805556	25.870370
##	1140	1993-12-28	3.2508781	24.66739	7.4578319	41.611111	22.185185

##	1141	1993-12-29	3.4431375	24.62661	7.6582554	33.416667	18.500000
##	1142	1993-12-30	2.9389255	24.78953	6.7645022	17.730769	61.538462
##	1143	1993-12-31	2.9916750	24.59386	7.3774221	41.636364	12.969697
##	1144	1994-01-01	3.0444246	24.75041	6.9168219	250.000000	40.000000
##	1145	1994-01-02	3.0971741	24.90696	6.4562216	126.333333	21.000000
##	1146	1994-01-03	3.1499236	25.06350	5.9956214	2.666667	2.000000
##	1147	1994-01-04	3.2026732	25.22005	5.5350212	12.000000	10.541667
##	1148	1994-01-05	3.2554227	25.11124	6.0040266	21.333333	19.083333
##	1149	1994-01-06	3.3081722	25.00242	6.4730320	20.666667	17.777778
##	1150	1994-01-07	3.3609218	24.89361	6.9420375	32.000000	8.000000
##	1151	1994-01-08	3.4136713	24.78479	7.4110429	8.583333	8.583333
##	1152	1994-01-09	3.4664208	24.67598	7.8800483	18.500000	2.333333
##	1153	1994-01-10	3.3428273	24.94494	7.0765030	6.083333	32.750000
##	1154	1994-01-11	3.2192337	25.21732	6.3072408	34.730769	586.115385
##	1155	1994-01-12	3.0956401	25.18621	6.4312269	22.363636	3.878788
##	1156	1994-01-13	2.9720466	25.15511	6.5552130	19.640152	4.897727
##	1157	1994-01-14	2.8484530	25.14776	6.6715763	16.916667	5.916667
##	1158	1994-01-15	2.7248594	25.14042	6.7879396	172.444444	51.111111
##	1159	1994-01-16	2.6012658	25.13307	6.9043030	3.461538	9.615385
##	1160	1994-01-17	2.4776723	25.12573	7.0206663	5.000000	5.416667
##	1161	1994-01-18	2.3540787	25.11839	7.1370296	2.000000	2.250000
##	1162	1994-01-19	2.2304851	25.11104	7.2533929	4.121212	10.969697
##	1163	1994-01-20	2.1068916	25.37577	6.0038929	22.083333	169.750000
##	1164	1994-01-21	1.9832980	25.78804	4.7017534	17.169811	345.396226
##	1165	1994-01-22	2.1173646	25.70396	4.6141912	2.250000	8.916667
##	1166	1994-01-23	2.2514311	25.61988	4.5266290	2.569444	9.125000
##	1167	1994-01-24	2.3854977	25.50355	4.9853251	2.888889	9.333333
##	1168	1994-01-25	2.5195643	25.38722	5.4440211	2.320000	3.680000
##	1169	1994-01-26	2.6536308	25.27090	5.9027172	2.000000	2.000000
##	1170	1994-01-27	2.7876974	25.15457	6.3614133	232.444444	1416.222222
##	1171	1994-01-28	2.9217639	25.03824	6.8201094	2.000000	6.000000
##	1172	1994-01-29	3.0558305	24.92192	7.2788055	2.000000	3.333333
##	1173	1994-01-30	3.1898971	25.21591	5.6101408	3.416667	8.000000
##	1174	1994-01-31	3.3239636	25.47394	5.1798498	20.384615	661.615385
##	1175	1994-02-01	3.4580302	25.48214	5.1165943	158.666667	253.555556
##	1176	1994-02-02	3.5920968	25.49034	5.0533389	9.000000	72.000000
##	1177	1994-02-03	3.7261633	25.49854	4.9900834	2.060606	2.545455
##	1178	1994-02-04	3.8602299	25.50674	4.9268279	6.363636	7.814394
##	1179	1994-02-05	3.9942965	25.40359	5.2511861	10.666667	13.083333
##	1180	1994-02-06	4.1283630	25.30045	5.5755443	2.444444	2.000000
##	1181	1994-02-07	4.2624296	25.19730	5.8999025	2.000000	2.250000
##	1182	1994-02-08	4.3964961	25.09415	6.2242607	2.000000	2.000000
##	1183	1994-02-09	4.5305627	24.99100	6.5486189	2.000000	3.555556
##	1184	1994-02-10	4.6646293	24.88785	6.8729771	4.166667	3.333333
##	1185	1994-02-11	4.7986958	25.10279	6.8961762	12.250000	31.916667
##	1186	1994-02-12	4.7491106	25.46306	5.6500989	84.461538	1710.500000
##	1187	1994-02-13	4.6995254	25.44177	5.7800904	7.111111	18.000000
##	1188	1994-02-14	4.6499402	25.42049	5.9100818	4.080000	14.080000
##	1189	1994-02-15	4.6003549	25.39921	6.0400733	15.498333	8.040000
##	1190	1994-02-16	4.5507697	25.33570	6.2176112	26.916667	2.000000
##	1191	1994-02-17	4.5011845	25.27219	6.3951491	4.666667	4.222222
##	1192	1994-02-18	4.4515992	25.20868	6.5726870	20.000000	100.000000
##	1193	1994-02-19	4.4020140	25.14517	6.7502250	2.000000	2.000000
##	1194	1994-02-20	4.3524288	25.08166	6.9277629	3.575758	13.272727

## 1195	1994-02-21	4.3028436	25.01815	7.1053008	2.000000	6.000000
## 1196	1994-02-22	4.2532583	24.95464	7.2828387	12.500000	10.500000
## 1197	1994-02-23	7.2718979	25.34558	6.7451398	27.692308	331.115385
## 1198	1994-02-24	10.2905375	24.70418	9.9423662	2.363636	2.787879
## 1199	1994-02-25	6.7068045	24.91738	8.3573803	4.333333	2.333333
## 1200	1994-02-26	3.1230714	25.13059	6.7723943	5.500000	18.166667
## 1201	1994-02-27	3.2416399	25.05586	6.9185705	6.666667	34.000000
## 1202	1994-02-28	3.3602083	24.98114	7.0647467	14.000000	50.000000
## 1203	1994-03-01	3.4787768	24.90642	7.2109229	4.166667	7.458333
## 1204	1994-03-02	3.5973452	24.83169	7.3570990	242.666667	29.333333
## 1205	1994-03-03	3.7159137	24.75697	7.5032752	2.083333	8.416667
## 1206	1994-03-04	3.8344821	24.68225	7.6494514	10.333333	5.583333
## 1207	1994-03-05	3.9530506	24.60752	7.7956276	2.666667	6.000000
## 1208	1994-03-06	4.0716190	24.53280	7.9418038	10.333333	18.833333
## 1209	1994-03-07	4.1901875	24.45808	8.0879800	2.363636	7.151515
## 1210	1994-03-08	3.9013833	24.69610	7.8564342	2.316498	6.101010
## 1211	1994-03-09	3.4552327	24.86780	7.6283573	2.269360	5.050505
## 1212	1994-03-10	3.4161050	24.88170	7.3887795	2.222222	4.000000
## 1213	1994-03-11	3.3769773	24.89559	7.1492017	4.000000	5.416667
## 1214	1994-03-12	3.3378497	24.90949	6.9096239	7.333333	2.444444
## 1215	1994-03-13	3.2987220	24.92338	6.6700461	8.833333	3.847222
## 1216	1994-03-14	2.9925565	24.83685	7.1012187	10.333333	5.250000
## 1217	1994-03-15	2.6863911	24.75032	7.5323913	2.000000	2.166667
## 1218	1994-03-16	2.3802256	24.66379	7.9635639	6.666667	16.222222
## 1219	1994-03-17	2.0740601	24.57726	8.3947365	2.000000	4.083333
## 1220	1994-03-18	1.7678946	24.49073	8.8259091	4.222222	2.666667
## 1221	1994-03-19	1.4617292	24.40420	9.2570817	2.166667	2.416667
## 1222	1994-03-20	1.6479463	24.89415	6.9633191	4.416667	10.208333
## 1223	1994-03-21	1.8341634	24.89452	6.9737284	6.666667	18.000000
## 1224	1994-03-22	2.0203806	24.89490	6.9841378	18.583333	2.083333
## 1225	1994-03-23	2.2065977	24.89528	6.9945471	11.291667	13.708333
## 1226	1994-03-24	2.3928148	24.82194	7.0636383	4.000000	25.333333
## 1227	1994-03-25	2.5790319	24.74861	7.1327295	6.500000	243.666667
## 1228	1994-03-26	2.7652491	24.67527	7.2018206	6.000000	2.000000
## 1229	1994-03-27	2.9514662	24.60194	7.2709118	2.000000	10.916667
## 1230	1994-03-28	3.1376833	24.52860	7.3400029	9.212121	41.636364
## 1231	1994-03-29	3.4182028	24.89319	6.8685830	29.614035	440.175439
## 1232	1994-03-30	3.6987222	25.11103	6.3355681	16.727273	518.690909
## 1233	1994-03-31	3.9792417	25.13286	6.1452410	5.111111	5.333333
## 1234	1994-04-01	4.2597611	25.15470	5.9549139	2.000000	10.250000
## 1235	1994-04-02	4.5402806	25.17654	5.7645869	2.083333	6.875000
## 1236	1994-04-03	4.8208000	25.03081	6.1680124	2.166667	3.500000
## 1237	1994-04-04	5.1013194	24.88508	6.5714380	4.333333	4.666667
## 1238	1994-04-05	5.3818389	24.73936	6.9748636	2.888889	9.555556
## 1239	1994-04-06	5.6623583	24.59363	7.3782892	2.000000	2.666667
## 1240	1994-04-07	1.8257458	24.87494	7.1496133	21.583333	28.666667
## 1241	1994-04-08	1.8596366	25.17820	6.4958837	30.076923	1083.115385
## 1242	1994-04-09	1.8935274	25.19926	6.3432328	8.500000	6.500000
## 1243	1994-04-10	1.9274182	25.22032	6.1905819	10.250000	2.000000
## 1244	1994-04-11	1.9613090	25.24139	6.0379310	4.444444	8.000000
## 1245	1994-04-12	1.9951998	25.26245	5.8852801	2.083333	5.333333
## 1246	1994-04-13	2.0290906	25.28352	5.7326292	2.000000	2.000000
## 1247	1994-04-14	2.0629814	25.30458	5.5799783	18.000000	7.000000
## 1248	1994-04-15	2.0968722	25.38397	5.4379717	34.000000	12.000000

##	1249	1994-04-16	2.1307630	25.46336	5.2959651	2.250000	4.916667
##	1250	1994-04-17	2.1646538	25.54274	5.1539585	49.576923	524.423077
##	1251	1994-04-18	2.9860417	25.33336	5.5837325	59.166667	164.500000
##	1252	1994-04-19	4.5063042	25.18432	6.3259117	5.000000	12.500000
##	1253	1994-04-20	4.1661140	25.28463	6.0043458	8.222222	4.000000
##	1254	1994-04-21	3.8259238	25.38495	5.6827799	2.583333	4.166667
##	1255	1994-04-22	3.4857337	25.48526	5.3612141	3.291667	3.541667
##	1256	1994-04-23	3.6080586	25.42610	5.6655470	4.000000	2.916667
##	1257	1994-04-24	3.7303836	25.36695	5.9698799	3.111111	4.444444
##	1258	1994-04-25	3.8527085	25.30779	6.2742129	2.166667	3.500000
##	1259	1994-04-26	3.9750334	25.24863	6.5785458	3.250000	7.416667
##	1260	1994-04-27	4.0973584	25.18948	6.8828787	2.250000	11.833333
##	1261	1994-04-28	4.2196833	25.13032	7.1872117	6.333333	4.750000
##	1262	1994-04-29	4.3698923	25.07031	7.1720812	6.000000	3.757576
##	1263	1994-04-30	4.5201013	25.31702	6.2839068	45.230769	273.700000
##	1264	1994-05-01	4.6703103	25.33222	6.1612013	72.727273	123.818182
##	1265	1994-05-02	4.8205193	25.34742	6.0384957	3.818182	3.151515
##	1266	1994-05-03	4.9707283	25.36262	5.9157902	19.835017	353.750000
##	1267	1994-05-04	5.1209373	25.37783	5.7930847	35.851852	390.114286
##	1268	1994-05-05	5.2711463	25.34460	6.8868948	888.101695	718.169492
##	1269	1994-05-06	5.4213553	25.22979	7.7111622	198.888889	119.555556
##	1270	1994-05-07	5.5715642	25.21151	8.0360596	2.000000	169.000000
##	1271	1994-05-08	5.7217732	25.19323	8.3609570	23.818182	39.393939
##	1272	1994-05-09	5.8719822	25.17494	8.6858544	5.333333	45.342857
##	1273	1994-05-10	5.2666253	25.21664	8.3817212	63.625000	54.250000
##	1274	1994-05-11	4.6612683	25.28857	8.1083034	10.055556	88.888889
##	1275	1994-05-12	4.5175240	25.31711	8.0350131	108.060606	78.121212
##	1276	1994-05-13	4.3737796	25.34565	7.9617228	5.333333	3.333333
##	1277	1994-05-14	4.2300353	25.37420	7.8884325	277.454545	282.454545
##	1278	1994-05-15	4.0862910	25.40274	7.8151422	170.949495	754.000000
##	1279	1994-05-16	3.9425466	25.43128	7.7418519	64.444444	11.777778
##	1280	1994-05-17	3.7988023	25.45982	7.6685616	35.555556	145.500000
##	1281	1994-05-18	3.6550580	25.48836	7.5952713	6.666667	13.454545
##	1282	1994-05-19	3.5113137	25.51691	7.5219810	488.545455	33.090909
##	1283	1994-05-20	3.3675693	25.54545	7.4486907	7.757576	59.560976
##	1284	1994-05-21	3.2238250	25.57399	7.3754004	5.083333	228.312500
##	1285	1994-05-22	5.6028676	25.92533	4.8787416	139.111111	1061.428571
##	1286	1994-05-23	7.9819103	25.79384	5.5531154	15.416667	22.666667
##	1287	1994-05-24	10.3609529	25.70183	7.4609583	7.777778	15.764706
##	1288	1994-05-25	12.7399956	25.60982	9.3688011	2.000000	4.962963
##	1289	1994-05-26	11.8853738	25.52976	8.0173006	38.437500	112.000000
##	1290	1994-05-27	11.0307521	25.51350	8.1908351	21.944444	438.666667
##	1291	1994-05-28	10.1761304	25.48815	8.2797559	12.699495	408.750000
##	1292	1994-05-29	9.3215086	25.46280	8.3686768	3.454545	2.181818
##	1293	1994-05-30	8.4668869	25.43745	8.4575976	74.909091	112.909091
##	1294	1994-05-31	7.6122652	25.41210	8.5465184	52.848485	39.750000
##	1295	1994-06-01	6.7576435	25.38674	8.6354392	30.787879	17.939394
##	1296	1994-06-02	5.9030217	25.36139	8.7243600	5.777778	6.444444
##	1297	1994-06-03	5.0484000	25.33604	8.8132808	3.259259	17.185185
##	1298	1994-06-04	4.5084600	25.66640	6.4259793	91.307692	308.076923
##	1299	1994-06-05	4.2114924	25.85643	5.2872535	153.904762	1011.320000
##	1300	1994-06-06	3.9145247	25.74964	6.0469610	9.894737	72.315789
##	1301	1994-06-07	3.6175571	25.68919	6.3331789	12.311005	19.750000
##	1302	1994-06-08	3.3205895	25.62875	6.6193968	14.727273	8.727273

##	1303	1994-06-09	3.0236219	25.56830	6.9056148	2.060606	2.969697
##	1304	1994-06-10	2.7266542	25.50785	7.1918327	11.111111	8.888889
##	1305	1994-06-11	2.4296866	25.44740	7.4780506	3.957447	20.085106
##	1306	1994-06-12	2.1327190	25.38696	7.7642685	5.200000	56.266667
##	1307	1994-06-13	1.8357514	25.41308	7.4927384	141.106383	696.297872
##	1308	1994-06-14	1.5387837	25.24285	8.0519364	336.228571	481.885714
##	1309	1994-06-15	1.2418161	24.58020	7.6117258	4.722222	22.722222
##	1310	1994-06-16	0.9448485	23.91755	7.1715152	6.227778	29.872222
##	1311	1994-06-17	1.1047081	24.28973	6.8992361	7.733333	37.022222
##	1312	1994-06-18	1.2645678	24.66192	6.6269570	264.727273	224.909091
##	1313	1994-06-19	1.4244274	25.03411	6.3546779	41.333333	58.666667
##	1314	1994-06-20	1.5842870	25.40630	6.0823988	5.722222	92.888889
##	1315	1994-06-21	1.7441467	25.77848	5.8101197	27.363636	256.545455
##	1316	1994-06-22	3.6596714	25.51554	7.2912500	7.461538	32.153846
##	1317	1994-06-23	5.5751961	25.77726	5.1481054	9.333333	134.952381
##	1318	1994-06-24	7.4907208	24.95150	8.4401108	3.259259	40.518519
##	1319	1994-06-25	6.9353928	25.11889	8.0948322	4.900000	3.400000
##	1320	1994-06-26	6.3800647	25.28628	7.7495536	5.111111	20.166667
##	1321	1994-06-27	5.8247366	25.45367	7.4042750	4.190476	11.238095
##	1322	1994-06-28	5.2694085	25.48226	7.5510762	11.392857	164.642857
##	1323	1994-06-29	4.7140804	25.51241	7.7561719	2.074074	3.037037
##	1324	1994-06-30	4.1587523	25.52180	7.4193834	2.000000	2.611111
##	1325	1994-07-01	3.6034243	25.53119	7.0825949	4.042553	22.127660
##	1326	1994-07-02	3.0480962	25.54059	6.7458065	9.111111	12.000000
##	1327	1994-07-03	2.4927681	25.54998	6.4090180	15.157895	135.052632
##	1328	1994-07-04	1.9374400	25.24668	7.1530693	44.055138	891.407268
##	1329	1994-07-05	2.2762010	25.59256	7.6376887	72.952381	1647.761905
##	1330	1994-07-06	2.6149619	24.81500	8.1843471	2.740741	7.407407
##	1331	1994-07-07	2.9537229	24.93294	8.0189210	3.111111	6.666667
##	1332	1994-07-08	3.2924838	25.05089	7.8534949	63.777778	367.666667
##	1333	1994-07-09	3.6312448	25.16884	7.6880688	28.909091	38.181818
##	1334	1994-07-10	3.9700057	25.28679	7.5226428	17.500000	89.944444
##	1335	1994-07-11	4.3087667	25.40473	7.3572167	13.861111	48.861111
##	1336	1994-07-12	5.1925892	25.39674	7.5182613	10.222222	7.777778
##	1337	1994-07-13	6.0764117	25.38875	7.6793059	20.181818	84.181818
##	1338	1994-07-14	6.9602342	25.38075	7.8403505	2.000000	2.055556
##	1339	1994-07-15	7.8440567	25.37276	8.0013951	2.222222	2.444444
##	1340	1994-07-16	8.7278792	25.36476	8.1624397	4.571429	44.095238
##	1341	1994-07-17	9.6117017	25.27592	8.6892836	2.785714	3.857143
##	1342	1994-07-18	10.4955242	25.27942	8.3872285	2.111111	2.111111
##	1343	1994-07-19	9.7544426	25.30849	8.0675436	2.055556	2.111111
##	1344	1994-07-20	9.0133609	25.33756	7.7478588	2.055556	4.055556
##	1345	1994-07-21	8.2722792	25.36664	7.4281739	8.666667	28.444444
##	1346	1994-07-22	7.5311975	25.39571	7.1084890	9.818182	7.636364
##	1347	1994-07-23	6.7901159	25.42478	6.7888042	17.473684	112.631579
##	1348	1994-07-24	6.0490342	25.20668	7.4731640	18.800000	407.371429
##	1349	1994-07-25	5.3079525	25.54452	6.1552293	52.952381	899.285714
##	1350	1994-07-26	4.5668708	24.84181	9.1078283	4.962963	15.703704
##	1351	1994-07-27	4.5041937	24.85003	9.0881759	2.000000	2.666667
##	1352	1994-07-28	4.4415165	24.85825	9.0685235	4.000000	5.818182
##	1353	1994-07-29	4.3788393	24.86648	9.0488711	2.000000	2.888889
##	1354	1994-07-30	4.3161622	24.87470	9.0292187	3.111111	34.166667
##	1355	1994-07-31	4.2534850	24.88292	9.0095663	3.500000	29.500000
##	1356	1994-08-01	4.1908078	24.95239	8.3855921	28.666667	69.644444

## 1357	1994-08-02	4.1281307	24.84656	8.7383145	15.481481	19.185185
## 1358	1994-08-03	4.0654535	24.88643	8.5452018	2.000000	12.000000
## 1359	1994-08-04	4.0027763	24.92630	8.3520890	3.444444	3.666667
## 1360	1994-08-05	3.9400992	24.96617	8.1589762	6.363636	6.909091
## 1361	1994-08-06	3.8774220	25.00605	7.9658634	2.166667	5.111111
## 1362	1994-08-07	3.8147448	25.04592	7.7727506	30.000000	12.444444
## 1363	1994-08-08	3.7520677	25.08579	7.5796378	4.000000	12.000000
## 1364	1994-08-09	3.6893905	25.12566	7.3865250	42.842105	495.157895
## 1365	1994-08-10	3.6267133	24.88090	9.0009307	4.846154	12.230769
## 1366	1994-08-11	3.6000820	25.31006	6.7392307	5.666667	420.761905
## 1367	1994-08-12	3.5734506	24.69775	10.3293479	3.777778	3.925926
## 1368	1994-08-13	3.5468192	24.75164	9.9479489	135.111111	3.555556
## 1369	1994-08-14	3.5201879	24.80553	9.5665500	60.909091	30.545455
## 1370	1994-08-15	3.4935565	24.85941	9.1851510	2.333333	6.444444
## 1371	1994-08-16	3.4669252	24.91330	8.8037520	13.777778	4.000000
## 1372	1994-08-17	3.4402938	24.96719	8.4223530	4.285714	2.000000
## 1373	1994-08-18	3.4136624	25.13634	8.8185031	17.357143	219.392857
## 1374	1994-08-19	3.3870311	25.05531	8.7829579	2.000000	2.000000
## 1375	1994-08-20	3.3603997	25.12335	8.1117525	5.111111	7.822222
## 1376	1994-08-21	3.3337683	25.19138	7.4405471	5.818182	13.090909
## 1377	1994-08-22	3.3071370	25.25942	6.7693417	2.888889	6.611111
## 1378	1994-08-23	3.2805056	25.32746	6.0981363	36.631579	234.526316
## 1379	1994-08-24	3.2538742	25.25613	6.8552433	3.485714	17.600000
## 1380	1994-08-25	3.2272429	25.54476	5.8030337	5.761905	375.142857
## 1381	1994-08-26	3.2006115	25.05747	8.6988871	2.000000	2.083333
## 1382	1994-08-27	3.1739802	25.07557	8.4931422	2.000000	11.636364
## 1383	1994-08-28	3.1473488	25.09366	8.2873972	5.288889	24.222222
## 1384	1994-08-29	3.1207174	25.11176	8.0816523	3.702128	51.191489
## 1385	1994-08-30	3.0940861	25.12985	7.8759074	7.777778	6.222222
## 1386	1994-08-31	3.0674547	25.14794	7.6701625	2.111111	4.000000
## 1387	1994-09-01	3.0408233	25.16604	7.4644176	3.724138	7.172414
## 1388	1994-09-02	3.0141920	25.30790	6.9037009	13.555556	66.044444
## 1389	1994-09-03	2.9875606	25.26102	7.0546188	3.142857	12.285714
## 1390	1994-09-04	3.2512415	25.27254	6.9346733	13.777778	203.555556
## 1391	1994-09-05	3.5149223	25.28407	6.8147279	16.000000	2.000000
## 1392	1994-09-06	3.7786032	25.29560	6.6947824	8.388889	68.944444
## 1393	1994-09-07	4.0422841	25.30713	6.5748369	2.363636	3.090909
## 1394	1994-09-08	4.3059649	25.31866	6.4548915	8.622222	15.688889
## 1395	1994-09-09	4.5696458	25.33018	6.3349460	7.263158	18.000000
## 1396	1994-09-10	4.8333267	25.26841	7.2740860	4.538462	5.769231
## 1397	1994-09-11	4.7652380	25.49129	5.6217510	35.619048	895.190476
## 1398	1994-09-12	4.6971494	25.00958	8.2793938	3.777778	3.333333
## 1399	1994-09-13	4.6290607	25.02334	8.2092189	10.222222	5.555556
## 1400	1994-09-14	4.5609721	25.03711	8.1390440	3.333333	3.944444
## 1401	1994-09-15	4.4928834	25.05087	8.0688691	5.454545	6.363636
## 1402	1994-09-16	4.4247948	25.06463	7.9986943	2.055556	2.166667
## 1403	1994-09-17	4.3567061	25.07840	7.9285194	2.466667	7.200000
## 1404	1994-09-18	4.2886175	25.04301	8.2033106	3.428571	21.857143
## 1405	1994-09-19	4.2205289	25.02492	8.1573321	2.111111	2.000000
## 1406	1994-09-20	4.1524402	25.11954	7.7652591	4.055556	11.055556
## 1407	1994-09-21	4.0843516	25.21416	7.3731861	5.500000	46.722222
## 1408	1994-09-22	4.0162629	25.30878	6.9811130	5.000000	44.000000
## 1409	1994-09-23	3.9481743	25.40340	6.5890400	2.526316	8.526316
## 1410	1994-09-24	3.8800856	25.09278	7.6944133	4.461538	8.461538

## 1411	1994-09-25	3.8119970	25.38562	6.4252195	19.725490	855.568627
## 1412	1994-09-26	3.7439083	24.79397	8.3278188	2.000000	6.296296
## 1413	1994-09-27	4.0580261	24.82322	8.2269196	2.333333	5.722222
## 1414	1994-09-28	4.3721439	24.85248	8.1260205	245.636364	83.272727
## 1415	1994-09-29	4.6862617	24.88174	8.0251213	20.888889	7.333333
## 1416	1994-09-30	5.0003795	24.91100	7.9242222	3.523810	17.619048
## 1417	1994-10-01	5.3144973	24.96085	7.8870855	14.755556	151.200000
## 1418	1994-10-02	5.6286152	24.98569	8.0191927	2.000000	5.555556
## 1419	1994-10-03	5.5502026	25.06322	7.6737220	10.000000	9.454545
## 1420	1994-10-04	5.4717901	25.14074	7.3282514	4.666667	12.133333
## 1421	1994-10-05	5.3933776	25.21827	6.9827807	2.611111	16.666667
## 1422	1994-10-06	5.3149651	25.29579	6.6373100	28.909091	22.363636
## 1423	1994-10-07	5.2365525	25.37332	6.2918393	2.210526	2.421053
## 1424	1994-10-08	5.1581400	25.22215	7.0163333	4.769231	21.384615
## 1425	1994-10-09	5.1023263	25.50194	5.7011177	87.190476	1746.047619
## 1426	1994-10-10	5.0465125	25.08632	7.5045404	3.259259	17.333333
## 1427	1994-10-11	5.1320441	25.09949	7.5892879	31.777778	35.777778
## 1428	1994-10-12	5.2175757	25.11266	7.6740355	3.837838	23.675676
## 1429	1994-10-13	5.3031073	25.12582	7.7587830	64.545455	15.272727
## 1430	1994-10-14	5.3886389	25.13899	7.8435305	22.468085	63.787234
## 1431	1994-10-15	5.4741705	25.15216	7.9282781	2.444444	13.333333
## 1432	1994-10-16	5.5597021	25.16532	8.0130256	21.555556	6.666667
## 1433	1994-10-17	5.6452338	25.17849	8.0977731	4.571429	26.571429
## 1434	1994-10-18	5.7307654	25.13632	8.0065853	35.107143	401.892857
## 1435	1994-10-19	5.8162970	25.14939	8.2927003	2.111111	7.777778
## 1436	1994-10-20	5.7920457	25.27642	7.5501117	2.333333	8.333333
## 1437	1994-10-21	5.7677945	25.40344	6.8075231	4.809524	9.095238
## 1438	1994-10-22	5.7435432	25.55306	6.0929051	55.733333	591.688889
## 1439	1994-10-23	5.7192920	25.22272	8.0506929	6.148148	19.259259
## 1440	1994-10-24	5.6950407	25.21392	8.0201634	3.866667	3.511111
## 1441	1994-10-25	5.6707895	25.20512	7.9896338	171.636364	33.090909
## 1442	1994-10-26	5.6465383	25.19633	7.9591043	5.272727	10.727273
## 1443	1994-10-27	5.6222870	25.18753	7.9285747	2.388889	5.611111
## 1444	1994-10-28	5.5980358	25.17873	7.8980452	2.222222	3.111111
## 1445	1994-10-29	5.5737845	25.16231	7.8496557	11.138462	128.184615
## 1446	1994-10-30	5.5495333	25.19443	7.7877918	7.142857	20.000000
## 1447	1994-10-31	5.5252820	25.49758	6.1724208	4.682540	12.250000
## 1448	1994-11-01	5.5010308	25.48309	6.2488133	2.222222	4.500000
## 1449	1994-11-02	5.4767795	25.46861	6.3252057	8.727273	19.272727
## 1450	1994-11-03	5.4525283	25.45412	6.4015982	9.555556	40.611111
## 1451	1994-11-04	5.4282771	25.43963	6.4779907	6.382979	13.106383
## 1452	1994-11-05	5.4040258	25.42514	6.5543831	40.888889	107.555556
## 1453	1994-11-06	5.3797746	25.41065	6.6307756	41.000000	79.000000
## 1454	1994-11-07	5.3555233	25.39616	6.7071681	7.952381	14.095238
## 1455	1994-11-08	5.3312721	25.48661	6.3581781	31.155556	167.733333
## 1456	1994-11-09	5.3070208	25.12791	7.8837308	10.666667	71.185185
## 1457	1994-11-10	5.2614525	25.19512	8.0487459	3.055556	3.722222
## 1458	1994-11-11	5.2158842	25.26233	8.2137609	5.241379	7.448276
## 1459	1994-11-12	5.1703158	25.37398	7.2248658	207.866667	380.311111
## 1460	1994-11-13	5.1247475	25.27871	7.9612955	15.600000	136.000000
## 1461	1994-11-14	5.0791792	25.41191	7.0180007	2.500000	5.444444
## 1462	1994-11-15	5.0336108	25.54511	6.0747060	6.292553	9.828605
## 1463	1994-11-16	4.9880425	25.43690	6.4638047	10.085106	14.212766
## 1464	1994-11-17	4.9424742	25.32869	6.8529033	4.967742	5.548387

##	1465	1994-11-18	4.8969058	25.60256	5.6404936	88.285714	1024.035714
##	1466	1994-11-19	4.8513375	25.02425	7.9340500	6.296296	45.481481
##	1467	1994-11-20	4.7597068	25.02590	7.9745114	40.000000	150.000000
##	1468	1994-11-21	4.6680760	25.02756	8.0149728	24.888889	8.666667
##	1469	1994-11-22	4.5764453	25.02922	8.0554341	5813.636364	4695.454545
##	1470	1994-11-23	4.4848145	25.03087	8.0958955	1006.250000	542.500000
##	1471	1994-11-24	4.3931838	25.03253	8.1363569	191.666667	76.388889
##	1472	1994-11-25	4.3015530	25.03419	8.1768183	516.833333	692.285354
##	1473	1994-11-26	4.2099223	25.03584	8.2172796	842.000000	1308.181818
##	1474	1994-11-27	4.1182915	25.03750	8.2577410	737.333333	1176.000000
##	1475	1994-11-28	4.0266608	25.03916	8.2982024	11.944444	40.777778
##	1476	1994-11-29	3.9350300	25.04081	8.3386638	142.222222	71.222222
##	1477	1994-11-30	3.8433993	25.04247	8.3791252	101.818182	78.363636
##	1478	1994-12-01	3.7517686	25.00182	8.5066838	130.424242	73.060606
##	1479	1994-12-02	3.6601378	25.18093	8.0179261	159.030303	67.757576
##	1480	1994-12-03	3.5685071	25.67289	5.7380022	85.570707	49.628788
##	1481	1994-12-04	3.4768763	25.63628	5.8483545	12.111111	31.500000
##	1482	1994-12-05	3.3852456	25.59967	5.9587069	967.090909	2833.272727
##	1483	1994-12-06	3.2936148	25.56306	6.0690593	614.333333	2885.000000
##	1484	1994-12-07	3.2019841	25.52645	6.1794116	5.777778	3.777778
##	1485	1994-12-08	3.1103533	25.48984	6.2897640	13.161290	37.161290
##	1486	1994-12-09	2.5972911	25.79730	5.0872251	22.977778	297.288889
##	1487	1994-12-10	3.3304072	25.05303	7.8484213	2.666667	6.000000
##	1488	1994-12-11	4.0635233	25.07531	7.8838370	6.000000	34.000000
##	1489	1994-12-12	4.7966394	25.09758	7.9192528	41.000000	67.000000
##	1490	1994-12-13	5.5297556	25.11986	7.9546686	13.388889	86.277778
##	1491	1994-12-14	6.2628717	25.14213	7.9900843	24.545455	25.454545
##	1492	1994-12-15	6.9959878	25.16441	8.0255001	200.000000	60.000000
##	1493	1994-12-16	7.7291039	25.18669	8.0609159	3.333333	5.500000
##	1494	1994-12-17	8.4622200	25.20896	8.0963317	22.444444	6.666667
##	1495	1994-12-18	8.9659770	25.26411	7.5525864	98.821429	169.535714
##	1496	1994-12-19	9.4697341	25.52614	6.3242642	3.142857	5.238095
##	1497	1994-12-20	9.9734911	25.83738	4.8689561	3.265873	19.007937
##	1498	1994-12-21	10.4772481	25.81200	5.1961877	3.388889	32.777778
##	1499	1994-12-22	10.9810052	25.78662	5.5234193	10.893617	26.723404
##	1500	1994-12-23	11.4847622	25.76124	5.8506508	40.000000	26.000000
##	1501	1994-12-24	11.9885193	25.73586	6.1778824	12.451613	279.483871
##	1502	1994-12-25	12.4922763	25.84801	4.9706430	9.165200	149.863148
##	1503	1994-12-26	12.9960333	25.19712	9.0058163	5.878788	20.242424
##	1504	1994-12-27	12.5614391	25.20482	8.5248482	2.000000	2.000000
##	1505	1994-12-28	12.1268448	25.21253	8.0438801	2.111111	10.388889
##	1506	1994-12-29	11.6922505	25.22023	7.5629121	2.000000	3.444444
##	1507	1994-12-30	11.2576562	25.22794	7.0819440	35.454545	26.000000
##	1508	1994-12-31	10.8230620	25.23564	6.6009759	40.000000	58.000000
##	1509	1995-01-01	10.3884677	25.24335	6.1200079	11.288889	320.844444
##	1510	1995-01-02	9.9538734	25.23142	6.4926585	4.068966	4.896552
##	1511	1995-01-03	9.5192791	25.25422	5.9333681	2.333333	2.266667
##	1512	1995-01-04	9.0846848	25.43613	6.7504618	6.888889	14.244444
##	1513	1995-01-05	9.0846848	25.61368	5.5881975	11.444444	26.222222
##	1514	1995-01-06	9.0846848	25.79123	4.4259332	7.090909	11.090909
##	1515	1995-01-07	9.0846848	25.77708	4.8348534	2.577778	21.688889
##	1516	1995-01-08	9.0846848	25.76293	5.2437735	2.645161	5.548387
##	1517	1995-01-09	9.0846848	25.84509	4.8149919	14.892857	207.714286
##	1518	1995-01-10	9.0846848	25.56779	7.0849279	2.518519	2.888889

##	1519	1995-01-11	9.0846848	25.55133	7.0431197	2.444444	5.333333
##	1520	1995-01-12	9.0846848	25.53487	7.0013114	30.340426	173.063830
##	1521	1995-01-13	9.0846848	25.51842	6.9595031	133.000000	312.000000
##	1522	1995-01-14	9.0846848	25.50196	6.9176949	8.222222	18.222222
##	1523	1995-01-15	9.0846848	25.48550	6.8758866	6.936170	11.404255
##	1524	1995-01-16	9.0846848	25.46904	6.8340783	2.500000	3.333333
##	1525	1995-01-17	9.0846848	25.45259	6.7922701	6.888889	7.777778
##	1526	1995-01-18	9.0846848	25.43613	6.7504618	2.000000	4.888889
##	1527	1995-01-19	8.9938543	25.35828	6.8991260	11.642857	98.785714
##	1528	1995-01-20	8.9030237	25.40862	6.7309025	2.476190	3.238095
##	1529	1995-01-21	8.8121931	25.83448	4.8334305	2.960317	2.896825
##	1530	1995-01-22	8.7213626	25.63364	5.5405133	3.444444	2.555556
##	1531	1995-01-23	8.6305320	25.43281	6.2475961	3.600000	16.050000
##	1532	1995-01-24	8.5397014	25.69458	5.2633891	28.607143	743.107143
##	1533	1995-01-25	8.4488708	25.04280	8.4871433	2.000000	2.740741
##	1534	1995-01-26	8.2423745	25.04751	8.3440204	69.100000	93.800000
##	1535	1995-01-27	8.0358781	25.05221	8.2008975	2.000000	3.055556
##	1536	1995-01-28	7.8293818	25.05692	8.0577746	7.636364	11.272727
##	1537	1995-01-29	7.6228854	25.06163	7.9146517	4.222222	9.111111
##	1538	1995-01-30	7.4163890	25.06633	7.7715288	2.000000	2.277778
##	1539	1995-01-31	7.2098927	25.07104	7.6284059	2.000000	8.000000
##	1540	1995-02-01	7.0033963	25.07575	7.4852830	35.172414	11.310345
##	1541	1995-02-02	6.7969000	24.85794	7.8787881	5.703704	29.925926
##	1542	1995-02-03	6.5904036	24.82943	7.5639400	2.000000	3.714286
##	1543	1995-02-04	6.3839072	25.08348	6.6077729	2.000000	2.666667
##	1544	1995-02-05	6.1774109	25.33753	5.6516058	78.321429	662.928571
##	1545	1995-02-06	5.9709145	24.95399	6.6140394	37.225806	339.096774
##	1546	1995-02-07	5.7644182	24.53445	6.4556348	2.000000	2.000000
##	1547	1995-02-08	5.5579218	24.73807	6.2972303	4.000000	5.777778
##	1548	1995-02-09	5.3514254	24.94169	6.1388257	13.090909	16.363636
##	1549	1995-02-10	5.1449291	25.14531	5.9804212	27.111111	319.111111
##	1550	1995-02-11	4.9384327	25.34892	5.8220166	2.000000	2.000000
##	1551	1995-02-12	4.7319364	25.29693	5.9430868	2.468085	4.680851
##	1552	1995-02-13	4.5254400	25.24494	6.0641570	4.166667	4.277778
##	1553	1995-02-14	5.5290285	25.10558	6.4566689	20.444444	9.111111
##	1554	1995-02-15	6.5326170	24.96622	6.8491808	2.055556	2.333333
##	1555	1995-02-16	7.5362055	24.82686	7.2416927	56.727273	535.454545
##	1556	1995-02-17	8.5397939	24.68750	7.6342045	3.185185	2.518519
##	1557	1995-02-18	6.6741269	24.51069	7.2319902	11.535714	48.428571
##	1558	1995-02-19	6.7382046	24.56035	6.9079387	2.000000	2.000000
##	1559	1995-02-20	6.8022822	24.48160	6.7865829	2.111111	5.777778
##	1560	1995-02-21	6.8663599	24.40284	6.6652271	18.500000	95.600000
##	1561	1995-02-22	6.9304375	24.32408	6.5438713	2.444444	6.000000
##	1562	1995-02-23	3.8501226	24.80383	6.4225155	3.225806	21.935484
##	1563	1995-02-24	3.9483123	25.28946	5.2191891	53.377778	765.200000
##	1564	1995-02-25	4.0465019	24.98819	5.2804075	2.055556	4.555556
##	1565	1995-02-26	4.1446916	24.68692	5.3416259	6.181818	3.818182
##	1566	1995-02-27	4.2428813	24.38564	5.4028444	2.000000	2.222222
##	1567	1995-02-28	4.3410710	24.08437	5.4640628	2.388889	4.972222
##	1568	1995-03-01	4.4392606	24.26161	5.7658371	2.777778	7.722222
##	1569	1995-03-02	4.5374503	24.43885	6.0676114	4.909091	6.727273
##	1570	1995-03-03	4.6356400	24.61609	6.3693857	12.177778	50.088889
##	1571	1995-03-04	4.7338297	24.79333	6.6711600	2.000000	6.000000
##	1572	1995-03-05	4.8320194	24.97057	6.9729344	39.875000	19.937500

## 1573	1995-03-06	4.9302090	24.77238	7.2747087	17.155556	318.133333
## 1574	1995-03-07	5.0283987	24.72854	7.1060683	14.000000	62.111111
## 1575	1995-03-08	5.1265884	24.84551	6.9374279	3.777778	2.222222
## 1576	1995-03-09	5.2247781	24.96248	6.7687875	2.000000	2.111111
## 1577	1995-03-10	5.3229677	25.07945	6.6001471	3.806452	52.451613
## 1578	1995-03-11	5.2611964	25.25367	7.4962856	13.714286	381.607143
## 1579	1995-03-12	5.1994250	24.51420	8.3924242	2.000000	2.888889
## 1580	1995-03-13	5.0515272	24.61446	8.2952468	2.333333	7.944444
## 1581	1995-03-14	4.9036293	24.71473	8.1980694	58.888889	6.888889
## 1582	1995-03-15	4.7557315	24.81500	8.1008920	7.243243	24.756757
## 1583	1995-03-16	4.6078336	24.91526	8.0037147	26.000000	177.636364
## 1584	1995-03-17	4.4599358	25.01553	7.9065373	5.111111	6.222222
## 1585	1995-03-18	4.3120380	25.11580	7.8093599	10.737374	5.383838
## 1586	1995-03-19	4.1641401	24.89987	7.7121825	16.363636	4.545455
## 1587	1995-03-20	4.0162423	24.68395	7.6150052	7.277778	11.833333
## 1588	1995-03-21	3.8683444	24.46802	7.5178278	1343.555556	33.111111
## 1589	1995-03-22	4.5243117	24.34115	8.1617003	39.396226	771.283019
## 1590	1995-03-23	5.9892718	24.28404	7.5580564	2.333333	3.066667
## 1591	1995-03-24	5.6533359	25.26590	7.7891915	2.474359	6.482051
## 1592	1995-03-25	5.3174000	24.23263	8.0203267	2.615385	9.897436
## 1593	1995-03-26	5.0342133	24.50442	7.5891609	14.700000	42.100000
## 1594	1995-03-27	4.7510267	24.77620	7.1579951	14.324324	74.891892
## 1595	1995-03-28	4.4678400	25.04798	6.7268294	4.516129	10.258065
## 1596	1995-03-29	4.1846533	25.33931	7.4348666	211.964286	1025.428571
## 1597	1995-03-30	3.9014667	24.65720	8.1429038	10.333333	32.055556
## 1598	1995-03-31	4.2820102	24.65933	8.0903151	6.297872	17.063830
## 1599	1995-04-01	4.6625538	24.66147	8.0377264	28.222222	41.333333
## 1600	1995-04-02	5.0430973	24.66360	7.9851378	2.722222	10.388889
## 1601	1995-04-03	5.4236409	24.66573	7.9325491	263.818182	508.545455
## 1602	1995-04-04	5.8041845	24.66787	7.8799605	10.000000	38.000000
## 1603	1995-04-05	6.1847280	24.67000	7.8273718	3.111111	6.222222
## 1604	1995-04-06	6.5652716	24.67213	7.7747832	5.500000	25.555556
## 1605	1995-04-07	6.9458152	24.67427	7.7221945	2.444444	13.333333
## 1606	1995-04-08	6.5038326	24.58614	7.5397556	8.642857	64.500000
## 1607	1995-04-09	6.0618500	24.89044	7.3573167	16.095238	193.047619
## 1608	1995-04-10	4.2479000	24.55363	7.1748778	3.277778	34.111111
## 1609	1995-04-11	2.4339500	24.21681	6.9924389	487.234043	54.425532
## 1610	1995-04-12	0.6200000	23.88000	6.8100000	244.839243	28.323877
## 1611	1995-04-13	1.5848250	24.56756	7.1375852	2.444444	2.222222
## 1612	1995-04-14	2.5496500	25.25512	7.4651704	3.419355	9.870968
## 1613	1995-04-15	3.5144750	25.44774	7.7927556	250.500000	334.928571
## 1614	1995-04-16	4.4793000	24.99288	8.1203408	2.000000	2.370370
## 1615	1995-04-17	3.9481265	25.21743	7.0190960	2.611111	7.944444
## 1616	1995-04-18	3.4169529	25.44197	5.9178512	31.454545	16.181818
## 1617	1995-04-19	3.9158149	25.37040	6.1994459	3.888889	30.388889
## 1618	1995-04-20	4.4146768	25.29883	6.4810407	10.444444	7.111111
## 1619	1995-04-21	4.9135387	25.22726	6.7626355	6.645161	23.870968
## 1620	1995-04-22	4.3572841	25.35443	6.1861349	79.928571	656.500000
## 1621	1995-04-23	4.5724083	25.02482	7.2912225	6.074074	6.888889
## 1622	1995-04-24	8.0498773	25.15172	7.3210066	4.500000	108.666667
## 1623	1995-04-25	7.9485500	25.11187	7.3441137	4.016667	101.533333
## 1624	1995-04-26	7.9466119	25.10275	7.4269525	3.533333	94.400000
## 1625	1995-04-27	7.9446737	25.19735	7.5097913	4.055556	18.944444
## 1626	1995-04-28	7.9427356	25.29194	7.5926301	4.500000	30.222222

##	1627	1995-04-29	7.9407975	25.38654	7.6754688	4.444444	6.222222
##	1628	1995-04-30	7.9388593	25.48113	7.7583076	32.000000	430.545455
##	1629	1995-05-01	7.9369212	25.57572	7.8411464	17.111111	217.467172
##	1630	1995-05-02	7.9349831	25.34067	7.9239852	2.222222	4.388889
##	1631	1995-05-03	7.9330449	25.10561	8.0068239	5.052632	4.052632
##	1632	1995-05-04	7.9311068	25.00813	7.9289693	3.388889	3.055556
##	1633	1995-05-05	7.1764512	24.90811	7.5982118	2.933333	3.933333
##	1634	1995-05-06	6.4217956	24.96817	7.2674543	3.388889	5.666667
##	1635	1995-05-07	5.6671400	25.02824	6.9366968	8.451613	14.451613
##	1636	1995-05-08	4.9124844	25.19683	6.6059393	13.077658	16.707288
##	1637	1995-05-09	3.7434375	24.94779	7.5647333	17.703704	18.962963
##	1638	1995-05-10	4.6333694	25.16390	7.6096273	347.090909	2507.090909
##	1639	1995-05-11	5.5233014	25.38000	7.6545212	28.808511	128.255319
##	1640	1995-05-12	6.4132333	25.59611	7.6994151	38.978723	164.680851
##	1641	1995-05-13	7.3031653	25.54920	7.7443091	49.148936	201.106383
##	1642	1995-05-14	8.1930972	25.50229	7.7892030	60.400000	1970.000000
##	1643	1995-05-15	9.0830291	25.45539	7.8340969	2.000000	6.000000
##	1644	1995-05-16	9.9729611	25.40848	7.8789909	81.611111	94.333333
##	1645	1995-05-17	10.8628930	25.36157	7.9238848	482.727273	1731.090909
##	1646	1995-05-18	11.7528249	25.31467	7.9687788	1922.000000	3100.800000
##	1647	1995-05-19	12.6427569	25.26776	8.0136727	2.000000	6.222222
##	1648	1995-05-20	13.5326888	25.22085	8.0585666	3.833333	5.166667
##	1649	1995-05-21	14.4226208	25.17395	8.1034606	16.044444	3.644444
##	1650	1995-05-22	9.5592333	25.09894	7.8971050	23.000000	7.384615
##	1651	1995-05-23	8.6907630	25.22652	7.8696809	4.857143	3.047619
##	1652	1995-05-24	7.8222927	25.60051	7.7488286	2.000000	2.000000
##	1653	1995-05-25	6.9538224	25.54960	7.6279763	4.222222	7.000000
##	1654	1995-05-26	6.0853522	25.49869	7.5071240	5404.545455	9363.636364
##	1655	1995-05-27	5.2168819	25.44779	7.3862717	4721.428571	4550.000000
##	1656	1995-05-28	4.3484116	25.39688	7.2654194	29.688889	17.022222
##	1657	1995-05-29	3.4799413	25.34597	7.1445671	39.000000	122.000000
##	1658	1995-05-30	2.6114710	25.29506	7.0237148	75.809524	383.761905
##	1659	1995-05-31	2.5100295	25.53357	6.0804077	30.166667	261.666667
##	1660	1995-06-01	4.2868125	25.20181	7.5002729	6.962963	10.296296
##	1661	1995-06-02	4.6057826	25.18431	7.5590076	2528.481481	1515.564815
##	1662	1995-06-03	4.9247527	25.16681	7.6177423	5050.000000	3020.833333
##	1663	1995-06-04	5.2437227	25.14931	7.6764770	210.000000	74.388889
##	1664	1995-06-05	5.5626928	25.13181	7.7352117	17.555556	5.555556
##	1665	1995-06-06	5.8816629	25.11431	7.7939464	190.000000	262.000000
##	1666	1995-06-07	6.2006330	25.09680	7.8526811	24.044444	349.466667
##	1667	1995-06-08	6.5196030	24.93507	7.9114158	2383.000000	2372.230769
##	1668	1995-06-09	6.5599455	24.97352	7.7232488	77.055556	101.111111
##	1669	1995-06-10	6.6002879	25.01198	7.5350818	20.086957	6.608696
##	1670	1995-06-11	5.4992226	25.23664	6.7099906	31.636364	32.909091
##	1671	1995-06-12	4.3981573	25.46131	5.8848994	2400.000000	9600.000000
##	1672	1995-06-13	3.2970921	25.68598	5.0598081	1202.833333	4806.000000
##	1673	1995-06-14	4.0988990	25.61543	5.2793937	5.666667	12.000000
##	1674	1995-06-15	4.9007060	25.54487	5.4989793	4.222222	3.111111
##	1675	1995-06-16	5.7025129	25.47432	5.7185648	11.612903	27.870968
##	1676	1995-06-17	7.4113815	25.68204	4.8683050	43.357143	565.250000
##	1677	1995-06-18	9.1202500	25.11575	7.2499179	14.733333	407.466667
##	1678	1995-06-19	9.3028821	25.24044	6.7713573	44.363636	613.818182
##	1679	1995-06-20	9.4855141	25.36514	6.2927966	4.166667	9.944444
##	1680	1995-06-21	9.6681462	25.48983	5.8142360	14.444444	46.000000

##	1681	1995-06-22	9.8507783	25.61453	5.3356753	47.224490	165.959184
##	1682	1995-06-23	10.0334104	25.73923	4.8571147	24.778912	84.035147
##	1683	1995-06-24	10.2160424	25.25963	7.0364597	2.333333	2.111111
##	1684	1995-06-25	10.2476617	25.41103	6.8163838	668.000000	694.062500
##	1685	1995-06-26	10.2792811	25.35718	6.5963079	167.125000	459.208333
##	1686	1995-06-27	10.3109004	25.55551	5.7709727	14.055556	36.944444
##	1687	1995-06-28	10.3425197	25.75383	4.9456374	34.967742	127.741935
##	1688	1995-06-29	10.3741390	26.03695	5.6532239	81.630769	667.169231
##	1689	1995-06-30	10.4057583	25.62177	6.3608104	6.962963	11.333333
##	1690	1995-07-01	10.2517791	25.57901	6.4286697	34.166667	14.666667
##	1691	1995-07-02	10.0977999	25.53624	6.4965290	2.000000	2.000000
##	1692	1995-07-03	9.9438206	25.49348	6.5643883	5.818182	107.454545
##	1693	1995-07-04	9.7898414	25.45071	6.6322476	20.000000	84.000000
##	1694	1995-07-05	9.6358622	25.40795	6.7001069	2.611111	10.944444
##	1695	1995-07-06	9.4818829	25.36518	6.7679662	7.454545	6.909091
##	1696	1995-07-07	9.3279037	25.32242	6.8358256	4.000000	4.222222
##	1697	1995-07-08	9.1739245	25.27965	6.9036849	5.277778	37.833333
##	1698	1995-07-09	9.0199452	25.23689	6.9715442	31.818182	16.545455
##	1699	1995-07-10	8.8659660	25.19412	7.0394035	4.888889	12.666667
##	1700	1995-07-11	8.7119868	25.15136	7.1072628	2.000000	7.944444
##	1701	1995-07-12	8.5580075	25.10859	7.1751221	8.488889	152.666667
##	1702	1995-07-13	8.7783545	25.18898	7.0167991	12.689655	7.310345
##	1703	1995-07-14	7.1903438	25.26353	6.8641203	2.095238	2.000000
##	1704	1995-07-15	6.5930152	25.27931	6.5886297	2.000000	2.444444
##	1705	1995-07-16	5.9956866	25.29508	6.3131390	2.444444	4.444444
##	1706	1995-07-17	5.3983581	25.31085	6.0376484	10.000000	36.258065
##	1707	1995-07-18	4.8684364	25.56157	5.4061150	25.785714	446.964286
##	1708	1995-07-19	4.6687542	25.05598	8.0041779	2.370370	4.296296
##	1709	1995-07-20	5.7096391	25.61416	5.4998008	9.518519	5.703704
##	1710	1995-07-21	6.7505240	25.53046	5.9004423	16.666667	7.111111
##	1711	1995-07-22	7.7914089	25.44676	6.3010838	4.000000	5.531915
##	1712	1995-07-23	8.8322938	25.36306	6.7017252	6.277778	372.888889
##	1713	1995-07-24	9.8731787	25.27936	7.1023667	3.000000	4.200000
##	1714	1995-07-25	10.9140636	25.19565	7.5030082	2.555556	3.888889
##	1715	1995-07-26	6.6314970	25.24094	7.0558076	5.312500	4.437500
##	1716	1995-07-27	6.2930518	25.14201	6.8712927	4.400000	22.977778
##	1717	1995-07-28	5.9546066	25.14671	6.6867778	12.611111	53.055556
##	1718	1995-07-29	5.6161614	25.15140	6.5022630	2.133333	3.688889
##	1719	1995-07-30	5.2777162	25.15610	6.3177481	4.545455	31.454545
##	1720	1995-07-31	4.9392710	25.16079	6.1332332	19.870968	104.516129
##	1721	1995-08-01	6.6386626	24.75680	7.0608416	7.000000	4.600000
##	1722	1995-08-02	8.3380542	24.35280	7.9884500	3.111111	6.370370
##	1723	1995-08-03	4.1667214	25.40696	5.6330283	23.511111	941.466667
##	1724	1995-08-04	3.4835485	25.48441	5.4598658	15.505556	472.011111
##	1725	1995-08-05	3.7655154	25.50210	5.4876805	7.500000	2.555556
##	1726	1995-08-06	4.0474823	25.51979	5.5154952	16.000000	48.363636
##	1727	1995-08-07	4.3294492	25.53747	5.5433098	2.000000	2.444444
##	1728	1995-08-08	4.6114161	25.55516	5.5711245	114.727273	199.818182
##	1729	1995-08-09	4.8933830	25.57285	5.5989392	2.666667	3.777778
##	1730	1995-08-10	5.1753499	25.59054	5.6267538	2.500000	5.277778
##	1731	1995-08-11	5.4573168	25.60822	5.6545685	10.696809	6.872931
##	1732	1995-08-12	6.3369962	25.51829	6.0332373	18.893617	8.468085
##	1733	1995-08-13	7.2166755	25.42836	6.4119061	4.444444	9.777778
##	1734	1995-08-14	8.0963548	25.33843	6.7905748	5.741935	27.354839

##	1735	1995-08-15	5.1422511	25.55815	5.6331520	11.071429	399.678571
##	1736	1995-08-16	26.7030333	24.76613	9.5748733	2.666667	7.037037
##	1737	1995-08-17	24.6262576	24.80026	9.1504701	34.000000	117.555556
##	1738	1995-08-18	22.5494818	24.83438	8.7260669	8.000000	2.000000
##	1739	1995-08-19	20.4727061	24.86851	8.3016636	2.111111	2.444444
##	1740	1995-08-20	14.3479195	24.75980	7.9122556	11.861111	169.888889
##	1741	1995-08-21	19.1238705	24.77453	7.8031059	21.611111	337.333333
##	1742	1995-08-22	17.0738092	24.81874	7.6650405	2.777778	2.277778
##	1743	1995-08-23	15.0237480	24.86295	7.5269751	6.444444	5.777778
##	1744	1995-08-24	12.9736867	24.90715	7.3889096	12.833333	90.277778
##	1745	1995-08-25	10.9236255	24.95136	7.2508442	18.545455	6.909091
##	1746	1995-08-26	8.8735643	24.99557	7.1127788	2.444444	5.611111
##	1747	1995-08-27	6.8235030	25.03977	6.9747133	3.777778	2.296296
##	1748	1995-08-28	6.4529364	25.08631	6.9702607	12.000000	31.659574
##	1749	1995-08-29	7.2780952	24.98649	7.1589810	4.800000	31.266667
##	1750	1995-08-30	6.8780233	25.07235	6.8387675	2.833333	6.166667
##	1751	1995-08-31	6.4779514	25.15820	6.5185540	3.722222	2.444444
##	1752	1995-09-01	6.0778795	25.24406	6.1983406	2.700000	3.800000
##	1753	1995-09-02	5.6778075	25.32991	5.8781271	3.350000	18.029032
##	1754	1995-09-03	5.5293459	24.92148	6.4258465	4.000000	32.258065
##	1755	1995-09-04	8.0329875	24.23176	7.1874279	28.157895	18.157895
##	1756	1995-09-05	5.0581244	25.34542	5.9733002	28.555556	336.555556
##	1757	1995-09-06	5.7126399	25.27754	6.2366591	2.000000	2.000000
##	1758	1995-09-07	6.3671554	25.20967	6.5000179	2.545455	4.727273
##	1759	1995-09-08	7.0216708	25.14180	6.7633767	11.444444	5.166667
##	1760	1995-09-09	7.6761863	25.07393	7.0267355	19.777778	17.555556
##	1761	1995-09-10	8.3307018	25.00606	7.2900944	2.000000	6.000000
##	1762	1995-09-11	8.9852172	24.93819	7.5534532	4.000000	3.636364
##	1763	1995-09-12	9.6397327	24.87032	7.8168120	11.555556	12.444444
##	1764	1995-09-13	10.2942482	24.80244	8.0801709	2.500000	4.611111
##	1765	1995-09-14	10.9487636	24.73457	8.3435297	2.888889	12.111111
##	1766	1995-09-15	10.5602381	25.01580	7.7040707	7.466667	44.200000
##	1767	1995-09-16	9.9513747	25.06376	7.5328589	4.500000	3.888889
##	1768	1995-09-17	9.3425114	25.11172	7.3616470	4.500000	66.666667
##	1769	1995-09-18	7.4225702	25.09162	6.8305156	11.777778	22.666667
##	1770	1995-09-19	5.5026290	25.07151	6.2993842	23.548387	268.064516
##	1771	1995-09-20	10.6365375	24.64760	7.7240521	12.052632	45.473684
##	1772	1995-09-21	4.8968200	25.35855	5.8611524	52.000000	771.911111
##	1773	1995-09-22	5.1802605	25.44145	5.6224550	2.666667	2.888889
##	1774	1995-09-23	5.4637010	25.52434	5.3837575	2.787879	2.717172
##	1775	1995-09-24	6.1733394	25.35363	6.0139714	2.909091	2.545455
##	1776	1995-09-25	6.8829778	25.18291	6.6441853	2.000000	2.333333
##	1777	1995-09-26	7.5926162	25.01219	7.2743992	3.333333	2.055556
##	1778	1995-09-27	8.3022545	24.84148	7.9046130	8.645833	4.486111
##	1779	1995-09-28	8.0128386	24.64807	8.0163166	13.958333	6.916667
##	1780	1995-09-29	7.2518000	24.66479	7.8346402	20.533333	59.533333
##	1781	1995-09-30	6.7231008	24.73861	7.5079305	9.111111	93.611111
##	1782	1995-10-01	6.1944016	24.81244	7.1812208	6.400000	28.600000
##	1783	1995-10-02	5.6657024	24.88626	6.8545110	2.944444	11.166667
##	1784	1995-10-03	5.1370032	24.96008	6.5278013	5.354839	39.290323
##	1785	1995-10-04	9.1804542	24.56856	7.2445917	15.052632	26.736842
##	1786	1995-10-05	8.6567762	24.72505	6.4755823	4.888889	15.555556
##	1787	1995-10-06	8.1330982	24.88153	5.7065729	25.466667	419.911111
##	1788	1995-10-07	7.6094203	25.03802	5.6474687	2.000000	2.000000

##	1789	1995-10-08	7.0857423	25.19451	5.5883644	5.636364	129.636364
##	1790	1995-10-09	6.5620644	25.35100	5.5292602	2.000000	2.444444
##	1791	1995-10-10	7.6497012	25.26249	5.9919335	8.545455	8.545455
##	1792	1995-10-11	8.7373380	25.17399	6.4546068	2.277778	11.055556
##	1793	1995-10-12	9.8249748	25.08548	6.9172801	3.388889	7.722222
##	1794	1995-10-13	10.9126117	24.99698	7.3799534	2.611111	5.333333
##	1795	1995-10-14	12.0002485	24.90848	7.8426267	81.724138	359.448276
##	1796	1995-10-15	10.1886727	24.90749	7.8490673	30.789474	613.105263
##	1797	1995-10-16	7.3018119	24.91360	7.7922048	2.266667	13.933333
##	1798	1995-10-17	7.3324141	25.37398	5.7781821	2.666667	11.555556
##	1799	1995-10-18	5.3034129	25.06903	6.8719584	27.619048	45.571429
##	1800	1995-10-19	6.7189708	24.83469	7.2020325	5.629630	6.518519
##	1801	1995-10-20	0.7200000	23.88100	6.7900000	19.348148	268.459259
##	1802	1995-10-21	4.9806956	25.34418	5.8001376	33.066667	530.400000
##	1803	1995-10-22	5.3204780	25.31808	5.9962685	6.833333	27.166667
##	1804	1995-10-23	5.6602605	25.29199	6.1923995	26.000000	31.272727
##	1805	1995-10-24	6.0000430	25.26590	6.3885305	11.555556	2.888889
##	1806	1995-10-25	6.3398255	25.23980	6.5846614	15.276596	128.893617
##	1807	1995-10-26	6.6796080	25.21371	6.7807924	36.000000	36.000000
##	1808	1995-10-27	7.0193905	25.18762	6.9769234	871.272727	84.000000
##	1809	1995-10-28	7.3591730	25.16152	7.1730544	3.055556	9.444444
##	1810	1995-10-29	7.6989555	25.13543	7.3691853	2.888889	6.444444
##	1811	1995-10-30	8.0387380	25.10934	7.5653163	9.957447	6.510638
##	1812	1995-10-31	8.3785205	25.08324	7.7614473	22.944444	148.444444
##	1813	1995-11-01	11.6486303	25.08554	7.7497815	2.111111	10.000000
##	1814	1995-11-02	8.4714667	25.07515	7.7971452	8.333333	7.733333
##	1815	1995-11-03	6.1791645	25.25078	6.7051381	48.193548	269.612903
##	1816	1995-11-04	5.7560614	25.38723	6.3294814	28.750000	543.500000
##	1817	1995-11-05	7.0688417	25.09216	7.6022063	3.777778	2.592593
##	1818	1995-11-06	4.9637980	25.49981	5.5610288	3.000000	2.962963
##	1819	1995-11-07	4.7792498	25.45023	5.8894517	2.222222	3.333333
##	1820	1995-11-08	4.5947016	25.40064	6.2178745	7.272727	11.090909
##	1821	1995-11-09	4.4101534	25.35106	6.5462974	211.111111	14.000000
##	1822	1995-11-10	4.2256052	25.30147	6.8747202	10.333333	12.500000
##	1823	1995-11-11	4.0410570	25.25188	7.2031431	8.085106	7.063830
##	1824	1995-11-12	3.8565088	25.20230	7.5315659	5.777778	19.444444
##	1825	1995-11-13	3.6719606	25.15271	7.8599888	2.666667	4.666667
##	1826	1995-11-14	3.5954517	25.14323	7.6857456	17.100000	9.500000
##	1827	1995-11-15	3.5189429	25.13375	7.5115024	2.733333	3.600000
##	1828	1995-11-16	3.5760250	25.14012	7.7129750	5.055556	203.055556
##	1829	1995-11-17	1.7246419	25.28593	6.7967187	22.193548	88.516129
##	1830	1995-11-18	1.5363743	25.33453	6.6288966	17.454545	104.000000
##	1831	1995-11-19	1.3481067	25.38312	6.4610744	70.800000	593.288889
##	1832	1995-11-20	6.4727458	25.06673	7.2018183	2.222222	6.518519
##	1833	1995-11-21	4.7838216	25.45663	5.8856703	60.020202	81.895623
##	1834	1995-11-22	4.5891738	25.45330	6.0146669	117.818182	157.272727
##	1835	1995-11-23	4.3945260	25.44997	6.1436636	2.444444	5.111111
##	1836	1995-11-24	4.1998783	25.44664	6.2726602	3.000000	9.055556
##	1837	1995-11-25	4.0052305	25.44331	6.4016568	2.611111	3.388889
##	1838	1995-11-26	3.8105827	25.43998	6.5306534	73.818182	182.727273
##	1839	1995-11-27	3.6159349	25.43665	6.6596501	775.000000	2425.000000
##	1840	1995-11-28	3.4212872	25.43332	6.7886467	6.500000	34.444444
##	1841	1995-11-29	3.2266394	25.42999	6.9176433	2.555556	4.444444
##	1842	1995-11-30	3.2617068	25.46185	6.8409927	66.444444	585.000000

##	1843	1995-12-01	4.2056786	25.31258	7.3360805	4.878049	4.487805
##	1844	1995-12-02	3.5739416	25.34235	7.2355177	2.444444	3.555556
##	1845	1995-12-03	2.9422047	25.37211	7.1349550	4.444444	16.333333
##	1846	1995-12-04	2.3104677	25.40187	7.0343923	4.709677	10.064516
##	1847	1995-12-05	3.1143333	25.20095	7.7791617	8.789474	28.315789
##	1848	1995-12-06	1.7916489	25.50995	6.0520818	101.777778	915.688889
##	1849	1995-12-07	1.2790500	25.64343	5.5810273	1114.909091	1226.545455
##	1850	1995-12-08	1.2824643	25.61923	5.6796633	5.052632	20.578947
##	1851	1995-12-09	1.2858786	25.59503	5.7782993	2.666667	3.555556
##	1852	1995-12-10	1.2892929	25.57084	5.8769353	3.555556	10.500000
##	1853	1995-12-11	1.2927073	25.54664	5.9755714	22.181818	13.818182
##	1854	1995-12-12	1.2961216	25.52244	6.0742074	6.944444	40.444444
##	1855	1995-12-13	1.2995359	25.49825	6.1728434	3.574468	6.042553
##	1856	1995-12-14	1.3029502	25.47405	6.2714795	3.555556	6.222222
##	1857	1995-12-15	1.3063645	25.44985	6.3701155	18.645161	53.870968
##	1858	1995-12-16	1.0657467	25.69097	5.3654713	10.507766	28.713262
##	1859	1995-12-17	3.1278167	25.14899	7.7300675	2.370370	3.555556
##	1860	1995-12-18	2.6215212	25.67150	6.2218348	2.000000	3.888889
##	1861	1995-12-19	1.9239488	25.71547	5.7180205	324.682927	571.121951
##	1862	1995-12-20	3.4126409	25.71515	5.7940066	25.794872	678.923077
##	1863	1995-12-21	2.9651677	25.74232	5.7688012	2.500000	4.111111
##	1864	1995-12-22	2.5176945	25.76948	5.7435959	3.822222	12.311111
##	1865	1995-12-23	2.0702212	25.79665	5.7183905	8.545455	4.000000
##	1866	1995-12-24	1.6227480	25.82382	5.6931852	6.376176	4.689655
##	1867	1995-12-25	5.5469515	25.47401	7.0189215	4.206897	5.379310
##	1868	1995-12-26	6.1911023	25.38974	7.4713058	2.888889	16.611111
##	1869	1995-12-27	4.5899643	25.36739	6.9578824	2.533333	43.266667
##	1870	1995-12-28	3.8833128	25.43867	6.6471883	2.055556	2.555556
##	1871	1995-12-29	3.1766612	25.50994	6.3364942	3.333333	16.222222
##	1872	1995-12-30	2.4700097	25.58122	6.0258002	13.833333	2.333333
##	1873	1995-12-31	1.7633582	25.65250	5.7151061	2.777778	5.111111
##	1874	1996-01-01	1.0567067	25.72378	5.4044120	49.071429	411.107143
##	1875	1996-01-02	2.4843167	24.89156	8.4580829	4.740741	10.888889
##	1876	1996-01-03	1.5195161	25.48392	6.1329374	5.354839	16.000000
##	1877	1996-01-04	1.3241161	25.63533	5.5732592	6.888889	28.000000
##	1878	1996-01-05	1.1287160	25.78674	5.0135809	3.200000	6.000000
##	1879	1996-01-06	1.7530088	25.76497	5.2456286	10.638298	89.872340
##	1880	1996-01-07	2.3773015	25.74321	5.4776763	6.545455	13.636364
##	1881	1996-01-08	3.0015943	25.72145	5.7097239	3.277778	4.111111
##	1882	1996-01-09	3.6258871	25.69968	5.9417716	5.419355	5.548387
##	1883	1996-01-10	1.4285644	25.88729	4.6927264	230.285714	1847.928571
##	1884	1996-01-11	7.9166500	25.15400	7.7259408	2.000000	2.000000
##	1885	1996-01-12	7.2152624	25.16677	7.6329183	4.666667	2.222222
##	1886	1996-01-13	6.5138749	25.17954	7.5398957	5.166667	22.777778
##	1887	1996-01-14	5.8124873	25.19231	7.4468732	10.545455	9.818182
##	1888	1996-01-15	5.1110998	25.20507	7.3538506	2.000000	4.222222
##	1889	1996-01-16	4.4097122	25.21784	7.2608280	35.066667	264.400000
##	1890	1996-01-17	5.0494606	25.47282	6.5712185	2.551724	2.551724
##	1891	1996-01-18	4.0834773	25.58643	5.0139050	2.055556	2.722222
##	1892	1996-01-19	3.3034105	25.63987	4.6462681	4.888889	6.833333
##	1893	1996-01-20	2.5233438	25.69331	4.2786313	5.777778	9.111111
##	1894	1996-01-21	1.7432771	25.74675	3.9109944	27.454545	18.181818
##	1895	1996-01-22	1.7943890	25.61614	4.7161845	2.055556	2.000000
##	1896	1996-01-23	1.8455010	25.48552	5.5213747	3.333333	2.000000

## 1897	1996-01-24	1.8966129	25.35490	6.3265648	11.096774	74.709677
## 1898	1996-01-25	0.8946227	25.66776	5.3938293	442.714286	2088.357143
## 1899	1996-01-26	4.8811500	25.02583	6.7894017	3.333333	6.148148
## 1900	1996-01-27	5.0955735	24.92591	7.1054633	2.444444	3.555556
## 1901	1996-01-28	5.3099970	24.82600	7.4215249	5.191489	6.553191
## 1902	1996-01-29	5.5244205	24.72608	7.7375866	485.555556	1011.500000
## 1903	1996-01-30	6.2826545	24.76301	7.7645036	2.333333	11.555556
## 1904	1996-01-31	3.9083119	25.19494	6.9350707	3.133333	11.933333
## 1905	1996-02-01	3.1381663	25.30211	6.4432093	3.900000	2.800000
## 1906	1996-02-02	2.3680207	25.40928	5.9513479	2.000000	2.888889
## 1907	1996-02-03	1.5978750	25.51645	5.4594865	7.944444	27.000000
## 1908	1996-02-04	0.8277294	25.62362	4.9676251	3.818182	4.909091
## 1909	1996-02-05	4.2451630	25.45298	5.9828578	4.666667	3.777778
## 1910	1996-02-06	7.6625967	25.28235	6.9980906	4.444444	11.500000
## 1911	1996-02-07	11.0800303	25.11171	8.0133233	3.000000	6.555556
## 1912	1996-02-08	5.5216341	25.05562	8.0644880	3.712121	4.459596
## 1913	1996-02-09	5.7474222	25.03123	8.0971022	4.424242	2.363636
## 1914	1996-02-10	4.6688022	25.05850	7.6430012	3.111111	2.000000
## 1915	1996-02-11	3.5901821	25.08577	7.1889001	2.277778	3.222222
## 1916	1996-02-12	2.5115620	25.11304	6.7347991	2.444444	4.000000
## 1917	1996-02-13	1.4329419	25.14031	6.2806981	12.064516	51.806452
## 1918	1996-02-14	3.6301875	24.48828	8.2288783	54.321147	423.903226
## 1919	1996-02-15	1.2695289	25.44432	5.5280916	96.577778	796.000000
## 1920	1996-02-16	1.4426317	25.45465	5.4607079	3.000000	16.333333
## 1921	1996-02-17	1.6157345	25.46497	5.3933242	4.444444	6.000000
## 1922	1996-02-18	1.7888373	25.47530	5.3259405	2.388889	3.055556
## 1923	1996-02-19	1.9619401	25.48563	5.2585568	4.222222	3.555556
## 1924	1996-02-20	2.1350429	25.49596	5.1911732	6.888889	17.388889
## 1925	1996-02-21	3.8376352	25.45052	5.9121773	9.555556	31.222222
## 1926	1996-02-22	5.5402275	25.40508	6.6331814	23.555556	11.000000
## 1927	1996-02-23	7.2428198	25.35964	7.3541856	4.000000	5.888889
## 1928	1996-02-24	8.9454121	25.31420	8.0751897	5.851852	15.407407
## 1929	1996-02-25	9.1820818	25.25016	8.4336055	3.992593	8.837037
## 1930	1996-02-26	5.6060488	25.22334	7.6419759	2.133333	2.266667
## 1931	1996-02-27	1.8960387	25.09677	5.9103542	4.709677	10.967742
## 1932	1996-02-28	4.6301042	24.75904	7.7266350	29.361702	73.319149
## 1933	1996-02-29	0.6109489	25.45027	5.0562411	204.311111	1773.244444
## 1934	1996-03-01	0.6622955	25.46259	4.9786535	14.181818	4.181818
## 1935	1996-03-02	0.7136421	25.47490	4.9010659	3.022222	3.022222
## 1936	1996-03-03	0.7649887	25.48721	4.8234783	6.722222	6.000000
## 1937	1996-03-04	0.8163353	25.49952	4.7458908	17.636364	12.727273
## 1938	1996-03-05	0.8676818	25.51183	4.6683032	2.222222	3.111111
## 1939	1996-03-06	0.9190284	25.52415	4.5907156	4.076628	2.727969
## 1940	1996-03-07	5.7122667	24.77158	7.7469752	5.931034	2.344828
## 1941	1996-03-08	4.2474684	24.65737	7.4699066	4.133333	9.266667
## 1942	1996-03-09	8.1299867	24.58123	7.6669324	257.444444	594.722222
## 1943	1996-03-10	4.8356272	24.78624	6.8519464	5.422222	5.733333
## 1944	1996-03-11	1.5412677	24.99124	6.0369603	13.666667	82.333333
## 1945	1996-03-12	1.3386907	25.27893	5.4178084	7.644444	225.111111
## 1946	1996-03-13	1.2845542	24.14867	7.2712246	2.000000	2.592593
## 1947	1996-03-14	1.2580894	24.34761	6.9079030	9.777778	2.888889
## 1948	1996-03-15	1.2316247	24.54655	6.5445813	4.222222	10.055556
## 1949	1996-03-16	1.2051599	24.74549	6.1812597	5.636364	4.363636
## 1950	1996-03-17	1.1786952	24.94443	5.8179381	10.888889	22.444444

##	1951	1996-03-18	1.1522304	25.14337	5.4546164	13.636364	10.363636
##	1952	1996-03-19	1.1257657	25.34231	5.0912948	7.818182	6.181818
##	1953	1996-03-20	2.9093118	25.14393	5.8653882	2.000000	2.000000
##	1954	1996-03-21	4.6928580	24.94555	6.6394816	2.000000	2.311111
##	1955	1996-03-22	6.4764042	24.74717	7.4135750	4.275862	4.827586
##	1956	1996-03-23	5.0710800	24.84936	7.5153638	147.722222	367.666667
##	1957	1996-03-24	3.1541905	24.88554	7.3477019	2.000000	2.000000
##	1958	1996-03-25	2.1643778	25.06797	6.5459922	2.444444	4.277778
##	1959	1996-03-26	2.1719534	25.06736	6.5437784	2.111111	2.055556
##	1960	1996-03-27	2.1795290	25.06676	6.5415645	5.225806	18.129032
##	1961	1996-03-28	1.4904791	25.29897	5.9745467	55.642857	958.071429
##	1962	1996-03-29	3.2715292	24.81784	6.8795725	3.611111	5.333333
##	1963	1996-03-30	2.6299184	24.94968	6.4364640	18.181818	8.909091
##	1964	1996-03-31	1.9883077	25.08153	5.9933555	4.800000	6.711111
##	1965	1996-04-01	1.3466969	25.21337	5.5502469	2.765957	20.893617
##	1966	1996-04-02	0.7050861	25.34521	5.1071384	5.160757	16.891253
##	1967	1996-04-03	1.2982479	25.21452	5.6170481	7.555556	12.888889
##	1968	1996-04-04	1.8914097	25.08383	6.1269578	2.000000	2.555556
##	1969	1996-04-05	2.4845715	24.95314	6.6368675	2.000000	5.277778
##	1970	1996-04-06	3.0777333	24.82245	7.1467771	103.317073	31.219512
##	1971	1996-04-07	3.6141133	24.83610	7.3292331	266.166667	672.777778
##	1972	1996-04-08	4.0425879	24.91302	7.2398809	2.222222	2.777778
##	1973	1996-04-09	1.6628613	25.07454	6.2107442	21.714286	145.714286
##	1974	1996-04-10	1.5182292	24.68932	6.5024054	3.407407	9.333333
##	1975	1996-04-11	1.2131727	25.24272	5.4875270	135.733333	1403.244444
##	1976	1996-04-12	0.8600000	23.88500	6.7500000	72.088889	707.733333
##	1977	1996-04-13	0.8539257	24.20299	6.4031708	8.444444	12.222222
##	1978	1996-04-14	0.8478515	24.52097	6.0563416	42.363636	22.545455
##	1979	1996-04-15	0.8417772	24.83896	5.7095124	2.000000	2.000000
##	1980	1996-04-16	0.8357029	25.15694	5.3626832	2.106383	2.425532
##	1981	1996-04-17	1.1952444	25.01048	5.7350608	2.212766	2.851064
##	1982	1996-04-18	1.5547859	24.86403	6.1074384	3.555556	6.666667
##	1983	1996-04-19	1.9143274	24.71757	6.4798160	2.777778	4.111111
##	1984	1996-04-20	2.2738689	24.57111	6.8521936	83.574468	342.893617
##	1985	1996-04-21	2.9156545	24.61064	6.9584142	2.000000	2.000000
##	1986	1996-04-22	1.9946929	24.61820	6.7620931	4.200000	7.333333
##	1987	1996-04-23	1.2444871	24.90545	5.9882945	9.225806	42.193548
##	1988	1996-04-24	3.0939208	24.55917	6.5750400	3.473684	5.315789
##	1989	1996-04-25	1.0343200	25.16714	5.2348420	46.311111	512.133333
##	1990	1996-04-26	1.0524251	25.17748	5.2305709	56.444444	12.222222
##	1991	1996-04-27	1.0705302	25.18783	5.2262998	280.181818	483.272727
##	1992	1996-04-28	1.0886353	25.19817	5.2220288	6000.000000	12000.000000
##	1993	1996-04-29	1.1067404	25.20852	5.2177577	3020.833333	6035.305556
##	1994	1996-04-30	1.4710573	25.16868	5.4456832	41.666667	70.611111
##	1995	1996-05-01	1.8353742	25.12885	5.6736086	50.000000	160.800000
##	1996	1996-05-02	2.1996912	25.08901	5.9015341	3016.500000	3069.500000
##	1997	1996-05-03	2.5640081	25.04918	6.1294596	2.444444	7.722222
##	1998	1996-05-04	2.9283250	25.00934	6.3573851	61.882353	351.647059
##	1999	1996-05-05	3.2926419	24.96951	6.5853106	270.000000	3100.000000
##	2000	1996-05-06	3.6569588	24.92967	6.8132360	3.666667	6.888889
##	2001	1996-05-07	4.0212758	24.88984	7.0411615	6.111111	49.666667
##	2002	1996-05-08	3.6786391	24.84925	7.0738331	58.545455	45.818182
##	2003	1996-05-09	3.3360024	24.80867	7.1065048	17.866667	58.066667
##	2004	1996-05-10	3.5297000	24.76806	7.2612862	23.944444	87.666667

##	2005	1996-05-11	2.4902323	24.90791	6.7571820	2.666667	4.500000
##	2006	1996-05-12	1.4507645	25.04775	6.2530777	9.047619	44.904762
##	2007	1996-05-13	1.1270659	25.22805	5.7042439	19.407407	561.000000
##	2008	1996-05-14	1.4415542	24.90697	6.8948179	8.074074	57.555556
##	2009	1996-05-15	1.3162890	24.97387	6.6178287	296.545455	66.727273
##	2010	1996-05-16	1.1910239	25.04076	6.3408395	2.944444	6.388889
##	2011	1996-05-17	1.0657587	25.10765	6.0638503	4.833333	13.777778
##	2012	1996-05-18	0.9404936	25.17454	5.7868612	6.545455	7.090909
##	2013	1996-05-19	0.8152284	25.24143	5.5098720	5.828283	4.878788
##	2014	1996-05-20	1.4800691	25.12079	6.0502717	5.111111	2.666667
##	2015	1996-05-21	2.1449097	25.00014	6.5906714	2.000000	2.000000
##	2016	1996-05-22	2.8097503	24.87950	7.1310712	13.702128	36.851064
##	2017	1996-05-23	3.4745909	24.75885	7.6714709	2.000000	2.000000
##	2018	1996-05-24	4.0393432	24.76099	7.8783402	79.000000	432.500000
##	2019	1996-05-25	2.3875500	24.76115	7.7204505	2.533333	3.400000
##	2020	1996-05-26	1.5748619	25.13593	6.3254143	648.424242	1146.000000
##	2021	1996-05-27	1.4558895	24.91192	6.9230316	296.695652	1219.217391
##	2022	1996-05-28	1.6094250	24.60423	7.6801128	4.615385	12.923077
##	2023	1996-05-29	1.6336955	24.80289	7.1106441	824.500000	735.812500
##	2024	1996-05-30	1.3817802	24.92678	6.7818457	230.500000	122.000000
##	2025	1996-05-31	1.1298649	25.05068	6.4530473	74.341463	346.731707
##	2026	1996-06-01	0.8779496	25.17458	6.1242490	36.000000	3.000000
##	2027	1996-06-02	0.6260343	25.29848	5.7954506	20.611111	4.444444
##	2028	1996-06-03	1.0428406	25.26973	5.9034182	5.222222	5.888889
##	2029	1996-06-04	1.4596468	25.24098	6.0113858	8400.000000	8520.000000
##	2030	1996-06-05	1.8764531	25.21222	6.1193534	50.133333	48.000000
##	2031	1996-06-06	2.2932594	25.18347	6.2273210	22.000000	14.000000
##	2032	1996-06-07	2.7100656	25.15472	6.3352886	107.090909	557.090909
##	2033	1996-06-08	3.1268719	25.12597	6.4432562	315.200000	2047.200000
##	2034	1996-06-09	3.5436782	25.09721	6.5512238	20.333333	31.833333
##	2035	1996-06-10	3.9604844	25.06846	6.6591915	500.000000	3000.000000
##	2036	1996-06-11	4.3772907	25.03971	6.7671591	5.277778	6.222222
##	2037	1996-06-12	4.7940970	25.01096	6.8751267	2.666667	2.222222
##	2038	1996-06-13	3.2872881	25.09920	6.5688729	298.243902	341.414634
##	2039	1996-06-14	5.0990273	24.97055	7.2934991	366.307692	1577.743590
##	2040	1996-06-15	0.6048882	25.59211	4.0651052	1034.376068	1766.316239
##	2041	1996-06-16	0.7395193	25.48902	4.2960522	1702.444444	1954.888889
##	2042	1996-06-17	0.8741504	25.38593	4.5269993	658.666667	550.000000
##	2043	1996-06-18	1.0087814	25.28284	4.7579463	439.272727	407.090909
##	2044	1996-06-19	1.1434125	25.17975	4.9888933	28.785714	96.071429
##	2045	1996-06-20	1.9112710	25.50793	5.1544826	13.096774	64.129032
##	2046	1996-06-21	1.6531187	25.78419	4.1924359	129.000000	805.625000
##	2047	1996-06-22	1.4125923	25.74264	3.6646469	47.866667	232.933333
##	2048	1996-06-23	3.1031653	25.57977	4.5734311	808.666667	4017.333333
##	2049	1996-06-24	4.7937384	25.41691	5.4822154	2.000000	2.222222
##	2050	1996-06-25	6.4843114	25.25405	6.3909996	3.872340	9.787234
##	2051	1996-06-26	8.1748844	25.09118	7.2997838	31.722222	99.166667
##	2052	1996-06-27	7.3612667	25.24249	7.2210206	7.111111	78.222222
##	2053	1996-06-28	4.8538571	25.35696	6.5550140	33.800000	165.666667
##	2054	1996-06-29	2.8080516	25.62383	5.0709365	25.419355	134.064516
##	2055	1996-06-30	1.8441488	25.80588	4.2682244	65.250000	601.214286
##	2056	1996-07-01	4.7600583	25.24538	6.0778967	5.703704	29.185185
##	2057	1996-07-02	4.3584197	25.31845	5.7577225	2241.300000	2762.500000
##	2058	1996-07-03	3.9567810	25.39151	5.4375484	619.000000	3050.000000

## 2059	1996-07-04	3.5551423	25.46458	5.1173743	16.944444	344.222222
## 2060	1996-07-05	3.1535036	25.53764	4.7972002	2.000000	2.500000
## 2061	1996-07-06	2.7518650	25.61070	4.4770260	383.636364	1593.454545
## 2062	1996-07-07	2.3502263	25.68377	4.1568519	414.666667	4002.666667
## 2063	1996-07-08	1.9485876	25.75683	3.8366778	8.500000	38.333333
## 2064	1996-07-09	1.5469489	25.82990	3.5165036	5.111111	15.166667
## 2065	1996-07-10	1.1453102	25.90296	3.1963295	12.000000	4.909091
## 2066	1996-07-11	0.7436716	25.97602	2.8761554	7.138889	6.204545
## 2067	1996-07-12	4.6440507	25.72643	4.5187476	2.277778	7.500000
## 2068	1996-07-13	8.5444299	25.47683	6.1613399	3.000000	15.722222
## 2069	1996-07-14	12.4448091	25.22723	7.8039321	5.000000	22.333333
## 2070	1996-07-15	8.3862841	25.15373	7.6324493	64.085106	648.000000
## 2071	1996-07-16	4.1722976	25.27272	6.7648986	345.111111	832.833333
## 2072	1996-07-17	2.6409488	25.82653	4.4502465	176.974910	439.287634
## 2073	1996-07-18	2.2674839	25.51925	4.7955177	8.838710	45.741935
## 2074	1996-07-19	3.3873375	25.58895	6.7818688	10.578947	39.105263
## 2075	1996-07-20	2.7812019	25.65865	6.1036013	2.000000	2.888889
## 2076	1996-07-21	2.1750663	25.72835	5.4253339	2.555556	8.888889
## 2077	1996-07-22	1.5689307	25.79804	4.7470665	11.090909	6.000000
## 2078	1996-07-23	0.9627951	25.86774	4.0687990	7.545455	4.111111
## 2079	1996-07-24	2.1656794	25.72548	4.5899338	4.000000	2.222222
## 2080	1996-07-25	3.3685637	25.58323	5.1110686	50.909091	103.272727
## 2081	1996-07-26	4.5714480	25.44097	5.6322035	3.611111	58.944444
## 2082	1996-07-27	5.7743324	25.29871	6.1533383	2.222222	2.000000
## 2083	1996-07-28	6.9772167	25.15645	6.6744731	5.000000	10.933333
## 2084	1996-07-29	8.5528311	24.87624	7.3234669	258.553191	616.170213
## 2085	1996-07-30	7.3449640	24.82280	7.3498230	2.444444	11.000000
## 2086	1996-07-31	6.1370970	24.76935	7.3761791	2.111111	3.222222
## 2087	1996-08-01	2.1166645	25.44336	5.1442284	60.950000	4.600000
## 2088	1996-08-02	3.6122458	24.93738	7.4237325	42.105263	32.473684
## 2089	1996-08-03	1.5580333	25.68291	4.4570267	85.466667	1257.288889
## 2090	1996-08-04	1.2638851	25.67552	4.5347787	80.400000	43.600000
## 2091	1996-08-05	0.9697370	25.66814	4.6125308	4.000000	8.944444
## 2092	1996-08-06	0.6755888	25.66075	4.6902829	3.363636	9.472222
## 2093	1996-08-07	1.2118279	25.59496	4.6642679	2.727273	10.000000
## 2094	1996-08-08	1.7480670	25.52916	4.6382530	2.355556	18.933333
## 2095	1996-08-09	2.2843061	25.46337	4.6122381	4.388889	7.500000
## 2096	1996-08-10	2.8205452	25.39757	4.5862232	9.904762	30.238095
## 2097	1996-08-11	6.2854042	24.86923	7.7266233	2.000000	2.000000
## 2098	1996-08-12	0.9103562	25.58816	4.4065175	12.080000	883.680000
## 2099	1996-08-13	2.8168088	25.18438	4.9878348	2.000000	5.611111
## 2100	1996-08-14	4.7232613	24.78061	5.5691521	73.568966	766.137931
## 2101	1996-08-15	4.3611956	24.42179	7.5181556	263.444444	338.000000
## 2102	1996-08-16	3.3692929	24.67388	7.5542133	2.533333	2.000000
## 2103	1996-08-17	3.4083866	24.67100	7.5450189	2.000000	13.111111
## 2104	1996-08-18	3.4474803	24.66813	7.5358245	12.545455	22.000000
## 2105	1996-08-19	3.4865741	24.66525	7.5266301	4.666667	25.777778
## 2106	1996-08-20	3.5256678	24.66237	7.5174356	9.555556	14.000000
## 2107	1996-08-21	3.5647616	24.65949	7.5082412	18.000000	37.454545
## 2108	1996-08-22	3.6038553	24.65662	7.4990468	2.000000	2.000000
## 2109	1996-08-23	3.6429491	24.65374	7.4898524	4.444444	6.444444
## 2110	1996-08-24	3.6820428	24.65086	7.4806579	26.727273	27.454545
## 2111	1996-08-25	3.7211366	24.64798	7.4714635	3.333333	5.333333
## 2112	1996-08-26	3.7602303	24.64511	7.4622691	2.611111	38.555556

##	2113	1996-08-27	7.0344182	25.00007	7.7085703	2.307692	6.538462
##	2114	1996-08-28	7.8448556	25.00405	8.0517880	11.021277	23.617021
##	2115	1996-08-29	5.1328976	25.12166	7.2432181	7.066667	12.200000
##	2116	1996-08-30	3.7885208	24.75364	7.0473158	2.962963	3.333333
##	2117	1996-08-31	5.9251879	24.91151	7.4813230	22.036364	11.018182
##	2118	1996-09-01	5.2535394	24.44853	8.5205909	2.000000	2.722222
##	2119	1996-09-02	4.7989341	24.51978	8.1169773	4.727273	2.909091
##	2120	1996-09-03	4.3443288	24.59102	7.7133638	2.250000	6.500000
##	2121	1996-09-04	3.8897235	24.66227	7.3097502	9.818182	11.454545
##	2122	1996-09-05	3.4351182	24.73351	6.9061367	2.000000	2.111111
##	2123	1996-09-06	6.2235455	24.71051	7.5154323	8.500000	5.500000
##	2124	1996-09-07	9.0119727	24.68750	8.1247279	75.862069	18.896552
##	2125	1996-09-08	7.7924956	24.70444	8.0891071	343.000000	376.500000
##	2126	1996-09-09	6.0004667	24.81793	7.5491124	2.600000	4.200000
##	2127	1996-09-10	3.6488848	24.68117	7.7089882	2.318182	4.818182
##	2128	1996-09-11	6.0608583	24.11300	8.2238979	2.962963	2.666667
##	2129	1996-09-12	7.0190470	24.09723	8.0095480	101.454545	127.272727
##	2130	1996-09-13	7.9772356	24.08146	7.7951981	3.500000	6.250000
##	2131	1996-09-14	8.9354242	24.06569	7.5808482	4.444444	43.722222
##	2132	1996-09-15	8.8416417	24.20649	7.3898294	27.818182	9.636364
##	2133	1996-09-16	8.7478591	24.34729	7.1988106	3.750000	9.750000
##	2134	1996-09-17	8.6540765	24.48809	7.0077918	5.636364	3.636364
##	2135	1996-09-18	8.5602939	24.62889	6.8167730	5.111111	11.111111
##	2136	1996-09-19	15.6675485	24.58576	7.2255682	5.750000	8.250000
##	2137	1996-09-20	22.7748030	24.54263	7.6343633	9.063830	5.191489
##	2138	1996-09-21	14.5271848	24.51010	8.4167048	2.222222	3.333333
##	2139	1996-09-22	18.2777644	24.58426	7.8853333	5.722222	10.611111
##	2140	1996-09-23	8.1641714	24.64903	8.3776643	19.333333	13.666667
##	2141	1996-09-24	17.9138909	24.31299	7.3098745	16.888889	6.722222
##	2142	1996-09-25	30.3534917	24.31519	7.0476246	44.347826	49.347826
##	2143	1996-09-26	4.8975778	24.84229	6.5085084	18.177778	102.444444
##	2144	1996-09-27	3.0618125	24.92251	6.7823737	72.166667	1213.875000
##	2145	1996-09-28	5.4746521	24.82331	7.0030279	11.000000	90.791667
##	2146	1996-09-29	8.2229408	24.52741	7.2765663	34.909091	67.636364
##	2147	1996-09-30	10.9712295	24.23150	7.5501047	59.000000	98.500000
##	2148	1996-10-01	13.7195182	23.93560	7.8236430	5.333333	3.500000
##	2149	1996-10-02	7.0386273	24.05128	6.6505967	5.787234	16.425532
##	2150	1996-10-03	4.5161348	24.13626	6.9275230	17.750000	80.250000
##	2151	1996-10-04	1.9936424	24.22124	7.2044494	4.055556	3.500000
##	2152	1996-10-05	2.6214924	24.18962	7.0247468	3.500000	4.250000
##	2153	1996-10-06	3.2493424	24.15801	6.8450442	2.055556	17.000000
##	2154	1996-10-07	3.2760956	24.23916	7.5666262	162.042553	518.170213
##	2155	1996-10-08	3.8908370	24.33590	7.6737485	3.466667	2.000000
##	2156	1996-10-09	2.1812042	24.44456	7.4730475	4.341463	14.341463
##	2157	1996-10-10	3.8448970	24.44308	7.2162639	2.666667	6.722222
##	2158	1996-10-11	3.8263758	24.41810	7.1950435	106.750000	61.500000
##	2159	1996-10-12	3.8078545	24.39312	7.1738230	12.510638	106.765957
##	2160	1996-10-13	0.9100000	23.88600	6.8700000	6.250000	8.250000
##	2161	1996-10-14	3.4217042	24.46771	6.7995437	4.842105	3.736842
##	2162	1996-10-15	3.5131309	24.53185	6.9247063	6.250000	12.250000
##	2163	1996-10-16	3.6045576	24.59599	7.0498688	4.500000	22.444444
##	2164	1996-10-17	3.5820140	24.57165	7.1336651	18.000000	18.210526
##	2165	1996-10-18	3.5594705	24.54731	7.2174615	4.500000	10.000000
##	2166	1996-10-19	3.5369269	24.52296	7.3012578	6.181818	4.181818

## 2167	1996-10-20	3.5143833	24.49862	7.3850542	5.111111	61.333333
## 2168	1996-10-21	3.6115326	24.51541	7.4652727	167.500000	87.750000
## 2169	1996-10-22	3.7086818	24.53220	7.5454912	3.222222	14.888889
## 2170	1996-10-23	4.4480311	24.49034	7.5890938	6.851064	11.659574
## 2171	1996-10-24	3.2166119	24.54483	7.7351238	4.866667	20.933333
## 2172	1996-10-25	3.2886167	24.50195	7.2294779	5.183333	11.966667
## 2173	1996-10-26	2.7443182	24.56357	7.2097832	5.500000	3.000000
## 2174	1996-10-27	2.2000197	24.62518	7.1900884	155.454545	50.727273
## 2175	1996-10-28	1.6557212	24.68679	7.1703936	2.444444	4.000000
## 2176	1996-10-29	2.4899379	24.71345	7.1102488	7.500000	10.500000
## 2177	1996-10-30	3.3241545	24.74011	7.0501039	14.127660	10.340426
## 2178	1996-10-31	2.9282621	24.79072	6.9988103	21.250000	23.750000
## 2179	1996-11-01	2.5323697	24.84134	6.9475167	4.000000	15.222222
## 2180	1996-11-02	2.8805333	24.86936	7.0156570	38.210526	135.052632
## 2181	1996-11-03	3.2286970	24.89738	7.0837974	19.000000	36.000000
## 2182	1996-11-04	3.5768606	24.92541	7.1519378	2.000000	2.611111
## 2183	1996-11-05	5.4084727	24.90402	8.1090355	3.153846	3.846154
## 2184	1996-11-06	5.6563644	24.92361	8.1509744	48.127660	339.957447
## 2185	1996-11-07	2.4293833	24.85360	7.5274212	2.074074	3.111111
## 2186	1996-11-08	4.4328881	24.88671	7.9189419	2.933333	5.866667
## 2187	1996-11-09	4.0410507	24.96338	7.4716986	17.750000	18.250000
## 2188	1996-11-10	3.6492133	25.04004	7.0244553	6.533333	24.444444
## 2189	1996-11-11	3.1576542	25.11218	6.7231142	98.576271	569.389831
## 2190	1996-11-12	3.0231875	25.09304	6.8002879	7.458333	18.625000
## 2191	1996-11-13	3.4856879	24.80141	7.5939003	2.000000	2.333333
## 2192	1996-11-14	2.7207682	24.76154	7.4628470	68.000000	14.000000
## 2193	1996-11-15	1.9558485	24.72168	7.3317936	18.510638	27.361702
## 2194	1996-11-16	1.8963232	24.72223	7.4101800	5.500000	4.000000
## 2195	1996-11-17	1.8367980	24.72278	7.4885664	10.545455	112.909091
## 2196	1996-11-18	1.7772727	24.72332	7.5669527	7.661616	62.037879
## 2197	1996-11-19	2.0879303	24.78187	7.3390200	4.777778	11.166667
## 2198	1996-11-20	2.8469808	24.81902	7.4460480	3.500000	18.500000
## 2199	1996-11-21	3.6060313	24.85616	7.5530760	2.000000	8.250000
## 2200	1996-11-22	4.3650818	24.89331	7.6601040	2.333333	3.888889
## 2201	1996-11-23	5.3231659	24.94141	7.7671320	8.000000	7.454545
## 2202	1996-11-24	6.2812500	24.98951	7.8741600	5.478261	9.304348
## 2203	1996-11-25	5.3818667	25.02815	7.6797206	2.666667	11.538462
## 2204	1996-11-26	5.6525810	25.03124	7.7896521	4.000000	19.866667
## 2205	1996-11-27	2.7703250	25.00773	7.2177700	5.185185	10.888889
## 2206	1996-11-28	3.0647049	24.86593	7.7763555	151.250000	68.750000
## 2207	1996-11-29	3.3590848	24.72413	8.3349409	404.829268	252.487805
## 2208	1996-11-30	5.2336909	24.87018	7.8292603	18.230769	4.692308
## 2209	1996-12-01	4.0059044	24.74693	7.9294182	197.115385	190.787330
## 2210	1996-12-02	4.4704439	24.88089	7.5755937	376.000000	376.882353
## 2211	1996-12-03	2.8765939	24.55967	8.1417067	7.272727	19.454545
## 2212	1996-12-04	3.0140960	24.56303	8.0580374	2.000000	2.000000
## 2213	1996-12-05	3.1515980	24.56640	7.9743681	21.272727	563.272727
## 2214	1996-12-06	3.2891000	24.56976	7.8906988	21.684211	434.947368
## 2215	1996-12-07	3.1010485	24.56459	7.9391817	2.000000	7.250000
## 2216	1996-12-08	2.9129970	24.55943	7.9876646	22.000000	79.090909
## 2217	1996-12-09	2.7249455	24.55426	8.0361476	2.222222	3.722222
## 2218	1996-12-10	2.8864530	24.76270	7.6447197	6.000000	13.000000
## 2219	1996-12-11	3.0479606	24.97114	7.2532918	6.765957	32.765957
## 2220	1996-12-12	2.6119532	24.95409	7.2386874	3.500000	9.000000

##	2221	1996-12-13	2.1759458	24.93703	7.2240829	2.740741	6.444444
##	2222	1996-12-14	3.9766153	24.94706	7.4295639	28.842105	20.105263
##	2223	1996-12-15	5.7772848	24.95708	7.6350448	2.888889	10.722222
##	2224	1996-12-16	3.2238583	24.64644	8.3221146	2.666667	9.629630
##	2225	1996-12-17	6.5055121	24.64977	7.5293785	6.461538	32.615385
##	2226	1996-12-18	6.6076533	24.62869	7.6114982	132.297872	1299.446809
##	2227	1996-12-19	4.7568905	24.75011	6.9999193	45.513514	788.702703
##	2228	1996-12-20	3.8940710	24.69831	7.3662316	4.250000	7.250000
##	2229	1996-12-21	3.0312515	24.64651	7.7325439	4.666667	18.055556
##	2230	1996-12-22	3.7412644	25.16794	5.6077409	26.214286	60.321429
##	2231	1996-12-23	3.2612979	25.24729	5.1667000	64.208333	608.708333
##	2232	1996-12-24	2.7533271	25.25132	5.0668602	38.125000	481.833333
##	2233	1996-12-25	3.4306932	25.23733	5.5786611	3.000000	4.750000
##	2234	1996-12-26	4.1080593	25.22335	6.0904621	2.000000	114.545455
##	2235	1996-12-27	4.7854254	25.20937	6.6022630	2.000000	65.000000
##	2236	1996-12-28	5.4627915	25.19538	7.1140639	4.250000	4.750000
##	2237	1996-12-29	6.1401576	25.18140	7.6258648	5.722222	58.222222
##	2238	1996-12-30	7.9135364	25.13146	7.1177615	3.404255	12.765957
##	2239	1996-12-31	5.2324273	24.49132	8.5264991	6.000000	56.222222
##	2240	1997-01-01	5.9199909	25.05869	6.1293470	2.000000	2.666667
##	2241	1997-01-02	5.7068667	25.02161	6.6497263	2.333333	8.370370
##	2242	1997-01-03	3.3167750	24.43206	8.2702896	2.666667	14.074074
##	2243	1997-01-04	4.6923762	24.90285	6.7099248	2.400000	2.666667
##	2244	1997-01-05	6.9290111	24.96976	7.6267089	29.733333	312.933333
##	2245	1997-01-06	5.4850182	24.43825	8.0478279	41.593939	161.648485
##	2246	1997-01-07	5.4241667	24.18031	8.0648212	53.454545	10.363636
##	2247	1997-01-08	5.3633152	23.92236	8.0818145	2.297872	3.234043
##	2248	1997-01-09	4.6706045	24.45541	7.4183435	603.818182	504.363636
##	2249	1997-01-10	3.9778939	24.98846	6.7548724	2.000000	2.611111
##	2250	1997-01-11	3.0725545	24.49912	7.2884127	2.425532	2.851064
##	2251	1997-01-12	4.1470208	24.00978	7.7715767	2.000000	2.074074
##	2252	1997-01-13	8.7789970	24.32787	7.1494585	3.241379	3.034483
##	2253	1997-01-14	8.4576667	24.54560	7.0762071	3.009404	4.204807
##	2254	1997-01-15	6.0011878	24.87402	6.6321959	2.777429	5.375131
##	2255	1997-01-16	7.2835151	24.44978	7.0212207	2.545455	6.545455
##	2256	1997-01-17	8.5658424	24.02554	7.4102455	2.277778	2.555556
##	2257	1997-01-18	9.3150818	24.61618	7.5698024	2.833333	2.888889
##	2258	1997-01-19	7.1364818	24.23315	7.7163800	2.555556	2.777778
##	2259	1997-01-20	6.1972106	24.24958	7.4277908	2.363636	3.818182
##	2260	1997-01-21	5.2579394	24.26601	7.1392015	7.277778	75.111111
##	2261	1997-01-22	2.9564625	24.46690	6.8785858	25.315789	88.947368
##	2262	1997-01-23	7.4374667	24.90146	6.6265521	228.713450	442.057018
##	2263	1997-01-24	5.5336114	24.93044	6.5981195	432.111111	795.166667
##	2264	1997-01-25	6.0557857	24.87888	6.9026702	2.000000	2.066667
##	2265	1997-01-26	2.9148222	25.13220	6.0446398	23.555556	160.311111
##	2266	1997-01-27	2.1929000	25.17774	5.8094069	60.881356	789.898305
##	2267	1997-01-28	2.6724636	24.59465	7.4182876	2.166667	2.166667
##	2268	1997-01-29	2.7490604	25.12528	5.9545402	2.291667	7.666667
##	2269	1997-01-30	3.0410681	24.73631	6.8861713	4.545455	4.545455
##	2270	1997-01-31	3.3330758	24.34734	7.8178024	3.272727	3.272727
##	2271	1997-02-01	2.3677364	24.16319	8.2375048	2.000000	2.000000
##	2272	1997-02-02	1.1417000	23.85611	8.3488300	2.448276	2.413793
##	2273	1997-02-03	4.1997848	24.38306	7.6706503	2.896552	2.827586
##	2274	1997-02-04	4.5257159	24.45988	7.7992386	29.777778	174.611111

##	2275	1997-02-05	3.6582929	24.54767	7.6581690	2.666667	10.666667
##	2276	1997-02-06	3.7414722	24.38485	8.0612619	3.454545	9.636364
##	2277	1997-02-07	3.8246515	24.22204	8.4643548	2.000000	2.000000
##	2278	1997-02-08	3.2951894	24.24495	8.2395556	8.363636	5.272727
##	2279	1997-02-09	2.7657273	24.26787	8.0147564	5.363636	4.090909
##	2280	1997-02-10	2.6809576	24.21145	8.0063139	2.363636	2.909091
##	2281	1997-02-11	2.5961879	24.15502	7.9978715	2.265152	2.537879
##	2282	1997-02-12	3.0330939	23.97054	7.6778485	2.166667	2.166667
##	2283	1997-02-13	2.1483667	24.39571	7.7837248	3.277778	12.055556
##	2284	1997-02-14	2.2335667	23.84814	7.6104529	2.315789	2.842105
##	2285	1997-02-15	4.4196030	23.83095	7.5607333	10.222222	24.111111
##	2286	1997-02-16	3.2661489	23.87305	7.6277649	6.144444	13.055556
##	2287	1997-02-17	3.2671738	24.09796	7.5005345	2.066667	2.000000
##	2288	1997-02-18	3.2708369	23.72776	7.5597783	23.272727	17.636364
##	2289	1997-02-19	3.2745000	23.35755	7.6190221	2.222222	7.777778
##	2290	1997-02-20	2.7151242	24.06223	7.8123782	13.000000	8.833333
##	2291	1997-02-21	2.6849015	24.26429	7.8484059	3.818182	3.090909
##	2292	1997-02-22	2.6546788	24.46635	7.8844336	3.333333	6.666667
##	2293	1997-02-23	2.6998980	24.45811	7.8493768	11.090909	6.000000
##	2294	1997-02-24	2.7451172	24.44986	7.8143199	4.000000	20.000000
##	2295	1997-02-25	2.7903364	24.44162	7.7792630	2.000000	2.888889
##	2296	1997-02-26	3.4688455	24.64004	7.9519161	2.000000	2.000000
##	2297	1997-02-27	2.8278292	24.52299	7.6160733	11.060606	7.757576
##	2298	1997-02-28	4.1443821	24.62049	8.0054877	20.121212	13.515152
##	2299	1997-03-01	3.0231250	24.62159	8.2079744	2.000000	2.000000
##	2300	1997-03-02	3.9727222	24.76392	7.1870393	14.322034	149.186441
##	2301	1997-03-03	1.9916604	24.76003	7.0399098	26.644068	296.372881
##	2302	1997-03-04	2.2714354	24.76425	7.3564612	3.583333	26.166667
##	2303	1997-03-05	3.9497939	24.02594	8.3484500	2.111111	3.555556
##	2304	1997-03-06	3.7764606	23.90572	8.1002046	767.750000	491.750000
##	2305	1997-03-07	3.6031273	23.78551	7.8519592	26.000000	180.000000
##	2306	1997-03-08	3.4297939	23.66530	7.6037139	12000.000000	12000.000000
##	2307	1997-03-09	3.2564606	23.54508	7.3554685	1532.444444	1909.111111
##	2308	1997-03-10	3.1643812	23.55396	7.3177461	3266.666667	2788.888889
##	2309	1997-03-11	3.0723018	23.56284	7.2800236	9.250000	27.750000
##	2310	1997-03-12	2.9802224	23.57171	7.2423012	241.454545	2950.727273
##	2311	1997-03-13	2.8881430	23.58059	7.2045788	12000.000000	12000.000000
##	2312	1997-03-14	2.7960636	23.58947	7.1668564	399.454545	441.954545
##	2313	1997-03-15	2.7698437	23.76767	7.4054579	985.000000	1160.000000
##	2314	1997-03-16	2.7436238	23.94588	7.6440595	3.777778	3.777778
##	2315	1997-03-17	3.0730807	23.86692	7.4543779	122.678571	191.071429
##	2316	1997-03-18	2.1702071	24.11497	7.5225212	46.000000	293.470588
##	2317	1997-03-19	2.7516786	24.08546	7.2799285	6.250000	10.500000
##	2318	1997-03-20	3.3331500	24.05595	7.0373358	2.740741	9.407407
##	2319	1997-03-21	2.7292061	24.08064	6.9953364	277.744681	447.021277
##	2320	1997-03-22	1.8346030	23.98482	6.9076682	86.545455	584.181818
##	2321	1997-03-23	0.9400000	23.88900	6.8200000	74.588517	658.880383
##	2322	1997-03-24	2.3928833	24.20304	7.0507133	62.631579	733.578947
##	2323	1997-03-25	3.8457667	24.51708	7.2814267	12.051282	132.000000
##	2324	1997-03-26	3.2009303	24.48223	7.2577848	7.750000	10.250000
##	2325	1997-03-27	2.5560939	24.44738	7.2341430	57.148936	607.021277
##	2326	1997-03-28	2.7308455	24.50189	7.2144848	61.666667	1273.666667
##	2327	1997-03-29	2.9055970	24.55639	7.1948267	27.681818	9.727273
##	2328	1997-03-30	2.9682091	24.60519	7.5085756	51.454545	430.363636

##	2329	1997-03-31	3.0308212	24.65400	7.8223244	4.000000	7.000000
##	2330	1997-04-01	3.0934333	24.70281	8.1360733	3.181818	4.818182
##	2331	1997-04-02	1.9971515	24.47747	7.8971561	237.888889	363.555556
##	2332	1997-04-03	1.3202542	24.41433	7.7640054	674.105263	650.263158
##	2333	1997-04-04	2.0449556	24.48784	8.0241504	241.641026	391.282051
##	2334	1997-04-05	2.0179098	24.53205	7.7308037	2.666667	2.000000
##	2335	1997-04-06	1.9715573	24.54520	7.6034849	330.250000	103.000000
##	2336	1997-04-07	1.9252049	24.55836	7.4761661	35.454545	169.818182
##	2337	1997-04-08	1.8788524	24.57151	7.3488473	18.000000	170.000000
##	2338	1997-04-09	1.8325000	24.58466	7.2215285	6.090909	34.818182
##	2339	1997-04-10	2.1351848	24.53775	7.5380582	2.722222	3.444444
##	2340	1997-04-11	2.0143263	24.50335	7.5594663	18.727273	44.363636
##	2341	1997-04-12	1.8934677	24.46894	7.5808743	12000.000000	12000.000000
##	2342	1997-04-13	1.7726091	24.43453	7.6022824	550.444444	248.500000
##	2343	1997-04-14	2.1880742	24.44761	7.6886636	1776.666667	1373.333333
##	2344	1997-04-15	2.6035394	24.46069	7.7750448	125.461538	51.076923
##	2345	1997-04-16	2.1030708	24.40733	7.2786375	1425.130769	809.713462
##	2346	1997-04-17	2.3252489	24.35579	7.7467149	2724.800000	1568.350000
##	2347	1997-04-18	1.9171833	24.48987	7.7694721	111.888889	27.111111
##	2348	1997-04-19	1.8540220	24.33873	7.6293920	140.250000	81.500000
##	2349	1997-04-20	1.7908606	24.18758	7.4893118	119.333333	47.538462
##	2350	1997-04-21	1.8268690	24.36407	7.3288736	220.000000	260.000000
##	2351	1997-04-22	1.8628773	24.54056	7.1684354	10.000000	13.250000
##	2352	1997-04-23	1.8988857	24.71705	7.0079971	282.304348	293.826087
##	2353	1997-04-24	1.9541879	24.83423	6.8136919	148.576271	844.779661
##	2354	1997-04-25	3.5617182	24.39076	7.7261676	11.555556	4.444444
##	2355	1997-04-26	1.8539042	24.78186	6.9850158	16.321429	15.642857
##	2356	1997-04-27	2.1152036	24.58443	7.2679275	426.000000	1219.636364
##	2357	1997-04-28	2.3765030	24.38701	7.5508391	119.350000	474.900000
##	2358	1997-04-29	2.1529515	24.44949	7.4812512	9.333333	32.666667
##	2359	1997-04-30	1.9294000	24.51198	7.4116633	13.666667	9.000000
##	2360	1997-05-01	2.0567167	24.63594	7.2149727	1123.636364	1159.454545
##	2361	1997-05-02	2.1840333	24.75991	7.0182821	8.666667	43.055556
##	2362	1997-05-03	2.2081071	24.67317	7.3713370	19.368421	59.684211
##	2363	1997-05-04	2.2321810	24.58644	7.7243919	2.357143	4.500000
##	2364	1997-05-05	2.3412789	24.54004	7.6605408	11.500000	9.000000
##	2365	1997-05-06	2.4503768	24.49364	7.5966897	1446.363636	1794.545455
##	2366	1997-05-07	2.5594748	24.44724	7.5328387	2440.000000	3920.000000
##	2367	1997-05-08	2.6685727	24.40084	7.4689876	6.722222	3.222222
##	2368	1997-05-09	2.4906038	24.34087	7.5336841	5.000000	11.750000
##	2369	1997-05-10	2.3126348	24.28089	7.5983806	6254.545455	4854.545455
##	2370	1997-05-11	2.1346659	24.22092	7.6630771	8956.666667	7896.666667
##	2371	1997-05-12	1.9566970	24.16094	7.7277736	380.000000	241.944444
##	2372	1997-05-13	2.3298323	24.20024	7.7525583	810.666667	421.000000
##	2373	1997-05-14	2.7029677	24.23953	7.7773429	76.750000	26.250000
##	2374	1997-05-15	3.0761030	24.27883	7.8021276	20.666667	26.111111
##	2375	1997-05-16	2.5404030	24.51998	7.5850273	479.931034	502.275862
##	2376	1997-05-17	3.2567244	24.51732	7.6403167	370.052632	435.578947
##	2377	1997-05-18	2.8695095	24.61778	7.5111857	11.466667	21.600000
##	2378	1997-05-19	3.3357942	24.43887	7.4459323	7.750000	22.000000
##	2379	1997-05-20	3.8020788	24.25996	7.3806788	50.277778	142.277778
##	2380	1997-05-21	3.5651848	24.34942	7.2568091	25.111111	50.333333
##	2381	1997-05-22	3.9276133	24.39373	7.2582739	1005.636364	310.727273
##	2382	1997-05-23	4.2900418	24.43805	7.2597388	3186.666667	613.333333

## 2383	1997-05-24	4.6524703	24.48237	7.2612036	112.250000	104.500000
## 2384	1997-05-25	5.0148988	24.52668	7.2626685	1817.272727	3729.272727
## 2385	1997-05-26	5.3773273	24.57100	7.2641333	309.166667	744.958333
## 2386	1997-05-27	4.3721486	24.62801	6.9953521	42.000000	320.000000
## 2387	1997-05-28	3.3669699	24.68501	6.7265708	658.526316	942.842105
## 2388	1997-05-29	2.3617912	24.74202	6.4577896	23.000000	880.000000
## 2389	1997-05-30	1.3566125	24.79903	6.1890083	14.962963	25.703704
## 2390	1997-05-31	1.8754047	24.96214	6.0504477	4.000000	6.500000
## 2391	1997-06-01	2.3941970	25.12525	5.9118870	28.127660	349.191489
## 2392	1997-06-02	3.3977576	25.11608	6.2098739	4076.000000	7733.333333
## 2393	1997-06-03	4.4013182	25.10690	6.5078609	7.333333	16.500000
## 2394	1997-06-04	8.0502058	25.25634	6.7631943	2.500000	2.750000
## 2395	1997-06-05	11.6990933	25.40579	7.0185277	11.692308	334.384615
## 2396	1997-06-06	16.1011854	25.41234	6.7745648	24.850000	441.200000
## 2397	1997-06-07	12.7855208	25.29370	7.1384650	3.214286	14.000000
## 2398	1997-06-08	10.3097571	25.46923	6.4521562	2.133333	26.266667
## 2399	1997-06-09	6.2036419	25.53219	5.9848072	7.750000	11.750000
## 2400	1997-06-10	2.0975267	25.59515	5.5174582	4.888889	9.111111
## 2401	1997-06-11	1.8027458	25.71352	5.1716854	50.067797	684.813559
## 2402	1997-06-12	11.4583091	25.33519	7.0980933	329.589744	856.871795
## 2403	1997-06-13	2.6979833	25.68427	5.4581798	44.312500	363.583333
## 2404	1997-06-14	4.2395977	25.24985	7.2295754	3.500000	7.000000
## 2405	1997-06-15	5.7812121	24.81544	9.0009709	260.723404	462.978723
## 2406	1997-06-16	5.2501303	24.91871	8.4547407	1105.000000	3539.000000
## 2407	1997-06-17	4.7190485	25.02197	7.9085105	3.750000	2.750000
## 2408	1997-06-18	4.1879667	25.12524	7.3622803	5.222222	51.888889
## 2409	1997-06-19	3.6870917	25.04488	7.3156055	2.000000	2.000000
## 2410	1997-06-20	3.1862167	24.96452	7.2689306	13.454545	742.363636
## 2411	1997-06-21	2.6853417	24.88415	7.2222558	1254.333333	3014.500000
## 2412	1997-06-22	2.1844667	24.80379	7.1755809	381.709091	628.145455
## 2413	1997-06-23	1.9400604	24.84099	6.7633240	450.000000	8666.666667
## 2414	1997-06-24	1.6956542	24.87818	6.3510671	3.142857	16.628571
## 2415	1997-06-25	2.3838939	25.45522	5.4064324	54.827586	1277.103448
## 2416	1997-06-26	2.6418111	25.59760	5.1618469	6.500000	28.600000
## 2417	1997-06-27	2.2325143	25.43990	5.7270586	23.000000	105.600000
## 2418	1997-06-28	3.6417499	25.18642	6.3001927	14.000000	43.000000
## 2419	1997-06-29	5.0509856	24.93295	6.8733268	24.363636	129.636364
## 2420	1997-06-30	6.4602212	24.67948	7.4464609	2.162162	2.702703
## 2421	1997-07-01	6.5873939	24.91899	6.9102061	9.250000	10.000000
## 2422	1997-07-02	6.7145667	25.15851	6.3739512	2.888889	5.500000
## 2423	1997-07-03	7.6187045	24.99871	7.0365130	9.272727	52.181818
## 2424	1997-07-04	8.5228424	24.83891	7.6990748	4.777778	39.888889
## 2425	1997-07-05	7.8657189	24.72207	7.6373241	4.750000	14.000000
## 2426	1997-07-06	7.2085955	24.60523	7.5755733	3.454545	5.272727
## 2427	1997-07-07	6.5514720	24.48840	7.5138226	4.250000	6.000000
## 2428	1997-07-08	5.8943485	24.37156	7.4520718	3.833333	8.388889
## 2429	1997-07-09	5.6538717	24.43687	7.0531065	12.545455	387.090909
## 2430	1997-07-10	5.4133949	24.50219	6.6541411	2.000000	7.000000
## 2431	1997-07-11	5.1729182	24.56751	6.2551758	34.444444	13.277778
## 2432	1997-07-12	6.0391439	24.60933	6.5910227	2.000000	2.000000
## 2433	1997-07-13	6.9053697	24.65115	6.9268697	18.555556	160.666667
## 2434	1997-07-14	6.1980778	24.70514	6.2989504	228.363636	661.272727
## 2435	1997-07-15	7.0496833	24.47049	6.1826321	2.148148	3.259259
## 2436	1997-07-16	6.4403286	24.83249	6.9998586	2.666667	9.666667

## 2437	1997-07-17	4.4026788	25.01971	5.3725300	4.272727	21.500000
## 2438	1997-07-18	7.6932838	25.04152	5.8950216	5.454545	4.545455
## 2439	1997-07-19	10.9838889	25.06332	6.4175132	3.250000	254.500000
## 2440	1997-07-20	14.2744939	25.08513	6.9400048	8.978723	9.361702
## 2441	1997-07-21	13.9654939	25.30114	5.8365473	3.777778	6.722222
## 2442	1997-07-22	9.6259059	25.33262	5.7574933	2.000000	2.750000
## 2443	1997-07-23	5.2863178	25.36411	5.6784393	32.750000	176.678571
## 2444	1997-07-24	3.1828190	25.17742	5.8165471	2.571429	6.666667
## 2445	1997-07-25	1.97778704	25.31069	5.9375378	102.962963	1409.481481
## 2446	1997-07-26	2.6914896	25.19744	6.2009662	41.250000	488.428571
## 2447	1997-07-27	7.2091576	24.62403	7.6253227	2.277778	3.666667
## 2448	1997-07-28	9.0520818	24.42865	8.7736009	19.379310	49.862069
## 2449	1997-07-29	13.1868911	24.45279	8.6357173	133.500000	405.944444
## 2450	1997-07-30	9.0502042	24.62430	6.8444654	10.000000	134.514286
## 2451	1997-07-31	5.7430976	24.86255	7.8432626	4.000000	9.400000
## 2452	1997-08-01	5.7952049	24.57373	8.2003919	22.727273	19.454545
## 2453	1997-08-02	5.8473121	24.28490	8.5575212	3.000000	3.136364
## 2454	1997-08-03	4.4460636	24.17550	8.4262509	5.781818	3.636364
## 2455	1997-08-04	5.3574214	24.53295	7.6838161	2.750000	3.250000
## 2456	1997-08-05	6.2687792	24.89040	6.9413813	15.842105	84.052632
## 2457	1997-08-06	5.3191424	25.19166	7.0718867	2.333333	3.000000
## 2458	1997-08-07	3.5921422	25.25927	7.1038840	7.555556	32.111111
## 2459	1997-08-08	4.6592476	25.04410	7.7626324	4.800000	24.400000
## 2460	1997-08-09	7.9781394	24.55815	8.4429970	7.500000	16.727273
## 2461	1997-08-10	8.6820020	24.53416	8.3878519	14.545455	64.000000
## 2462	1997-08-11	9.3858646	24.51017	8.3327069	3.250000	9.500000
## 2463	1997-08-12	10.0897273	24.48618	8.2775618	3.833333	5.500000
## 2464	1997-08-13	8.6920265	24.54470	7.9274757	112.181818	429.090909
## 2465	1997-08-14	7.2943258	24.60322	7.5773895	6.750000	21.500000
## 2466	1997-08-15	5.8966250	24.66173	7.2273034	4.000000	13.636364
## 2467	1997-08-16	4.4989242	24.72025	6.8772173	2.590909	7.136364
## 2468	1997-08-17	5.5318773	24.53907	7.3230697	4.000000	6.000000
## 2469	1997-08-18	6.5648303	24.35789	7.7689221	3.045455	9.954545
## 2470	1997-08-19	4.0498242	24.73025	6.9389400	4.072727	14.218182
## 2471	1997-08-20	4.8722625	24.68483	6.8523754	2.800000	6.971429
## 2472	1997-08-21	6.8881388	24.79433	7.0563486	4.727273	6.545455
## 2473	1997-08-22	8.9040152	24.90384	7.2603218	3.222222	3.555556
## 2474	1997-08-23	8.4939622	25.00743	6.8666929	76.944444	362.722222
## 2475	1997-08-24	5.3615286	25.06275	6.5088500	3.266667	9.133333
## 2476	1997-08-25	5.8131716	25.04115	6.3397517	9.000000	3.750000
## 2477	1997-08-26	6.2648146	25.01956	6.1706534	11.454545	46.000000
## 2478	1997-08-27	6.7164576	24.99797	6.0015552	2.055556	4.055556
## 2479	1997-08-28	8.0373121	24.94576	6.3599079	2.250000	2.000000
## 2480	1997-08-29	9.3581667	24.89355	6.7182606	4.111111	5.000000
## 2481	1997-08-30	7.9872424	24.87903	6.8003861	2.545455	2.181818
## 2482	1997-08-31	6.6163182	24.86451	6.8825115	2.444444	2.666667
## 2483	1997-09-01	6.9700652	24.84281	6.7776503	2.000000	4.500000
## 2484	1997-09-02	7.3238121	24.82112	6.6727891	14.000000	10.275862
## 2485	1997-09-03	3.8883156	24.93468	6.5230707	104.055556	455.888889
## 2486	1997-09-04	3.6175500	24.56323	6.3706558	40.800000	12.228571
## 2487	1997-09-05	8.0500286	24.66889	7.6358662	21.636364	84.545455
## 2488	1997-09-06	1.9666500	24.97634	5.9582135	21.850000	216.950000
## 2489	1997-09-07	2.5247981	25.07372	5.5804264	16.625000	419.609375
## 2490	1997-09-08	2.5877417	25.08275	5.8056652	4.785714	29.285714

## 2491	1997-09-09	5.6026000	24.49790	6.9813085	2.055556	2.000000
## 2492	1997-09-10	3.9246515	24.31152	7.0344274	111.894737	104.105263
## 2493	1997-09-11	2.2467030	24.12515	7.0875464	2.222222	4.722222
## 2494	1997-09-12	2.3165924	24.36103	6.8759005	62.500000	104.750000
## 2495	1997-09-13	2.3864818	24.59691	6.6642545	3.234043	6.425532
## 2496	1997-09-14	3.2088727	24.76234	6.4411611	22.750000	13.250000
## 2497	1997-09-15	4.0312636	24.92777	6.2180676	17.666667	228.666667
## 2498	1997-09-16	4.6734652	24.82235	6.6238183	4.181818	4.363636
## 2499	1997-09-17	5.3156667	24.71692	7.0295691	2.909091	8.545455
## 2500	1997-09-18	7.8655879	24.81508	8.0568676	5.555556	115.111111
## 2501	1997-09-19	5.1187467	24.65294	7.9074691	5.021277	15.191489
## 2502	1997-09-20	4.7619119	24.61353	8.1140038	2.266667	6.066667
## 2503	1997-09-21	3.6304333	24.47821	7.5810462	2.518519	5.629630
## 2504	1997-09-22	2.2802167	24.18410	7.1855231	16.750000	37.000000
## 2505	1997-09-23	0.9300000	23.89000	6.7900000	9.272727	95.818182
## 2506	1997-09-24	3.2943485	24.59814	6.0843227	2.222222	4.666667
## 2507	1997-09-25	3.3474273	24.58291	6.2504042	4.750000	4.500000
## 2508	1997-09-26	3.4005061	24.56767	6.4164858	2.638298	7.957447
## 2509	1997-09-27	2.9189924	24.56755	6.3414792	2.000000	4.750000
## 2510	1997-09-28	2.4374788	24.56744	6.2664727	3.888889	20.944444
## 2511	1997-09-29	2.6261561	24.61550	6.6229486	2.421053	3.157895
## 2512	1997-09-30	2.8148333	24.66357	6.9794245	5.444444	23.722222
## 2513	1997-10-01	2.3790083	24.81438	6.7625758	4.250000	37.000000
## 2514	1997-10-02	1.9431833	24.96519	6.5457271	3.105263	5.157895
## 2515	1997-10-03	6.4886606	25.06507	7.5342776	7.000000	45.111111
## 2516	1997-10-04	5.0391978	24.96041	7.4830218	6.444444	93.833333
## 2517	1997-10-05	4.7525381	25.06758	7.0897026	3.600000	15.000000
## 2518	1997-10-06	3.5349788	24.97699	7.3960400	4.772727	21.954545
## 2519	1997-10-07	3.2727303	24.95865	7.4859376	9.090909	2.545455
## 2520	1997-10-08	3.0104818	24.94030	7.5758352	13.777778	77.500000
## 2521	1997-10-09	3.2095295	24.94677	7.5382733	4.750000	6.500000
## 2522	1997-10-10	3.4085773	24.95324	7.5007114	5.454545	53.272727
## 2523	1997-10-11	3.6076250	24.95971	7.4631496	6.477273	28.261364
## 2524	1997-10-12	3.4693354	24.93534	7.3564349	7.500000	3.250000
## 2525	1997-10-13	3.3310458	24.91096	7.2497203	11.090909	15.818182
## 2526	1997-10-14	3.1927562	24.88659	7.1430056	5.500000	97.250000
## 2527	1997-10-15	3.0544667	24.86222	7.0362910	927.750000	1248.625000
## 2528	1997-10-16	3.8378955	24.89839	7.4250381	1850.000000	2400.000000
## 2529	1997-10-17	4.6213242	24.93456	7.8137852	3.000000	8.307692
## 2530	1997-10-18	4.7809933	24.91761	8.0733462	168.212766	576.127660
## 2531	1997-10-19	3.7422262	24.94919	7.7630931	32.266667	218.400000
## 2532	1997-10-20	2.1728917	24.79153	7.8582096	2.000000	2.370370
## 2533	1997-10-21	1.9307292	25.06626	6.9271078	2.500000	4.250000
## 2534	1997-10-22	1.6885667	25.34098	5.9960060	10.642857	27.285714
## 2535	1997-10-23	1.8026625	25.47761	5.6087904	11.000000	33.000000
## 2536	1997-10-24	2.7238667	25.28060	6.4811779	3.111111	7.666667
## 2537	1997-10-25	2.1693083	25.43300	5.9810144	9.373134	20.507463
## 2538	1997-10-26	6.3634667	25.17348	7.8566336	3.000000	11.833333
## 2539	1997-10-27	5.5491182	25.09490	7.9038548	4.181818	7.318182
## 2540	1997-10-28	6.3488242	25.08873	7.7806108	22.181818	9.272727
## 2541	1997-10-29	7.1485303	25.08256	7.6573668	3.250000	9.250000
## 2542	1997-10-30	7.9482364	25.07639	7.5341227	2.777778	6.555556
## 2543	1997-10-31	4.6430929	25.16923	7.6848514	2.600000	4.733333
## 2544	1997-11-01	8.5988687	25.12941	8.2525837	26.000000	349.090909

##	2545	1997-11-02	12.5546444	25.08958	8.8203160	5.388889	33.000000
##	2546	1997-11-03	11.4979939	25.08599	8.8906406	4.076923	29.538462
##	2547	1997-11-04	6.8144333	24.98919	8.6230221	2.222222	6.333333
##	2548	1997-11-05	4.0195576	24.89497	8.2341673	4.680851	12.340426
##	2549	1997-11-06	3.6062768	24.97094	7.9059223	381.894737	1513.684211
##	2550	1997-11-07	3.1929960	25.04691	7.5776774	1002.000000	4040.666667
##	2551	1997-11-08	2.7797152	25.12289	7.2494324	10.055556	91.722222
##	2552	1997-11-09	3.0094000	25.26583	6.5684967	9.300505	68.474747
##	2553	1997-11-10	3.9348455	25.30792	6.6944439	8.545455	45.227273
##	2554	1997-11-11	5.7537364	25.24920	6.9958742	12000.000000	12000.000000
##	2555	1997-11-12	7.5726273	25.19047	7.2973045	4.055556	7.388889
##	2556	1997-11-13	8.9188603	25.27343	7.2695787	5.750000	18.750000
##	2557	1997-11-14	10.2650933	25.35638	7.2418529	268.808511	457.106383
##	2558	1997-11-15	6.1314049	25.49307	6.4979749	368.303030	1050.181818
##	2559	1997-11-16	3.2054125	25.59682	5.6280796	49.333333	22.296296
##	2560	1997-11-17	7.5641250	25.58617	5.9831183	2.000000	2.000000
##	2561	1997-11-18	10.9832268	25.51465	6.9631173	10.500000	4.500000
##	2562	1997-11-19	14.4023286	25.44313	7.9431162	68.500000	79.833333
##	2563	1997-11-20	11.1006764	25.52261	7.6791640	20.000000	55.090909
##	2564	1997-11-21	7.7990242	25.60209	7.4152118	317.894737	321.578947
##	2565	1997-11-22	9.3490606	25.54007	7.7875245	2.250000	2.750000
##	2566	1997-11-23	10.8990970	25.47804	8.1598373	1141.818182	1299.272727
##	2567	1997-11-24	12.4491333	25.41602	8.5321500	318.526316	326.315789
##	2568	1997-11-25	7.4986015	25.41601	7.7727047	2.250000	5.000000
##	2569	1997-11-26	2.5480697	25.41600	7.0132594	5.055556	34.111111
##	2570	1997-11-27	2.3902812	25.38289	6.7811138	109.263158	340.526316
##	2571	1997-11-28	2.2324927	25.34978	6.5489681	70.000000	154.000000
##	2572	1997-11-29	2.0747042	25.31668	6.3168225	300.695652	745.130435
##	2573	1997-11-30	3.8688621	25.34489	6.3772196	12000.000000	12000.000000
##	2574	1997-12-01	5.6630200	25.37310	6.4376167	160.611111	623.166667
##	2575	1997-12-02	5.6119697	25.38913	6.1596006	2.333333	4.777778
##	2576	1997-12-03	2.3709143	25.64184	5.4933090	4.157895	19.052632
##	2577	1997-12-04	2.1222289	25.72283	5.4392476	5.250000	64.428571
##	2578	1997-12-05	1.2046396	25.81116	4.9834231	61.720000	526.080000
##	2579	1997-12-06	9.7156667	25.44282	6.2709545	10.444444	12.277778
##	2580	1997-12-07	1.8485333	25.82150	5.2416231	10.750000	31.000000
##	2581	1997-12-08	3.7303220	25.67179	5.7125089	6.250000	13.500000
##	2582	1997-12-09	5.6121106	25.52208	6.1833946	20.000000	1211.636364
##	2583	1997-12-10	7.4938992	25.37237	6.6542803	10.000000	750.000000
##	2584	1997-12-11	9.3756879	25.22266	7.1251661	3.000000	25.000000
##	2585	1997-12-12	9.2840384	25.27358	6.8874080	4.500000	15.750000
##	2586	1997-12-13	9.1923889	25.32450	6.6496499	11.454545	135.272727
##	2587	1997-12-14	9.1007394	25.37542	6.4118918	8.594595	101.027027
##	2588	1997-12-15	9.7035182	25.32249	6.2428652	2.750000	5.750000
##	2589	1997-12-16	10.3062970	25.26956	6.0738385	2.666667	8.611111
##	2590	1997-12-17	10.7469192	25.19782	6.5003171	1134.909091	1398.545455
##	2591	1997-12-18	11.1875414	25.12607	6.9267957	6170.000000	9600.000000
##	2592	1997-12-19	11.6281636	25.05432	7.3532742	5.636364	2.818182
##	2593	1997-12-20	6.8858222	25.35040	6.1606291	6.611111	18.055556
##	2594	1997-12-21	8.0198909	25.27124	5.9839155	4.758621	4.551724
##	2595	1997-12-22	4.4938833	25.28389	6.9708895	10.789474	102.315789
##	2596	1997-12-23	6.8676625	25.12649	5.7415233	3.407407	3.333333
##	2597	1997-12-24	8.8170873	24.90450	6.8350550	13.578947	11.263158
##	2598	1997-12-25	10.7665121	24.68250	7.9285867	12.277778	93.444444

##	2599	1997-12-26	9.5227616	24.72056	7.6107004	101.750000	61.250000
##	2600	1997-12-27	8.2790111	24.75862	7.2928141	1240.909091	4129.818182
##	2601	1997-12-28	7.0352606	24.79668	6.9749279	305.200000	311.650000
##	2602	1997-12-29	5.7572020	24.81672	6.8954980	260.000000	12000.000000
##	2603	1997-12-30	4.4791434	24.83677	6.8160681	12.250000	7.250000
##	2604	1997-12-31	3.2010848	24.85681	6.7366382	56.468085	278.468085
##	2605	1998-01-01	4.4350909	24.72410	6.8968061	18.000000	1000.000000
##	2606	1998-01-02	5.6690970	24.59139	7.0569739	7.111111	15.222222
##	2607	1998-01-03	8.8896218	24.65200	7.3785880	2.750000	4.750000
##	2608	1998-01-04	12.1101467	24.71261	7.7002020	6.255319	10.042553
##	2609	1998-01-05	6.1845500	24.38122	6.7997587	2.074074	4.592593
##	2610	1998-01-06	7.7332214	24.75496	7.9914900	18.466667	143.666667
##	2611	1998-01-07	12.9994727	24.45702	8.3715315	4.384615	13.307692
##	2612	1998-01-08	6.3419152	24.72031	6.0746982	4.765957	7.446809
##	2613	1998-01-09	6.1654742	24.44534	6.4735556	3.000000	8.500000
##	2614	1998-01-10	5.9890333	24.17038	6.8724130	4.111111	5.277778
##	2615	1998-01-11	5.1911990	24.46080	6.4930883	12.545455	37.818182
##	2616	1998-01-12	4.3933646	24.75121	6.1137635	24.500000	9.250000
##	2617	1998-01-13	3.5955303	25.04162	5.7344388	2.166667	2.388889
##	2618	1998-01-14	3.9613165	25.03371	5.8075734	12.421053	22.210526
##	2619	1998-01-15	4.3271027	25.02579	5.8807080	2.000000	4.500000
##	2620	1998-01-16	4.6928889	25.01787	5.9538427	5.000000	28.142857
##	2621	1998-01-17	3.7153813	25.06971	5.7214350	73.916667	917.000000
##	2622	1998-01-18	2.3675187	25.10061	5.5774690	6.083333	9.458333
##	2623	1998-01-19	4.2502442	24.86408	6.5409201	16.750000	7.750000
##	2624	1998-01-20	6.1329697	24.62754	7.5043712	19.689655	19.103448
##	2625	1998-01-21	4.7555689	24.63457	7.2707616	126.944444	421.444444
##	2626	1998-01-22	4.8818690	24.68193	7.1153876	2.000000	2.000000
##	2627	1998-01-23	3.4039500	24.50647	7.5554083	2.000000	2.000000
##	2628	1998-01-24	3.4297883	24.31560	7.5740128	5.750000	19.750000
##	2629	1998-01-25	3.4556265	24.12474	7.5926173	24.363636	4002.545455
##	2630	1998-01-26	3.4814648	23.93388	7.6112219	3.500000	91.500000
##	2631	1998-01-27	3.5073030	23.74302	7.6298264	6.500000	103.722222
##	2632	1998-01-28	2.9781227	24.03286	7.6442732	3.750000	5.750000
##	2633	1998-01-29	2.4489424	24.32271	7.6587200	2.000000	2.722222
##	2634	1998-01-30	2.6220970	24.02212	7.5128992	25.636364	247.272727
##	2635	1998-01-31	2.7952515	23.72152	7.3670785	2.055556	3.888889
##	2636	1998-02-01	2.5028061	23.79269	7.5787424	5.500000	32.000000
##	2637	1998-02-02	2.2103606	23.86386	7.7904064	2.500000	9.222222
##	2638	1998-02-03	2.1753717	23.83783	7.6400722	6.909091	56.545455
##	2639	1998-02-04	2.1403828	23.81179	7.4897381	21.000000	11.500000
##	2640	1998-02-05	2.1053939	23.78575	7.3394039	2.055556	2.722222
##	2641	1998-02-06	3.2891444	24.65491	7.3280604	18.611111	70.277778
##	2642	1998-02-07	2.9460544	24.74283	7.2752227	3.578947	3.684211
##	2643	1998-02-08	2.6029643	24.83075	7.2223850	7.333333	7.800000
##	2644	1998-02-09	2.5094042	24.45502	7.6506367	4.000000	7.333333
##	2645	1998-02-10	4.7629000	24.72298	7.4697127	2.777778	2.111111
##	2646	1998-02-11	4.5647152	24.67931	7.6874900	3.750000	5.250000
##	2647	1998-02-12	4.3665303	24.63563	7.9052673	23.636364	78.909091
##	2648	1998-02-13	4.1683455	24.59195	8.1230445	2.777778	6.833333
##	2649	1998-02-14	5.3269758	24.75973	8.2343815	2.545455	4.636364
##	2650	1998-02-15	6.6026566	24.79700	8.3072309	72.909091	33.454545
##	2651	1998-02-16	7.8783374	24.83427	8.3800803	2.000000	9.000000
##	2652	1998-02-17	9.1540182	24.87154	8.4529297	4.255319	28.765957

##	2653	1998-02-18	4.4720424	24.66487	8.4102618	2.090909	4.363636
##	2654	1998-02-19	4.1484455	24.56972	8.3223756	6.181818	16.000000
##	2655	1998-02-20	3.8248485	24.47457	8.2344894	3.363636	10.954545
##	2656	1998-02-21	6.1054378	24.36485	8.2420798	30.500000	134.222222
##	2657	1998-02-22	2.1473167	24.53807	7.3814146	2.894737	11.684211
##	2658	1998-02-23	5.2077788	24.72340	7.4320082	2.076923	3.000000
##	2659	1998-02-24	3.5560810	24.69821	7.4938336	3.800000	6.333333
##	2660	1998-02-25	2.7555152	24.52311	7.8129979	5.833333	85.333333
##	2661	1998-02-26	2.6440242	24.29412	7.8938395	7.473684	19.789474
##	2662	1998-02-27	2.5325333	24.06513	7.9746812	7.277778	2.000000
##	2663	1998-02-28	2.4726738	24.25088	7.6765633	3.250000	10.500000
##	2664	1998-03-01	2.4128142	24.43662	7.3784453	5.272727	7.818182
##	2665	1998-03-02	2.3529547	24.62236	7.0803274	2.750000	3.000000
##	2666	1998-03-03	2.2930951	24.80811	6.7822095	36.545455	43.090909
##	2667	1998-03-04	2.2332356	24.99385	6.4840916	16.177778	113.244444
##	2668	1998-03-05	2.1069937	24.99712	6.3899723	38.791667	467.833333
##	2669	1998-03-06	2.3285146	24.99635	6.6005008	2.000000	2.000000
##	2670	1998-03-07	1.9046121	24.57516	7.8449282	6.227273	9.863636
##	2671	1998-03-08	4.1737756	24.73661	7.8116320	28.833333	145.444444
##	2672	1998-03-09	3.4132091	24.70702	7.7066291	3.310345	2.689655
##	2673	1998-03-10	2.2769458	24.43829	7.8838175	2.000000	2.000000
##	2674	1998-03-11	2.5843429	24.53036	7.7861248	37.736842	67.947368
##	2675	1998-03-12	2.1410608	24.33199	7.7259339	462.363636	4840.909091
##	2676	1998-03-13	1.6977788	24.13362	7.6657430	233.951220	651.707317
##	2677	1998-03-14	1.5097773	24.08387	7.6363950	9.500000	5.750000
##	2678	1998-03-15	1.3217758	24.03412	7.6070470	4.553191	8.127660
##	2679	1998-03-16	2.2436727	24.17215	7.5364503	14.750000	17.500000
##	2680	1998-03-17	3.1655697	24.31018	7.4658536	2.472727	5.163636
##	2681	1998-03-18	2.8935000	24.35330	7.4304930	2.944444	15.500000
##	2682	1998-03-19	3.0164636	24.38883	7.5265742	11.750000	28.750000
##	2683	1998-03-20	3.1394273	24.42437	7.6226555	8.909091	3.636364
##	2684	1998-03-21	3.2623909	24.45991	7.7187367	2.055556	3.500000
##	2685	1998-03-22	2.6035330	24.38256	7.5740662	2.750000	15.250000
##	2686	1998-03-23	1.9446750	24.30521	7.4293958	17.473684	12.052632
##	2687	1998-03-24	3.5906283	24.32976	7.5284185	3.833333	15.555556
##	2688	1998-03-25	2.7906061	24.42388	7.4731452	2.000000	2.666667
##	2689	1998-03-26	1.8489714	24.48662	7.4284645	2.066667	2.666667
##	2690	1998-03-27	2.5005660	24.41144	7.5211736	41.250000	75.750000
##	2691	1998-03-28	3.1521606	24.33625	7.6138827	3.555556	12.277778
##	2692	1998-03-29	2.7848475	24.33378	7.6289764	6.909091	3.272727
##	2693	1998-03-30	2.4175343	24.33131	7.6440700	48.750000	23.000000
##	2694	1998-03-31	2.0502212	24.32883	7.6591636	29.404255	132.808511
##	2695	1998-04-01	2.1504636	24.45747	7.5516526	2.250000	8.000000
##	2696	1998-04-02	2.2507061	24.58611	7.4441415	5.555556	17.611111
##	2697	1998-04-03	2.2571717	24.61336	7.5011741	3.818182	5.454545
##	2698	1998-04-04	2.2636374	24.64062	7.5582068	32.750000	57.750000
##	2699	1998-04-05	2.2701030	24.66788	7.6152394	2.722222	5.888889
##	2700	1998-04-06	1.7853917	24.66308	7.6279554	3.703704	18.888889
##	2701	1998-04-07	3.9217333	24.70292	7.6028818	400.054054	981.351351
##	2702	1998-04-08	2.7927079	24.70798	7.4239055	5.030303	103.575758
##	2703	1998-04-09	2.5357133	24.79492	7.0412524	2.000000	10.444444
##	2704	1998-04-10	2.3530909	24.70007	7.2431797	3.055556	24.722222
##	2705	1998-04-11	2.4783778	24.74488	7.3501658	26.250000	17.750000
##	2706	1998-04-12	2.6036646	24.78969	7.4571518	22.000000	90.545455

##	2707	1998-04-13	2.7289515	24.83450	7.5641379	13.166667	3.277778
##	2708	1998-04-14	2.6686261	24.83929	7.4768041	168.250000	10.500000
##	2709	1998-04-15	2.6083008	24.84408	7.3894702	10.363636	24.909091
##	2710	1998-04-16	2.5479754	24.84887	7.3021364	3.000000	4.750000
##	2711	1998-04-17	2.4876500	24.85366	7.2148026	3.684211	2.947368
##	2712	1998-04-18	3.1767105	24.86380	7.3643311	11.416667	9.166667
##	2713	1998-04-19	3.1181053	24.97323	7.1126200	21.250000	7.000000
##	2714	1998-04-20	3.0595000	25.08267	6.8609089	8.722222	11.111111
##	2715	1998-04-21	1.5593854	25.27884	5.6953544	56.474576	357.593220
##	2716	1998-04-22	2.6197833	25.20260	6.1145423	25.458333	82.916667
##	2717	1998-04-23	5.2088424	24.97169	7.6708655	2.045455	2.500000
##	2718	1998-04-24	3.6228773	25.06844	7.7736441	2.181818	5.818182
##	2719	1998-04-25	2.0369121	25.16519	7.8764227	5.909091	5.954545
##	2720	1998-04-26	1.7768178	25.14403	6.7379980	18.177778	73.466667
##	2721	1998-04-27	1.9386576	25.05635	8.0293806	2.727273	4.036364
##	2722	1998-04-28	1.7835758	24.97559	7.7814282	2.333333	8.055556
##	2723	1998-04-29	1.7885141	24.97137	7.7470247	8.250000	5.000000
##	2724	1998-04-30	1.7934525	24.96716	7.7126213	719.454545	256.000000
##	2725	1998-05-01	1.7983909	24.96294	7.6782179	10.777778	17.111111
##	2726	1998-05-02	1.8917616	24.95489	7.6898499	17.600000	6.800000
##	2727	1998-05-03	1.9851323	24.94685	7.7014819	4.727273	47.636364
##	2728	1998-05-04	2.0785030	24.93881	7.7131139	3.363636	4.136364
##	2729	1998-05-05	1.8121078	25.01683	7.2498393	26.000000	35.272727
##	2730	1998-05-06	1.5457125	25.09485	6.7865646	4.962963	30.740741
##	2731	1998-05-07	2.2517190	25.05295	6.9970367	3.000000	3.400000
##	2732	1998-05-08	3.3055667	25.09985	6.8095655	12.153846	9.384615
##	2733	1998-05-09	3.1875333	25.04515	7.0670777	3275.272727	1771.636364
##	2734	1998-05-10	3.0695000	24.99046	7.3245900	254.350000	301.150000
##	2735	1998-05-11	2.5775333	24.91614	7.5972148	8.727273	12.954545
##	2736	1998-05-12	3.4228242	25.09766	6.8902755	9.090909	20.454545
##	2737	1998-05-13	2.9583889	25.23853	6.4360995	478.545455	2041.454545
##	2738	1998-05-14	2.4939535	25.37941	5.9819235	910.000000	2000.000000
##	2739	1998-05-15	2.0295182	25.52028	5.5277476	23.694444	1001.500000
##	2740	1998-05-16	4.7888576	25.58735	5.6623177	3.250000	3.000000
##	2741	1998-05-17	7.5481970	25.65442	5.7968879	2.111111	3.222222
##	2742	1998-05-18	13.1349711	25.60560	7.1388833	12.085106	87.234043
##	2743	1998-05-19	6.9200500	25.39445	7.0866254	3.210526	5.315789
##	2744	1998-05-20	9.3059500	25.47481	7.2949683	3.200000	4.200000
##	2745	1998-05-21	9.9807121	25.33779	7.8442558	5.890909	9.490909
##	2746	1998-05-22	3.8402545	25.26439	6.8637915	4.045455	4.863636
##	2747	1998-05-23	4.6696803	25.17002	7.1377079	2.909091	2.000000
##	2748	1998-05-24	5.4991061	25.07564	7.4116242	42.681818	2.909091
##	2749	1998-05-25	4.8525690	25.20013	6.9333318	84.545455	978.545455
##	2750	1998-05-26	4.2060319	25.32463	6.4550393	12.000000	565.000000
##	2751	1998-05-27	3.5594948	25.44913	5.9767469	2.750000	3.000000
##	2752	1998-05-28	2.9129578	25.57362	5.4984544	3.166667	4.695122
##	2753	1998-05-29	2.7099357	25.42484	6.1382436	3.707317	6.390244
##	2754	1998-05-30	7.5890485	25.43410	6.1651948	2.000000	2.222222
##	2755	1998-05-31	1.9957458	25.26308	6.6177363	2.148148	5.037037
##	2756	1998-06-01	1.7267685	25.36711	6.1221385	90.000000	13.000000
##	2757	1998-06-02	1.4577911	25.47114	5.6265407	20.088889	203.644444
##	2758	1998-06-03	1.3644351	25.51661	5.3953500	2.909091	5.818182
##	2759	1998-06-04	1.2710792	25.56208	5.1641594	50.041667	374.375000
##	2760	1998-06-05	4.8790944	25.48596	5.6525461	3.153846	2.307692

##	2761	1998-06-06	6.2720909	25.25476	6.2910721	9.444444	24.777778
##	2762	1998-06-07	2.5543733	25.80796	4.3564973	46.975610	216.878049
##	2763	1998-06-08	6.2774352	25.67549	5.2219667	6.250000	9.000000
##	2764	1998-06-09	10.0004970	25.54303	6.0874361	22.833333	388.000000
##	2765	1998-06-10	9.5010015	25.43659	6.4605264	5.473684	162.315789
##	2766	1998-06-11	9.0015061	25.33014	6.8336167	6.105263	165.157895
##	2767	1998-06-12	14.3518121	24.99975	7.8723930	2.454545	3.500000
##	2768	1998-06-13	10.2816773	25.08672	7.3313877	5.090909	30.000000
##	2769	1998-06-14	6.2115424	25.17369	6.7903824	2.388889	19.666667
##	2770	1998-06-15	4.5623581	25.34822	6.1387742	5.000000	6.250000
##	2771	1998-06-16	2.9131738	25.52276	5.4871660	5.170732	26.048780
##	2772	1998-06-17	6.1351758	25.46951	5.7453800	2.000000	2.666667
##	2773	1998-06-18	4.2551822	25.57848	5.3181033	6.277778	20.333333
##	2774	1998-06-19	12.4647208	25.46292	6.3751467	11.629630	73.925926
##	2775	1998-06-20	12.6516543	25.47836	6.3550739	3.250000	2.250000
##	2776	1998-06-21	12.8385878	25.49380	6.3350012	4.727273	49.454545
##	2777	1998-06-22	13.0255212	25.50924	6.3149285	2.888889	4.000000
##	2778	1998-06-23	10.9247828	25.28261	7.0258352	5.000000	8.250000
##	2779	1998-06-24	8.8240444	25.05599	7.7367418	6.727273	31.636364
##	2780	1998-06-25	6.7233061	24.82936	8.4476485	2.555556	7.055556
##	2781	1998-06-26	7.7075000	24.91352	7.9255334	4.000000	9.000000
##	2782	1998-06-27	8.6916939	24.99768	7.4034184	20.727273	9.454545
##	2783	1998-06-28	9.6758879	25.08185	6.8813033	2.909091	6.909091
##	2784	1998-06-29	10.8308818	25.17828	6.8933433	3.611111	12.055556
##	2785	1998-06-30	5.0339956	25.40156	5.7553518	22.000000	89.745455
##	2786	1998-07-01	3.9101857	25.35018	6.5073710	16.000000	48.333333
##	2787	1998-07-02	8.9114542	25.29326	6.1895350	6.148148	14.962963
##	2788	1998-07-03	7.5239121	25.32816	6.3439242	2.000000	2.888889
##	2789	1998-07-04	16.6182697	25.09308	7.2996406	2.166667	3.666667
##	2790	1998-07-05	16.3722470	25.03647	7.5417439	2.250000	4.250000
##	2791	1998-07-06	16.1262242	24.97986	7.7838471	41.636364	24.909091
##	2792	1998-07-07	15.8802015	24.92325	8.0259504	8.500000	28.500000
##	2793	1998-07-08	15.6341788	24.86664	8.2680536	2.277778	3.388889
##	2794	1998-07-09	13.5143960	24.79574	8.0580667	7.818182	8.909091
##	2795	1998-07-10	11.3946131	24.72484	7.8480797	1051.750000	124.000000
##	2796	1998-07-11	9.2748303	24.65393	7.6380927	2.510638	2.510638
##	2797	1998-07-12	7.9198152	24.91368	7.0529456	4.000000	25.750000
##	2798	1998-07-13	6.5648000	25.17342	6.4677984	32.533333	196.577778
##	2799	1998-07-14	4.5997604	25.26587	6.2367877	25.254237	155.016949
##	2800	1998-07-15	4.2139917	25.20036	6.5961715	4.035714	31.500000
##	2801	1998-07-16	4.7496606	24.42902	6.8602533	54.611111	40.944444
##	2802	1998-07-17	7.8056303	24.62689	7.0358109	2.000000	2.000000
##	2803	1998-07-18	6.6470640	24.72567	7.4106809	2.000000	2.181818
##	2804	1998-07-19	5.4884976	24.82444	7.7855510	4.105263	8.736842
##	2805	1998-07-20	5.7918956	24.92885	6.6390751	19.333333	20.000000
##	2806	1998-07-21	4.4917292	25.03327	7.3445763	2.148148	3.111111
##	2807	1998-07-22	4.9991828	24.84659	7.7369418	21.157895	6.526316
##	2808	1998-07-23	5.5066364	24.65992	8.1293073	2.777778	2.000000
##	2809	1998-07-24	5.3841859	24.52205	8.1450814	7.750000	5.500000
##	2810	1998-07-25	5.2617354	24.38419	8.1608556	10.545455	7.090909
##	2811	1998-07-26	5.1392848	24.24632	8.1766297	2.055556	2.555556
##	2812	1998-07-27	5.8491697	24.11864	8.2064886	6.250000	192.750000
##	2813	1998-07-28	6.5590545	23.99097	8.2363476	2.765957	3.489362
##	2814	1998-07-29	5.2191273	24.11605	8.1399685	2.000000	2.500000

##	2815	1998-07-30	5.6734803	24.09109	8.1881021	3.500000	16.750000
##	2816	1998-07-31	6.1278333	24.06613	8.2362358	2.000000	2.000000
##	2817	1998-08-01	5.0498292	23.97883	7.9573533	11.000000	29.736842
##	2818	1998-08-02	4.3753000	24.30283	8.2173238	59.611111	230.555556
##	2819	1998-08-03	2.6029643	24.83075	7.2223850	9.200000	14.600000
##	2820	1998-08-04	3.4315408	24.62922	7.4809262	4.750000	4.750000
##	2821	1998-08-05	4.2601174	24.42770	7.7394673	20.181818	3.818182
##	2822	1998-08-06	5.0886939	24.22617	7.9980085	2.555556	3.111111
##	2823	1998-08-07	4.5477030	24.01167	8.0170944	3.750000	8.500000
##	2824	1998-08-08	4.0067121	23.79717	8.0361803	2.611111	2.944444
##	2825	1998-08-09	3.3412485	24.13521	7.5733164	6.947368	4.421053
##	2826	1998-08-10	2.6757848	24.47326	7.1104524	2.111111	2.111111
##	2827	1998-08-11	3.1969455	24.39882	7.3044696	6.250000	7.250000
##	2828	1998-08-12	3.7181061	24.32438	7.4984869	7.272727	12.727273
##	2829	1998-08-13	4.2392667	24.24993	7.6925041	27.250000	7.750000
##	2830	1998-08-14	4.7604273	24.17549	7.8865213	24.545455	8.000000
##	2831	1998-08-15	5.2815879	24.10105	8.0805385	2.500000	5.500000
##	2832	1998-08-16	5.8027485	24.02661	8.2745558	2.000000	2.222222
##	2833	1998-08-17	5.5868076	24.47921	8.2059539	3.000000	4.250000
##	2834	1998-08-18	5.3708667	24.93181	8.1373521	2.000000	2.000000
##	2835	1998-08-19	4.4433133	25.04955	7.8339474	2.545455	4.363636
##	2836	1998-08-20	3.5157600	25.16729	7.5305427	2.277778	2.388889
##	2837	1998-08-21	5.0829000	25.00360	7.85999595	8.888889	42.148148
##	2838	1998-08-22	4.0000214	25.20685	7.5582521	10.789474	6.736842
##	2839	1998-08-23	3.4949531	24.95070	7.6076285	11.454545	5.090909
##	2840	1998-08-24	2.9898848	24.69455	7.6570048	2.444444	11.111111
##	2841	1998-08-25	3.0802742	24.67675	7.6259858	2.000000	4.000000
##	2842	1998-08-26	3.1706636	24.65895	7.5949667	4.893617	8.085106
##	2843	1998-08-27	3.1699455	24.77381	7.6945262	8.000000	4.250000
##	2844	1998-08-28	3.1692273	24.88868	7.7940858	2.500000	3.388889
##	2845	1998-08-29	3.9061394	24.88054	8.0831388	2.000000	2.000000
##	2846	1998-08-30	4.2043356	24.91799	7.9693689	102.218182	221.381818
##	2847	1998-08-31	2.3361708	24.68255	7.6695479	2.074074	9.481481
##	2848	1998-09-01	5.9818333	24.80885	7.7221521	3.000000	5.200000
##	2849	1998-09-02	1.9116711	25.09123	6.8233538	5.622642	4.528302
##	2850	1998-09-03	1.6175042	25.18379	6.3902200	7.050847	34.440678
##	2851	1998-09-04	1.6559333	25.22571	6.4082765	27.000000	259.125000
##	2852	1998-09-05	3.3168727	24.84138	7.2086315	2.388889	3.333333
##	2853	1998-09-06	3.5927828	24.84806	7.1612074	52.000000	93.250000
##	2854	1998-09-07	3.8686929	24.85475	7.1137832	2.000000	3.454545
##	2855	1998-09-08	4.1446030	24.86144	7.0663591	2.944444	10.888889
##	2856	1998-09-09	3.7246720	24.78861	7.2436023	2.500000	4.250000
##	2857	1998-09-10	3.3047409	24.71578	7.4208456	6.545455	2.727273
##	2858	1998-09-11	2.8848098	24.64295	7.5980889	30.250000	38.500000
##	2859	1998-09-12	2.4648788	24.57012	7.7753321	2.055556	2.777778
##	2860	1998-09-13	2.9694242	24.66269	7.6594212	3.148936	2.382979
##	2861	1998-09-14	3.1005106	24.73441	7.4462542	5.000000	4.750000
##	2862	1998-09-15	3.2315970	24.80613	7.2330873	7.111111	2.777778
##	2863	1998-09-16	4.3918689	25.15891	7.0441191	5.319149	5.191489
##	2864	1998-09-17	3.0721405	25.13366	7.0679381	5.789474	6.578947
##	2865	1998-09-18	2.8544750	25.10130	6.4232392	4.296296	3.777778
##	2866	1998-09-19	7.5216788	25.14190	7.2830936	2.111111	2.000000
##	2867	1998-09-20	6.1091621	25.09646	7.2139802	54.000000	17.578947
##	2868	1998-09-21	4.6966455	25.05102	7.1448667	2.722222	5.444444

##	2869	1998-09-22	0.8600000	23.89900	6.7600000	4.861111	6.222222
##	2870	1998-09-23	2.5301348	24.44724	6.9500906	7.000000	7.000000
##	2871	1998-09-24	4.2002697	24.99547	7.1401812	3.063830	3.063830
##	2872	1998-09-25	3.7805924	24.94556	7.3670689	21.250000	40.500000
##	2873	1998-09-26	3.3609152	24.89565	7.5939567	2.388889	7.555556
##	2874	1998-09-27	3.3702606	24.84700	7.6292008	2.727273	5.090909
##	2875	1998-09-28	3.3796061	24.79835	7.6644449	922.500000	1494.750000
##	2876	1998-09-29	3.3889515	24.74970	7.6996891	2.700000	7.800000
##	2877	1998-09-30	2.7840178	24.86574	7.5060556	84.936170	681.659574
##	2878	1998-10-01	3.5429283	24.80540	7.5847203	97.333333	220.000000
##	2879	1998-10-02	4.3018389	24.74506	7.6633850	49.666667	111.000000
##	2880	1998-10-03	3.6093683	24.84660	7.6451143	2.000000	2.000000
##	2881	1998-10-04	2.9168976	24.94814	7.6268436	23.170732	47.902439
##	2882	1998-10-05	1.9046394	24.92628	7.3436145	2.318182	6.000000
##	2883	1998-10-06	4.0121545	24.93948	7.7946897	2.888889	4.611111
##	2884	1998-10-07	3.6024182	24.95294	7.6563358	33.684211	18.947368
##	2885	1998-10-08	3.1926818	24.96641	7.5179818	3.555556	6.888889
##	2886	1998-10-09	3.3114242	25.04745	7.3880695	9.250000	11.500000
##	2887	1998-10-10	3.4301667	25.12849	7.2581571	13.090909	63.636364
##	2888	1998-10-11	3.5489091	25.20953	7.1282448	8.250000	5.250000
##	2889	1998-10-12	3.6676515	25.29057	6.9983324	3.055556	2.611111
##	2890	1998-10-13	3.3580345	25.26038	7.3871896	5.000000	4.000000
##	2891	1998-10-14	3.0484176	25.23019	7.7760468	11.818182	141.636364
##	2892	1998-10-15	2.7388006	25.20000	8.1649039	2.222222	7.666667
##	2893	1998-10-16	2.4291836	25.27048	7.1890289	196.000000	36.000000
##	2894	1998-10-17	2.1195667	25.34095	6.2131538	445.928571	328.857143
##	2895	1998-10-18	2.1972208	25.36324	6.2505500	87.423077	455.153846
##	2896	1998-10-19	2.0295979	25.44888	5.8806025	10.107143	39.964286
##	2897	1998-10-20	2.9304727	25.12073	7.3101742	7.055556	28.611111
##	2898	1998-10-21	4.9404061	25.25427	7.1231667	420.413793	440.482759
##	2899	1998-10-22	5.8471556	25.12772	8.0499484	328.526316	390.000000
##	2900	1998-10-23	3.4517667	25.25416	7.4155948	2.736842	3.157895
##	2901	1998-10-24	3.0215917	25.21184	7.1570733	4.000000	5.185185
##	2902	1998-10-25	4.9154091	25.17458	7.6968133	12.510638	9.106383
##	2903	1998-10-26	5.6737576	25.09144	7.8518314	3.750000	5.750000
##	2904	1998-10-27	6.4321061	25.00829	8.0068494	37.277778	17.500000
##	2905	1998-10-28	5.6601939	25.02531	7.9447778	1613.368421	1686.947368
##	2906	1998-10-29	4.8882818	25.04233	7.8827062	4233.333333	4140.000000
##	2907	1998-10-30	4.1163697	25.05935	7.8206345	5.166667	16.555556
##	2908	1998-10-31	4.0086191	25.12517	7.6219504	27.500000	39.750000
##	2909	1998-11-01	3.9008684	25.19100	7.4232663	1458.727273	1260.000000
##	2910	1998-11-02	3.7931178	25.25682	7.2245822	340.054054	342.216216
##	2911	1998-11-03	3.7926042	25.15263	7.6530971	171.993694	172.674775
##	2912	1998-11-04	4.7539476	25.26013	7.4988026	3.933333	3.133333
##	2913	1998-11-05	6.6376697	25.22964	7.4179527	3.263158	2.000000
##	2914	1998-11-06	6.9649606	25.15363	7.7275824	58.000000	1145.090909
##	2915	1998-11-07	7.2922515	25.07761	8.0372121	13.863636	127.500000
##	2916	1998-11-08	5.9919727	25.11677	7.8935674	40.500000	21.500000
##	2917	1998-11-09	4.6916939	25.15592	7.7499226	12.000000	12.000000
##	2918	1998-11-10	3.3914152	25.19508	7.6062779	32.566038	220.377358
##	2919	1998-11-11	4.7606121	25.15004	7.6487692	6558.000000	8120.000000
##	2920	1998-11-12	6.1298091	25.10500	7.6912605	144.750000	29.250000
##	2921	1998-11-13	7.4990061	25.05996	7.7337518	12.285714	26.857143
##	2922	1998-11-14	6.9817265	25.05659	7.7153198	1113.454545	1258.181818

## 2923	1998-11-15	6.4644470	25.05321	7.6968877	12000.00000	12000.00000
## 2924	1998-11-16	5.9471674	25.04984	7.6784557	2.000000	2.750000
## 2925	1998-11-17	5.4298879	25.04647	7.6600236	8.238095	30.380952
## 2926	1998-11-18	5.5518924	25.06279	7.7374012	2.000000	2.000000
## 2927	1998-11-19	5.6738970	25.07911	7.8147788	1466.545455	2358.909091
## 2928	1998-11-20	5.7959015	25.09543	7.8921564	89.454545	493.636364
## 2929	1998-11-21	5.9179061	25.11175	7.9695339	2.571429	3.476190
## 2930	1998-11-22	5.5343323	25.07303	7.8024926	95.894737	153.684211
## 2931	1998-11-23	5.1507586	25.03431	7.6354513	8.000000	2.000000
## 2932	1998-11-24	4.7671848	24.99559	7.4684100	2.095238	2.190476
## 2933	1998-11-25	4.7716485	25.38699	6.3664667	2.615385	2.769231
## 2934	1998-11-26	3.9942511	25.44135	6.1956604	30.042553	72.255319
## 2935	1998-11-27	3.5690667	25.38566	6.6867683	18.857143	33.028571
## 2936	1998-11-28	4.6577238	25.51064	5.8921102	3.133333	2.133333
## 2937	1998-11-29	8.8442271	25.54683	6.3144125	2.750000	9.000000
## 2938	1998-11-30	13.0307303	25.58302	6.7367148	2.339623	2.301887
## 2939	1998-12-01	12.6028652	25.55960	6.6921044	3.250000	6.500000
## 2940	1998-12-02	12.1750000	25.53618	6.6474939	3.724138	2.689655
## 2941	1998-12-03	8.2550022	25.66534	5.6881478	2.222222	2.666667
## 2942	1998-12-04	4.8647048	25.66268	5.7011683	2.000000	2.200000
## 2943	1998-12-05	4.9882125	25.47955	6.0080788	2.926829	2.487805
## 2944	1998-12-06	6.1742911	25.58219	5.7198626	34.363636	101.818182
## 2945	1998-12-07	7.3603697	25.68483	5.4316464	12.600000	36.480000
## 2946	1998-12-08	11.2073909	25.63742	6.2124715	9.698113	4.641509
## 2947	1998-12-09	3.1069800	25.79714	4.8850873	26.867925	72.566038
## 2948	1998-12-10	2.4995958	25.83034	4.5670294	77.250000	235.875000
## 2949	1998-12-11	2.7730000	25.75888	5.0132440	2.083333	2.000000
## 2950	1998-12-12	5.7893909	25.44665	6.2678200	2.000000	2.428571
## 2951	1998-12-13	7.3249000	25.48117	6.1260671	4.105263	3.157895
## 2952	1998-12-14	8.8604091	25.51569	5.9843142	2.880000	2.800000
## 2953	1998-12-15	10.3959182	25.33368	6.7798148	2.909091	3.636364
## 2954	1998-12-16	11.9314273	25.15168	7.5753155	2.000000	2.238095
## 2955	1998-12-17	10.1862727	25.20870	7.1215280	2.500000	2.250000
## 2956	1998-12-18	8.4411182	25.26572	6.6677405	50.181818	62.545455
## 2957	1998-12-19	6.6959636	25.32274	6.2139530	2.380952	5.714286
## 2958	1998-12-20	8.6934697	25.34615	6.3785742	3.750000	3.750000
## 2959	1998-12-21	10.6909758	25.36957	6.5431955	2.555556	5.666667
## 2960	1998-12-22	11.4919970	25.29918	7.0623703	5.818182	13.636364
## 2961	1998-12-23	12.2930182	25.22880	7.5815452	2.000000	2.444444
## 2962	1998-12-24	5.6870417	25.11083	6.8292250	2.000000	2.787879
## 2963	1998-12-25	7.9934048	25.24552	6.8459557	2.421053	2.052632
## 2964	1998-12-26	5.8362145	25.03382	6.7620224	5.272727	5.636364
## 2965	1998-12-27	3.6790242	24.82213	6.6780891	4.640000	5.040000
## 2966	1998-12-28	4.4674515	24.98200	6.3258573	13.924528	24.452830
## 2967	1998-12-29	7.0557258	25.32044	5.8590239	2.000000	3.750000
## 2968	1998-12-30	9.6440000	25.65887	5.3921906	2.444444	2.666667
## 2969	1998-12-31	13.0603111	25.54488	6.1063110	31.894737	55.789474
## 2970	1999-01-01	16.4766222	25.43089	6.8204313	2.388889	2.277778
## 2971	1999-01-02	7.5988143	25.53510	5.9417345	2.200000	3.133333
## 2972	1999-01-03	15.9182250	25.30776	6.8813433	2.181818	7.757576
## 2973	1999-01-04	12.9692460	25.11790	7.0579632	2.500000	4.500000
## 2974	1999-01-05	10.0202669	24.92804	7.2345831	6.181818	11.454545
## 2975	1999-01-06	7.0712879	24.73818	7.4112030	2.000000	2.333333
## 2976	1999-01-07	6.3807505	24.84534	7.1197218	2.000000	2.000000

## 2977	1999-01-08	5.6902131	24.95250	6.8282406	10.363636	20.909091
## 2978	1999-01-09	4.9996758	25.05965	6.5367594	2.000000	2.428571
## 2979	1999-01-10	7.4699773	24.63529	7.4934030	5.000000	5.750000
## 2980	1999-01-11	9.9402788	24.21092	8.4500467	2.142857	2.952381
## 2981	1999-01-12	9.5549384	24.31833	7.9600139	9.090909	36.545455
## 2982	1999-01-13	9.1695980	24.42574	7.4699812	2.000000	10.250000
## 2983	1999-01-14	8.7842576	24.53314	6.9799485	3.000000	4.380952
## 2984	1999-01-15	6.0321061	24.70213	6.2550918	2.909091	4.000000
## 2985	1999-01-16	3.2799545	24.87112	5.5302352	2.666667	4.523810
## 2986	1999-01-17	3.0575551	25.04010	5.9739572	9.250000	10.250000
## 2987	1999-01-18	2.8351556	25.20909	6.4176793	26.750000	212.321429
## 2988	1999-01-19	1.7776042	25.23973	6.3031917	93.178571	572.857143
## 2989	1999-01-20	1.9048250	25.25107	6.4280906	21.500000	106.875000
## 2990	1999-01-21	4.8314424	24.45518	7.6473897	2.142857	3.000000
## 2991	1999-01-22	5.9559939	24.81915	8.2286815	2.000000	2.111111
## 2992	1999-01-23	8.5819444	24.94814	7.0606033	11.636364	29.309091
## 2993	1999-01-24	4.5044119	25.06967	7.1625243	2.000000	2.266667
## 2994	1999-01-25	2.8121125	24.76048	6.8111250	2.000000	2.000000
## 2995	1999-01-26	3.9835033	24.65794	7.1481755	4.000000	13.750000
## 2996	1999-01-27	5.1548941	24.55540	7.4852259	2.000000	4.363636
## 2997	1999-01-28	6.3262848	24.45286	7.8222764	2.380952	6.714286
## 2998	1999-01-29	6.6972000	24.48822	7.4351432	5.250000	7.250000
## 2999	1999-01-30	7.0681152	24.52359	7.0480100	2.226415	2.981132
## 3000	1999-01-31	4.4689939	24.27497	7.7990042	4.560000	5.880000
## 3001	1999-02-01	4.8554357	24.59875	8.1081095	4.731707	3.804878
## 3002	1999-02-02	8.5573911	24.46105	8.6357696	2.000000	2.000000
## 3003	1999-02-03	3.7548333	24.23202	7.5886283	2.606061	3.636364
## 3004	1999-02-04	7.7677424	24.62415	8.5813288	3.384615	3.384615
## 3005	1999-02-05	6.7868152	24.59366	8.2159276	2.363636	3.090909
## 3006	1999-02-06	5.8058879	24.56316	7.8505264	2.809524	12.904762
## 3007	1999-02-07	5.3809591	24.55354	7.5816814	2.000000	2.000000
## 3008	1999-02-08	4.9560303	24.54392	7.3128364	4.188679	7.132075
## 3009	1999-02-09	4.4941152	24.48688	7.4155726	36.500000	64.000000
## 3010	1999-02-10	4.0322000	24.42983	7.5183088	2.476190	3.095238
## 3011	1999-02-11	4.3280939	24.37364	7.7892187	2.736842	11.789474
## 3012	1999-02-12	4.6239879	24.31746	8.0601286	6.000000	12.750000
## 3013	1999-02-13	4.9198818	24.26128	8.3310386	10.727273	5.090909
## 3014	1999-02-14	5.2157758	24.20509	8.6019485	2.190476	2.857143
## 3015	1999-02-15	5.9877545	24.36531	8.6392964	3.250000	3.250000
## 3016	1999-02-16	6.7597333	24.52552	8.6766442	6.127660	23.957447
## 3017	1999-02-17	4.4911250	24.25489	7.9888879	2.606061	2.484848
## 3018	1999-02-18	5.7798310	24.56898	8.5351667	39.066667	6.933333
## 3019	1999-02-19	11.6577545	24.48495	8.4584670	2.555556	2.111111
## 3020	1999-02-20	8.1039106	24.51530	8.1503973	8.750000	19.750000
## 3021	1999-02-21	4.5500667	24.54566	7.8423276	2.285714	5.238095
## 3022	1999-02-22	4.2316667	24.46139	7.6859728	68.000000	20.181818
## 3023	1999-02-23	3.9132667	24.37712	7.5296181	14.750000	19.000000
## 3024	1999-02-24	3.5948667	24.29286	7.3732633	2.190476	3.238095
## 3025	1999-02-25	3.7420222	24.36917	7.2354776	8.181818	5.636364
## 3026	1999-02-26	3.8891778	24.44548	7.0976918	3.000000	10.000000
## 3027	1999-02-27	4.0363333	24.52179	6.9599061	5.095238	9.047619
## 3028	1999-02-28	3.7211258	24.50595	7.1964088	10.000000	4.631579
## 3029	1999-03-01	3.4059182	24.49010	7.4329115	2.190476	2.095238
## 3030	1999-03-02	2.2346867	24.71136	7.5647764	17.155556	164.088889

##	3031	1999-03-03	2.1627208	24.79057	7.4697775	8.298507	106.567164
##	3032	1999-03-04	2.3237125	24.85481	7.2445417	2.000000	2.000000
##	3033	1999-03-05	2.2342909	23.94426	6.8044406	2.047619	2.190476
##	3034	1999-03-06	4.6454758	24.59134	7.8762533	4.538462	3.076923
##	3035	1999-03-07	5.0218089	24.72591	7.8272658	186.170213	290.425532
##	3036	1999-03-08	4.8209214	24.66895	8.4035588	16.733333	59.866667
##	3037	1999-03-09	2.8512333	24.57672	7.1423146	2.000000	2.181818
##	3038	1999-03-10	2.6730293	24.53651	7.1836704	47.000000	8.000000
##	3039	1999-03-11	2.4948253	24.49630	7.2250263	2.000000	2.000000
##	3040	1999-03-12	2.3166212	24.45608	7.2663821	2.000000	2.000000
##	3041	1999-03-13	2.3651985	24.50886	7.1871244	4.250000	7.250000
##	3042	1999-03-14	2.4137758	24.56163	7.1078667	3.849057	6.301887
##	3043	1999-03-15	2.8679530	24.42659	7.3084027	11.000000	19.250000
##	3044	1999-03-16	3.3221303	24.29155	7.5089388	2.000000	2.619048
##	3045	1999-03-17	4.7368600	24.29102	8.1988040	2.944444	7.555556
##	3046	1999-03-18	3.5643955	24.44155	7.9873213	152.909091	93.454545
##	3047	1999-03-19	2.3919310	24.59208	7.7758386	518.774194	75.483871
##	3048	1999-03-20	2.9885208	24.41137	7.0987042	2.146341	3.121951
##	3049	1999-03-21	3.7462576	24.66188	7.3814279	2.333333	2.000000
##	3050	1999-03-22	2.6455970	24.59381	6.4852518	11.147541	12.360656
##	3051	1999-03-23	0.7700000	23.91900	6.6400000	6.645199	7.466042
##	3052	1999-03-24	3.4989152	24.66768	6.5626379	2.142857	2.571429
##	3053	1999-03-25	3.0751409	24.58607	6.7124065	3.052632	2.421053
##	3054	1999-03-26	2.6513667	24.50445	6.8621752	2.680000	3.280000
##	3055	1999-03-27	3.3684566	24.50849	7.1314489	9.818182	15.636364
##	3056	1999-03-28	4.0855465	24.51254	7.4007226	36.750000	25.500000
##	3057	1999-03-29	4.8026364	24.51658	7.6699964	29.111111	15.111111
##	3058	1999-03-30	4.6700089	24.58846	7.6299062	78.425532	521.234043
##	3059	1999-03-31	3.3642956	24.66464	7.6307887	7.090909	52.666667
##	3060	1999-04-01	2.1221958	24.46667	6.5815658	2.060606	3.151515
##	3061	1999-04-02	2.3765376	24.50169	6.7194296	10.000000	10.000000
##	3062	1999-04-03	2.6308794	24.53670	6.8572935	10.909091	36.727273
##	3063	1999-04-04	2.8852212	24.57171	6.9951573	3.047619	2.285714
##	3064	1999-04-05	2.7654394	24.63176	6.9933647	26.000000	25.500000
##	3065	1999-04-06	2.6456576	24.69180	6.9915721	1137.471698	498.754717
##	3066	1999-04-07	2.5130505	24.65883	7.0198678	8266.666667	5186.666667
##	3067	1999-04-08	2.3804434	24.62585	7.0481634	750.500000	130.750000
##	3068	1999-04-09	2.2478364	24.59288	7.0764591	248.142857	159.809524
##	3069	1999-04-10	2.5048833	24.64645	6.8416573	290.000000	58.000000
##	3070	1999-04-11	2.7619303	24.70001	6.6068555	107.047619	24.571429
##	3071	1999-04-12	2.9810056	24.73754	6.7941951	5070.000000	4900.000000
##	3072	1999-04-13	3.2000810	24.77506	6.9815347	2722.181818	3294.181818
##	3073	1999-04-14	3.4191563	24.81259	7.1688743	19.750000	11.000000
##	3074	1999-04-15	3.6382316	24.85011	7.3562139	139.090909	434.727273
##	3075	1999-04-16	3.8573069	24.88764	7.5435535	370.000000	5600.000000
##	3076	1999-04-17	4.0763823	24.92517	7.7308931	3.750000	21.000000
##	3077	1999-04-18	4.2954576	24.96269	7.9182327	448.068966	610.413793
##	3078	1999-04-19	3.4610089	24.96529	7.7982338	84.550000	690.300000
##	3079	1999-04-20	2.9724500	25.02584	7.3823621	21.066667	53.200000
##	3080	1999-04-21	2.2499909	25.02087	6.7698748	5.523810	17.095238
##	3081	1999-04-22	3.3141172	25.00113	6.9376865	7.000000	2.750000
##	3082	1999-04-23	4.3782434	24.98140	7.1054981	69.090909	1064.545455
##	3083	1999-04-24	5.4423697	24.96166	7.2733097	26.511628	249.209302
##	3084	1999-04-25	4.8661583	24.93160	7.3090424	16.666667	303.333333

##	3085	1999-04-26	4.2899468	24.90154	7.3447752	8.500000	4.750000
##	3086	1999-04-27	3.7137354	24.87147	7.3805079	548.545455	1661.636364
##	3087	1999-04-28	3.1375239	24.84141	7.4162406	1211.000000	6013.000000
##	3088	1999-04-29	2.5613125	24.81135	7.4519733	2.363636	3.333333
##	3089	1999-04-30	2.4999381	24.78550	7.2688197	52.500000	26.000000
##	3090	1999-05-01	2.4385636	24.75965	7.0856661	2.285714	2.476190
##	3091	1999-05-02	2.6152384	24.83425	7.0639174	104.727273	750.181818
##	3092	1999-05-03	2.7919131	24.90884	7.0421687	8.000000	10.000000
##	3093	1999-05-04	2.9685879	24.98344	7.0204200	2.714286	4.761905
##	3094	1999-05-05	9.4389244	25.00475	7.5124624	109.888889	475.944444
##	3095	1999-05-06	5.8184810	25.06534	7.2096798	95.073171	296.000000
##	3096	1999-05-07	6.8338000	25.00222	7.4441807	37.500000	64.125000
##	3097	1999-05-08	4.9701917	24.92189	7.6530316	30.500000	7.750000
##	3098	1999-05-09	3.1065833	24.84155	7.8618825	8.242424	2.424242
##	3099	1999-05-10	1.6677208	25.20554	6.0918944	274.881356	238.237288
##	3100	1999-05-11	2.2692364	24.91271	6.9000455	244.078431	240.470588
##	3101	1999-05-12	1.7851583	25.28541	5.9592365	6.750000	56.500000
##	3102	1999-05-13	1.9980844	25.27846	5.8634913	2.622222	2.133333
##	3103	1999-05-14	3.7650697	24.92806	7.3982164	1074.918033	849.049180
##	3104	1999-05-15	3.5445167	24.94199	7.3526782	254.727273	1016.545455
##	3105	1999-05-16	3.3239636	24.95592	7.3071400	8.720000	26.400000
##	3106	1999-05-17	3.4270273	24.98417	7.1791968	1768.000000	1250.000000
##	3107	1999-05-18	3.5300909	25.01243	7.0512535	12000.000000	12000.000000
##	3108	1999-05-19	3.6331545	25.04068	6.9233103	3.428571	4.809524
##	3109	1999-05-20	4.4299039	25.16869	6.4333884	2.000000	8.750000
##	3110	1999-05-21	5.2266533	25.29669	5.9434664	34.388889	505.055556
##	3111	1999-05-22	5.1019481	25.32374	5.9125223	1138.363636	2624.363636
##	3112	1999-05-23	4.9772429	25.35079	5.8815781	248.727273	538.969697
##	3113	1999-05-24	3.5747667	25.17833	6.1149550	2.424242	2.303030
##	3114	1999-05-25	7.5056030	25.41339	5.7879912	6.000000	9.222222
##	3115	1999-05-26	7.1761674	25.36542	6.0573344	6.000000	5.250000
##	3116	1999-05-27	6.8467318	25.31744	6.3266776	22.727273	47.818182
##	3117	1999-05-28	6.5172962	25.26947	6.5960208	2.500000	4.250000
##	3118	1999-05-29	6.1878606	25.22149	6.8653639	2.761905	9.761905
##	3119	1999-05-30	5.6528788	25.27391	6.5843688	3.698113	5.018868
##	3120	1999-05-31	7.9246636	25.09554	7.2676195	7.250000	3.750000
##	3121	1999-06-01	10.1964485	24.91716	7.9508703	2.285714	2.047619
##	3122	1999-06-02	10.5489374	24.99008	7.7997749	21.636364	18.545455
##	3123	1999-06-03	10.9014263	25.06299	7.6486796	4.750000	3.500000
##	3124	1999-06-04	11.2539152	25.13591	7.4975842	2.190476	2.571429
##	3125	1999-06-05	8.5842576	25.02115	7.9289803	9.500000	28.500000
##	3126	1999-06-06	5.9146000	24.90640	8.3603764	3.358491	4.792453
##	3127	1999-06-07	5.9060788	25.03061	6.7217997	2.000000	3.076923
##	3128	1999-06-08	5.3525786	25.12154	6.4208505	4.780488	10.926829
##	3129	1999-06-09	5.6045956	25.03193	6.4250362	89.111111	285.722222
##	3130	1999-06-10	2.9519583	25.13137	6.5708279	2.666667	3.272727
##	3131	1999-06-11	2.8182998	25.19743	6.4449375	2.500000	4.500000
##	3132	1999-06-12	2.6846413	25.26350	6.3190470	1288.363636	2480.727273
##	3133	1999-06-13	2.5509828	25.32956	6.1931565	10.666667	41.333333
##	3134	1999-06-14	2.4173242	25.39563	6.0672661	2.761905	4.285714
##	3135	1999-06-15	5.7414924	25.37340	6.5567109	2.000000	2.000000
##	3136	1999-06-16	9.0656606	25.35118	7.0461558	2.226415	8.000000
##	3137	1999-06-17	8.2174758	25.15516	7.6483395	3.750000	5.000000
##	3138	1999-06-18	7.3692909	24.95914	8.2505233	2.047619	2.142857

## 3139	1999-06-19	6.2706646	25.06993	7.1589788	30.909091	46.181818
## 3140	1999-06-20	5.1720384	25.18073	6.0674342	4.750000	12.000000
## 3141	1999-06-21	4.0734121	25.29152	4.9758897	2.571429	2.619048
## 3142	1999-06-22	2.7591133	25.57372	4.7789031	2.088889	2.711111
## 3143	1999-06-23	2.2644083	25.66112	4.5325800	50.125000	672.041667
## 3144	1999-06-24	2.1869042	25.69094	4.2888258	9.552239	92.238806
## 3145	1999-06-25	11.7470182	25.28675	5.6097824	3.523810	4.190476
## 3146	1999-06-26	17.9609422	24.91884	7.6552380	2.055556	2.444444
## 3147	1999-06-27	13.6748842	24.99476	7.1186452	10.105263	6.315789
## 3148	1999-06-28	9.3888262	25.07067	6.5820524	2.266667	2.733333
## 3149	1999-06-29	9.9177722	24.71375	7.0511779	4.121212	33.090909
## 3150	1999-06-30	10.4467182	24.63418	7.5203033	2.000000	2.333333
## 3151	1999-07-01	8.5435162	24.75805	6.8194831	2.000000	2.750000
## 3152	1999-07-02	6.6403141	24.88192	6.1186629	2.909091	8.363636
## 3153	1999-07-03	4.7371121	25.00579	5.4178427	70.809524	7.380952
## 3154	1999-07-04	4.7242909	25.02148	5.3654815	4.000000	6.000000
## 3155	1999-07-05	4.7114697	25.03718	5.3131203	18.716981	4.566038
## 3156	1999-07-06	3.9821970	25.03138	5.5117431	2.000000	2.500000
## 3157	1999-07-07	3.2529242	25.02559	5.7103660	2.181818	4.545455
## 3158	1999-07-08	2.5236515	25.01979	5.9089888	2.095238	4.142857
## 3159	1999-07-09	6.2039846	25.08661	6.1334578	6.750000	9.250000
## 3160	1999-07-10	9.8843178	25.15343	6.3579269	17.333333	65.055556
## 3161	1999-07-11	6.9848881	24.98139	6.6383428	10.181818	7.272727
## 3162	1999-07-12	4.0854583	24.80935	6.9187588	12.545455	2.121212
## 3163	1999-07-13	5.5427429	25.06275	6.6828681	5.052632	19.789474
## 3164	1999-07-14	11.1702273	25.06460	6.6894206	2.000000	2.000000
## 3165	1999-07-15	3.8425182	24.60757	6.7412561	5.433962	10.301887
## 3166	1999-07-16	6.3456212	24.61830	6.6966356	2.250000	2.000000
## 3167	1999-07-17	8.8487242	24.62902	6.6520152	862.190476	5.000000
## 3168	1999-07-18	6.4938439	24.72553	6.2486130	42.526316	5.157895
## 3169	1999-07-19	4.1389636	24.82203	5.8452109	48.428571	5.095238
## 3170	1999-07-20	4.6145313	24.91699	5.7413545	2.500000	3.000000
## 3171	1999-07-21	5.0900990	25.01195	5.6374982	2.000000	2.181818
## 3172	1999-07-22	5.5656667	25.10690	5.5336418	17.571429	2.761905
## 3173	1999-07-23	8.8610356	25.18849	6.0222605	2.750000	2.750000
## 3174	1999-07-24	12.1564044	25.27007	6.5108791	28.222222	56.444444
## 3175	1999-07-25	12.1197367	25.15372	6.7551079	3.545455	2.500000
## 3176	1999-07-26	12.0830690	25.03736	6.9993367	2.000000	2.933333
## 3177	1999-07-27	14.3809939	24.88410	7.8139461	2.444444	5.666667
## 3178	1999-07-28	11.5623747	24.76936	7.7470507	8.500000	6.750000
## 3179	1999-07-29	8.7437556	24.65462	7.6801554	18.000000	76.727273
## 3180	1999-07-30	5.9251364	24.53988	7.6132600	2.857143	2.333333
## 3181	1999-07-31	4.9972197	24.47863	7.5651779	5.000000	2.000000
## 3182	1999-08-01	4.0693030	24.41738	7.5170958	2.000000	2.000000
## 3183	1999-08-02	4.9732048	24.32697	7.4509712	36.727273	16.545455
## 3184	1999-08-03	5.8771067	24.23656	7.3848465	9.250000	5.500000
## 3185	1999-08-04	6.7810085	24.14615	7.3187219	15.090909	4.363636
## 3186	1999-08-05	7.6849103	24.05574	7.2525973	177.250000	3.500000
## 3187	1999-08-06	8.5888121	23.96533	7.1864727	4.000000	9.190476
## 3188	1999-08-07	1.7749622	24.91661	6.0104562	6.755556	39.200000
## 3189	1999-08-08	1.7952051	25.02593	5.8486901	4.842105	9.368421
## 3190	1999-08-09	1.8154479	25.13526	5.6869240	11.333333	53.875000
## 3191	1999-08-10	2.2702604	25.11809	5.8274950	10.875000	121.000000
## 3192	1999-08-11	4.7365515	24.65564	6.4622567	13.761905	2.428571

## 3193	1999-08-12	9.3571978	24.70142	7.4099982	43.045455	180.272727
## 3194	1999-08-13	9.6707810	24.68170	7.5098417	4.390244	3.853659
## 3195	1999-08-14	9.0899000	24.63511	7.3910233	2.111111	2.000000
## 3196	1999-08-15	2.8612708	24.26395	6.2195162	12.787879	4.303030
## 3197	1999-08-16	2.8916775	24.28567	6.2338420	2.000000	2.750000
## 3198	1999-08-17	2.9220842	24.30740	6.2481678	9.090909	6.000000
## 3199	1999-08-18	2.9524909	24.32912	6.2624936	12.190476	3.190476
## 3200	1999-08-19	2.9242545	24.27066	6.3218753	14.000000	11.000000
## 3201	1999-08-20	2.8960182	24.21220	6.3812570	3.471698	2.716981
## 3202	1999-08-21	3.2805561	24.21182	6.5707177	8.000000	11.250000
## 3203	1999-08-22	3.6650939	24.21144	6.7601785	15.190476	7.095238
## 3204	1999-08-23	3.2691788	24.13615	6.9140298	2.727273	3.818182
## 3205	1999-08-24	2.8732636	24.06085	7.0678811	5.750000	13.750000
## 3206	1999-08-25	2.4773485	23.98556	7.2217324	2.333333	3.904762
## 3207	1999-08-26	3.0813561	23.88328	7.0316476	19.090909	8.727273
## 3208	1999-08-27	3.6853636	23.78099	6.8415627	33.160000	5.840000
## 3209	1999-08-28	3.7621583	24.50410	6.4785487	8.307692	3.384615
## 3210	1999-08-29	7.0484119	24.57002	7.5076786	132.722222	197.722222
## 3211	1999-08-30	7.6253667	24.43704	7.6109222	27.619048	7.619048
## 3212	1999-08-31	2.6708143	24.34993	7.2888545	2.000000	2.000000
## 3213	1999-09-01	3.9451636	24.29965	7.0370824	4.440000	4.200000
## 3214	1999-09-02	3.3681045	24.25166	7.0232305	11.636364	9.636364
## 3215	1999-09-03	2.7910455	24.20367	7.0093785	5.280000	2.280000
## 3216	1999-09-04	2.4747197	24.22078	6.9022850	4.909091	9.090909
## 3217	1999-09-05	2.1583939	24.23789	6.7951915	16.080000	7.160000
## 3218	1999-09-06	4.4540644	24.41706	7.5552547	3.666667	7.555556
## 3219	1999-09-07	3.1750714	24.47113	7.4468110	4.000000	2.536585
## 3220	1999-09-08	4.2594333	24.27836	7.3997130	10.777778	14.111111
## 3221	1999-09-09	2.6196833	24.20255	6.6471554	167.951220	17.707317
## 3222	1999-09-10	2.9856235	24.14553	6.5346579	2.000000	2.000000
## 3223	1999-09-11	3.3515636	24.08852	6.4221603	6.720000	5.000000
## 3224	1999-09-12	2.6681970	24.13518	6.3902398	13.090909	3.090909
## 3225	1999-09-13	1.9848303	24.18185	6.3583194	6.680000	4.440000
## 3226	1999-09-14	2.3135939	24.11965	6.3815767	4.327869	2.819672
## 3227	1999-09-15	2.4574870	24.50970	6.5771559	4.000000	14.000000
## 3228	1999-09-16	2.6013800	24.89976	6.7727351	5.018868	8.037736
## 3229	1999-09-17	2.4440265	24.93490	6.7066167	8.363636	3.454545
## 3230	1999-09-18	2.2866729	24.97004	6.6404983	23.875000	273.833333
## 3231	1999-09-19	2.3229458	24.86947	6.8460927	2.625000	2.458333
## 3232	1999-09-20	3.3075121	24.51421	8.3514239	2.904762	2.142857
## 3233	1999-09-21	7.2711222	24.58227	7.5247200	4.181818	11.954545
## 3234	1999-09-22	4.8642571	24.67565	7.4008819	4.341463	3.121951
## 3235	1999-09-23	6.5645091	24.73476	7.1449952	2.000000	2.222222
## 3236	1999-09-24	1.7669333	24.37823	7.9564950	3.212121	2.181818
## 3237	1999-09-25	0.7000000	23.93200	6.6600000	4.250000	7.500000
## 3238	1999-09-26	1.3778212	24.19970	7.3600700	38.545455	4.727273
## 3239	1999-09-27	2.0556424	24.46740	8.0601400	2.428571	3.619048
## 3240	1999-09-28	2.1505606	24.42898	8.1198752	8.000000	5.250000
## 3241	1999-09-29	2.2454788	24.39055	8.1796103	3.773585	11.207547
## 3242	1999-09-30	2.2495864	24.46346	7.9767085	3.250000	3.000000
## 3243	1999-10-01	2.2536939	24.53636	7.7738067	23.047619	11.571429
## 3244	1999-10-02	2.3008311	24.55392	7.8512193	52.363636	1327.090909
## 3245	1999-10-03	2.3479682	24.57148	7.9286320	26.000000	1200.000000
## 3246	1999-10-04	2.3951053	24.58904	8.0060446	7.500000	8.500000

## 3247	1999-10-05	2.4422424	24.60660	8.0834573	32.000000	3.904762
## 3248	1999-10-06	2.2383936	24.60983	8.0289548	4.000000	2.000000
## 3249	1999-10-07	2.0345447	24.61305	7.9744524	6515.090909	2584.545455
## 3250	1999-10-08	1.8306958	24.61628	7.9199500	600.083333	440.833333
## 3251	1999-10-09	0.6685095	24.66991	7.1042048	47.400000	18.666667
## 3252	1999-10-10	0.7062697	24.80313	7.0999706	27.111111	5.888889
## 3253	1999-10-11	2.6390818	24.59230	7.9973888	37.142857	6.333333
## 3254	1999-10-12	2.3993205	24.61144	7.9196114	2.000000	2.000000
## 3255	1999-10-13	2.1595591	24.63058	7.8418339	809.157895	565.263158
## 3256	1999-10-14	1.9197977	24.64971	7.7640565	50.666667	80.000000
## 3257	1999-10-15	1.6800364	24.66885	7.6862791	2.619048	3.095238
## 3258	1999-10-16	3.0646422	24.70389	7.0330869	59.888889	38.500000
## 3259	1999-10-17	3.0021841	24.72541	7.2435718	1754.000000	7.250000
## 3260	1999-10-18	2.9397259	24.74692	7.4540566	176.727273	215.090909
## 3261	1999-10-19	2.8772678	24.76843	7.6645415	3.000000	2.000000
## 3262	1999-10-20	2.8148097	24.78995	7.8750263	16.000000	5.500000
## 3263	1999-10-21	2.7523515	24.81146	8.0855112	2.000000	2.000000
## 3264	1999-10-22	2.3997174	24.80717	8.0602556	167.636364	268.363636
## 3265	1999-10-23	2.0470833	24.80288	8.0350000	2.121212	2.060606
## 3266	1999-10-24	6.9988889	24.80102	7.6097778	288.893617	350.723404
## 3267	1999-10-25	4.0692857	24.74950	7.4385714	4.580645	3.548387
## 3268	1999-10-26	7.1803030	24.80597	7.6936364	8.444444	4.555556
## 3269	1999-10-27	3.1360606	24.71891	8.3166667	11.698113	3.433962
## 3270	1999-10-28	2.3387879	24.67717	8.0803030	5457.454545	1874.000000
## 3271	1999-10-29	1.5415152	24.63542	7.8439394	97.904762	12.952381
## 3272	1999-10-30	1.7550000	24.64309	7.8348485	4336.666667	5340.000000
## 3273	1999-10-31	1.9684848	24.65076	7.8257576	15.857143	11.571429
## 3274	1999-11-01	2.8645455	24.67767	7.8839394	9.904762	5.238095
## 3275	1999-11-02	2.7789091	24.68412	7.9800606	379.090909	262.727273
## 3276	1999-11-03	2.6932727	24.69058	8.0761818	180.000000	260.000000
## 3277	1999-11-04	2.6076364	24.69703	8.1723030	1674.000000	2731.454545
## 3278	1999-11-05	2.5220000	24.70348	8.2684242	9666.666667	9266.666667
## 3279	1999-11-06	2.4363636	24.70994	8.3645455	28.952381	32.476190
## 3280	1999-11-07	2.4887879	24.74158	7.6433333	166.385281	203.965368
## 3281	1999-11-08	2.4542424	24.68220	7.8371212	303.818182	375.454545
## 3282	1999-11-09	2.4196970	24.62282	8.0309091	4.363636	19.363636
## 3283	1999-11-10	3.8462929	24.63973	7.8997879	4.000000	46.000000
## 3284	1999-11-11	5.2728889	24.65664	7.7686667	558.680851	629.872340
## 3285	1999-11-12	2.3233333	24.71579	7.4427273	86.888889	304.444444
## 3286	1999-11-13	3.6169048	24.80760	7.2550000	45.444444	153.611111
## 3287	1999-11-14	3.8578788	24.86733	7.0166667	4.000000	2.777778
## 3288	1999-11-15	1.8085714	24.85850	7.0000000	5.708333	14.680556
## 3289	1999-11-16	1.5770833	25.16996	6.1635417	7.416667	26.583333
## 3290	1999-11-17	2.1231111	25.04873	6.4988889	76.392857	215.285714
## 3291	1999-11-18	4.8781818	24.90003	6.8890909	10.190476	15.190476
## 3292	1999-11-19	10.0054545	24.77424	7.6863636	282.000000	327.888889
## 3293	1999-11-20	6.4912689	24.88550	7.2571402	230.000000	310.000000
## 3294	1999-11-21	2.9770833	24.99675	6.8279167	2.303030	4.181818
## 3295	1999-11-22	1.2783333	25.47779	5.3387500	10.227273	40.066919
## 3296	1999-11-23	3.0288095	25.50569	5.5550000	18.151515	75.952020
## 3297	1999-11-24	4.0651515	25.39991	6.0227273	26.075758	111.837121
## 3298	1999-11-25	3.5166667	25.41200	6.3002222	34.000000	147.722222
## 3299	1999-11-26	6.9524242	25.05485	7.8751515	107.619048	4.904762
## 3300	1999-11-27	5.5262121	25.02582	7.6398485	188.000000	1538.666667

## 3301	1999-11-28	4.1000000	24.99679	7.4045455	2.000000	2.476190
## 3302	1999-11-29	5.8736364	25.22942	6.4393939	7.476190	32.476190
## 3303	1999-11-30	6.8792424	25.17330	6.4250000	2.000000	140.000000
## 3304	1999-12-01	7.8848485	25.11718	6.4106061	2.142857	3.761905
## 3305	1999-12-02	7.5893939	25.00097	7.1278788	2.190476	3.380952
## 3306	1999-12-03	4.3163636	25.41394	6.0927273	2.047619	5.238095
## 3307	1999-12-04	6.2890909	25.32352	6.4245455	2.523810	30.119048
## 3308	1999-12-05	6.1746970	25.38000	6.3912121	3.000000	55.000000
## 3309	1999-12-06	6.0603030	25.43648	6.3578788	2.380952	5.523810
## 3310	1999-12-07	6.1054640	25.53270	5.7737311	2.500000	7.250000
## 3311	1999-12-08	6.1506250	25.62892	5.1895833	52.610169	126.000000
## 3312	1999-12-09	8.5944444	25.47831	5.8386667	2.042553	2.936170
## 3313	1999-12-10	4.5916667	25.54204	5.1883333	13.500000	188.333333
## 3314	1999-12-11	9.5566667	24.93067	8.1248485	33.476190	2.190476
## 3315	1999-12-12	14.3445238	25.10477	7.0111147	8.750000	5.000000
## 3316	1999-12-13	19.1323810	25.27888	5.8973810	2.133333	2.066667
## 3317	1999-12-14	15.9603030	25.29833	5.9872727	2.896552	5.724138
## 3318	1999-12-15	14.3995556	25.34467	5.3273333	2.222222	2.944444
## 3319	1999-12-16	6.4208333	25.25825	5.8891667	2.303030	2.848485
## 3320	1999-12-17	7.7223864	25.11229	6.6494318	4.250000	2.000000
## 3321	1999-12-18	9.0239394	24.96633	7.4096970	7.360000	17.040000
## 3322	1999-12-19	7.3033333	25.08477	6.9456566	88.000000	54.000000
## 3323	1999-12-20	5.5827273	25.20320	6.4816162	2.750000	2.750000
## 3324	1999-12-21	3.8621212	25.32164	6.0175758	5.952381	32.095238
## 3325	1999-12-22	5.3537157	25.30858	5.9427489	12.181818	14.545455
## 3326	1999-12-23	6.8453102	25.29553	5.8679221	3.750000	2.500000
## 3327	1999-12-24	8.3369048	25.28248	5.7930952	4.040816	39.714286
## 3328	1999-12-25	12.8128889	25.02876	6.8842222	82.055556	310.833333
## 3329	1999-12-26	16.8081818	24.82039	7.7690909	19.666667	48.222222
## 3330	1999-12-27	14.2308333	24.54512	9.0687500	3.151515	15.696970
## 3331	1999-12-28	13.1163131	24.46144	8.7362374	2.000000	3.500000
## 3332	1999-12-29	12.0017929	24.37775	8.4037247	102.363636	66.000000
## 3333	1999-12-30	10.8872727	24.29406	8.0712121	2.000000	2.190476
## 3334	1999-12-31	9.0808081	24.37185	7.7450505	3.250000	2.500000
## 3335	2000-01-01	7.2743434	24.44964	7.4188889	4.545455	9.272727
## 3336	2000-01-02	5.4678788	24.52742	7.0927273	2.000000	2.095238
## 3337	2000-01-03	5.5381818	24.61176	7.0369697	14.500000	2.750000
## 3338	2000-01-04	5.6084848	24.69609	6.9812121	2.490566	4.113208
## 3339	2000-01-05	8.3860606	24.83506	7.2675758	2.250000	3.000000
## 3340	2000-01-06	11.1636364	24.97403	7.5539394	2.142857	2.000000
## 3341	2000-01-07	9.5327273	24.83109	7.7446970	37.090909	9.636364
## 3342	2000-01-08	7.9018182	24.68815	7.9354545	2.160000	2.440000
## 3343	2000-01-09	8.1834343	24.81752	7.4360606	19.454545	16.545455
## 3344	2000-01-10	8.4650505	24.94688	6.9366667	3.500000	2.250000
## 3345	2000-01-11	8.7466667	25.07624	6.4372727	2.142857	2.000000
## 3346	2000-01-12	6.2803030	25.22015	6.3196970	2.000000	2.000000
## 3347	2000-01-13	2.2869048	25.35288	6.3930952	31.102041	61.632653
## 3348	2000-01-14	4.6591111	25.42604	6.1073333	290.944444	569.500000
## 3349	2000-01-15	5.1827407	25.11533	6.5819596	2.750000	2.500000
## 3350	2000-01-16	5.7063704	24.80462	7.0565859	28.181818	71.636364
## 3351	2000-01-17	6.2300000	24.49391	7.5312121	2.523810	2.571429
## 3352	2000-01-18	4.7733333	24.61608	7.1862500	2.000000	2.181818
## 3353	2000-01-19	4.6943939	24.78710	7.1564583	2.000000	2.000000
## 3354	2000-01-20	4.6154545	24.95812	7.1266667	4.452830	11.358491

## 3355	2000-01-21	12.6665152	25.12632	7.0475758	14.250000	5.500000
## 3356	2000-01-22	20.7175758	25.29452	6.9684848	7.444444	29.000000
## 3357	2000-01-23	10.2307143	25.37988	6.5528571	3.902439	5.756098
## 3358	2000-01-24	17.8160000	25.32364	7.3517778	2.055556	2.000000
## 3359	2000-01-25	11.2891667	24.80504	7.2266667	3.212121	5.515152
## 3360	2000-01-26	8.6665833	25.05311	6.3611111	2.000000	3.750000
## 3361	2000-01-27	6.0440000	25.30118	5.4955556	12.533333	4.056818
## 3362	2000-01-28	6.5945000	25.35711	5.5102778	3.636364	4.363636
## 3363	2000-01-29	7.1450000	25.41304	5.5250000	2.041667	5.431818
## 3364	2000-01-30	6.8508333	25.40015	5.3639583	27.428571	6.500000
## 3365	2000-01-31	11.5254545	24.99782	6.8957576	2.000000	2.363636
## 3366	2000-02-01	12.9153030	24.98150	7.3065152	3.272727	2.909091
## 3367	2000-02-02	14.3051515	24.96518	7.7172727	2.243902	2.292683
## 3368	2000-02-03	10.6793939	25.25909	6.9690909	9.090909	2.000000
## 3369	2000-02-04	8.9613131	25.16090	7.1081818	2.750000	3.250000
## 3370	2000-02-05	7.2432323	25.06271	7.2472727	38.000000	20.000000
## 3371	2000-02-06	5.5251515	24.96452	7.3863636	2.060606	2.000000
## 3372	2000-02-07	6.7917172	24.92243	7.3487879	3.000000	3.500000
## 3373	2000-02-08	8.0582828	24.88035	7.3112121	14.545455	34.727273
## 3374	2000-02-09	9.3248485	24.83827	7.2736364	2.000000	2.000000
## 3375	2000-02-10	8.3674242	24.87461	7.3654545	6.000000	2.500000
## 3376	2000-02-11	7.4100000	24.91094	7.4572727	23.172414	44.068966
## 3377	2000-02-12	13.6260000	24.90393	7.3933333	37.111111	136.888889
## 3378	2000-02-13	9.9919048	24.91993	7.5823810	2.000000	2.000000
## 3379	2000-02-14	7.0637500	24.80071	7.5541667	2.250000	3.416667
## 3380	2000-02-15	5.4592677	24.87757	6.9756061	5.750000	9.250000
## 3381	2000-02-16	3.8547854	24.95444	6.3970455	2.181818	2.000000
## 3382	2000-02-17	2.2503030	25.03130	5.8184848	2.000000	2.060606
## 3383	2000-02-18	4.5828788	25.10806	5.6400000	2.000000	3.500000
## 3384	2000-02-19	6.9154545	25.18482	5.4615152	2.060606	2.181818
## 3385	2000-02-20	7.6451515	25.08133	6.2841414	11.454545	8.363636
## 3386	2000-02-21	8.3748485	24.97785	7.1067677	2.000000	3.250000
## 3387	2000-02-22	9.1045455	24.87436	7.9293939	2.121212	2.121212
## 3388	2000-02-23	8.2595960	24.59787	7.8011111	18.500000	18.500000
## 3389	2000-02-24	7.4146465	24.32137	7.6728283	12.500000	4.000000
## 3390	2000-02-25	6.5696970	24.04488	7.5445455	25.818182	264.484848
## 3391	2000-02-26	6.6437374	24.06840	7.4553535	2.000000	2.000000
## 3392	2000-02-27	6.7177778	24.09193	7.3661616	7.875000	21.625000
## 3393	2000-02-28	6.7918182	24.11545	7.2769697	9.333333	5.818182
## 3394	2000-02-29	6.5604545	24.26821	7.4806061	23.750000	65.250000
## 3395	2000-03-01	6.3290909	24.42097	7.6842424	4.466667	5.400000
## 3396	2000-03-02	6.4359524	24.58660	7.4897619	3.000000	5.066667
## 3397	2000-03-03	6.2866667	24.48909	7.2555556	17.666667	70.222222
## 3398	2000-03-04	11.5987500	24.23846	7.1975000	2.000000	2.000000
## 3399	2000-03-05	10.2038352	24.24049	7.1125947	21.000000	6.500000
## 3400	2000-03-06	8.8089205	24.24252	7.0276894	50.000000	58.704545
## 3401	2000-03-07	7.4140057	24.24455	6.9427841	127.636364	110.909091
## 3402	2000-03-08	6.0190909	24.24658	6.8578788	464.352941	463.588235
## 3403	2000-03-09	6.1197980	24.28053	6.8636364	420.000000	880.000000
## 3404	2000-03-10	6.2205051	24.31448	6.8693939	80.000000	83.000000
## 3405	2000-03-11	6.3212121	24.34844	6.8751515	109.750000	61.000000
## 3406	2000-03-12	6.4219192	24.38239	6.8809091	2.000000	31.500000
## 3407	2000-03-13	6.5226263	24.41635	6.8866667	20.000000	2.000000
## 3408	2000-03-14	6.6233333	24.45030	6.8924242	60.090909	60.772727

## 3409	2000-03-15	5.1688889	24.69077	6.6248754	61.000000	390.000000
## 3410	2000-03-16	3.7144444	24.93124	6.3573266	4.500000	8.444444
## 3411	2000-03-17	2.2600000	25.17171	6.0897778	20.166667	7.546296
## 3412	2000-03-18	2.3485417	25.21140	6.0637500	35.833333	6.648148
## 3413	2000-03-19	2.9975000	25.16117	6.3197917	3.508772	5.750000
## 3414	2000-03-20	7.8666667	24.50961	7.6542424	8.181818	9.151515
## 3415	2000-03-21	8.3300000	24.54270	7.7210101	2.000000	14.030303
## 3416	2000-03-22	8.7933333	24.57579	7.7877778	64.363636	18.909091
## 3417	2000-03-23	9.2566667	24.60888	7.8545455	2.780488	2.634146
## 3418	2000-03-24	7.0784848	24.87521	7.5539394	2.000000	2.222222
## 3419	2000-03-25	8.1906667	24.81536	7.6184444	11.000000	141.461538
## 3420	2000-03-26	7.7295238	24.80688	7.6378571	3.515152	4.666667
## 3421	2000-03-27	4.0083333	24.68142	7.1533333	13.375000	9.125000
## 3422	2000-03-28	3.4793939	24.80373	6.9445455	14.711111	85.681818
## 3423	2000-03-29	3.3116162	25.00861	6.7564646	2.000000	18.666667
## 3424	2000-03-30	3.1438384	25.21348	6.5683838	2.500000	3.000000
## 3425	2000-03-31	2.9760606	25.41836	6.3803030	2.818182	6.500000
## 3426	2000-04-01	7.7660606	25.30282	7.0339394	2.000000	2.000000
## 3427	2000-04-02	13.3413636	25.24399	7.6857197	17.500000	6.500000
## 3428	2000-04-03	18.9166667	25.18517	8.3375000	6.250000	2.000000
## 3429	2000-04-04	8.0808889	25.23147	7.9222222	17.170213	7.574468
## 3430	2000-04-05	9.1804762	25.29155	7.4750000	2.000000	2.000000
## 3431	2000-04-06	12.0121212	25.23809	7.9706061	2.111111	2.222222
## 3432	2000-04-07	12.6995455	25.20445	7.7657576	2.250000	2.000000
## 3433	2000-04-08	13.3869697	25.17082	7.5609091	2.000000	2.000000
## 3434	2000-04-09	14.4102020	25.14190	7.7725253	4.909091	2.909091
## 3435	2000-04-10	15.4334343	25.11298	7.9841414	2.750000	5.750000
## 3436	2000-04-11	16.4566667	25.08406	8.1957576	2.242424	2.121212
## 3437	2000-04-12	14.2452020	25.00685	8.0174242	8577.777778	6031.111111
## 3438	2000-04-13	12.0337374	24.92965	7.8390909	320.000000	135.250000
## 3439	2000-04-14	9.8222727	24.85244	7.6607576	6219.846154	4410.000000
## 3440	2000-04-15	7.6108081	24.77523	7.4824242	133.555556	302.333333
## 3441	2000-04-16	5.3993434	24.69803	7.3040909	740.000000	40.000000
## 3442	2000-04-17	3.1878788	24.62082	7.1257576	157.307692	292.692308
## 3443	2000-04-18	3.9244697	24.67595	7.3196970	130.000000	44.000000
## 3444	2000-04-19	4.6610606	24.73109	7.5136364	4490.000000	12000.000000
## 3445	2000-04-20	5.3976515	24.78623	7.7075758	2881.777778	6200.000000
## 3446	2000-04-21	6.1342424	24.84136	7.9015152	657.677419	877.500000
## 3447	2000-04-22	5.4122222	24.80487	7.8933333	416.541667	528.680851
## 3448	2000-04-23	4.2500000	24.90890	7.6966667	5.866667	9.200000
## 3449	2000-04-24	4.0614583	24.84529	7.5614583	4029.333333	4283.333333
## 3450	2000-04-25	3.8729167	24.78167	7.4262500	482.000000	465.230769
## 3451	2000-04-26	3.7205303	24.81161	7.3473990	6.222222	6.222222
## 3452	2000-04-27	3.5681439	24.84155	7.2685480	17.272727	44.363636
## 3453	2000-04-28	3.4157576	24.87148	7.1896970	3.636364	2.000000
## 3454	2000-04-29	4.9400000	24.88733	7.4093939	5.000000	13.500000
## 3455	2000-04-30	6.4642424	24.90318	7.6290909	125.409091	318.363636
## 3456	2000-05-01	7.0493939	24.87677	7.8017172	3001.000000	142.500000
## 3457	2000-05-02	7.6345455	24.85035	7.9743434	27.111111	4.000000
## 3458	2000-05-03	8.2196970	24.82394	8.1469697	6.000000	13.515152
## 3459	2000-05-04	7.6428283	24.85386	7.9886869	26.727273	31.818182
## 3460	2000-05-05	7.0659596	24.88378	7.8304040	5.500000	6.750000
## 3461	2000-05-06	6.4890909	24.91370	7.6721212	9.393939	2.181818
## 3462	2000-05-07	9.7677778	24.99189	7.3124444	310.340426	721.829787

## 3463	2000-05-08	5.6871429	25.14740	6.8921429	4.631579	17.263158
## 3464	2000-05-09	8.5715152	25.10258	7.6712121	3.000000	24.800000
## 3465	2000-05-10	8.4513636	25.12333	7.5396970	2.924242	80.000000
## 3466	2000-05-11	8.3312121	25.14409	7.4081818	2.848485	2.121212
## 3467	2000-05-12	6.1340476	25.38724	6.5428571	62.983607	28.315789
## 3468	2000-05-13	2.5545455	25.50759	5.9627273	6.681818	19.543860
## 3469	2000-05-14	1.8303636	25.64529	5.5718182	23.200000	10.771930
## 3470	2000-05-15	5.8237500	24.95971	8.1229167	2.000000	2.000000
## 3471	2000-05-16	5.5775505	24.98448	7.8026515	3.500000	6.750000
## 3472	2000-05-17	5.3313510	25.00926	7.4823864	2.727273	2.545455
## 3473	2000-05-18	5.0851515	25.03403	7.1621212	2.181818	2.000000
## 3474	2000-05-19	4.8243939	25.00653	7.3725758	46.727273	32.181818
## 3475	2000-05-20	4.5636364	24.97903	7.5830303	3.818182	8.666667
## 3476	2000-05-21	4.3075000	25.01770	7.3985606	360.000000	22.944444
## 3477	2000-05-22	4.0513636	25.05636	7.2140909	29.000000	37.222222
## 3478	2000-05-23	3.7952273	25.09503	7.0296212	7.500000	51.500000
## 3479	2000-05-24	3.5390909	25.13370	6.8451515	2.000000	2.303030
## 3480	2000-05-25	4.2827273	25.50085	6.2496970	6.068966	441.517241
## 3481	2000-05-26	3.4808889	25.50313	5.8897778	3.833333	54.166667
## 3482	2000-05-27	3.6540476	25.51319	5.9347619	85.161290	162.387097
## 3483	2000-05-28	2.8133333	25.39392	5.7704167	8.303030	8.000000
## 3484	2000-05-29	7.4674242	25.38252	6.4849337	76.000000	401.090909
## 3485	2000-05-30	12.1215152	25.37112	7.1994508	128.545455	794.181818
## 3486	2000-05-31	16.7756061	25.35973	7.9139678	2.000000	3.200000
## 3487	2000-06-01	21.4296970	25.34833	8.6284848	13.515152	2.787879
## 3488	2000-06-02	19.0974747	25.35786	8.1720202	76.000000	182.121212
## 3489	2000-06-03	16.7652525	25.36738	7.7155556	35.818182	361.454545
## 3490	2000-06-04	14.4330303	25.37691	7.2590909	5.512195	3.804878
## 3491	2000-06-05	13.4338636	25.33074	7.3958333	360.000000	2003.000000
## 3492	2000-06-06	12.4346970	25.28458	7.5325758	84.000000	440.000000
## 3493	2000-06-07	11.4355303	25.23841	7.6693182	215.730769	10.000000
## 3494	2000-06-08	10.4363636	25.19224	7.8060606	347.461538	455.115385
## 3495	2000-06-09	10.2836364	25.19039	7.5372727	3610.600000	6010.000000
## 3496	2000-06-10	10.1309091	25.18855	7.2684848	1240.000000	5600.000000
## 3497	2000-06-11	9.9781818	25.18670	6.9996970	2.444444	3.222222
## 3498	2000-06-12	9.2273939	25.17712	7.0027273	2.000000	5.250000
## 3499	2000-06-13	8.4766061	25.16755	7.0057576	7.272727	7.636364
## 3500	2000-06-14	7.7258182	25.15797	7.0087879	2.606061	3.151515
## 3501	2000-06-15	6.9750303	25.12032	7.0118182	2.000000	4.250000
## 3502	2000-06-16	6.2242424	25.08267	7.0148485	6.111111	2.111111
## 3503	2000-06-17	4.7338095	25.11845	6.8776190	12.634146	12.634146
## 3504	2000-06-18	5.7051111	25.01138	7.0486667	5.555556	18.277778
## 3505	2000-06-19	4.8843165	25.02612	7.0677980	4.250000	24.000000
## 3506	2000-06-20	4.0635219	25.04086	7.0869293	1275.090909	1849.636364
## 3507	2000-06-21	3.2427273	25.05561	7.1060606	32.545455	2.424242
## 3508	2000-06-22	3.6128788	24.97701	7.1553788	4034.000000	4803.333333
## 3509	2000-06-23	3.9830303	24.89841	7.2046970	3.200000	149.600000
## 3510	2000-06-24	4.3531818	24.81981	7.2540152	2.630303	1200.000000
## 3511	2000-06-25	4.7233333	24.74121	7.3033333	2.060606	2.121212
## 3512	2000-06-26	3.8795833	24.85392	7.0187500	44.909091	143.454545
## 3513	2000-06-27	3.0358333	24.96663	6.7341667	7.875000	29.878788
## 3514	2000-06-28	4.0282197	24.97654	6.8279924	2.000000	2.000000
## 3515	2000-06-29	5.0206061	24.98645	6.9218182	25.772727	337.590909
## 3516	2000-06-30	5.3587229	25.08294	6.8355022	4.250000	2.000000

## 3517	2000-07-01	5.6968398	25.17942	6.7491861	40.000000	6550.000000
## 3518	2000-07-02	6.0349567	25.27590	6.6628701	25.684211	42.000000
## 3519	2000-07-03	6.3730736	25.37238	6.5765541	11.368421	7.263158
## 3520	2000-07-04	6.7111905	25.46886	6.4902381	2.000000	5.947368
## 3521	2000-07-05	4.6490698	25.64495	5.7302326	8.454545	4.631579
## 3522	2000-07-06	4.9978182	25.67269	5.3421818	13.018182	3.315789
## 3523	2000-07-07	16.0436364	25.01761	9.6627273	2.000000	2.000000
## 3524	2000-07-08	11.3711515	24.97881	8.8413636	2.250000	3.250000
## 3525	2000-07-09	6.6986667	24.94002	8.0200000	4.425532	24.170213
## 3526	2000-07-10	8.1203030	24.92858	8.3269697	2.111111	2.000000
## 3527	2000-07-11	4.0845238	25.16783	7.2950000	2.000000	2.000000
## 3528	2000-07-12	5.0575000	24.99329	7.4741667	2.000000	2.166667
## 3529	2000-07-13	5.4880303	25.04848	7.2678283	3.250000	4.500000
## 3530	2000-07-14	5.9185606	25.10366	7.0614899	7.636364	3.272727
## 3531	2000-07-15	6.3490909	25.15885	6.8551515	5.575758	51.515152
## 3532	2000-07-16	5.7734091	25.05155	7.0485606	4.537879	9.000000
## 3533	2000-07-17	5.1977273	24.94424	7.2419697	3.500000	7.000000
## 3534	2000-07-18	4.6220455	24.83694	7.4353788	76.363636	578.909091
## 3535	2000-07-19	4.0463636	24.72964	7.6287879	2.000000	2.060606
## 3536	2000-07-20	4.8743434	24.92420	7.1187879	12.000000	200.000000
## 3537	2000-07-21	5.7023232	25.11877	6.6087879	2.000000	2.000000
## 3538	2000-07-22	6.5303030	25.31333	6.0987879	13.409091	31.681818
## 3539	2000-07-23	7.4998485	25.38136	6.0542424	8.750000	66.888889
## 3540	2000-07-24	8.4693939	25.44939	6.0096970	2.000000	2.000000
## 3541	2000-07-25	15.8148485	25.31148	7.2642424	2.000000	2.000000
## 3542	2000-07-26	7.0721429	25.45710	6.3142857	2.341463	2.731707
## 3543	2000-07-27	11.9186667	25.40771	6.5077778	3.227273	3.000000
## 3544	2000-07-28	7.2783333	25.13304	6.9241667	2.000000	2.000000
## 3545	2000-07-29	7.9472727	25.04103	7.3348485	8.076923	11.000000
## 3546	2000-07-30	6.5439394	24.69806	8.2118182	3.024390	2.341463
## 3547	2000-07-31	7.1727273	24.72697	7.8580303	2.363636	2.545455
## 3548	2000-08-01	7.8015152	24.75588	7.5042424	3.121951	2.341463
## 3549	2000-08-02	7.7336291	24.74463	7.4671140	95.272727	80.363636
## 3550	2000-08-03	7.6657431	24.73337	7.4299856	11.500000	10.250000
## 3551	2000-08-04	7.5978571	24.72212	7.3928571	2.292683	2.341463
## 3552	2000-08-05	11.4277778	24.55727	7.5840000	6.444444	18.722222
## 3553	2000-08-06	14.3130303	24.64458	7.9063636	2.000000	2.666667
## 3554	2000-08-07	8.0429167	24.45404	8.6562500	2.187500	6.625000
## 3555	2000-08-08	6.5494886	24.42020	8.5199432	2.000000	2.545455
## 3556	2000-08-09	5.0560606	24.38636	8.3836364	2.000000	2.000000
## 3557	2000-08-10	4.6736364	24.57736	8.2157576	4.250000	9.500000
## 3558	2000-08-11	4.2912121	24.76836	8.0478788	2.409091	2.227273
## 3559	2000-08-12	3.5356061	24.59717	8.3395455	2.500000	6.000000
## 3560	2000-08-13	2.7800000	24.42597	8.6312121	2.000000	2.000000
## 3561	2000-08-14	3.4490909	24.58161	8.3227273	17.157895	9.157895
## 3562	2000-08-15	4.1181818	24.73724	8.0142424	2.363636	5.878788
## 3563	2000-08-16	4.6916162	24.70386	8.1949495	3.000000	5.500000
## 3564	2000-08-17	5.2650505	24.67047	8.3756566	2.181818	2.727273
## 3565	2000-08-18	5.8384848	24.63709	8.5563636	2.000000	2.000000
## 3566	2000-08-19	5.0932323	24.60371	8.5572727	2.000000	4.250000
## 3567	2000-08-20	4.3479798	24.57032	8.5581818	2.181818	3.090909
## 3568	2000-08-21	3.6027273	24.53694	8.5590909	2.000000	2.000000
## 3569	2000-08-22	3.1404545	24.71743	7.7988312	3.250000	30.250000
## 3570	2000-08-23	2.6781818	24.89793	7.0385714	3.622642	3.818182

## 3571	2000-08-24	2.2159091	25.11414	6.1622727	28.318182	3.358463
## 3572	2000-08-25	1.8709091	25.27191	5.8278182	7.309091	2.898744
## 3573	2000-08-26	4.9912121	24.47806	9.2178788	2.097561	2.439024
## 3574	2000-08-27	7.9312121	24.42355	8.7872727	2.000000	2.111111
## 3575	2000-08-28	6.6664444	24.70876	8.3006667	2.765957	6.468085
## 3576	2000-08-29	4.4183333	24.89545	7.4354762	2.133333	2.133333
## 3577	2000-08-30	5.4429167	24.90983	7.4983333	3.250000	3.437500
## 3578	2000-08-31	8.0239394	24.69079	8.0181818	2.500000	4.727273
## 3579	2000-09-01	9.1824242	24.81820	7.6081818	6.500000	6.500000
## 3580	2000-09-02	10.3409091	24.94561	7.1981818	2.807692	4.038462
## 3581	2000-09-03	10.8150000	24.54583	8.9441667	2.750000	2.875000
## 3582	2000-09-04	13.6047619	24.67590	8.5457143	2.000000	2.048780
## 3583	2000-09-05	13.6560000	24.55356	8.8291111	2.000000	2.000000
## 3584	2000-09-06	9.1618182	24.54885	8.5693939	2.222222	2.000000
## 3585	2000-09-07	7.5509091	24.57588	8.2518182	2.292683	2.536585
## 3586	2000-09-08	8.7557576	24.68748	8.0425758	2.545455	2.545455
## 3587	2000-09-09	9.9606061	24.79909	7.8333333	2.060606	2.000000
## 3588	2000-09-10	9.2902020	24.81542	7.7885859	3.250000	13.250000
## 3589	2000-09-11	8.6197980	24.83176	7.7438384	35.272727	20.181818
## 3590	2000-09-12	7.9493939	24.84809	7.6990909	2.060606	2.121212
## 3591	2000-09-13	5.7653030	24.86267	7.6109091	3.000000	7.750000
## 3592	2000-09-14	3.5812121	24.87724	7.5227273	2.000000	2.303030
## 3593	2000-09-15	5.7324242	24.82206	7.7460606	2.000000	2.000000
## 3594	2000-09-16	4.8464286	24.82214	7.6266667	4.487805	7.463415
## 3595	2000-09-17	4.5895556	24.83816	7.6811111	2.000000	2.000000
## 3596	2000-09-18	3.6570694	24.77077	7.5136806	32.000000	60.000000
## 3597	2000-09-19	2.7245833	24.70338	7.3462500	2.000000	2.000000
## 3598	2000-09-20	3.3307765	24.80431	7.0363068	7.818182	3.454545
## 3599	2000-09-21	3.9369697	24.90524	6.7263636	7.560976	6.195122
## 3600	2000-09-22	8.5448485	24.96391	6.2606061	2.192308	2.423077
## 3601	2000-09-23	1.8354545	24.82621	5.4496970	4.195122	5.219512
## 3602	2000-09-24	3.3511760	24.94176	5.6845599	33.272727	18.727273
## 3603	2000-09-25	4.8668975	25.05731	5.9194228	4.750000	4.750000
## 3604	2000-09-26	6.3826190	25.17286	6.1542857	2.264151	2.000000
## 3605	2000-09-27	2.1993182	25.27298	5.4127273	4.727273	2.000000
## 3606	2000-09-28	1.6301818	25.35900	5.0163636	4.872727	2.000000
## 3607	2000-09-29	23.6809091	24.73858	9.1027273	2.000000	2.000000
## 3608	2000-09-30	21.0001515	24.82053	8.6207576	16.250000	13.250000
## 3609	2000-10-01	18.3193939	24.90248	8.1387879	8.666667	27.111111
## 3610	2000-10-02	13.6631111	24.92293	7.9166667	5.400000	14.555556
## 3611	2000-10-03	10.2126190	25.03448	7.2716667	2.133333	2.000000
## 3612	2000-10-04	6.8041667	24.93792	7.4550000	17.307692	48.461538
## 3613	2000-10-05	5.8796405	24.82435	7.6834314	542.000000	590.444444
## 3614	2000-10-06	4.9551144	24.71078	7.9118627	12000.000000	12000.000000
## 3615	2000-10-07	4.0305882	24.59721	8.1402941	13.545455	48.090909
## 3616	2000-10-08	3.1716578	24.56582	7.9015107	4.222222	8.000000
## 3617	2000-10-09	2.3127273	24.53442	7.6627273	2.000000	2.000000
## 3618	2000-10-10	2.5134091	24.58622	7.2075000	971.454545	2750.000000
## 3619	2000-10-11	2.7140909	24.63802	6.7522727	120.909091	1017.333333
## 3620	2000-10-12	2.9147727	24.68981	6.2970455	73.333333	53.333333
## 3621	2000-10-13	3.1154545	24.74161	5.8418182	3.696970	2.424242
## 3622	2000-10-14	3.3024242	24.73315	6.6206061	12.421053	20.210526
## 3623	2000-10-15	3.4893939	24.72470	7.3993939	2.000000	2.000000
## 3624	2000-10-16	5.2157576	24.86085	7.8112121	2.307692	2.153846

## 3625	2000-10-17	3.3730952	24.83886	7.5607143	2.000000	2.000000
## 3626	2000-10-18	5.5771111	24.83656	7.7337778	2.500000	2.055556
## 3627	2000-10-19	2.9325000	24.87342	6.2887500	2.000000	2.000000
## 3628	2000-10-20	2.9089394	24.85544	6.3277525	5.750000	6.750000
## 3629	2000-10-21	2.8853788	24.83746	6.3667551	3543.272727	911.454545
## 3630	2000-10-22	2.8618182	24.81948	6.4057576	42.263158	52.571429
## 3631	2000-10-23	3.0733333	24.82410	6.3858586	55.500000	150.000000
## 3632	2000-10-24	3.2848485	24.82872	6.3659596	20.400000	5.250000
## 3633	2000-10-25	3.4963636	24.83333	6.3460606	7.090909	18.666667
## 3634	2000-10-26	3.3606061	24.86532	6.2434848	78.181818	127.666667
## 3635	2000-10-27	3.2248485	24.89730	6.1409091	2.909091	2.424242
## 3636	2000-10-28	4.3790909	24.90662	6.4327273	67.000000	8.000000
## 3637	2000-10-29	5.5333333	24.91595	6.7245455	2.000000	7.000000
## 3638	2000-10-30	6.6875758	24.92527	7.0163636	423.454545	910.909091
## 3639	2000-10-31	7.8418182	24.93459	7.3081818	2.500000	4.750000
## 3640	2000-11-01	8.9960606	24.94391	7.6000000	2.551724	3.931034
## 3641	2000-11-02	12.5002222	24.92538	7.7740000	4.727273	3.227273
## 3642	2000-11-03	8.5523810	24.94900	7.4838095	2.000000	2.000000
## 3643	2000-11-04	5.9133333	24.87003	6.5245455	3.454545	2.424242
## 3644	2000-11-05	4.5468750	24.90681	6.2949811	357.157895	449.894737
## 3645	2000-11-06	3.1804167	24.94358	6.0654167	2.166667	2.916667
## 3646	2000-11-07	2.4311869	24.95757	6.2790657	2.250000	2.500000
## 3647	2000-11-08	1.6819571	24.97156	6.4927146	34.181818	135.636364
## 3648	2000-11-09	0.9327273	24.98555	6.7063636	2.114286	2.457143
## 3649	2000-11-10	1.6538384	25.01614	6.6859596	5.500000	5.250000
## 3650	2000-11-11	2.3749495	25.04674	6.6655556	1937.272727	2156.545455
## 3651	2000-11-12	3.0960606	25.07733	6.6451515	2.242424	4.848485
## 3652	2000-11-13	3.0759596	25.06830	6.7671717	19.000000	171.000000
## 3653	2000-11-14	3.0558586	25.05927	6.8891919	2.250000	3.000000
## 3654	2000-11-15	3.0357576	25.05024	7.0112121	2.000000	2.303030
## 3655	2000-11-16	2.4854545	25.05120	7.2661616	56.181818	292.727273
## 3656	2000-11-17	1.9351515	25.05216	7.5211111	400.000000	560.000000
## 3657	2000-11-18	1.3848485	25.05312	7.7760606	5.380952	7.809524
## 3658	2000-11-19	3.8395455	25.04977	7.0560606	64.000000	5.293651
## 3659	2000-11-20	6.2942424	25.04642	6.3360606	2.000000	2.777778
## 3660	2000-11-21	6.1830952	25.01064	5.9242857	40.439024	55.658537
## 3661	2000-11-22	7.6844444	24.89944	7.1913095	27.388889	38.611111
## 3662	2000-11-23	0.9004167	24.93188	8.4583333	135.312500	71.187500
## 3663	2000-11-24	0.9631061	24.96262	8.2984848	2.000000	10.000000
## 3664	2000-11-25	1.0257955	24.99337	8.1386364	3246.363636	2637.090909
## 3665	2000-11-26	1.0884848	25.02412	7.9787879	23.365854	39.707317
## 3666	2000-11-27	1.2086364	25.06079	7.6931061	5006.666667	6660.000000
## 3667	2000-11-28	1.3287879	25.09745	7.4074242	448.400000	1328.800000
## 3668	2000-11-29	1.4489394	25.13412	7.1217424	20.000000	70.000000
## 3669	2000-11-30	1.5690909	25.17079	6.8360606	8.153846	3.153846
## 3670	2000-12-01	2.7642857	25.42750	5.4452381	2.428571	3.023921
## 3671	2000-12-02	1.8490909	25.63780	4.6677273	9.818182	2.893996
## 3672	2000-12-03	1.9858182	25.70242	4.4596364	12.727273	2.764071
## 3673	2000-12-04	1.4233333	25.02506	7.9533333	2.097561	2.634146
## 3674	2000-12-05	1.2688889	25.13458	7.4451515	14.000000	303.000000
## 3675	2000-12-06	1.1144444	25.24409	6.9369697	9.000000	220.000000
## 3676	2000-12-07	0.9600000	25.35361	6.4287879	4.000000	2.000000
## 3677	2000-12-08	4.5433333	25.37954	6.2909416	14.250000	11.000000
## 3678	2000-12-09	8.1266667	25.40548	6.1530952	6.341463	4.585366

## 3679	2000-12-10	11.2862222	25.30211	6.7373333	2.666667	5.500000
## 3680	2000-12-11	10.0121212	25.49652	5.8769697	2.000000	2.000000
## 3681	2000-12-12	3.0012500	25.48079	6.7287500	2.000000	2.000000
## 3682	2000-12-13	3.3962879	25.45326	6.5104798	2.000000	2.250000
## 3683	2000-12-14	3.7913258	25.42572	6.2922096	17.636364	4.000000
## 3684	2000-12-15	4.1863636	25.39818	6.0739394	6.058824	2.000000
## 3685	2000-12-16	3.0671717	25.43065	6.0133333	5.777778	5.750000
## 3686	2000-12-17	1.9479798	25.46311	5.9527273	1158.727273	1242.909091
## 3687	2000-12-18	0.8287879	25.49558	5.8921212	22.121212	210.545455
## 3688	2000-12-19	1.6539394	25.39613	6.6149495	6.400000	58.000000
## 3689	2000-12-20	2.4790909	25.29669	7.3377778	10.000000	16.000000
## 3690	2000-12-21	3.3042424	25.19724	8.0606061	121.954545	330.772727
## 3691	2000-12-22	3.2215909	25.28729	7.4836364	2.909091	10.200000
## 3692	2000-12-23	3.1389394	25.37733	6.9066667	24.349282	2.000000
## 3693	2000-12-24	3.0562879	25.46738	6.3296970	45.789474	97.157895
## 3694	2000-12-25	2.9736364	25.55742	5.7527273	2.000000	2.000000
## 3695	2000-12-26	4.6950505	25.50415	6.6778788	2.500000	17.750000
## 3696	2000-12-27	6.4164646	25.45088	7.6030303	1275.636364	2184.181818
## 3697	2000-12-28	8.1378788	25.39761	8.5281818	355.235294	357.705882
## 3698	2000-12-29	6.0813636	25.44371	7.6535101	280.000000	4600.000000
## 3699	2000-12-30	4.0248485	25.48981	6.7788384	2.666667	4.000000
## 3700	2000-12-31	1.9683333	25.53592	5.9041667	2.000000	2.833333
## 3701	2001-01-01	8.2460556	25.63070	5.2884167	16.363636	128.000000
## 3702	2001-01-02	14.5237778	25.72549	4.6726667	2.055556	2.944444
## 3703	2001-01-03	10.7385714	25.61879	5.3180952	2.193548	2.967742
## 3704	2001-01-04	28.8709091	25.44009	6.9154545	2.000000	2.111111
## 3705	2001-01-05	19.9891919	25.41405	6.8052525	2.250000	4.500000
## 3706	2001-01-06	11.1074747	25.38801	6.6950505	18.545455	36.545455
## 3707	2001-01-07	2.2257576	25.36197	6.5848485	2.000000	2.000000
## 3708	2001-01-08	2.0123232	25.18376	7.0330303	12000.000000	12000.000000
## 3709	2001-01-09	1.7988889	25.00555	7.4812121	1335.333333	1354.000000
## 3710	2001-01-10	1.5854545	24.82733	7.9293939	9.000000	49.176471
## 3711	2001-01-11	0.8125000	25.02829	7.6679167	6.375000	20.125000
## 3712	2001-01-12	7.5714286	25.11207	6.5621429	11.636364	11.333333
## 3713	2001-01-13	8.0748889	24.98431	6.9797778	2.000000	3.244444
## 3714	2001-01-14	7.4045455	24.97570	6.7648485	2.000000	2.222222
## 3715	2001-01-15	1.1263636	24.81121	7.2639394	2.000000	2.000000
## 3716	2001-01-16	2.3854762	25.26214	5.5092857	7.132075	7.636364
## 3717	2001-01-17	2.1436472	25.47450	4.8231818	5.137466	5.860140
## 3718	2001-01-18	1.9018182	25.61095	4.4794545	3.142857	4.083916
## 3719	2001-01-19	1.0657576	25.38609	5.3621212	2.000000	2.307692
## 3720	2001-01-20	5.2363636	25.19948	7.2563636	2.000000	2.181818
## 3721	2001-01-21	4.3525455	25.13492	7.2604242	2.000000	2.000000
## 3722	2001-01-22	3.4687273	25.07036	7.2644848	2.545455	3.090909
## 3723	2001-01-23	2.5849091	25.00579	7.2685455	2.500000	4.750000
## 3724	2001-01-24	1.7010909	24.94123	7.2726061	2.000000	2.000000
## 3725	2001-01-25	0.8172727	24.87667	7.2766667	2.000000	2.000000
## 3726	2001-01-26	1.2969697	24.95203	7.0100000	2.048780	2.195122
## 3727	2001-01-27	5.9676190	24.96019	7.3428571	2.048780	2.341463
## 3728	2001-01-28	10.3015556	25.07311	7.1415556	2.500000	4.722222
## 3729	2001-01-29	12.0109091	24.93067	7.2418182	2.000000	2.000000
## 3730	2001-01-30	1.5208333	24.47762	7.8495833	2.250000	5.187500
## 3731	2001-01-31	1.4749621	24.51719	7.7996402	2.000000	2.181818
## 3732	2001-02-01	1.4290909	24.55676	7.7496970	2.146341	2.243902

## 3733	2001-02-02	1.4289394	24.79141	7.6018182	11.818182	7.272727
## 3734	2001-02-03	1.4287879	25.02606	7.4539394	2.097561	2.292683
## 3735	2001-02-04	5.6190909	25.05727	8.8393939	3.038462	2.423077
## 3736	2001-02-05	4.2230303	24.98242	8.2245455	2.000000	2.000000
## 3737	2001-02-06	6.1135671	25.02883	8.0899697	3.750000	7.000000
## 3738	2001-02-07	8.0041039	25.07523	7.9553939	3.818182	3.272727
## 3739	2001-02-08	9.8946407	25.12163	7.8208182	3630.500000	835.750000
## 3740	2001-02-09	11.7851775	25.16803	7.6862424	2.000000	4.000000
## 3741	2001-02-10	13.6757143	25.21443	7.5516667	2.731707	3.853659
## 3742	2001-02-11	13.7024444	25.26229	7.4062222	2.000000	2.000000
## 3743	2001-02-12	14.3106061	25.10679	7.8272727	2.000000	2.888889
## 3744	2001-02-13	1.2495833	24.74513	8.0200000	2.000000	2.000000
## 3745	2001-02-14	1.5471970	24.70266	8.1748485	2.000000	2.750000
## 3746	2001-02-15	1.8448106	24.66019	8.3296970	11.454545	128.909091
## 3747	2001-02-16	2.1424242	24.61773	8.4845455	2.000000	2.000000
## 3748	2001-02-17	2.1226061	24.65498	8.3561212	12.750000	2.000000
## 3749	2001-02-18	2.1027879	24.69222	8.2276970	23.500000	15.750000
## 3750	2001-02-19	2.0829697	24.72947	8.0992727	2.000000	9.693182
## 3751	2001-02-20	2.0631515	24.76672	7.9708485	2.545455	3.636364
## 3752	2001-02-21	2.0433333	24.80397	7.8424242	2.097561	5.853659
## 3753	2001-02-22	4.3890909	24.91267	8.2845455	4.681818	3.000000
## 3754	2001-02-23	2.8248485	24.66158	8.2292424	5.500000	7.250000
## 3755	2001-02-24	1.2606061	24.41048	8.1739394	2.000000	2.000000
## 3756	2001-02-25	2.5294872	24.78646	7.1517949	2.379310	2.631579
## 3757	2001-02-26	2.4529787	25.03560	6.4397872	6.765957	2.421053
## 3758	2001-02-27	1.3523636	25.18296	6.0558182	10.909091	2.210526
## 3759	2001-02-28	1.0375758	24.12685	8.2675758	2.000000	2.000000
## 3760	2001-03-01	8.4077778	24.29602	8.4582222	2.181818	2.954545
## 3761	2001-03-02	5.1054545	24.48076	8.2178788	5.310345	4.758621
## 3762	2001-03-03	7.7200000	24.59381	8.0042857	2.000000	2.000000
## 3763	2001-03-04	0.9417391	24.57430	7.2126087	2.000000	2.000000
## 3764	2001-03-05	0.9983311	24.33002	7.4168906	7.500000	9.250000
## 3765	2001-03-06	1.0549231	24.08574	7.6211726	33.636364	27.090909
## 3766	2001-03-07	1.1115152	23.84145	7.8254545	2.121212	2.000000
## 3767	2001-03-08	1.0936364	23.99611	7.7509091	30.000000	6.272727
## 3768	2001-03-09	1.0757576	24.15076	7.6763636	13.863636	10.545455
## 3769	2001-03-10	2.0259596	24.26719	7.8589899	71.250000	39.500000
## 3770	2001-03-11	2.9761616	24.38363	8.0416162	26.000000	21.543103
## 3771	2001-03-12	3.9263636	24.50006	8.2242424	5.241379	3.586207
## 3772	2001-03-13	3.6591111	24.47940	8.1695556	2.111111	2.111111
## 3773	2001-03-14	3.8792857	24.38617	8.0152381	6.157895	12.052632
## 3774	2001-03-15	0.8645833	24.10129	8.1483333	2.166667	2.000000
## 3775	2001-03-16	0.9135606	24.18620	8.0519192	5.272727	3.818182
## 3776	2001-03-17	0.9625379	24.27112	7.9555051	2.250000	4.000000
## 3777	2001-03-18	1.0115152	24.35603	7.8590909	2.000000	2.000000
## 3778	2001-03-19	1.0484848	24.22012	7.8353030	54.052632	21.894737
## 3779	2001-03-20	1.0854545	24.08421	7.8115152	7.222222	2.060606
## 3780	2001-03-21	1.0843939	24.06939	7.7803788	8.000000	2.405303
## 3781	2001-03-22	1.0833333	24.05458	7.7492424	2.500000	2.750000
## 3782	2001-03-23	1.0822727	24.03976	7.7181061	3.272727	8.363636
## 3783	2001-03-24	1.0812121	24.02494	7.6869697	2.000000	2.121212
## 3784	2001-03-25	1.1190909	24.21009	8.1848485	3.268293	5.756098
## 3785	2001-03-26	4.9409091	24.30003	7.9703030	2.000000	2.000000
## 3786	2001-03-27	4.3304762	24.37783	7.9623810	8.243902	2.634146

## 3787	2001-03-28	1.1954167	24.11517	7.8454167	2.416667	2.000000
## 3788	2001-03-29	4.8913333	24.20351	8.1740000	2.000000	2.000000
## 3789	2001-03-30	3.6182626	24.14214	8.0100404	2.500000	8.500000
## 3790	2001-03-31	2.3451919	24.08077	7.8460808	2.363636	2.909091
## 3791	2001-04-01	1.0721212	24.01939	7.6821212	29.073171	48.975610
## 3792	2001-04-02	1.0697727	24.06749	7.6355303	17.000000	25.487805
## 3793	2001-04-03	1.0674242	24.11559	7.5889394	50.500000	2.000000
## 3794	2001-04-04	1.0650758	24.16369	7.5423485	84.000000	20.363636
## 3795	2001-04-05	1.0627273	24.21179	7.4957576	2.060606	2.000000
## 3796	2001-04-06	1.0648485	24.28057	7.4304040	14.222222	52.000000
## 3797	2001-04-07	1.0669697	24.34934	7.3650505	3.000000	13.250000
## 3798	2001-04-08	1.0690909	24.41812	7.2996970	2.000000	2.000000
## 3799	2001-04-09	1.2745455	24.45106	7.8669697	2.000000	2.000000
## 3800	2001-04-10	1.3550000	24.44718	7.7863636	10.421053	14.421053
## 3801	2001-04-11	1.4354545	24.44330	7.7057576	2.000000	3.636364
## 3802	2001-04-12	2.8306061	24.46758	7.6460606	5.750000	11.000000
## 3803	2001-04-13	4.2257576	24.49185	7.5863636	4.827586	4.482759
## 3804	2001-04-14	2.4073333	24.44700	7.6120000	2.000000	4.055556
## 3805	2001-04-15	2.0935714	24.57612	7.3100000	2.000000	2.000000
## 3806	2001-04-16	1.2704545	24.48573	7.2318182	2.000000	2.000000
## 3807	2001-04-17	1.3954654	24.69807	7.0724567	2.250000	7.750000
## 3808	2001-04-18	1.5204762	24.91040	6.9130952	6.188679	39.636364
## 3809	2001-04-19	1.9912121	24.83952	7.6824242	2.848485	4.363636
## 3810	2001-04-20	0.7933333	24.83796	6.5033333	3.363636	30.492424
## 3811	2001-04-21	0.5572727	24.96289	6.1869091	6.618182	56.621212
## 3812	2001-04-22	1.0503030	24.76525	7.1557273	9.750000	82.750000
## 3813	2001-04-23	1.5433333	24.56761	8.1245455	2.000000	2.060606
## 3814	2001-04-24	1.4350000	24.57505	7.9505303	7.090909	2.000000
## 3815	2001-04-25	1.3266667	24.58250	7.7765152	12.181818	10.363636
## 3816	2001-04-26	1.2183333	24.58995	7.6025000	6.000000	4.750000
## 3817	2001-04-27	1.1100000	24.59739	7.4284848	3.227273	2.727273
## 3818	2001-04-28	1.2122727	24.56247	7.5406061	18.500000	50.250000
## 3819	2001-04-29	1.3145455	24.52755	7.6527273	2.363636	2.424242
## 3820	2001-04-30	5.0380952	24.68910	7.1504762	2.266667	2.800000
## 3821	2001-05-01	3.6346667	24.81929	6.6611111	3.106383	4.680851
## 3822	2001-05-02	3.8196970	24.85018	6.4233333	3.000000	4.230769
## 3823	2001-05-03	1.2654167	24.71229	7.3033333	3.833333	2.000000
## 3824	2001-05-04	1.2678788	24.77385	7.1566667	2.060606	2.060606
## 3825	2001-05-05	1.2005303	24.74011	7.2807576	30.315789	17.789474
## 3826	2001-05-06	1.1331818	24.70638	7.4048485	2.000000	16.144737
## 3827	2001-05-07	1.0658333	24.67264	7.5289394	4.750000	14.500000
## 3828	2001-05-08	0.9984848	24.63891	7.6530303	10.363636	36.272727
## 3829	2001-05-09	0.9962121	24.79073	7.3430303	6.303030	10.000000
## 3830	2001-05-10	0.9939394	24.94255	7.0330303	2.242424	6.969697
## 3831	2001-05-11	1.0862338	24.96916	7.1837229	6.750000	12.000000
## 3832	2001-05-12	1.1785281	24.99577	7.3344156	4.363636	16.909091
## 3833	2001-05-13	1.2708225	25.02238	7.4851082	6.500000	9.000000
## 3834	2001-05-14	1.3631169	25.04899	7.6358009	53.818182	203.818182
## 3835	2001-05-15	1.4554113	25.07560	7.7864935	62.000000	66.000000
## 3836	2001-05-16	1.5477056	25.10221	7.9371861	2.000000	3.000000
## 3837	2001-05-17	1.6400000	25.12882	8.0878788	2.000000	2.060606
## 3838	2001-05-18	6.4136364	25.12521	7.6033333	601.724138	662.068966
## 3839	2001-05-19	5.1613333	25.12396	7.5648889	12.052632	31.684211
## 3840	2001-05-20	3.6592381	25.22406	7.2383968	9.000000	7.500000

##	3841	2001-05-21	2.1571429	25.32417	6.9119048	2.133333	2.133333
##	3842	2001-05-22	1.5106061	25.40209	7.7981818	26.227273	52.272727
##	3843	2001-05-23	1.5930429	25.38264	7.9508712	2.000000	3.250000
##	3844	2001-05-24	1.6754798	25.36320	8.1035606	8.000000	2.000000
##	3845	2001-05-25	1.7579167	25.34375	8.2562500	2.000000	2.000000
##	3846	2001-05-26	1.8042614	25.29560	8.4023674	6.947368	4.736842
##	3847	2001-05-27	1.8506061	25.24745	8.5484848	2.363636	2.000000
##	3848	2001-05-28	1.3922727	25.17524	8.2654545	5.750000	9.500000
##	3849	2001-05-29	0.9339394	25.10303	7.9824242	10.181818	61.090909
##	3850	2001-05-30	3.2275758	25.13708	7.5259091	3.750000	10.250000
##	3851	2001-05-31	5.5212121	25.17112	7.0693939	432.620690	469.448276
##	3852	2001-06-01	4.3055556	25.15073	7.2053333	6.722222	29.555556
##	3853	2001-06-02	3.8338095	25.14105	7.3709524	2.125000	6.242424
##	3854	2001-06-03	1.1824242	25.10221	7.5154545	2.000000	2.000000
##	3855	2001-06-04	1.2287879	25.15605	7.3162121	6.000000	5.250000
##	3856	2001-06-05	1.2751515	25.20988	7.1169697	4.848485	12.545455
##	3857	2001-06-06	2.1509091	25.54875	5.6501818	13.963636	40.090909
##	3858	2001-06-07	2.3327273	25.51323	5.7854545	16.909091	67.636364
##	3859	2001-06-08	2.3519048	25.41586	6.1602381	6.523810	38.141711
##	3860	2001-06-09	1.3872727	25.23848	7.1330303	2.121212	8.647059
##	3861	2001-06-10	1.3542929	25.25742	7.0953535	3.250000	2.750000
##	3862	2001-06-11	1.3213131	25.27636	7.0576768	9.454545	22.000000
##	3863	2001-06-12	1.2883333	25.29529	7.0200000	2.500000	4.562500
##	3864	2001-06-13	1.8493939	25.30891	7.0751515	2.000000	2.000000
##	3865	2001-06-14	1.9677778	25.30166	7.1465657	6.545455	32.727273
##	3866	2001-06-15	2.0861616	25.29440	7.2179798	2.000000	2.750000
##	3867	2001-06-16	2.2045455	25.28715	7.2893939	2.000000	2.000000
##	3868	2001-06-17	2.7770000	25.15327	7.9993333	3.135135	5.081081
##	3869	2001-06-18	2.2466667	25.21771	7.2628889	2.000000	2.000000
##	3870	2001-06-19	0.7883333	25.28946	6.2941667	27.562500	8.937500
##	3871	2001-06-20	1.3520000	25.43669	6.0462222	269.659574	301.234043
##	3872	2001-06-21	1.9791818	25.39075	6.3387172	2.000000	151.647324
##	3873	2001-06-22	2.6063636	25.34482	6.6312121	2.000000	2.060606
##	3874	2001-06-23	2.6557576	25.27090	7.1338384	2.000000	5.000000
##	3875	2001-06-24	2.7051515	25.19698	7.6364646	1121.272727	1730.909091
##	3876	2001-06-25	2.7545455	25.12306	8.1390909	2.000000	2.000000
##	3877	2001-06-26	2.4565152	25.12405	7.8790909	38.666667	622.666667
##	3878	2001-06-27	2.1584848	25.12505	7.6190909	62.000000	140.000000
##	3879	2001-06-28	1.8604545	25.12604	7.3590909	5.000000	5.750000
##	3880	2001-06-29	1.5624242	25.12703	7.0990909	2.121212	2.000000
##	3881	2001-06-30	1.4060606	25.15319	6.8807828	6.727273	4.181818
##	3882	2001-07-01	1.2496970	25.17934	6.6624747	3.500000	6.750000
##	3883	2001-07-02	1.0933333	25.20550	6.4441667	2.342857	3.200000
##	3884	2001-07-03	6.1660606	25.42761	6.4912121	2.000000	2.000000
##	3885	2001-07-04	4.9764444	25.43247	6.1662222	2.318182	7.363636
##	3886	2001-07-05	1.8688095	25.44650	5.9623810	2.000000	2.000000
##	3887	2001-07-06	2.4387879	25.33312	5.9278788	2.000000	2.030303
##	3888	2001-07-07	2.4538636	25.30111	6.0994697	12.909091	7.454545
##	3889	2001-07-08	2.4689394	25.26909	6.2710606	2.500000	4.250000
##	3890	2001-07-09	2.4840152	25.23708	6.4426515	192.736842	687.684211
##	3891	2001-07-10	2.4990909	25.20506	6.6142424	2.000000	2.000000
##	3892	2001-07-11	2.4888889	25.07758	7.1450505	4.000000	2.750000
##	3893	2001-07-12	2.4786869	24.95009	7.6758586	2.000000	3.454545
##	3894	2001-07-13	2.4684848	24.82261	8.2066667	2.060606	2.000000

##	3895	2001-07-14	2.1543939	24.84509	7.9510606	3.250000	5.500000
##	3896	2001-07-15	1.8403030	24.86758	7.6954545	2.954545	3.136364
##	3897	2001-07-16	1.9983333	24.73550	7.6489394	2.000000	6.750000
##	3898	2001-07-17	2.1563636	24.60342	7.6024242	147.103448	561.034483
##	3899	2001-07-18	1.4116667	24.75855	7.5923810	2.000000	4.466667
##	3900	2001-07-19	1.8473333	24.67633	7.7635556	2.054054	5.333333
##	3901	2001-07-20	1.3650000	24.75637	7.2620833	2.125000	2.625000
##	3902	2001-07-21	0.6827273	25.50267	5.0825455	2.545455	7.494318
##	3903	2001-07-22	0.8113636	25.42695	5.2063636	6.327273	12.363636
##	3904	2001-07-23	1.4830952	25.22910	5.6671429	2.904762	7.279379
##	3905	2001-07-24	1.5369697	24.98184	7.7157576	11.707317	2.195122
##	3906	2001-07-25	2.0484848	24.73459	7.8624242	2.000000	2.400591
##	3907	2001-07-26	2.5600000	24.48733	8.0090909	2.000000	2.606061
##	3908	2001-07-27	2.0350000	24.47097	7.7192424	2.363636	12.000000
##	3909	2001-07-28	1.5100000	24.45461	7.4293939	2.146341	3.073171
##	3910	2001-07-29	1.2590909	24.48194	7.2372727	3.615385	6.000000
##	3911	2001-07-30	1.6395455	24.39923	7.3295455	2.000000	2.500000
##	3912	2001-07-31	2.0200000	24.31652	7.4218182	2.206897	4.620690
##	3913	2001-08-01	3.1855556	24.63429	6.7093333	2.944444	7.166667
##	3914	2001-08-02	2.5680952	25.09205	6.2142857	3.000000	6.066667
##	3915	2001-08-03	1.3891667	25.08183	5.3845833	2.083333	2.000000
##	3916	2001-08-04	2.8019697	25.08179	6.0017424	2.750000	4.750000
##	3917	2001-08-05	4.2147727	25.08174	6.6189015	5.090909	3.636364
##	3918	2001-08-06	5.6275758	25.08170	7.2360606	2.000000	2.000000
##	3919	2001-08-07	3.9265152	24.95411	7.7148485	2.250000	4.000000
##	3920	2001-08-08	2.2254545	24.82652	8.1936364	2.000000	2.863636
##	3921	2001-08-09	1.8474242	24.63705	7.9375758	2.500000	7.750000
##	3922	2001-08-10	1.4693939	24.44758	7.6815152	2.303030	2.000000
##	3923	2001-08-11	1.6380808	24.48049	7.5152525	2.000000	2.363636
##	3924	2001-08-12	1.8067677	24.51341	7.3489899	6.750000	5.000000
##	3925	2001-08-13	1.9754545	24.54633	7.1827273	2.000000	2.303030
##	3926	2001-08-14	1.6140909	24.43856	7.3943939	4.000000	3.818182
##	3927	2001-08-15	1.2527273	24.33079	7.6060606	2.097561	2.829268
##	3928	2001-08-16	1.2241667	24.76008	7.0520833	2.790698	3.395349
##	3929	2001-08-17	1.7248889	24.92467	7.3666667	2.000000	2.000000
##	3930	2001-08-18	1.4685714	24.78188	7.1104762	2.000000	2.000000
##	3931	2001-08-19	2.0372727	24.87167	7.4060606	2.000000	2.000000
##	3932	2001-08-20	1.6660606	24.48185	8.0821212	2.731707	2.048780
##	3933	2001-08-21	1.7815152	24.73545	7.7969697	15.090909	18.181818
##	3934	2001-08-22	1.8969697	24.98906	7.5118182	3.317073	3.170732
##	3935	2001-08-23	2.1050909	24.97843	7.5012121	11.090909	12.727273
##	3936	2001-08-24	2.3132121	24.96781	7.4906061	904.000000	14.750000
##	3937	2001-08-25	2.5213333	24.95718	7.4800000	2.000000	8.647727
##	3938	2001-08-26	2.7294545	24.94656	7.4693939	4.000000	2.545455
##	3939	2001-08-27	2.9375758	24.93593	7.4587879	2.000000	2.000000
##	3940	2001-08-28	2.4976515	24.92530	7.2248485	2.250000	3.750000
##	3941	2001-08-29	2.0577273	24.91468	6.9909091	4.363636	13.636364
##	3942	2001-08-30	1.6178030	24.90405	6.7569697	2.250000	3.250000
##	3943	2001-08-31	1.1778788	24.89342	6.5230303	2.000000	2.303030
##	3944	2001-09-01	1.5543434	24.77599	6.9358586	17.636364	169.636364
##	3945	2001-09-02	1.9308081	24.65856	7.3486869	3.500000	4.500000
##	3946	2001-09-03	2.3072727	24.54112	7.7615152	2.000000	2.000000
##	3947	2001-09-04	2.8203030	25.03006	7.1696970	2.111111	2.111111
##	3948	2001-09-05	6.8778571	25.01545	7.4042857	8.448980	9.306122

## 3949	2001-09-06	2.5608889	25.10382	7.0971111	2.111111	2.555556
## 3950	2001-09-07	1.0500000	24.87679	7.1266667	2.000000	2.000000
## 3951	2001-09-08	1.5724242	24.81388	7.2809091	2.097561	3.268293
## 3952	2001-09-09	1.4828571	24.98433	7.0126190	2.264151	4.545455
## 3953	2001-09-10	1.0018182	25.21302	5.9897727	2.045455	3.696970
## 3954	2001-09-11	1.0703636	25.31815	5.7023636	2.436364	2.848485
## 3955	2001-09-12	3.8883333	24.83550	8.1679167	2.083333	2.000000
## 3956	2001-09-13	4.3567424	24.78660	8.4653220	12.000000	4.500000
## 3957	2001-09-14	4.8251515	24.73770	8.7627273	2.620690	4.275862
## 3958	2001-09-15	2.7619048	24.69112	8.6478571	2.000000	2.266667
## 3959	2001-09-16	3.5291111	24.73120	8.5060000	2.000000	2.111111
## 3960	2001-09-17	3.5541667	24.53692	8.1745833	2.000000	2.000000
## 3961	2001-09-18	2.8863131	24.53378	8.0573990	7.500000	16.250000
## 3962	2001-09-19	2.2184596	24.53065	7.9402146	8.727273	55.818182
## 3963	2001-09-20	1.5506061	24.52752	7.8230303	2.000000	2.000000
## 3964	2001-09-21	1.4727879	24.56056	7.6754545	3.500000	3.250000
## 3965	2001-09-22	1.3949697	24.59360	7.5278788	71.090909	104.545455
## 3966	2001-09-23	1.3171515	24.62664	7.3803030	2.121212	2.060606
## 3967	2001-09-24	1.2393333	24.62450	7.1827273	5.000000	5.000000
## 3968	2001-09-25	1.1615152	24.62236	6.9851515	2.000000	2.000000
## 3969	2001-09-26	1.1998990	24.48297	7.0490909	4.727273	8.727273
## 3970	2001-09-27	1.2382828	24.34358	7.1130303	2.750000	3.500000
## 3971	2001-09-28	1.2766667	24.20418	7.1769697	2.000000	2.060606
## 3972	2001-09-29	1.6277778	24.44349	7.9608889	2.727273	3.090909
## 3973	2001-09-30	1.7716667	24.48802	7.7085714	4.666667	3.600000
## 3974	2001-10-01	1.9406061	24.30688	7.6396970	2.000000	2.000000
## 3975	2001-10-02	1.2633333	24.15829	6.9095833	2.000000	2.000000
## 3976	2001-10-03	1.3712727	24.23286	6.9690000	9.750000	20.250000
## 3977	2001-10-04	1.4792121	24.30744	7.0284167	5.272727	6.727273
## 3978	2001-10-05	1.5871515	24.38201	7.0878333	2.000000	2.000000
## 3979	2001-10-06	1.6950909	24.45658	7.1472500	31.272727	107.636364
## 3980	2001-10-07	1.8030303	24.53115	7.2066667	2.000000	3.272727
## 3981	2001-10-08	1.7566667	24.56561	7.0832323	7.250000	10.750000
## 3982	2001-10-09	1.7103030	24.60006	6.9597980	16.545455	49.454545
## 3983	2001-10-10	1.6639394	24.63452	6.8363636	2.000000	2.121212
## 3984	2001-10-11	1.4978788	24.62824	6.9250000	2.000000	4.250000
## 3985	2001-10-12	1.3318182	24.62197	7.0136364	12.954545	31.000000
## 3986	2001-10-13	1.5327273	24.70239	6.8748485	8.829268	5.170732
## 3987	2001-10-14	1.4818182	24.75379	6.8219697	2.000000	15.312639
## 3988	2001-10-15	1.4309091	24.80518	6.7690909	2.000000	25.454545
## 3989	2001-10-16	1.1950379	24.75453	6.8866288	11.971429	2.000000
## 3990	2001-10-17	0.9591667	24.70388	7.0041667	21.942857	10.685714
## 3991	2001-10-18	1.6707143	24.77848	7.7526190	4.421053	20.473684
## 3992	2001-10-19	1.8422222	24.82589	7.5851111	2.368421	2.111111
## 3993	2001-10-20	1.9951515	24.77436	7.5306061	2.000000	2.111111
## 3994	2001-10-21	1.6554545	24.62458	7.3533333	6.653846	7.384615
## 3995	2001-10-22	1.4578571	24.80131	7.3883333	2.285714	6.343340
## 3996	2001-10-23	0.8018182	24.93948	6.8618182	8.409091	5.302064
## 3997	2001-10-24	0.8530357	25.00180	6.6708929	2.618182	4.260788
## 3998	2001-10-25	1.1742424	24.50048	7.1860606	7.365854	3.219512
## 3999	2001-10-26	1.1707071	24.51685	7.0663636	13.818182	111.090909
## 4000	2001-10-27	1.1671717	24.53321	6.9466667	2.000000	79.740576
## 4001	2001-10-28	1.1636364	24.54958	6.8269697	30.585366	48.390244
## 4002	2001-10-29	1.1706494	24.55354	6.8591775	25.000000	29.000000

## 4003	2001-10-30	1.1776623	24.55750	6.8913853	125.636364	1160.545455
## 4004	2001-10-31	1.1846753	24.56146	6.9235931	1100.000000	4870.000000
## 4005	2001-11-01	1.1916883	24.56542	6.9558009	1100.000000	1323.000000
## 4006	2001-11-02	1.1987013	24.56938	6.9880087	7.000000	16.250000
## 4007	2001-11-03	1.2057143	24.57334	7.0202165	1300.000000	5000.000000
## 4008	2001-11-04	1.2127273	24.57730	7.0524242	2.000000	2.000000
## 4009	2001-11-05	2.1357576	24.61809	7.5751515	14.413793	35.034483
## 4010	2001-11-06	2.7622222	24.62178	7.9651111	6.277778	15.500000
## 4011	2001-11-07	1.9004762	24.66505	7.8238095	157.736842	239.289474
## 4012	2001-11-08	1.7731548	24.72884	7.7889881	1096.727273	1106.363636
## 4013	2001-11-09	1.6458333	24.79263	7.7541667	2.000000	2.250000
## 4014	2001-11-10	1.7118561	24.79972	7.8042045	15.111111	65.111111
## 4015	2001-11-11	1.7778788	24.80682	7.8542424	2.121212	17.647059
## 4016	2001-11-12	1.7516162	24.81608	7.7735354	9.878788	82.000000
## 4017	2001-11-13	1.7253535	24.82534	7.6928283	17.636364	71.090909
## 4018	2001-11-14	1.6990909	24.83461	7.6121212	2.780488	5.756098
## 4019	2001-11-15	1.2542424	24.83648	7.6984848	11.454545	43.227273
## 4020	2001-11-16	1.1663636	24.84468	7.6784848	5.250000	16.750000
## 4021	2001-11-17	1.0784848	24.85287	7.6584848	104.105263	157.578947
## 4022	2001-11-18	0.9906061	24.86106	7.6384848	3.818182	2.545455
## 4023	2001-11-19	1.1853535	24.86074	7.7093939	11.000000	11.000000
## 4024	2001-11-20	1.3801010	24.86041	7.7803030	7.454545	22.000000
## 4025	2001-11-21	1.5748485	24.86009	7.8512121	2.181818	2.121212
## 4026	2001-11-22	1.4418182	24.84856	7.7315152	6.500000	4.750000
## 4027	2001-11-23	1.3087879	24.83703	7.6118182	2.060606	2.545455
## 4028	2001-11-24	1.2762121	24.81847	7.6886364	58.181818	94.181818
## 4029	2001-11-25	1.2436364	24.79991	7.7654545	2.000000	2.000000
## 4030	2001-11-26	1.2110606	24.78135	7.8422727	73.090909	204.181818
## 4031	2001-11-27	1.1784848	24.76279	7.9190909	2.048780	2.097561
## 4032	2001-11-28	1.0500000	24.71415	7.6169697	2.000000	2.000000
## 4033	2001-11-29	1.2862963	24.74484	7.5998316	15.090909	9.272727
## 4034	2001-11-30	1.5225926	24.77553	7.5826936	101.000000	13.000000
## 4035	2001-12-01	1.7588889	24.80622	7.5655556	2.888889	16.666667
## 4036	2001-12-02	1.3552778	24.81082	7.6315278	2.000000	42.193798
## 4037	2001-12-03	0.9516667	24.81542	7.6975000	20.837209	67.720930
## 4038	2001-12-04	1.6548485	24.84809	7.6954545	3.000000	2.444444
## 4039	2001-12-05	1.4266667	24.88740	7.5792857	2.666667	6.333333
## 4040	2001-12-06	1.4746667	24.85989	7.5344444	24.111111	180.944444
## 4041	2001-12-07	0.4965455	25.47305	5.7432727	7.523810	4.500000
## 4042	2001-12-08	0.5288636	25.50648	5.5725000	21.527273	387.636364
## 4043	2001-12-09	0.6300000	25.40171	5.8050000	6.952381	198.818182
## 4044	2001-12-10	1.6709091	25.28950	6.4250505	2.000000	10.000000
## 4045	2001-12-11	2.7118182	25.17728	7.0451010	12.500000	8.500000
## 4046	2001-12-12	3.7527273	25.06506	7.6651515	14.590909	8.045455
## 4047	2001-12-13	1.2990909	24.80209	8.3787879	2.926829	4.146341
## 4048	2001-12-14	0.7263636	24.76552	8.2538182	2.000000	2.060606
## 4049	2001-12-15	0.7112879	24.70546	8.1288485	5.636364	22.727273
## 4050	2001-12-16	0.6962121	24.64541	8.0038788	164.000000	116.750000
## 4051	2001-12-17	0.6811364	24.58536	7.8789091	23.000000	63.193182
## 4052	2001-12-18	0.6660606	24.52530	7.7539394	4.787879	9.636364
## 4053	2001-12-19	0.8253102	24.61366	7.5473882	58.181818	336.727273
## 4054	2001-12-20	0.9845599	24.70202	7.3408369	56.000000	1554.727273
## 4055	2001-12-21	1.1438095	24.79038	7.1342857	2.142857	2.714286
## 4056	2001-12-22	1.3127814	24.73741	7.3033658	2000.000000	9400.000000

## 4057	2001-12-23	1.4817532	24.68443	7.4724459	34.000000	5135.333333
## 4058	2001-12-24	1.6507251	24.63146	7.6415260	61.818182	773.090909
## 4059	2001-12-25	1.8196970	24.57848	7.8106061	4.195122	4.634146
## 4060	2001-12-26	1.5037879	24.65426	7.6380303	50.000000	29.000000
## 4061	2001-12-27	1.1878788	24.73003	7.4654545	8.461538	14.307692
## 4062	2001-12-28	1.1516162	24.80157	7.1842424	17.250000	22.750000
## 4063	2001-12-29	1.1153535	24.87310	6.9030303	67.090909	166.727273
## 4064	2001-12-30	1.0790909	24.94464	6.6218182	2.000000	2.000000
## 4065	2001-12-31	1.7494733	25.06833	6.6047042	4.250000	7.000000
## 4066	2002-01-01	2.4198557	25.19202	6.5875902	1100.545455	1099.090909
## 4067	2002-01-02	3.0902381	25.31571	6.5704762	7.714286	16.714286
## 4068	2002-01-03	3.8246753	25.29626	6.8049870	5.500000	10.000000
## 4069	2002-01-04	4.5591126	25.27680	7.0394978	11.818182	133.272727
## 4070	2002-01-05	5.2935498	25.25734	7.2740087	7.284091	12.000000
## 4071	2002-01-06	6.0279870	25.23788	7.5085195	2.750000	2.500000
## 4072	2002-01-07	6.7624242	25.21842	7.7430303	3.272727	2.000000
## 4073	2002-01-08	5.1592424	25.16248	7.7060606	3.272727	4.545455
## 4074	2002-01-09	3.5560606	25.10655	7.6690909	2.000000	2.060606
## 4075	2002-01-10	3.0778788	25.00214	7.6278788	6.750000	4.750000
## 4076	2002-01-11	2.5996970	24.89773	7.5866667	7.000000	27.863636
## 4077	2002-01-12	3.4852525	25.03143	7.4033333	5.500000	3.750000
## 4078	2002-01-13	4.3708081	25.16514	7.2200000	3.684211	22.736842
## 4079	2002-01-14	5.2563636	25.29885	7.0366667	3.515152	2.000000
## 4080	2002-01-15	7.2642424	25.27039	7.8406061	2.060606	2.000000
## 4081	2002-01-16	3.5936364	24.80736	9.2039394	2.097561	2.536585
## 4082	2002-01-17	4.0217172	24.94308	8.4807071	8.909091	19.272727
## 4083	2002-01-18	4.4497980	25.07880	7.7574747	2.000000	4.750000
## 4084	2002-01-19	4.8778788	25.21452	7.0342424	3.172414	2.137931
## 4085	2002-01-20	3.0664286	25.17843	6.7947619	8.600000	2.066667
## 4086	2002-01-21	4.3268889	25.17251	7.0635556	2.000000	2.333333
## 4087	2002-01-22	1.2925000	24.81362	7.8008333	2.083333	1.958333
## 4088	2002-01-23	1.0630682	24.52233	8.0089015	3.250000	5.000000
## 4089	2002-01-24	0.8336364	24.23103	8.2169697	8.000000	15.681818
## 4090	2002-01-25	0.9034545	25.31436	6.0301818	2.145455	1007.840909
## 4091	2002-01-26	1.0250000	25.14220	6.4693182	3.288889	2000.000000
## 4092	2002-01-27	1.0126190	24.88824	7.0057143	2.080000	22.222222
## 4093	2002-01-28	1.0167641	24.66263	7.6142208	3.090909	4.181818
## 4094	2002-01-29	1.0209091	24.43703	8.2227273	2.060606	2.000000
## 4095	2002-01-30	0.9941667	24.58425	7.9180303	3.500000	3.750000
## 4096	2002-01-31	0.9674242	24.73147	7.6133333	29.090909	10.727273
## 4097	2002-02-01	0.9406818	24.87869	7.3086364	4.000000	2.500000
## 4098	2002-02-02	0.9139394	25.02591	7.0039394	2.000000	2.000000
## 4099	2002-02-03	1.2904221	24.87118	7.5623268	95.368421	67.578947
## 4100	2002-02-04	1.6669048	24.71645	8.1207143	2.047619	2.238095
## 4101	2002-02-05	1.4705628	24.60885	8.2486580	11.250000	2.750000
## 4102	2002-02-06	1.2742208	24.50124	8.3766017	102.000000	24.000000
## 4103	2002-02-07	1.0778788	24.39364	8.5045455	2.000000	2.000000
## 4104	2002-02-08	1.2290909	24.24293	8.3474242	4.750000	4.000000
## 4105	2002-02-09	1.3803030	24.09223	8.1903030	3.090909	2.909091
## 4106	2002-02-10	1.5315152	23.94152	8.0331818	5.000000	3.500000
## 4107	2002-02-11	1.6827273	23.79082	7.8760606	2.000000	2.000000
## 4108	2002-02-12	2.2036364	23.73833	7.8472727	4.909091	2.000000
## 4109	2002-02-13	2.3189610	23.87385	7.9811364	2.545455	3.818182
## 4110	2002-02-14	2.4342857	24.00936	8.1150000	5.714286	2.095238

## 4111	2002-02-15	1.9925974	23.95721	7.9932576	5.250000	2.500000
## 4112	2002-02-16	1.5509091	23.90506	7.8715152	2.272727	2.045455
## 4113	2002-02-17	1.2042424	24.17974	7.7106061	2.500000	4.750000
## 4114	2002-02-18	0.8575758	24.45442	7.5496970	2.000000	2.545455
## 4115	2002-02-19	0.7990909	24.33666	7.6145455	316.545455	65.454545
## 4116	2002-02-20	0.7406061	24.21889	7.6793939	2.250000	2.500000
## 4117	2002-02-21	0.6821212	24.10112	7.7442424	4.181818	2.000000
## 4118	2002-02-22	0.7059394	24.05988	7.8426667	22.421053	17.684211
## 4119	2002-02-23	0.7297576	24.01864	7.9410909	64.250000	134.000000
## 4120	2002-02-24	0.7535758	23.97739	8.0395152	8.545455	7.272727
## 4121	2002-02-25	0.7773939	23.93615	8.1379394	39.000000	40.000000
## 4122	2002-02-26	0.8012121	23.89491	8.2363636	2.000000	2.000000
## 4123	2002-02-27	0.9563636	23.86791	8.0996970	5.515152	2.000000
## 4124	2002-02-28	0.8452652	23.84275	7.9000568	15.250000	7.500000
## 4125	2002-03-01	0.7341667	23.81758	7.7004167	7.250000	2.000000
## 4126	2002-03-02	0.7871429	24.26876	7.8830952	2.292683	2.536585
## 4127	2002-03-03	1.1322222	24.37618	8.0175556	2.111111	2.222222
## 4128	2002-03-04	1.7254545	24.48627	7.7572727	2.222222	2.111111
## 4129	2002-03-05	1.1132727	24.65860	7.1665455	23.000000	10.500000
## 4130	2002-03-06	0.5010909	24.83093	6.5758182	17.750000	11.340909
## 4131	2002-03-07	0.8652273	24.75032	6.7345455	6.109091	12.181818
## 4132	2002-03-08	1.2557143	24.49919	7.4138095	2.523810	7.090909
## 4133	2002-03-09	0.9978788	24.09439	8.1727273	2.000000	2.000000
## 4134	2002-03-10	0.9552525	24.07199	8.1597980	2.000000	8.750000
## 4135	2002-03-11	0.9126263	24.04959	8.1468687	73.090909	12.000000
## 4136	2002-03-12	0.8700000	24.02718	8.1339394	2.000000	2.000000
## 4137	2002-03-13	0.9481061	24.05124	8.0455303	2.250000	3.750000
## 4138	2002-03-14	1.0262121	24.07530	7.9571212	2.000000	2.181818
## 4139	2002-03-15	1.1043182	24.09936	7.8687121	45.500000	10.000000
## 4140	2002-03-16	1.1824242	24.12342	7.7803030	2.000000	2.727273
## 4141	2002-03-17	0.9703030	23.51488	7.5557576	4.961538	2.576923
## 4142	2002-03-18	1.3200000	23.94981	7.5761905	4.720000	4.640000
## 4143	2002-03-19	1.2307576	23.84557	7.5630952	46.363636	8.000000
## 4144	2002-03-20	1.1415152	23.74133	7.5500000	2.390244	2.146341
## 4145	2002-03-21	1.1720000	23.79865	7.5205455	2.666667	2.000000
## 4146	2002-03-22	1.2024848	23.85598	7.4910909	2.250000	6.750000
## 4147	2002-03-23	1.2329697	23.91330	7.4616364	5.000000	6.000000
## 4148	2002-03-24	1.2634545	23.97062	7.4321818	4.181818	2.181818
## 4149	2002-03-25	1.2939394	24.02794	7.4027273	2.926829	2.926829
## 4150	2002-03-26	1.2231313	23.97985	7.4093939	6.000000	9.272727
## 4151	2002-03-27	1.1523232	23.93176	7.4160606	6.750000	4.500000
## 4152	2002-03-28	1.0815152	23.88367	7.4227273	4.181818	2.000000
## 4153	2002-03-29	0.9831602	23.75368	7.3534740	463.090909	107.090909
## 4154	2002-03-30	0.8848052	23.62370	7.2842208	13.750000	15.000000
## 4155	2002-03-31	0.7864502	23.49372	7.2149675	60.333333	8.500000
## 4156	2002-04-01	0.6880952	23.36374	7.1457143	2.181818	2.000000
## 4157	2002-04-02	1.0257576	23.44000	6.8978788	6.606061	2.000000
## 4158	2002-04-03	1.0453535	23.46241	6.8330303	50.947368	739.263158
## 4159	2002-04-04	1.0649495	23.48483	6.7681818	4.000000	16.000000
## 4160	2002-04-05	1.0845455	23.50724	6.7033333	2.000000	2.000000
## 4161	2002-04-06	1.1009091	23.59818	6.8054545	3.250000	8.250000
## 4162	2002-04-07	1.1172727	23.68912	6.9075758	131.727273	25.227273
## 4163	2002-04-08	1.1233333	23.72155	6.9421212	4.000000	22.363636
## 4164	2002-04-09	1.1293939	23.75397	6.9766667	33.750000	19.500000

##	4165	2002-04-10	1.1354545	23.78639	7.0112121	37.000000	6.909091
##	4166	2002-04-11	1.1415152	23.81882	7.0457576	2.060606	2.606061
##	4167	2002-04-12	1.0056926	23.96130	7.1728860	65.000000	27.500000
##	4168	2002-04-13	0.8698701	24.10378	7.3000144	42.000000	52.204545
##	4169	2002-04-14	0.7340476	24.24626	7.4271429	20.377358	76.909091
##	4170	2002-04-15	0.4354545	24.61352	7.0688636	31.136364	55.045085
##	4171	2002-04-16	0.3812727	24.83418	6.6263636	46.363636	33.181079
##	4172	2002-04-17	1.0933333	24.06618	7.2072727	17.162791	11.317073
##	4173	2002-04-18	0.8396970	23.96383	7.3015152	51.000000	8.726718
##	4174	2002-04-19	0.5860606	23.86148	7.3957576	16.954545	6.136364
##	4175	2002-04-20	0.7654545	23.88952	7.2836364	3.250000	18.500000
##	4176	2002-04-21	0.9448485	23.91755	7.1715152	2.000000	2.060606
##	4177	2002-04-22	0.9333333	24.09479	7.4897619	2.000000	2.000000
##	4178	2002-04-23	1.0893333	24.13102	7.5757778	2.255319	2.340426
##	4179	2002-04-24	0.9939394	24.16509	7.4890909	2.307692	6.846154
##	4180	2002-04-25	1.0416667	24.04783	7.2062500	2.333333	2.250000
##	4181	2002-04-26	0.9664881	24.26176	7.1669697	9.230769	10.884615
##	4182	2002-04-27	0.8913095	24.20780	7.2021861	5.500000	9.000000
##	4183	2002-04-28	0.8161310	24.15384	7.2374026	68.181818	16.545455
##	4184	2002-04-29	0.7409524	24.09988	7.2726190	2.380952	2.047619
##	4185	2002-04-30	0.8616883	24.17799	7.2743398	5.500000	14.000000
##	4186	2002-05-01	0.9824242	24.25609	7.2760606	10.909091	27.090909
##	4187	2002-05-02	0.9762879	24.23766	7.2689394	29.636364	23.272727
##	4188	2002-05-03	0.9701515	24.21923	7.2618182	2.000000	2.000000
##	4189	2002-05-04	0.9640152	24.20080	7.2546970	24.000000	15.000000
##	4190	2002-05-05	0.9578788	24.18236	7.2475758	610.454545	940.090909
##	4191	2002-05-06	0.9187879	24.19012	7.2268182	1320.666667	1466.235294
##	4192	2002-05-07	0.8796970	24.19788	7.2060606	420.555556	422.000000
##	4193	2002-05-08	1.2463636	24.24848	7.2742424	78.277778	67.333333
##	4194	2002-05-09	1.2827348	24.29701	7.3587677	100.000000	88.181818
##	4195	2002-05-10	1.3191061	24.34554	7.4432929	81.000000	49.340909
##	4196	2002-05-11	1.3554773	24.39406	7.5278182	7.750000	10.500000
##	4197	2002-05-12	1.3918485	24.44259	7.6123434	72.000000	8.545455
##	4198	2002-05-13	1.4282197	24.49111	7.6968687	521.111111	10.000000
##	4199	2002-05-14	1.4645909	24.53964	7.7813939	18000.000000	14.444444
##	4200	2002-05-15	1.5009621	24.58816	7.8659192	12000.000000	18.888889
##	4201	2002-05-16	1.5373333	24.63669	7.9504444	20.800000	23.333333
##	4202	2002-05-17	1.5954667	24.61368	7.9526222	17.789474	34.631579
##	4203	2002-05-18	1.6536000	24.59068	7.9548000	2.000000	2.000000
##	4204	2002-05-19	1.7117333	24.56768	7.9569778	290.000000	840.000000
##	4205	2002-05-20	1.7698667	24.54467	7.9591556	66.000000	32.000000
##	4206	2002-05-21	1.8280000	24.52167	7.9613333	2.355556	3.422222
##	4207	2002-05-22	1.7316444	24.51168	7.9025333	16.000000	18.586111
##	4208	2002-05-23	1.6352889	24.50169	7.8437333	93.500000	33.750000
##	4209	2002-05-24	1.5389333	24.49171	7.7849333	1446.909091	2042.909091
##	4210	2002-05-25	1.4425778	24.48172	7.7261333	4.000000	1181.515770
##	4211	2002-05-26	1.3462222	24.47173	7.6673333	266.653061	320.122449
##	4212	2002-05-27	1.3865926	24.46349	7.6663704	790.000000	2840.000000
##	4213	2002-05-28	1.4269630	24.45524	7.6654074	13.400000	6.400000
##	4214	2002-05-29	1.4673333	24.44700	7.6644444	15.392857	10.357143
##	4215	2002-05-30	1.3577778	24.46690	7.5715556	6.250000	2.750000
##	4216	2002-05-31	1.2482222	24.48681	7.4786667	12.181818	4.909091
##	4217	2002-06-01	1.1386667	24.50671	7.3857778	2.000000	2.000000
##	4218	2002-06-02	1.0220417	24.48644	7.3335139	7.250000	4.250000

## 4219	2002-06-03	0.9054167	24.46617	7.2812500	2.166667	2.000000
## 4220	2002-06-04	1.1697083	24.52605	7.5057143	5.365854	23.268293
## 4221	2002-06-05	1.4340000	24.49122	7.6840000	50.777778	107.833333
## 4222	2002-06-06	1.5548485	24.54509	7.4690909	4.275862	5.862069
## 4223	2002-06-07	1.3430195	24.67495	7.2512121	2.000000	2.000000
## 4224	2002-06-08	1.1311905	24.80481	7.0333333	8.000000	3.181818
## 4225	2002-06-09	0.6175000	24.97811	6.6534091	10.690909	4.363636
## 4226	2002-06-10	0.3990909	25.11242	6.3778182	15.812500	2.250000
## 4227	2002-06-11	1.2006667	24.77653	7.0128889	2.044444	2.177778
## 4228	2002-06-12	1.0960741	24.67008	7.3130370	8.000000	3.220468
## 4229	2002-06-13	0.9914815	24.56363	7.6131852	8.000000	4.263158
## 4230	2002-06-14	0.8868889	24.45718	7.9133333	2.000000	2.000000
## 4231	2002-06-15	1.1968889	24.38936	7.8075556	2.000000	2.000000
## 4232	2002-06-16	1.1981111	24.39171	7.7802222	16.250000	15.750000
## 4233	2002-06-17	1.1993333	24.39406	7.7528889	1104.909091	1189.818182
## 4234	2002-06-18	1.2005556	24.39641	7.7255556	335.333333	1259.800000
## 4235	2002-06-19	1.2017778	24.39876	7.6982222	8.869565	70.212766
## 4236	2002-06-20	1.3035000	24.41640	7.6561111	2.000000	2.000000
## 4237	2002-06-21	1.4052222	24.43404	7.6140000	2276.000000	2805.454545
## 4238	2002-06-22	1.5069444	24.45169	7.5718889	71.666667	79.000000
## 4239	2002-06-23	1.6086667	24.46933	7.5297778	5.854545	45.396226
## 4240	2002-06-24	1.5539259	24.47073	7.5722963	7.927273	28.666667
## 4241	2002-06-25	1.4991852	24.47212	7.6148148	10.000000	57.454545
## 4242	2002-06-26	1.4444444	24.47351	7.6573333	3.688889	2.888889
## 4243	2002-06-27	1.2871852	24.45814	7.7140000	3.719444	360.000000
## 4244	2002-06-28	1.1299259	24.44277	7.7706667	3.750000	12.888889
## 4245	2002-06-29	0.9726667	24.42740	7.8273333	9.000000	3.607143
## 4246	2002-06-30	0.9977778	24.39064	7.8237778	52.750000	37.750000
## 4247	2002-07-01	1.0228889	24.35387	7.8202222	6.000000	19.875000
## 4248	2002-07-02	1.0480000	24.31711	7.8166667	2.355556	2.000000
## 4249	2002-07-03	1.2860000	24.43559	7.5960000	27.157895	10.421053
## 4250	2002-07-04	1.5240000	24.55407	7.3753333	3.200000	2.000000
## 4251	2002-07-05	1.5814444	24.49863	7.4133333	9.473684	12.947368
## 4252	2002-07-06	1.6388889	24.44320	7.4513333	2.000000	2.044444
## 4253	2002-07-07	1.7502222	24.63025	7.3264444	3.750000	6.250000
## 4254	2002-07-08	1.8615556	24.81730	7.2015556	27.454545	23.636364
## 4255	2002-07-09	1.9728889	25.00436	7.0766667	2.000000	2.000000
## 4256	2002-07-10	2.0881481	24.91405	7.3085185	3.500000	5.750000
## 4257	2002-07-11	2.2034074	24.82375	7.5403704	2.727273	2.363636
## 4258	2002-07-12	2.3186667	24.73344	7.7722222	2.000000	2.133333
## 4259	2002-07-13	2.4845556	24.72601	7.8858889	19.750000	18.500000
## 4260	2002-07-14	2.6504444	24.71858	7.9995556	2.928571	3.714286
## 4261	2002-07-15	2.3694444	24.73969	7.7091111	10.250000	8.750000
## 4262	2002-07-16	2.0884444	24.76080	7.4186667	2.571429	3.607143
## 4263	2002-07-17	1.8671389	24.69790	7.3993333	2.500000	2.000000
## 4264	2002-07-18	1.6458333	24.63500	7.3800000	2.000000	2.000000
## 4265	2002-07-19	2.8676944	24.82069	7.4015556	10.625000	3.125000
## 4266	2002-07-20	4.0895556	25.00638	7.4231111	2.512821	2.717949
## 4267	2002-07-21	2.9264286	25.10495	7.1269048	2.709677	2.333333
## 4268	2002-07-22	4.3409091	24.86748	7.7484848	2.333333	3.000000
## 4269	2002-07-23	2.8297403	25.07446	6.9472186	4.000000	2.000000
## 4270	2002-07-24	1.3185714	25.28143	6.1459524	10.264151	271.272727
## 4271	2002-07-25	0.9245455	25.47370	5.4284091	30.318182	145.636364
## 4272	2002-07-26	0.6887273	25.58082	4.9825455	23.678571	20.000000

## 4273	2002-07-27	2.6348889	24.63164	7.7106667	26.367347	9.688889
## 4274	2002-07-28	2.4567348	24.58419	7.6554432	22.666667	38.250000
## 4275	2002-07-29	2.2785808	24.53674	7.6002197	2.000000	319.034091
## 4276	2002-07-30	2.1004268	24.48929	7.5449962	131.090909	599.818182
## 4277	2002-07-31	1.9222727	24.44184	7.4897727	16.893617	117.333333
## 4278	2002-08-01	2.2304268	24.53953	7.3444407	60.000000	51.000000
## 4279	2002-08-02	2.5385808	24.63721	7.1991086	2.500000	5.250000
## 4280	2002-08-03	2.8467348	24.73489	7.0537765	17.090909	4.181818
## 4281	2002-08-04	3.1548889	24.83258	6.9084444	4.666667	2.755556
## 4282	2002-08-05	3.4744444	24.88767	6.9475556	3.000000	2.250000
## 4283	2002-08-06	3.7940000	24.94276	6.9866667	2.044444	2.088889
## 4284	2002-08-07	3.6784444	24.88093	7.2864444	13.454545	2.000000
## 4285	2002-08-08	3.5628889	24.81910	7.5862222	5.250000	9.000000
## 4286	2002-08-09	3.4473333	24.75727	7.8860000	2.177778	2.000000
## 4287	2002-08-10	3.2681111	24.79429	7.5900000	3.272727	2.545455
## 4288	2002-08-11	3.0888889	24.83131	7.2940000	2.264151	2.301887
## 4289	2002-08-12	3.0360000	24.58617	7.5412222	68.421053	24.421053
## 4290	2002-08-13	2.9831111	24.34102	7.7884444	2.044444	2.044444
## 4291	2002-08-14	1.7346667	23.89716	8.2320000	3.660377	2.339623
## 4292	2002-08-15	1.7407302	23.95421	8.1642857	4.363636	2.363636
## 4293	2002-08-16	1.7467937	24.01127	8.0965714	2.250000	4.250000
## 4294	2002-08-17	1.7528571	24.06833	8.0288571	5.090909	4.909091
## 4295	2002-08-18	1.7589206	24.12538	7.9611429	10.000000	6.500000
## 4296	2002-08-19	1.7649841	24.18244	7.8934286	12.000000	7.636364
## 4297	2002-08-20	1.7710476	24.23950	7.8257143	2.500000	2.250000
## 4298	2002-08-21	1.7771111	24.29656	7.7580000	2.000000	2.044444
## 4299	2002-08-22	1.3108889	24.10958	8.1113333	2.000000	2.000000
## 4300	2002-08-23	1.5529630	24.10519	8.0774815	5.090909	2.909091
## 4301	2002-08-24	1.7950370	24.10081	8.0436296	4.750000	4.000000
## 4302	2002-08-25	2.0371111	24.09642	8.0097778	2.044444	2.044444
## 4303	2002-08-26	1.9235556	23.82732	8.0085253	1239.636364	4129.636364
## 4304	2002-08-27	1.8100000	23.55823	8.0072727	10.000000	5.622642
## 4305	2002-08-28	1.7207111	23.56920	7.9557737	412.000000	2732.000000
## 4306	2002-08-29	1.6314222	23.58017	7.9042747	90.000000	820.000000
## 4307	2002-08-30	1.5421333	23.59114	7.8527758	49.000000	21.333333
## 4308	2002-08-31	1.4528444	23.60212	7.8012768	8.000000	6.526316
## 4309	2002-09-01	1.3635556	23.61309	7.7497778	2.577778	2.222222
## 4310	2002-09-02	1.1500000	24.01612	7.5516667	4.937500	3.375000
## 4311	2002-09-03	1.4235714	24.22383	7.6759524	3.219512	3.268293
## 4312	2002-09-04	1.6946667	24.28544	7.9060000	2.500000	2.000000
## 4313	2002-09-05	1.9900000	24.34961	7.7924242	2.000000	2.000000
## 4314	2002-09-06	1.5670238	24.29417	7.7050216	3.500000	2.750000
## 4315	2002-09-07	1.1440476	24.23874	7.6176190	2.333333	2.556818
## 4316	2002-09-08	0.6745455	24.58180	6.8490909	8.181818	2.363636
## 4317	2002-09-09	0.6441818	24.78618	6.4989091	23.236364	2.181818
## 4318	2002-09-10	0.9671111	23.78071	7.8486667	2.000000	2.000000
## 4319	2002-09-11	1.0184444	23.64644	7.8129630	2.500000	5.500000
## 4320	2002-09-12	1.0697778	23.51216	7.7772593	24.181818	6.545455
## 4321	2002-09-13	1.1211111	23.37789	7.7415556	2.000000	2.000000
## 4322	2002-09-14	1.6301111	23.31258	7.5612222	3.250000	5.750000
## 4323	2002-09-15	2.1391111	23.24727	7.3808889	7.035714	3.857143
## 4324	2002-09-16	1.5104530	23.27122	7.2980085	6.250000	2.500000
## 4325	2002-09-17	0.8817949	23.29518	7.2151282	2.000000	2.000000
## 4326	2002-09-18	0.8956410	23.30845	7.1403077	15.636364	3.090909

## 4327	2002-09-19	0.9094872	23.32171	7.0654872	4.000000	8.000000
## 4328	2002-09-20	0.9233333	23.33498	6.9906667	2.000000	2.000000
## 4329	2002-09-21	0.8737778	23.33643	7.0405556	3.052632	2.315789
## 4330	2002-09-22	0.8242222	23.33789	7.0904444	3.200000	2.000000
## 4331	2002-09-23	1.0493333	23.08723	6.9287778	6.250000	4.000000
## 4332	2002-09-24	1.2744444	22.83658	6.7671111	34.821429	3.214286
## 4333	2002-09-25	1.2240000	23.02837	6.7991111	3.250000	3.000000
## 4334	2002-09-26	1.1735556	23.22016	6.8311111	2.0444444	3.155556
## 4335	2002-09-27	1.1920741	23.23003	6.9342222	5.454545	4.363636
## 4336	2002-09-28	1.2105926	23.23990	7.0373333	8.750000	7.000000
## 4337	2002-09-29	1.2291111	23.24978	7.1404444	2.000000	2.000000
## 4338	2002-09-30	1.0567778	23.40334	7.1465556	10.909091	3.272727
## 4339	2002-10-01	0.8844444	23.55691	7.1526667	2.000000	2.266667
## 4340	2002-10-02	0.9717037	23.49443	7.1015556	5.750000	7.500000
## 4341	2002-10-03	1.0589630	23.43195	7.0504444	2844.909091	3173.636364
## 4342	2002-10-04	1.1462222	23.36947	6.9993333	2.000000	3.022222
## 4343	2002-10-05	1.1101481	23.34852	6.9560741	252.833333	52.833333
## 4344	2002-10-06	1.0740741	23.32757	6.9128148	60.000000	28.291667
## 4345	2002-10-07	1.0380000	23.30662	6.8695556	9.035714	3.750000
## 4346	2002-10-08	1.0357222	23.33777	6.7810556	110.750000	340.750000
## 4347	2002-10-09	1.0334444	23.36892	6.6925556	18.666667	2.000000
## 4348	2002-10-10	1.0311667	23.40007	6.6040556	148.315789	4.631579
## 4349	2002-10-11	1.0288889	23.43122	6.5155556	2.800000	2.044444
## 4350	2002-10-12	1.2251111	23.45438	6.4608889	19.811321	5.283019
## 4351	2002-10-13	1.1902910	23.51391	6.6003042	20.363636	2.909091
## 4352	2002-10-14	1.1554709	23.57343	6.7397196	134.000000	10.431818
## 4353	2002-10-15	1.1206508	23.63296	6.8791349	820.000000	17.954545
## 4354	2002-10-16	1.0858307	23.69249	7.0185503	2.000000	25.477273
## 4355	2002-10-17	1.0510106	23.75202	7.1579656	2.750000	33.000000
## 4356	2002-10-18	1.0161905	23.81155	7.2973810	3.000000	22.227273
## 4357	2002-10-19	0.8345725	24.03377	7.0853950	50.909091	11.454545
## 4358	2002-10-20	0.6529545	24.25600	6.8734091	16.454545	9.736993
## 4359	2002-10-21	0.4554545	24.42291	6.6298182	22.145455	8.019440
## 4360	2002-10-22	1.2666667	23.85871	6.8915556	2.981132	6.301887
## 4361	2002-10-23	0.7657143	23.76098	7.1850000	2.733333	2.000000
## 4362	2002-10-24	0.9393484	23.87397	7.1612719	23.454545	12.363636
## 4363	2002-10-25	1.1129825	23.98696	7.1375439	2.047619	2.000000
## 4364	2002-10-26	1.2511111	24.00851	7.2968889	3.500000	5.954545
## 4365	2002-10-27	1.2586667	24.03583	7.2102222	24.727273	59.636364
## 4366	2002-10-28	1.2662222	24.06315	7.1235556	5.777778	12.000000
## 4367	2002-10-29	1.2737778	24.09047	7.0368889	2.133333	2.755556
## 4368	2002-10-30	0.8055556	23.96502	7.3573333	9.750000	3.285714
## 4369	2002-10-31	0.9774074	24.05221	7.3395556	315.333333	60.500000
## 4370	2002-11-01	1.1492593	24.13939	7.3217778	17.000000	16.000000
## 4371	2002-11-02	1.3211111	24.22658	7.3040000	7.200000	23.866667
## 4372	2002-11-03	1.2131111	24.22469	7.3062222	97.368421	12.736842
## 4373	2002-11-04	1.1051111	24.22280	7.3084444	2.0444444	2.000000
## 4374	2002-11-05	1.0703704	24.19616	7.2400741	3.000000	2.500000
## 4375	2002-11-06	1.0356296	24.16953	7.1717037	11.818182	2.000000
## 4376	2002-11-07	1.0008889	24.14289	7.1033333	2.4444444	2.000000
## 4377	2002-11-08	1.1223333	24.31564	6.9970000	16.500000	7.500000
## 4378	2002-11-09	1.2437778	24.48840	6.8906667	30.392857	15.785714
## 4379	2002-11-10	1.4182222	24.59718	6.9024444	5.666667	3.396226
## 4380	2002-11-11	1.0495556	24.57031	7.1960000	125.964286	50.250000

## 4381	2002-11-12	1.0556905	24.58857	7.1539524	3398.545455	425.125000
## 4382	2002-11-13	1.0618254	24.60683	7.1119048	120.000000	800.000000
## 4383	2002-11-14	1.0679603	24.62509	7.0698571	2.000000	2.000000
## 4384	2002-11-15	1.0740952	24.64336	7.0278095	1021.454545	287.272727
## 4385	2002-11-16	1.0802302	24.66162	6.9857619	20.250000	6.000000
## 4386	2002-11-17	1.0863651	24.67988	6.9437143	34.000000	1611.878788
## 4387	2002-11-18	1.0925000	24.69814	6.9016667	2239.727273	3217.757576
## 4388	2002-11-19	1.1668444	24.69011	6.9681333	4445.454545	4823.636364
## 4389	2002-11-20	1.2411889	24.68207	7.0346000	2900.750000	1390.250000
## 4390	2002-11-21	1.3155333	24.67404	7.1010667	3702.285714	3095.500000
## 4391	2002-11-22	1.3898778	24.66601	7.1675333	70.857143	71.200000
## 4392	2002-11-23	1.4642222	24.65798	7.2340000	6.844444	4.088889
## 4393	2002-11-24	1.7700000	24.66846	7.3594444	21.000000	4.750000
## 4394	2002-11-25	2.0757778	24.67893	7.4848889	11.821429	5.678571
## 4395	2002-11-26	1.9031111	24.70936	7.4611111	40.000000	4.589286
## 4396	2002-11-27	1.7304444	24.73978	7.4373333	3.750000	3.500000
## 4397	2002-11-28	1.5577778	24.77020	7.4135556	9.272727	5.636364
## 4398	2002-11-29	1.3851111	24.80062	7.3897778	134.452830	5.056604
## 4399	2002-11-30	1.0056237	24.96761	6.7456843	24.000000	649.619211
## 4400	2002-12-01	0.6261364	25.13459	6.1015909	664.763636	1294.181818
## 4401	2002-12-02	0.7852381	24.98952	6.5085714	5.280000	2.250000
## 4402	2002-12-03	1.5457778	24.91629	7.3188889	327.166667	323.833333
## 4403	2002-12-04	0.7849091	25.15315	5.9838182	280.206897	4310.000000
## 4404	2002-12-05	1.2986450	25.00235	6.6347662	473.333333	390.000000
## 4405	2002-12-06	1.8123810	24.85155	7.2857143	175.836735	40.571429
## 4406	2002-12-07	2.3960000	24.90607	7.4846667	50.222222	146.333333
## 4407	2002-12-08	2.5787879	24.84388	7.7869697	4.000000	3.555556
## 4408	2002-12-09	1.5683333	24.79433	7.6758333	2.166667	2.083333
## 4409	2002-12-10	1.5274074	24.74870	7.6069259	3.000000	2.250000
## 4410	2002-12-11	1.4864815	24.70307	7.5380185	6.727273	2.545455
## 4411	2002-12-12	1.4455556	24.65744	7.4691111	78.088889	2.844444
## 4412	2002-12-13	1.4465926	24.65966	7.4917037	5.000000	10.250000
## 4413	2002-12-14	1.4476296	24.66187	7.5142963	2.000000	9.910714
## 4414	2002-12-15	1.4486667	24.66409	7.5368889	6.321429	9.571429
## 4415	2002-12-16	1.3887778	24.61940	7.6091111	2.000000	5.750000
## 4416	2002-12-17	1.3288889	24.57471	7.6813333	2.000000	2.222222
## 4417	2002-12-18	1.2712963	24.59386	7.5710741	81.818182	42.000000
## 4418	2002-12-19	1.2137037	24.61301	7.4608148	2.750000	2.250000
## 4419	2002-12-20	1.1561111	24.63217	7.3505556	2.444444	3.222222
## 4420	2002-12-21	1.1959444	24.68507	7.1362778	122.000000	46.727273
## 4421	2002-12-22	1.2357778	24.73798	6.9220000	56.703704	8.905660
## 4422	2002-12-23	1.3285299	24.80909	6.7076667	68.800000	6.657958
## 4423	2002-12-24	1.4212821	24.88021	6.4933333	18.820513	4.410256
## 4424	2002-12-25	1.9813504	24.86768	6.7233333	130.181818	263.272727
## 4425	2002-12-26	2.5414188	24.85515	6.9533333	2.727273	2.000000
## 4426	2002-12-27	3.1014872	24.84262	7.1833333	24.000000	8.000000
## 4427	2002-12-28	3.6615556	24.83009	7.4133333	2.177778	2.000000
## 4428	2002-12-29	3.2084444	24.81458	7.4536111	12.210526	6.105263
## 4429	2002-12-30	2.7553333	24.79908	7.4938889	4.750000	21.750000
## 4430	2002-12-31	2.3022222	24.78357	7.5341667	29.818182	22.363636
## 4431	2003-01-01	1.8491111	24.76807	7.5744444	2.000000	2.044444
## 4432	2003-01-02	1.7442222	24.82437	7.0268889	64.250000	2.500000
## 4433	2003-01-03	1.6393333	24.88067	6.4793333	2.622222	2.088889
## 4434	2003-01-04	2.9730000	24.88229	6.7853333	19.166667	9.090909

## 4435	2003-01-05	4.3066667	24.88391	7.0913333	3.200000	2.355556
## 4436	2003-01-06	3.4687407	24.69864	7.3354074	5.500000	3.000000
## 4437	2003-01-07	2.6308148	24.51338	7.5794815	8.727273	12.909091
## 4438	2003-01-08	1.7928889	24.32811	7.8235556	3.955556	6.800000
## 4439	2003-01-09	2.2538889	24.51063	7.5737778	4.250000	5.000000
## 4440	2003-01-10	2.7148889	24.69316	7.3240000	2.500000	2.357143
## 4441	2003-01-11	2.4218333	24.67341	7.2389444	2.250000	2.000000
## 4442	2003-01-12	2.1287778	24.65366	7.1538889	132.909091	13.090909
## 4443	2003-01-13	1.8357222	24.63391	7.0688333	9.750000	5.250000
## 4444	2003-01-14	1.5426667	24.61416	6.9837778	2.000000	2.000000
## 4445	2003-01-15	0.3436364	25.40293	5.6454545	44.509091	2.263158
## 4446	2003-01-16	1.7266667	24.98540	6.2392857	22.524590	2.526316
## 4447	2003-01-17	0.8959091	25.28223	5.5461364	61.272727	2.263158
## 4448	2003-01-18	2.2493333	24.57382	6.9768889	2.044444	2.000000
## 4449	2003-01-19	2.1426190	24.83586	6.9333333	4.947368	2.000000
## 4450	2003-01-20	2.7246667	24.67511	7.0808889	494.680851	531.829787
## 4451	2003-01-21	2.7787879	24.82545	6.2551515	2.111111	2.000000
## 4452	2003-01-22	1.9387500	24.95829	6.0287500	329.333333	261.481481
## 4453	2003-01-23	1.8883519	24.82536	6.4751667	1800.000000	6400.000000
## 4454	2003-01-24	1.8379537	24.69242	6.9215833	9.555556	2.444444
## 4455	2003-01-25	1.7875556	24.55949	7.3680000	2.088889	2.044444
## 4456	2003-01-26	1.6220000	24.56328	7.1191111	58.727273	7.454545
## 4457	2003-01-27	1.4564444	24.56707	6.8702222	2.000000	2.044444
## 4458	2003-01-28	2.9248889	24.73346	6.6350000	65.454545	16.363636
## 4459	2003-01-29	4.3933333	24.89984	6.3997778	4.035714	3.321429
## 4460	2003-01-30	4.8224444	24.89660	6.7248889	9.911111	8.711111
## 4461	2003-01-31	4.2264444	24.57930	6.9085556	18.000000	7.636364
## 4462	2003-02-01	3.6304444	24.26200	7.0922222	2.000000	2.133333
## 4463	2003-02-02	2.6297778	24.94673	5.6117778	2.037736	2.113208
## 4464	2003-02-03	3.6621111	24.66159	6.3738889	25.818182	10.909091
## 4465	2003-02-04	4.6944444	24.37644	7.1360000	6.844444	3.288889
## 4466	2003-02-05	2.6122222	24.07111	6.9680000	2.150943	3.132075
## 4467	2003-02-06	2.7248889	24.10972	6.9960000	5.272727	10.363636
## 4468	2003-02-07	2.8375556	24.14833	7.0240000	3.750000	4.250000
## 4469	2003-02-08	2.9502222	24.18694	7.0520000	366.181818	220.181818
## 4470	2003-02-09	3.0628889	24.22556	7.0800000	2.000000	2.000000
## 4471	2003-02-10	2.9792889	24.16322	7.0560889	2.000000	2.500000
## 4472	2003-02-11	2.8956889	24.10088	7.0321778	2.000000	2.181818
## 4473	2003-02-12	2.8120889	24.03854	7.0082667	2.000000	2.000000
## 4474	2003-02-13	2.7284889	23.97620	6.9843556	2.000000	2.250000
## 4475	2003-02-14	2.6448889	23.91387	6.9604444	13.035714	2.535714
## 4476	2003-02-15	2.7956296	23.87078	7.0988889	3.250000	109.000000
## 4477	2003-02-16	2.9463704	23.82769	7.2373333	2.625000	2.000000
## 4478	2003-02-17	3.0971111	23.78460	7.3757778	2.000000	2.000000
## 4479	2003-02-18	3.0794815	23.75198	7.7113333	2.181818	3.636364
## 4480	2003-02-19	3.0618519	23.71936	8.0468889	2.500000	2.000000
## 4481	2003-02-20	3.0442222	23.68673	8.3824444	5.777778	2.133333
## 4482	2003-02-21	1.6866667	23.54029	8.5787500	2.333333	2.000000
## 4483	2003-02-22	2.0738095	23.98269	7.8776190	27.959184	13.673469
## 4484	2003-02-23	2.1942424	23.90261	7.3863636	2.000000	2.000000
## 4485	2003-02-24	2.3331111	23.85518	7.3702222	2.222222	2.000000
## 4486	2003-02-25	1.4569048	24.32264	6.9742857	4.400000	5.500000
## 4487	2003-02-26	0.8550000	24.63325	6.5993182	9.418182	5.272727
## 4488	2003-02-27	0.4721818	24.92951	5.9383636	31.927273	3.636364

## 4489	2003-02-28	2.3771111	23.53267	6.9217778	2.000000	2.000000
## 4490	2003-03-01	2.3771111	23.67355	7.0184444	4.000000	2.000000
## 4491	2003-03-02	2.3771111	23.81443	7.1151111	297.090909	9.818182
## 4492	2003-03-03	2.3771111	23.95531	7.2117778	3.000000	4.250000
## 4493	2003-03-04	2.3771111	24.09619	7.3084444	4.181818	6.181818
## 4494	2003-03-05	2.3771111	24.23707	7.4051111	2.000000	2.000000
## 4495	2003-03-06	2.7262222	24.22057	7.2906667	2.000000	6.750000
## 4496	2003-03-07	3.0753333	24.20407	7.1762222	2.000000	2.088889
## 4497	2003-03-08	1.6462222	24.20191	6.9620000	3.571429	3.214286
## 4498	2003-03-09	2.8060000	24.11702	6.8535556	2.113208	3.886792
## 4499	2003-03-10	2.4515556	24.09124	7.1755556	3.892857	2.428571
## 4500	2003-03-11	2.8667407	24.22002	7.1702222	2.250000	2.000000
## 4501	2003-03-12	3.2819259	24.34880	7.1648889	3.473684	3.473684
## 4502	2003-03-13	3.6971111	24.47758	7.1595556	2.000000	2.133333
## 4503	2003-03-14	2.7906667	24.41147	7.4126667	5.132075	7.433962
## 4504	2003-03-15	2.7013333	24.32728	7.5788889	1108.727273	538.909091
## 4505	2003-03-16	2.6120000	24.24309	7.7451111	2.075472	2.301887
## 4506	2003-03-17	2.5961778	24.24357	7.7482667	43.272727	14.363636
## 4507	2003-03-18	2.5803556	24.24406	7.7514222	17.500000	5.000000
## 4508	2003-03-19	2.5645333	24.24454	7.7545778	73.636364	22.727273
## 4509	2003-03-20	2.5487111	24.24503	7.7577333	4.000000	5.500000
## 4510	2003-03-21	2.5328889	24.24551	7.7608889	2.000000	2.177778
## 4511	2003-03-22	2.4700741	24.33770	7.5620000	46.545455	12.181818
## 4512	2003-03-23	2.4072593	24.42990	7.3631111	2.000000	2.500000
## 4513	2003-03-24	2.3444444	24.52209	7.1642222	2.088889	3.333333
## 4514	2003-03-25	2.5759259	24.54048	7.2535556	101.272727	43.090909
## 4515	2003-03-26	2.8074074	24.55887	7.3428889	7.750000	4.000000
## 4516	2003-03-27	3.0388889	24.57727	7.4322222	2.000000	2.044444
## 4517	2003-03-28	2.9642222	24.44844	7.7038889	13.894737	8.210526
## 4518	2003-03-29	2.8895556	24.31962	7.9755556	2.000000	2.088889
## 4519	2003-03-30	1.8702222	24.44796	7.2266667	2.679245	2.981132
## 4520	2003-03-31	2.3820000	24.57880	7.4880000	7.191489	5.276596
## 4521	2003-04-01	2.1097619	24.64507	7.4711905	2.000000	2.000000
## 4522	2003-04-02	2.5593939	24.63906	7.4842424	2.000000	2.000000
## 4523	2003-04-03	1.9650000	24.65042	7.2504167	2.583333	2.500000
## 4524	2003-04-04	1.3649545	24.92730	6.6158447	3.500000	2.750000
## 4525	2003-04-05	0.7649091	25.20418	5.9812727	25.054545	7.284091
## 4526	2003-04-06	1.0747619	24.80788	7.0919048	5.320755	11.818182
## 4527	2003-04-07	0.9381818	24.98482	6.6388636	4.500000	6.953535
## 4528	2003-04-08	2.1808889	24.40129	7.8684444	2.044444	2.088889
## 4529	2003-04-09	2.3640741	24.37799	7.9884444	17.750000	4.250000
## 4530	2003-04-10	2.5472593	24.35468	8.1084444	38.909091	13.818182
## 4531	2003-04-11	2.7304444	24.33138	8.2284444	2.355556	2.711111
## 4532	2003-04-12	2.4452222	24.41360	7.8056667	2.250000	3.750000
## 4533	2003-04-13	2.1600000	24.49582	7.3828889	2.000000	2.133333
## 4534	2003-04-14	2.2706222	24.51659	7.3464000	1434.363636	1577.272727
## 4535	2003-04-15	2.3812444	24.53735	7.3099111	2213.333333	6090.000000
## 4536	2003-04-16	2.4918667	24.55812	7.2734222	4.750000	6.500000
## 4537	2003-04-17	2.6024889	24.57888	7.2369333	70.000000	300.000000
## 4538	2003-04-18	2.7131111	24.59964	7.2004444	5.142857	4.178571
## 4539	2003-04-19	2.7524444	24.64959	7.0871111	4.500000	3.500000
## 4540	2003-04-20	2.7917778	24.69953	6.9737778	10.977778	49.600000
## 4541	2003-04-21	2.0633333	24.76862	7.1266667	2.577778	4.755556
## 4542	2003-04-22	1.9185333	24.75508	7.1174222	50.736842	155.684211

## 4543	2003-04-23	1.7737333	24.74154	7.1081778	30.000000	300.000000
## 4544	2003-04-24	1.6289333	24.72800	7.0989333	19.375000	24.000000
## 4545	2003-04-25	1.4841333	24.71445	7.0896889	8.750000	66.500000
## 4546	2003-04-26	1.3393333	24.70091	7.0804444	2.714286	3.214286
## 4547	2003-04-27	1.4532222	24.69931	7.2248889	7.357143	22.000000
## 4548	2003-04-28	1.5671111	24.69771	7.3693333	12.000000	17.733333
## 4549	2003-04-29	1.4450000	24.74250	7.4760000	4.250000	6.500000
## 4550	2003-04-30	1.3228889	24.78729	7.5826667	11.107143	25.321429
## 4551	2003-05-01	1.3123778	24.76825	7.5714889	12000.000000	12000.000000
## 4552	2003-05-02	1.3018667	24.74920	7.5603111	409.777778	122.666667
## 4553	2003-05-03	1.2913556	24.73016	7.5491333	3022.000000	8400.000000
## 4554	2003-05-04	1.2808444	24.71112	7.5379556	536.727273	418.909091
## 4555	2003-05-05	1.2703333	24.69208	7.5267778	68.000000	140.000000
## 4556	2003-05-06	1.2598222	24.67304	7.5156000	320.888889	11.250000
## 4557	2003-05-07	1.2493111	24.65399	7.5044222	600.000000	33.806818
## 4558	2003-05-08	1.2388000	24.63495	7.4932444	110.545455	56.363636
## 4559	2003-05-09	1.2282889	24.61591	7.4820667	1041.166667	6.250000
## 4560	2003-05-10	1.2177778	24.59687	7.4708889	364.255319	127.688889
## 4561	2003-05-11	1.3077333	24.59884	7.4902667	6020.000000	650.753535
## 4562	2003-05-12	1.3976889	24.60082	7.5096444	1141.454545	1173.818182
## 4563	2003-05-13	1.4876444	24.60280	7.5290222	48.250000	21.500000
## 4564	2003-05-14	1.5776000	24.60478	7.5484000	574.000000	1300.000000
## 4565	2003-05-15	1.6675556	24.60676	7.5677778	477.125000	164.808511
## 4566	2003-05-16	1.6378889	24.62288	7.4588889	511.000000	2100.000000
## 4567	2003-05-17	1.6082222	24.63900	7.3500000	56.656250	57.031250
## 4568	2003-05-18	1.4888889	24.63399	7.4045778	1650.000000	1200.000000
## 4569	2003-05-19	1.3695556	24.62897	7.4591556	12000.000000	2400.000000
## 4570	2003-05-20	1.2502222	24.62396	7.5137333	492.500000	152.500000
## 4571	2003-05-21	1.1308889	24.61895	7.5683111	4019.454545	2717.454545
## 4572	2003-05-22	1.0115556	24.61393	7.6228889	308.595745	285.869565
## 4573	2003-05-23	1.0380741	24.69418	7.3057778	1666.000000	2939.500000
## 4574	2003-05-24	1.0645926	24.77442	6.9886667	6280.000000	3355.000000
## 4575	2003-05-25	1.0911111	24.85467	6.6715556	311.890909	265.740741
## 4576	2003-05-26	1.4012698	24.89150	6.8132778	181.818182	176.181818
## 4577	2003-05-27	1.7114286	24.92833	6.9550000	6.952381	1148.090909
## 4578	2003-05-28	0.5645455	25.19868	6.1727273	229.125000	2120.000000
## 4579	2003-05-29	0.5967273	25.38320	5.7183636	14.290909	1256.821429
## 4580	2003-05-30	2.9313333	24.69311	7.9160000	494.561404	393.642857
## 4581	2003-05-31	1.2487500	24.76075	7.3916667	890.814815	925.000000
## 4582	2003-06-01	1.2997619	24.77062	7.5857143	349.317073	332.682927
## 4583	2003-06-02	1.5424444	24.70384	7.7253333	48.944444	42.888889
## 4584	2003-06-03	1.7681818	24.74655	7.5609091	512.166667	573.523810
## 4585	2003-06-04	1.8125657	24.75885	7.4850505	75.000000	53.111111
## 4586	2003-06-05	1.8569495	24.77114	7.4091919	38.000000	2.000000
## 4587	2003-06-06	1.9013333	24.78344	7.3333333	197.535714	28.500000
## 4588	2003-06-07	1.7988254	24.80560	7.2356190	268.444444	2.250000
## 4589	2003-06-08	1.6963175	24.82776	7.1379048	12000.000000	375.136364
## 4590	2003-06-09	1.5938095	24.84992	7.0401905	800.000000	748.022727
## 4591	2003-06-10	1.4913016	24.87208	6.9424762	1181.636364	1120.909091
## 4592	2003-06-11	1.3887937	24.89424	6.8447619	6.000000	4.500000
## 4593	2003-06-12	1.2862857	24.91640	6.7470476	323.000000	3000.000000
## 4594	2003-06-13	1.1837778	24.93856	6.6493333	26.800000	52.533333
## 4595	2003-06-14	1.1802222	24.89983	6.6598148	5600.000000	9800.000000
## 4596	2003-06-15	1.1766667	24.86110	6.6702963	12000.000000	12000.000000

## 4597	2003-06-16	1.1731111	24.82238	6.6807778	5684.842105	2617.263158
## 4598	2003-06-17	1.1695556	24.78365	6.6912593	557.714286	165.000000
## 4599	2003-06-18	1.1660000	24.74493	6.7017407	283.000000	89.428571
## 4600	2003-06-19	1.1624444	24.70620	6.7122222	118.192308	41.955556
## 4601	2003-06-20	1.3968000	24.74121	6.6269778	4063.333333	27.102778
## 4602	2003-06-21	1.6311556	24.77622	6.5417333	27.500000	12.250000
## 4603	2003-06-22	1.8655111	24.81123	6.4564889	300.727273	38.181818
## 4604	2003-06-23	2.0998667	24.84624	6.3712444	32.000000	22.246465
## 4605	2003-06-24	2.3342222	24.88124	6.2860000	41.040000	6.311111
## 4606	2003-06-25	2.3630556	24.82734	6.5733333	406.666667	5.280556
## 4607	2003-06-26	2.3918889	24.77344	6.8606667	15.400000	4.250000
## 4608	2003-06-27	2.4207222	24.71954	7.1480000	24.363636	12.727273
## 4609	2003-06-28	2.4495556	24.66564	7.4353333	5.509434	3.849057
## 4610	2003-06-29	3.6317778	24.53326	7.7273333	1019.272727	1097.636364
## 4611	2003-06-30	4.8140000	24.40087	8.0193333	5.555556	8.133333
## 4612	2003-07-01	4.3594074	24.53741	7.4396296	140.000000	20.000000
## 4613	2003-07-02	3.9048148	24.67396	6.8599259	12.222222	13.750000
## 4614	2003-07-03	3.4502222	24.81051	6.2802222	8.088889	7.288889
## 4615	2003-07-04	3.6505333	24.82143	6.3209333	161.090909	63.272727
## 4616	2003-07-05	3.8508444	24.83235	6.3616444	8.750000	2.250000
## 4617	2003-07-06	4.0511556	24.84327	6.4023556	1191.818182	1285.636364
## 4618	2003-07-07	4.2514667	24.85419	6.4430667	9.750000	2.500000
## 4619	2003-07-08	4.4517778	24.86511	6.4837778	20.638298	99.086957
## 4620	2003-07-09	3.2545556	25.04343	5.9446667	6.000000	12.000000
## 4621	2003-07-10	2.0573333	25.22176	5.4055556	4.133333	3.866667
## 4622	2003-07-11	2.1643333	25.22410	5.4373333	129.368421	14.421053
## 4623	2003-07-12	2.2713333	25.22644	5.4691111	3.911111	2.311111
## 4624	2003-07-13	2.3602222	25.18002	5.5660000	2.000000	2.000000
## 4625	2003-07-14	2.4491111	25.13360	5.6628889	42.363636	11.818182
## 4626	2003-07-15	2.5380000	25.08718	5.7597778	8.888889	29.733333
## 4627	2003-07-16	4.4975556	25.04076	6.2325926	2.000000	2.250000
## 4628	2003-07-17	6.4571111	24.99433	6.7054074	11.818182	7.090909
## 4629	2003-07-18	8.4166667	24.94791	7.1782222	5.111111	2.888889
## 4630	2003-07-19	5.5731250	24.99512	7.0372997	6.750000	2.750000
## 4631	2003-07-20	2.7295833	25.04233	6.8963771	2.083333	2.000000
## 4632	2003-07-21	3.2160606	25.03176	6.7554545	11.655172	5.586207
## 4633	2003-07-22	3.7595556	24.86791	7.6868889	2.055556	2.222222
## 4634	2003-07-23	4.0659524	24.96664	6.9007143	5.666667	3.333333
## 4635	2003-07-24	3.6835238	24.87490	6.9588466	4.000000	3.000000
## 4636	2003-07-25	3.3010952	24.78316	7.0169788	224.181818	1333.272727
## 4637	2003-07-26	2.9186667	24.69142	7.0751111	9.620690	6.068966
## 4638	2003-07-27	2.8039444	24.74947	6.7267778	18.545455	38.727273
## 4639	2003-07-28	2.6892222	24.80752	6.3784444	2.000000	2.250000
## 4640	2003-07-29	2.5745000	24.86557	6.0301111	6.000000	2.125000
## 4641	2003-07-30	2.4597778	24.92362	5.6817778	2.355556	2.000000
## 4642	2003-07-31	2.6070480	25.57045	4.6334545	22.690909	2.368421
## 4643	2003-08-01	2.7543182	25.50902	4.9738636	24.222222	2.736842
## 4644	2003-08-02	2.1859524	25.39529	5.3061905	5.571429	2.435088
## 4645	2003-08-03	5.9104444	25.28853	5.2826667	2.888889	2.133333
## 4646	2003-08-04	4.3270000	25.18329	5.3587778	8.857143	3.142857
## 4647	2003-08-05	2.7435556	25.07804	5.4348889	13.859649	8.631579
## 4648	2003-08-06	3.1928889	24.87618	5.9635556	2.488889	2.222222
## 4649	2003-08-07	3.2738519	24.74524	6.4746667	2.250000	2.500000
## 4650	2003-08-08	3.3548148	24.61431	6.9857778	15.454545	18.363636

## 4651	2003-08-09	3.4357778	24.48338	7.4968889	2.355556	2.533333
## 4652	2003-08-10	3.7855556	24.60544	6.9160000	3.000000	5.750000
## 4653	2003-08-11	4.1353333	24.72751	6.3351111	3.357143	3.821429
## 4654	2003-08-12	4.2975556	24.66422	5.9954444	2.000000	2.500000
## 4655	2003-08-13	4.4597778	24.60093	5.6557778	2.266667	2.000000
## 4656	2003-08-14	5.1744000	24.64037	6.0724444	9.272727	6.181818
## 4657	2003-08-15	5.8890222	24.67981	6.4891111	9.500000	6.750000
## 4658	2003-08-16	6.6036444	24.71925	6.9057778	146.545455	65.818182
## 4659	2003-08-17	7.3182667	24.75869	7.3224444	18.750000	4.250000
## 4660	2003-08-18	8.0328889	24.79813	7.7391111	2.000000	2.044444
## 4661	2003-08-19	7.2580000	24.73202	7.7267407	6.000000	9.500000
## 4662	2003-08-20	6.4831111	24.66591	7.7143704	12.545455	3.454545
## 4663	2003-08-21	5.7082222	24.59980	7.7020000	2.044444	2.000000
## 4664	2003-08-22	5.2460741	24.41533	8.1580741	2.000000	4.500000
## 4665	2003-08-23	4.7839259	24.23087	8.6141481	2.909091	2.000000
## 4666	2003-08-24	4.3217778	24.04640	9.0702222	2.044444	2.000000
## 4667	2003-08-25	3.5722222	23.82174	8.8311111	4.250000	4.250000
## 4668	2003-08-26	2.8226667	23.59709	8.5920000	2.035714	2.392857
## 4669	2003-08-27	2.2446667	23.83617	8.0007778	4.500000	6.750000
## 4670	2003-08-28	1.6666667	24.07524	7.4095556	99.785714	54.928571
## 4671	2003-08-29	1.7446667	24.09466	7.3631111	3.500000	3.000000
## 4672	2003-08-30	1.8226667	24.11407	7.3166667	2.000000	2.000000
## 4673	2003-08-31	1.7554762	24.51007	7.7511905	12.195122	7.073171
## 4674	2003-09-01	2.5071111	24.52460	7.7122222	2.055556	2.388889
## 4675	2003-09-02	3.3209091	24.52876	7.7472727	2.000000	2.461538
## 4676	2003-09-03	2.4108333	24.17679	7.7962500	2.000000	2.000000
## 4677	2003-09-04	2.0352381	24.48538	7.1180952	2.190476	4.090909
## 4678	2003-09-05	1.0765909	24.92532	5.9304545	12.181818	6.181818
## 4679	2003-09-06	0.8505455	25.11569	5.5876364	40.603175	2.500000
## 4680	2003-09-07	1.8980000	24.57900	7.2797778	2.044444	2.177778
## 4681	2003-09-08	1.6478889	24.42886	7.5094444	151.894737	18.315789
## 4682	2003-09-09	1.3977778	24.27871	7.7391111	2.044444	2.000000
## 4683	2003-09-10	1.4497778	24.31335	7.6252593	10.750000	8.000000
## 4684	2003-09-11	1.5017778	24.34799	7.5114074	6.545455	5.636364
## 4685	2003-09-12	1.5537778	24.38262	7.3975556	2.000000	2.444444
## 4686	2003-09-13	1.4836667	24.46354	7.4977778	280.000000	3.500000
## 4687	2003-09-14	1.4135556	24.54447	7.5980000	2.000000	2.177778
## 4688	2003-09-15	1.5810000	24.32067	7.7400556	6.000000	3.636364
## 4689	2003-09-16	1.7484444	24.09687	7.8821111	1504.750000	25.750000
## 4690	2003-09-17	1.9158889	23.87307	8.0241667	2.000000	14.232143
## 4691	2003-09-18	2.0833333	23.64927	8.1662222	12.714286	2.714286
## 4692	2003-09-19	1.8765185	23.93290	7.8905185	2.000000	2.482143
## 4693	2003-09-20	1.6697037	24.21654	7.6148148	2.000000	2.250000
## 4694	2003-09-21	1.4628889	24.50018	7.3391111	2.000000	2.000000
## 4695	2003-09-22	1.6421481	24.46122	7.4259259	2.727273	3.636364
## 4696	2003-09-23	1.8214074	24.42227	7.5127407	2.500000	27.250000
## 4697	2003-09-24	2.0006667	24.38331	7.5995556	2.000000	2.000000
## 4698	2003-09-25	1.9560000	24.24331	7.7390000	45.636364	9.636364
## 4699	2003-09-26	1.9113333	24.10331	7.8784444	3.584906	2.716981
## 4700	2003-09-27	1.7591111	24.13951	7.8947778	4.842105	3.052632
## 4701	2003-09-28	1.6068889	24.17571	7.9111111	2.044444	2.222222
## 4702	2003-09-29	1.3146667	23.81204	7.8646667	3.466667	2.000000
## 4703	2003-09-30	1.4526667	23.81802	7.7974444	45.636364	5.454545
## 4704	2003-10-01	1.5906667	23.82400	7.7302222	32.750000	18.000000

##	4705	2003-10-02	1.7286667	23.82998	7.6630000	54.000000	10.035714
##	4706	2003-10-03	1.8666667	23.83596	7.5957778	3.500000	2.071429
##	4707	2003-10-04	1.6008889	23.98318	7.5647778	9.250000	5.250000
##	4708	2003-10-05	1.3351111	24.13040	7.5337778	9.000000	3.857143
##	4709	2003-10-06	1.4247556	24.17758	7.5764444	13.000000	5.000000
##	4710	2003-10-07	1.5144000	24.22476	7.6191111	2.000000	3.590909
##	4711	2003-10-08	1.6040444	24.27193	7.6617778	2.181818	2.181818
##	4712	2003-10-09	1.6936889	24.31911	7.7044444	2.250000	4.250000
##	4713	2003-10-10	1.7833333	24.36629	7.7471111	129.288889	42.311111
##	4714	2003-10-11	1.5760000	24.05676	7.7200000	2.044444	2.000000
##	4715	2003-10-12	1.4415897	24.29265	7.4779487	46.000000	8.545455
##	4716	2003-10-13	1.3071795	24.52854	7.2358974	4.170213	3.500000
##	4717	2003-10-14	0.9702273	24.70700	6.8959091	4.727273	3.066667
##	4718	2003-10-15	0.7432759	24.83653	6.5337931	19.862069	2.633333
##	4719	2003-10-16	1.3138095	24.55900	7.4395238	2.066667	2.200000
##	4720	2003-10-17	1.4888889	24.62171	7.2180000	3.106383	2.765957
##	4721	2003-10-18	1.4818182	24.63142	6.9563636	5.384615	5.769231
##	4722	2003-10-19	1.3075000	24.52767	6.9491667	2.250000	2.000000
##	4723	2003-10-20	1.2833333	24.77367	6.8602222	3.178571	3.750000
##	4724	2003-10-21	1.2651111	24.82310	7.0015556	16.250000	10.250000
##	4725	2003-10-22	1.2468889	24.87253	7.1428889	2.452830	2.905660
##	4726	2003-10-23	1.3058519	24.76406	7.4132593	3.818182	2.181818
##	4727	2003-10-24	1.3648148	24.65559	7.6836296	476.363636	366.000000
##	4728	2003-10-25	1.4237778	24.54711	7.9540000	2.867925	2.226415
##	4729	2003-10-26	1.6071111	24.60364	7.6797778	23.833333	15.708333
##	4730	2003-10-27	1.4342667	24.59196	7.7157333	2.500000	2.000000
##	4731	2003-10-28	1.2614222	24.58028	7.7516889	2.250000	2.250000
##	4732	2003-10-29	1.0885778	24.56860	7.7876444	3.272727	3.636364
##	4733	2003-10-30	0.9157333	24.55692	7.8236000	2.250000	2.000000
##	4734	2003-10-31	0.7428889	24.54524	7.8595556	2.266667	2.000000
##	4735	2003-11-01	0.7929630	24.56761	7.8396296	9.636364	3.090909
##	4736	2003-11-02	0.8430370	24.58999	7.8197037	8.250000	8.750000
##	4737	2003-11-03	0.8931111	24.61236	7.7997778	2.044444	2.266667
##	4738	2003-11-04	1.2524444	24.73227	7.9464444	4.857143	2.428571
##	4739	2003-11-05	1.5431111	24.69293	7.8880000	4.250000	2.000000
##	4740	2003-11-06	1.8337778	24.65360	7.8295556	9.818182	3.818182
##	4741	2003-11-07	2.1244444	24.61427	7.7711111	15.471698	4.188679
##	4742	2003-11-08	1.8224444	24.59714	7.6650000	2.000000	979.457976
##	4743	2003-11-09	1.5204444	24.58002	7.5588889	5171.272727	1954.727273
##	4744	2003-11-10	1.2184444	24.56290	7.4527778	1720.750000	1676.250000
##	4745	2003-11-11	0.9164444	24.54578	7.3466667	876.230769	601.120000
##	4746	2003-11-12	1.1012593	24.57369	7.4217037	1612.500000	519.600000
##	4747	2003-11-13	1.2860741	24.60160	7.4967407	56.000000	71.000000
##	4748	2003-11-14	1.4708889	24.62951	7.5717778	23.285714	15.357143
##	4749	2003-11-15	1.3435556	24.69579	7.5240000	19.250000	4.250000
##	4750	2003-11-16	1.2162222	24.76207	7.4762222	10.000000	3.147222
##	4751	2003-11-17	1.0888889	24.82836	7.4284444	2.177778	2.044444
##	4752	2003-11-18	1.1540741	24.86736	7.4336296	42.909091	28.363636
##	4753	2003-11-19	1.2192593	24.90637	7.4388148	6.500000	3.750000
##	4754	2003-11-20	1.2844444	24.94538	7.4440000	2.000000	2.088889
##	4755	2003-11-21	1.2765556	24.88888	7.6808333	62.909091	45.090909
##	4756	2003-11-22	1.2686667	24.83238	7.9176667	42.500000	232.750000
##	4757	2003-11-23	1.2607778	24.77588	8.1545000	10.000000	24.000000
##	4758	2003-11-24	1.2528889	24.71938	8.3913333	2.000000	2.000000

## 4759	2003-11-25	1.7415152	24.79397	7.9554545	3.687500	2.437500
## 4760	2003-11-26	1.6900000	24.79119	8.0622222	2.843750	2.218750
## 4761	2003-11-27	1.3026667	24.79113	7.9776667	2.000000	2.000000
## 4762	2003-11-28	0.8797619	24.80657	7.5028571	9.735849	8.909091
## 4763	2003-11-29	0.5275000	24.99375	6.9413636	15.667925	9.198653
## 4764	2003-11-30	0.4636364	25.09036	6.5110909	21.600000	9.488215
## 4765	2003-12-01	1.3384444	24.62071	7.9768889	4.177778	9.777778
## 4766	2003-12-02	1.0197561	24.84659	7.3834146	5.500000	3.607143
## 4767	2003-12-03	1.0055556	25.04660	7.5348889	2.044444	2.000000
## 4768	2003-12-04	0.9751111	25.08041	7.3243704	1134.181818	1099.090909
## 4769	2003-12-05	0.9446667	25.11421	7.1138519	64.000000	550.745455
## 4770	2003-12-06	0.9142222	25.14802	6.9033333	2.044444	2.400000
## 4771	2003-12-07	2.5534444	24.97997	7.9067778	11.454545	20.545455
## 4772	2003-12-08	4.1926667	24.81191	8.9102222	5.377778	23.022222
## 4773	2003-12-09	3.2919259	24.95524	8.0945185	1093.454545	1157.454545
## 4774	2003-12-10	2.3911852	25.09858	7.2788148	44.000000	60.000000
## 4775	2003-12-11	1.4904444	25.24191	6.4631111	2.000000	2.444444
## 4776	2003-12-12	1.8754444	25.29944	6.5603333	132.000000	328.000000
## 4777	2003-12-13	2.2604444	25.35698	6.6575556	2.000000	2.000000
## 4778	2003-12-14	3.9895556	25.24622	7.6451111	42.727273	7.272727
## 4779	2003-12-15	5.7186667	25.13547	8.6326667	21.911111	36.311111
## 4780	2003-12-16	3.3664444	25.15598	7.5976667	6.727273	28.909091
## 4781	2003-12-17	1.0142222	25.17649	6.5626667	2.044444	2.933333
## 4782	2003-12-18	1.0673333	25.28788	6.2847778	9.090909	7.454545
## 4783	2003-12-19	1.1204444	25.39927	6.0068889	3.422222	3.422222
## 4784	2003-12-20	2.9770000	25.35022	6.9331111	12.727273	18.545455
## 4785	2003-12-21	4.8335556	25.30118	7.8593333	2.222222	2.222222
## 4786	2003-12-22	3.5547778	25.23832	7.7053333	3.090909	2.181818
## 4787	2003-12-23	2.2760000	25.17547	7.5513333	2.000000	2.000000
## 4788	2003-12-24	0.8666667	25.55133	5.5802381	3.520000	2.000000
## 4789	2003-12-25	0.3829091	25.80329	4.7616364	23.360000	2.000000
## 4790	2003-12-26	0.3681818	25.67586	5.1015909	43.200000	2.000000
## 4791	2003-12-27	1.1677778	25.32282	6.5817778	2.000000	2.000000
## 4792	2003-12-28	1.8463333	25.06258	7.7984444	9.454545	5.636364
## 4793	2003-12-29	2.5248889	24.80233	9.0151111	2.000000	2.000000
## 4794	2003-12-30	10.8154545	25.22885	7.9990909	2.187500	2.187500
## 4795	2003-12-31	9.1694444	25.30500	6.7152778	2.000000	2.000000
## 4796	2004-01-01	6.7723333	25.19227	7.6826667	2.000000	2.000000
## 4797	2004-01-02	3.2975556	24.82371	8.2357778	3.200000	2.444444
## 4798	2004-01-03	3.9260000	24.99691	7.2713333	2.909091	2.909091
## 4799	2004-01-04	4.5544444	25.17011	6.3068889	44.892857	30.750000
## 4800	2004-01-05	3.3242222	24.79240	8.0413333	2.444444	2.000000
## 4801	2004-01-06	7.8933333	24.60251	8.7548889	33.088889	3.090909
## 4802	2004-01-07	12.4624444	24.41262	9.4684444	63.733333	6.933333
## 4803	2004-01-08	9.5277778	24.36428	9.1315556	140.181818	22.000000
## 4804	2004-01-09	6.5931111	24.31594	8.7946667	3.000000	12.000000
## 4805	2004-01-10	3.6584444	24.26760	8.4577778	2.000000	2.000000
## 4806	2004-01-11	2.8432222	24.28716	8.2510000	21.636364	2.909091
## 4807	2004-01-12	2.0280000	24.30671	8.0442222	2.222222	2.000000
## 4808	2004-01-13	2.4957333	24.34399	7.9611111	115.454545	20.545455
## 4809	2004-01-14	2.9634667	24.38127	7.8780000	140.000000	15.909091
## 4810	2004-01-15	3.4312000	24.41855	7.7948889	320.000000	11.272727
## 4811	2004-01-16	3.8989333	24.45583	7.7117778	74.000000	6.636364
## 4812	2004-01-17	4.3666667	24.49311	7.6286667	2.000000	2.000000

##	4813	2004-01-18	4.0157778	24.32764	7.8996296	30.545455	16.000000
##	4814	2004-01-19	3.6648889	24.16216	8.1705926	4.000000	10.911111
##	4815	2004-01-20	3.3140000	23.99669	8.4415556	45.288889	5.822222
##	4816	2004-01-21	2.6123333	24.11887	8.3226667	9.272727	4.000000
##	4817	2004-01-22	1.9106667	24.24104	8.2037778	2.711111	2.000000
##	4818	2004-01-23	1.6518889	24.43316	7.8143333	10.363636	3.454545
##	4819	2004-01-24	1.3931111	24.62527	7.4248889	2.088889	2.044444
##	4820	2004-01-25	1.5676667	24.28262	7.6816667	5.272727	2.727273
##	4821	2004-01-26	1.7422222	23.93998	7.9384444	2.000000	2.000000
##	4822	2004-01-27	1.5137778	23.80947	8.0047111	34.909091	2.909091
##	4823	2004-01-28	1.2853333	23.67896	8.0709778	2.000000	2.454545
##	4824	2004-01-29	1.0568889	23.54844	8.1372444	2.000000	2.000000
##	4825	2004-01-30	1.5307778	23.66647	8.2035111	34.909091	8.909091
##	4826	2004-01-31	2.0046667	23.78449	8.2697778	2.000000	2.000000
##	4827	2004-02-01	1.8877778	23.70661	8.1695556	7.090909	2.000000
##	4828	2004-02-02	1.7708889	23.62873	8.0693333	2.000000	2.000000
##	4829	2004-02-03	1.2442424	23.99864	7.8336364	7.062500	4.500000
##	4830	2004-02-04	1.5752778	24.10456	7.8666667	4.531250	3.250000
##	4831	2004-02-05	1.8226667	24.02703	7.9320000	2.000000	2.000000
##	4832	2004-02-06	1.0542222	24.10007	7.9464444	2.000000	2.000000
##	4833	2004-02-07	0.8257143	24.41702	7.3423810	57.584906	27.272727
##	4834	2004-02-08	0.5422727	24.69520	6.7975000	34.428816	19.027056
##	4835	2004-02-09	0.2896364	24.87487	6.5447273	11.272727	10.781385
##	4836	2004-02-10	2.2697778	23.78173	7.8191111	4.357143	2.535714
##	4837	2004-02-11	0.7342222	24.21282	7.3440000	2.488889	2.000000
##	4838	2004-02-12	0.9668889	24.26046	7.4251852	40.363636	6.727273
##	4839	2004-02-13	1.1995556	24.30810	7.5063704	2.000000	31.074747
##	4840	2004-02-14	1.4322222	24.35573	7.5875556	5.955556	55.422222
##	4841	2004-02-15	1.2427778	24.33934	7.6550000	7.636364	5.636364
##	4842	2004-02-16	1.0533333	24.32296	7.7224444	2.044444	2.044444
##	4843	2004-02-17	1.2412222	24.44889	7.8091111	4.181818	5.090909
##	4844	2004-02-18	1.4291111	24.57482	7.8957778	2.000000	2.044444
##	4845	2004-02-19	1.2455556	24.35100	7.9064444	12.545455	2.727273
##	4846	2004-02-20	1.0620000	24.12718	7.9171111	2.000000	2.000000
##	4847	2004-02-21	1.3954444	24.18959	7.7705556	3.454545	2.727273
##	4848	2004-02-22	1.7288889	24.25200	7.6240000	2.088889	4.666667
##	4849	2004-02-23	1.5204444	24.27264	7.7308148	3.454545	49.090909
##	4850	2004-02-24	1.3120000	24.29327	7.8376296	2.727273	2.000000
##	4851	2004-02-25	1.1035556	24.31391	7.9444444	2.000000	2.000000
##	4852	2004-02-26	1.0191111	24.42243	7.6668889	24.181818	8.363636
##	4853	2004-02-27	0.9346667	24.53096	7.3893333	2.800000	2.000000
##	4854	2004-02-28	1.2973333	24.39072	7.7351111	231.818182	102.000000
##	4855	2004-02-29	1.6600000	24.25049	8.0808889	2.000000	2.000000
##	4856	2004-03-01	0.6739394	24.38018	7.8824242	11.562500	7.375000
##	4857	2004-03-02	0.7338889	24.31242	7.8672222	6.914583	4.820833
##	4858	2004-03-03	1.4633333	24.18487	7.9960000	2.266667	2.266667
##	4859	2004-03-04	1.1572222	24.25108	7.9044444	18.000000	4.909091
##	4860	2004-03-05	0.8511111	24.31729	7.8128889	11.863636	4.345051
##	4861	2004-03-06	0.3429545	24.75695	7.2188636	5.727273	3.781010
##	4862	2004-03-07	0.4442857	24.50517	7.5535714	2.619048	3.216970
##	4863	2004-03-08	0.3736364	24.81207	7.0960000	11.418182	2.652929
##	4864	2004-03-09	0.7808889	24.29162	7.6320000	2.000000	2.088889
##	4865	2004-03-10	0.8636667	24.32682	7.5672222	5.636364	2.727273
##	4866	2004-03-11	0.9464444	24.36202	7.5024444	2.000000	2.000000

##	4867	2004-03-12	0.9453333	24.52583	7.3093333	13.272727	21.636364
##	4868	2004-03-13	0.9442222	24.68964	7.1162222	11.377778	111.733333
##	4869	2004-03-14	1.0207111	24.64706	7.2253333	503.636364	1287.454545
##	4870	2004-03-15	1.0972000	24.60447	7.3344444	7400.000000	8466.666667
##	4871	2004-03-16	1.1736889	24.56188	7.4435556	7600.000000	6600.000000
##	4872	2004-03-17	1.2501778	24.51930	7.5526667	350.000000	760.000000
##	4873	2004-03-18	1.3266667	24.47671	7.6617778	54.711111	201.244444
##	4874	2004-03-19	1.2536667	24.48532	7.6330000	503.250000	1057.500000
##	4875	2004-03-20	1.1806667	24.49394	7.6042222	1537.200000	4505.000000
##	4876	2004-03-21	1.1076667	24.50255	7.5754444	162.500000	2633.333333
##	4877	2004-03-22	1.0346667	24.51117	7.5466667	2.666667	2.000000
##	4878	2004-03-23	1.5973333	24.52955	7.6506667	1545.250000	93.000000
##	4879	2004-03-24	2.1600000	24.54793	7.7546667	852.000000	82.400000
##	4880	2004-03-25	1.8788889	24.59461	7.7560000	30.000000	148.450000
##	4881	2004-03-26	1.5977778	24.64128	7.7573333	289.250000	214.500000
##	4882	2004-03-27	1.3166667	24.68796	7.7586667	1399.625000	4007.250000
##	4883	2004-03-28	1.1851852	24.76046	7.7938519	2510.000000	7800.000000
##	4884	2004-03-29	1.0537037	24.83296	7.8290370	71.000000	106.000000
##	4885	2004-03-30	0.9222222	24.90547	7.8642222	207.250000	235.821429
##	4886	2004-03-31	0.8971852	24.88378	7.8905185	136.000000	80.000000
##	4887	2004-04-01	0.8721481	24.86209	7.9168148	120.000000	60.355556
##	4888	2004-04-02	0.8471111	24.84040	7.9431111	41.866667	40.711111
##	4889	2004-04-03	0.9749778	24.83673	7.9306222	297.272727	570.545455
##	4890	2004-04-04	1.1028444	24.83307	7.9181333	69.333333	273.333333
##	4891	2004-04-05	1.2307111	24.82940	7.9056444	66.000000	480.000000
##	4892	2004-04-06	1.3585778	24.82573	7.8931556	70.200000	2400.000000
##	4893	2004-04-07	1.4864444	24.82207	7.8806667	74.400000	233.511111
##	4894	2004-04-08	1.3425000	24.85546	7.7542222	3011.500000	3145.000000
##	4895	2004-04-09	1.1985556	24.88884	7.6277778	160.000000	762.000000
##	4896	2004-04-10	1.0546111	24.92223	7.5013333	231.090909	289.636364
##	4897	2004-04-11	0.9106667	24.95562	7.3748889	116.545455	1344.818182
##	4898	2004-04-12	1.0482222	24.96043	7.5350556	2.000000	2400.000000
##	4899	2004-04-13	1.1857778	24.96524	7.6952222	9.822222	3600.000000
##	4900	2004-04-14	1.3233333	24.97006	7.8553889	17.644444	3200.000000
##	4901	2004-04-15	1.4608889	24.97487	8.0155556	25.466667	42.000000
##	4902	2004-04-16	1.3825714	24.94661	7.9822540	1147.090909	1221.090909
##	4903	2004-04-17	1.3042540	24.91836	7.9489524	139.000000	300.000000
##	4904	2004-04-18	1.2259365	24.89010	7.9156508	3400.000000	4133.333333
##	4905	2004-04-19	1.1476190	24.86185	7.8823492	9733.333333	7966.666667
##	4906	2004-04-20	1.0693016	24.83360	7.8490476	9000.000000	12000.000000
##	4907	2004-04-21	0.9909841	24.80534	7.8157460	780.909091	1110.833333
##	4908	2004-04-22	0.9126667	24.77709	7.7824444	44.755556	47.377778
##	4909	2004-04-23	1.0345926	24.81667	7.8495556	1680.000000	2433.333333
##	4910	2004-04-24	1.1565185	24.85624	7.9166667	2676.000000	5613.333333
##	4911	2004-04-25	1.2784444	24.89582	7.9837778	9.555556	29.955556
##	4912	2004-04-26	0.9793939	24.95533	7.6339394	427.937500	560.125000
##	4913	2004-04-27	0.8286111	25.00511	7.3963889	6213.968750	4320.062500
##	4914	2004-04-28	1.1366389	24.89702	7.6146944	12000.000000	8080.000000
##	4915	2004-04-29	1.4446667	24.78893	7.8330000	656.400000	482.400000
##	4916	2004-04-30	1.1858519	24.90513	7.5409630	7400.000000	6320.000000
##	4917	2004-05-01	0.9270370	25.02132	7.2489259	92.000000	72.400000
##	4918	2004-05-02	0.6682222	25.13751	6.9568889	204.285714	202.714286
##	4919	2004-05-03	0.9321111	25.15843	7.0551111	240.000000	64.000000
##	4920	2004-05-04	1.1960000	25.17936	7.1533333	9333.333333	48.207407

##	4921	2004-05-05	1.4598889	25.20028	7.2515556	4233.333333	32.414815
##	4922	2004-05-06	1.7237778	25.22120	7.3497778	9.600000	16.622222
##	4923	2004-05-07	1.6742222	25.18915	7.4667111	1512.545455	2194.727273
##	4924	2004-05-08	1.6246667	25.15710	7.5836444	6037.000000	6014.000000
##	4925	2004-05-09	1.5751111	25.12505	7.7005778	12000.000000	12000.000000
##	4926	2004-05-10	1.5255556	25.09300	7.8175111	12000.000000	12000.000000
##	4927	2004-05-11	1.4760000	25.06096	7.9344444	271.822222	375.022222
##	4928	2004-05-12	0.5356364	25.55731	6.0167273	191.696970	1456.363636
##	4929	2004-05-13	0.7061905	25.35119	6.5861905	18.720000	2.500000
##	4930	2004-05-14	0.4613636	25.51186	5.9350000	19.288889	1515.000000
##	4931	2004-05-15	1.1575758	25.37746	6.5682222	100.000000	2800.000000
##	4932	2004-05-16	1.8537879	25.24305	7.2014444	84.155556	6724.500000
##	4933	2004-05-17	2.5500000	25.10864	7.8346667	68.311111	355.555556
##	4934	2004-05-18	2.3240370	25.07409	7.8847407	3139.090909	3605.272727
##	4935	2004-05-19	2.0980741	25.03954	7.9348148	21.250000	29.750000
##	4936	2004-05-20	1.8721111	25.00499	7.9848889	5733.333333	12000.000000
##	4937	2004-05-21	1.6461481	24.97044	8.0349630	32.000000	8011.666667
##	4938	2004-05-22	1.4201852	24.93589	8.0850370	4006.000000	4023.333333
##	4939	2004-05-23	1.1942222	24.90133	8.1351111	14.434783	47.869565
##	4940	2004-05-24	1.2314074	24.91849	8.0096296	21.750000	9.500000
##	4941	2004-05-25	1.2685926	24.93564	7.8841481	93.090909	580.363636
##	4942	2004-05-26	1.3057778	24.95279	7.7586667	173.000000	330.666667
##	4943	2004-05-27	1.3429630	24.96994	7.6331852	36.000000	220.000000
##	4944	2004-05-28	1.3801481	24.98709	7.5077037	8.000000	28.000000
##	4945	2004-05-29	1.4173333	25.00424	7.3822222	67.422222	163.333333
##	4946	2004-05-30	1.7018095	24.98925	7.5543175	1682.181818	2363.090909
##	4947	2004-05-31	1.9862857	24.97425	7.7264127	2.500000	7.750000
##	4948	2004-06-01	2.2707619	24.95925	7.8985079	2560.333333	4244.400000
##	4949	2004-06-02	2.5552381	24.94426	8.0706032	4134.000000	4034.000000
##	4950	2004-06-03	2.8397143	24.92926	8.2426984	72.000000	180.000000
##	4951	2004-06-04	3.1241905	24.91426	8.4147937	40.727273	132.000000
##	4952	2004-06-05	3.4086667	24.89927	8.5868889	6.679245	23.773585
##	4953	2004-06-06	2.8785556	24.96844	7.9981111	12.000000	11.000000
##	4954	2004-06-07	2.3484444	25.03762	7.4093333	2.044444	2.755556
##	4955	2004-06-08	2.0831111	25.07128	7.3405926	52.181818	96.727273
##	4956	2004-06-09	1.8177778	25.10494	7.2718519	14.500000	9.750000
##	4957	2004-06-10	1.5524444	25.13860	7.2031111	2.000000	2.933333
##	4958	2004-06-11	1.3316296	25.03637	7.3716574	212.181818	355.272727
##	4959	2004-06-12	1.1108148	24.93414	7.5402037	2.500000	2.500000
##	4960	2004-06-13	0.8900000	24.83192	7.7087500	2.166667	2.666667
##	4961	2004-06-14	2.5785714	25.20652	7.0242857	10.312500	14.687500
##	4962	2004-06-15	2.0457440	25.05268	7.3640179	4.750000	4.750000
##	4963	2004-06-16	1.5129167	24.89883	7.7037500	2.500000	2.000000
##	4964	2004-06-17	2.2771429	24.63976	8.4704762	37.187500	23.812500
##	4965	2004-06-18	2.0752460	24.73138	8.1675238	64.000000	408.500000
##	4966	2004-06-19	1.8733492	24.82300	7.8645714	16.000000	580.000000
##	4967	2004-06-20	1.6714524	24.91462	7.5616190	9.000000	3.000000
##	4968	2004-06-21	1.4695556	25.00624	7.2586667	2.000000	2.400000
##	4969	2004-06-22	0.4749091	25.59416	5.1734545	19.666667	19.454545
##	4970	2004-06-23	1.0426190	25.38343	5.9390476	8.520000	3.750000
##	4971	2004-06-24	0.7084091	25.56270	5.3952273	13.045455	10.763889
##	4972	2004-06-25	1.9935556	24.68236	7.8726667	2.666667	17.777778
##	4973	2004-06-26	1.5321212	24.91194	7.7130303	42.312500	104.812500
##	4974	2004-06-27	2.8316667	24.93263	7.4826667	2.086957	2.173913

## 4975	2004-06-28	2.2047222	25.05997	7.4630556	2.000000	6.600000
## 4976	2004-06-29	2.2561111	25.12324	7.2320370	1194.909091	3245.272727
## 4977	2004-06-30	2.3075000	25.18651	7.0010185	4.500000	20.250000
## 4978	2004-07-01	2.3588889	25.24978	6.7700000	255.291667	285.333333
## 4979	2004-07-02	2.9141667	25.19672	7.0360000	12000.000000	6055.000000
## 4980	2004-07-03	3.4694444	25.14367	7.3020000	7200.000000	12000.000000
## 4981	2004-07-04	4.0247222	25.09061	7.5680000	330.727273	920.000000
## 4982	2004-07-05	4.5800000	25.03756	7.8340000	2.415094	19.773585
## 4983	2004-07-06	4.6180000	24.96463	7.7600000	28.000000	400.000000
## 4984	2004-07-07	4.6560000	24.89170	7.6860000	15.355556	80.000000
## 4985	2004-07-08	4.6940000	24.81878	7.6120000	2.711111	3.555556
## 4986	2004-07-09	4.6119259	24.77323	7.8688889	13.454545	160.545455
## 4987	2004-07-10	4.5298519	24.72768	8.1257778	11.000000	36.444444
## 4988	2004-07-11	4.4477778	24.68213	8.3826667	2.533333	4.400000
## 4989	2004-07-12	5.1387407	24.72296	7.9874815	7.818182	12.909091
## 4990	2004-07-13	5.8297037	24.76378	7.5922963	2.000000	6.500000
## 4991	2004-07-14	6.5206667	24.80460	7.1971111	2.177778	2.888889
## 4992	2004-07-15	6.4537222	24.83263	6.8927222	17.090909	11.454545
## 4993	2004-07-16	6.3867778	24.86067	6.5883333	4.250000	12.500000
## 4994	2004-07-17	6.3198333	24.88870	6.2839444	18.250000	50.000000
## 4995	2004-07-18	6.2528889	24.91673	5.9795556	20.958333	15.500000
## 4996	2004-07-19	4.4386667	24.94071	6.0621111	2.000000	4.750000
## 4997	2004-07-20	2.6244444	24.96469	6.1446667	3.094340	5.245283
## 4998	2004-07-21	2.4256667	24.57584	6.8482222	14.363636	25.090909
## 4999	2004-07-22	2.2268889	24.18700	7.5517778	7.866667	18.266667
## 5000	2004-07-23	1.9730370	24.39686	7.2147407	10.000000	12.545455
## 5001	2004-07-24	1.7191852	24.60672	6.8777037	2.000000	5.500000
## 5002	2004-07-25	1.4653333	24.81658	6.5406667	2.000000	2.044444
## 5003	2004-07-26	1.4102222	24.83270	6.5915111	5.750000	4.000000
## 5004	2004-07-27	1.3551111	24.84883	6.6423556	247.636364	4.000000
## 5005	2004-07-28	1.3000000	24.86495	6.6932000	2.000000	5.545455
## 5006	2004-07-29	1.2448889	24.88108	6.7440444	11.636364	7.090909
## 5007	2004-07-30	1.1897778	24.89720	6.7948889	3.018868	3.396226
## 5008	2004-07-31	3.4746667	24.44516	8.6862222	13.107143	18.964286
## 5009	2004-08-01	3.3912222	24.59752	8.2148889	7.250000	4.750000
## 5010	2004-08-02	3.3077778	24.74989	7.7435556	2.000000	2.044444
## 5011	2004-08-03	2.0806162	25.05618	6.7790505	23.818182	61.454545
## 5012	2004-08-04	0.8534545	25.36247	5.8145455	10.984127	12.500000
## 5013	2004-08-05	1.9723810	25.05419	7.0566667	4.285714	22.079365
## 5014	2004-08-06	0.8400000	25.25530	6.2972727	6.136364	31.658730
## 5015	2004-08-07	3.7390909	24.87885	7.2663636	24.190476	41.238095
## 5016	2004-08-08	3.1016667	24.82453	7.0141667	2.789474	2.631579
## 5017	2004-08-09	3.4926667	24.90203	7.0900000	6.000000	3.913043
## 5018	2004-08-10	2.8220000	24.91336	7.1688889	2.000000	2.088889
## 5019	2004-08-11	2.9786667	24.57936	7.9186667	2.088889	2.177778
## 5020	2004-08-12	3.0031667	24.47504	7.7963333	586.000000	93.454545
## 5021	2004-08-13	3.0276667	24.37072	7.6740000	8.750000	6.250000
## 5022	2004-08-14	3.0521667	24.26641	7.5516667	6.000000	3.090909
## 5023	2004-08-15	3.0766667	24.16209	7.4293333	2.188679	2.301887
## 5024	2004-08-16	3.2368889	24.16387	7.6673333	170.000000	92.250000
## 5025	2004-08-17	2.8059259	24.11193	7.5491111	59.000000	7.500000
## 5026	2004-08-18	2.3749630	24.06000	7.4308889	4.000000	15.660714
## 5027	2004-08-19	1.9440000	24.00807	7.3126667	67.571429	23.821429
## 5028	2004-08-20	2.6830000	24.17096	7.0323333	2.750000	8.500000

##	5029	2004-08-21	3.4220000	24.33384	6.7520000	6.250000	5.392857
##	5030	2004-08-22	2.9451111	24.28217	6.6928889	3.750000	2.750000
##	5031	2004-08-23	2.4682222	24.23049	6.6337778	3.178571	2.607143
##	5032	2004-08-24	2.0144444	24.25323	6.7475556	3.000000	3.750000
##	5033	2004-08-25	1.5606667	24.27596	6.8613333	2.266667	7.644444
##	5034	2004-08-26	1.7695556	24.29870	7.1163333	27.454545	28.363636
##	5035	2004-08-27	1.9784444	24.32144	7.3713333	2.000000	76.250000
##	5036	2004-08-28	2.1873333	24.34417	7.6263333	498.363636	293.818182
##	5037	2004-08-29	2.3962222	24.36691	7.8813333	2.188679	2.452830
##	5038	2004-08-30	1.8428889	24.56416	7.4464444	28.357143	21.285714
##	5039	2004-08-31	1.7477037	24.57455	7.4754074	121.750000	77.500000
##	5040	2004-09-01	1.6525185	24.58494	7.5043704	16.000000	32.000000
##	5041	2004-09-02	1.5573333	24.59533	7.5333333	2.571429	2.071429
##	5042	2004-09-03	1.7598889	24.47092	7.7801111	3.000000	3.000000
##	5043	2004-09-04	1.9624444	24.34651	8.0268889	6.142857	2.714286
##	5044	2004-09-05	1.9511111	24.40191	8.0854444	7.750000	3.250000
##	5045	2004-09-06	1.9397778	24.45731	8.1440000	19.777778	2.000000
##	5046	2004-09-07	0.7458182	25.06289	6.3932727	42.303030	14.545455
##	5047	2004-09-08	1.3264286	24.69286	7.4916667	4.080000	27.750000
##	5048	2004-09-09	1.0120455	24.90716	6.9497727	16.727273	15.250000
##	5049	2004-09-10	1.6995556	24.34656	7.7426667	4.321429	2.750000
##	5050	2004-09-11	1.7172727	24.51303	7.9157576	30.965517	13.448276
##	5051	2004-09-12	1.4922222	24.51064	7.8869444	2.000000	2.000000
##	5052	2004-09-13	1.7293333	24.61863	7.4526667	2.266667	4.266667
##	5053	2004-09-14	1.5046667	24.73178	7.0566667	2.000000	2.400000
##	5054	2004-09-15	1.6133333	24.66884	7.1931667	207.090909	221.454545
##	5055	2004-09-16	1.7220000	24.60590	7.3296667	65.750000	83.000000
##	5056	2004-09-17	1.8306667	24.54296	7.4661667	56.000000	660.388889
##	5057	2004-09-18	1.9393333	24.48002	7.6026667	247.846154	1237.777778
##	5058	2004-09-19	1.9067407	24.48059	7.6379259	439.692308	1815.166667
##	5059	2004-09-20	1.8741481	24.48115	7.6731852	364.000000	2950.000000
##	5060	2004-09-21	1.8415556	24.48171	7.7084444	6182.000000	640.000000
##	5061	2004-09-22	1.8089630	24.48227	7.7437037	12000.000000	12000.000000
##	5062	2004-09-23	1.7763704	24.48284	7.7789630	892.000000	2964.800000
##	5063	2004-09-24	1.7437778	24.48340	7.8142222	104.800000	251.466667
##	5064	2004-09-25	1.6755556	24.46770	7.7335556	1440.363636	2150.545455
##	5065	2004-09-26	1.6073333	24.45200	7.6528889	190.250000	63.250000
##	5066	2004-09-27	1.5391111	24.43629	7.5722222	6162.857143	3408.500000
##	5067	2004-09-28	1.4708889	24.42059	7.4915556	517.333333	493.333333
##	5068	2004-09-29	1.4026667	24.40489	7.4108889	762.754717	1114.943396
##	5069	2004-09-30	1.3300000	24.49872	7.3653778	219.333333	373.333333
##	5070	2004-10-01	1.2573333	24.59256	7.3198667	894.000000	1221.230769
##	5071	2004-10-02	1.1846667	24.68640	7.2743556	453.333333	273.333333
##	5072	2004-10-03	1.1120000	24.78023	7.2288444	180.000000	200.000000
##	5073	2004-10-04	1.0393333	24.87407	7.1833333	22.782609	59.866667
##	5074	2004-10-05	1.1614667	24.85966	7.3326667	966.909091	2359.090909
##	5075	2004-10-06	1.2836000	24.84525	7.4820000	2.000000	2.500000
##	5076	2004-10-07	1.4057333	24.83084	7.6313333	12000.000000	12000.000000
##	5077	2004-10-08	1.5278667	24.81643	7.7806667	9533.333333	12000.000000
##	5078	2004-10-09	1.6500000	24.80202	7.9300000	550.875000	594.750000
##	5079	2004-10-10	1.5878611	24.78734	7.8971389	7600.000000	7950.000000
##	5080	2004-10-11	1.5257222	24.77266	7.8642778	1490.000000	3215.000000
##	5081	2004-10-12	1.4635833	24.75797	7.8314167	916.400000	729.000000
##	5082	2004-10-13	1.4014444	24.74329	7.7985556	8277.250000	7280.000000

##	5083	2004-10-14	1.3393056	24.72861	7.7656944	1776.666667	4270.181818
##	5084	2004-10-15	1.2771667	24.71392	7.7328333	1212.181818	1260.363636
##	5085	2004-10-16	1.2150278	24.69924	7.6999722	210.000000	733.559177
##	5086	2004-10-17	1.1528889	24.68456	7.6671111	121.018868	206.754717
##	5087	2004-10-18	1.2451111	24.70299	7.6065926	6150.000000	12000.000000
##	5088	2004-10-19	1.3373333	24.72141	7.5460741	6060.000000	12000.000000
##	5089	2004-10-20	1.4295556	24.73984	7.4855556	91.963636	160.072727
##	5090	2004-10-21	1.4473333	24.75520	7.4781667	14.750000	14.500000
##	5091	2004-10-22	1.4651111	24.77056	7.4707778	510.000000	1190.000000
##	5092	2004-10-23	1.4828889	24.78591	7.4633889	620.000000	1870.000000
##	5093	2004-10-24	1.5006667	24.80127	7.4560000	56.723404	289.872340
##	5094	2004-10-25	1.4891852	24.79542	7.4964815	284.909091	1731.090909
##	5095	2004-10-26	1.4777037	24.78958	7.5369630	4.500000	3.500000
##	5096	2004-10-27	1.4662222	24.78373	7.5774444	8100.000000	12000.000000
##	5097	2004-10-28	1.4547407	24.77789	7.6179259	7300.000000	8400.000000
##	5098	2004-10-29	1.4432593	24.77204	7.6584074	640.000000	1200.000000
##	5099	2004-10-30	1.4317778	24.76620	7.6988889	232.830189	474.075472
##	5100	2004-10-31	1.4620556	24.76793	7.6784444	39.250000	25.000000
##	5101	2004-11-01	1.4923333	24.76967	7.6580000	2049.000000	2444.400000
##	5102	2004-11-02	1.5226111	24.77140	7.6375556	356.000000	200.000000
##	5103	2004-11-03	1.5528889	24.77313	7.6171111	53.433962	67.584906
##	5104	2004-11-04	1.5248333	24.81574	7.6156667	4.500000	2.500000
##	5105	2004-11-05	1.4967778	24.85836	7.6142222	26.000000	16.000000
##	5106	2004-11-06	1.4687222	24.90097	7.6127778	2969.818182	2880.909091
##	5107	2004-11-07	1.4406667	24.94358	7.6113333	544.357143	345.309091
##	5108	2004-11-08	1.4934074	24.90430	7.6683704	1126.666667	370.000000
##	5109	2004-11-09	1.5461481	24.86501	7.7254074	5666.666667	3300.000000
##	5110	2004-11-10	1.5988889	24.82573	7.7824444	99.511111	115.911111
##	5111	2004-11-11	1.3442424	24.90400	7.6315152	371.696970	378.363636
##	5112	2004-11-12	1.3538889	24.95567	7.4572222	3.703704	7.259259
##	5113	2004-11-13	1.2860000	24.93107	7.6390000	753.000000	753.000000
##	5114	2004-11-14	1.3923333	24.88213	7.7508333	12000.000000	12000.000000
##	5115	2004-11-15	1.4986667	24.83320	7.8626667	436.535714	574.392857
##	5116	2004-11-16	0.4558182	25.21316	6.2550909	30.476190	13.000000
##	5117	2004-11-17	0.9207143	24.95950	7.2942857	266.212766	3028.500000
##	5118	2004-11-18	0.6254545	25.09100	6.7184091	10.297872	62.000000
##	5119	2004-11-19	0.9315051	25.01174	7.1067601	2200.000000	84.428571
##	5120	2004-11-20	1.2375556	24.93249	7.4951111	46.464286	106.857143
##	5121	2004-11-21	1.2229206	24.89663	7.5416825	2.250000	3.750000
##	5122	2004-11-22	1.2082857	24.86078	7.5882540	1000.000000	6000.000000
##	5123	2004-11-23	1.1936508	24.82493	7.6348254	820.000000	980.000000
##	5124	2004-11-24	1.1790159	24.78907	7.6813968	10.000000	5.000000
##	5125	2004-11-25	1.1643810	24.75322	7.7279683	3347.636364	3792.363636
##	5126	2004-11-26	1.1497460	24.71737	7.7745397	3.750000	2.250000
##	5127	2004-11-27	1.1351111	24.68151	7.8211111	286.625000	592.666667
##	5128	2004-11-28	1.2004444	24.74169	7.6750000	9066.666667	12000.000000
##	5129	2004-11-29	1.2657778	24.80187	7.5288889	65.916667	225.041667
##	5130	2004-11-30	1.4436000	24.73470	7.6012889	2976.363636	3216.363636
##	5131	2004-12-01	1.6214222	24.66753	7.6736889	8.250000	9.750000
##	5132	2004-12-02	1.7992444	24.60036	7.7460889	4710.250000	7162.857143
##	5133	2004-12-03	1.9770667	24.53319	7.8184889	6336.666667	12000.000000
##	5134	2004-12-04	2.1548889	24.46602	7.8908889	512.269231	1254.600000
##	5135	2004-12-05	2.0345778	24.48749	7.8569778	4229.454545	4689.090909
##	5136	2004-12-06	1.9142667	24.50896	7.8230667	234.333333	64.333333

## 5137	2004-12-07	1.7939556	24.53042	7.7891556	4585.714286	5158.857143
## 5138	2004-12-08	1.6736444	24.55189	7.7552444	486.000000	850.000000
## 5139	2004-12-09	1.5533333	24.57336	7.7213333	90.678571	548.214286
## 5140	2004-12-10	2.3278889	24.73817	7.5398333	2.000000	11.250000
## 5141	2004-12-11	3.1024444	24.90298	7.3583333	32.000000	88.000000
## 5142	2004-12-12	3.8770000	25.06779	7.1768333	2856.000000	4449.818182
## 5143	2004-12-13	4.6515556	25.23260	6.9953333	267.642857	466.142857
## 5144	2004-12-14	4.9568000	25.07627	7.3480889	4313.333333	4240.000000
## 5145	2004-12-15	5.2620444	24.91993	7.7008444	4153.333333	6040.000000
## 5146	2004-12-16	5.5672889	24.76360	8.0536000	4352.727273	4890.909091
## 5147	2004-12-17	5.8725333	24.60727	8.4063556	10.250000	12.000000
## 5148	2004-12-18	6.1777778	24.45093	8.7591111	4055.125000	4863.142857
## 5149	2004-12-19	5.1451111	24.45679	8.5458519	8100.000000	9714.285714
## 5150	2004-12-20	4.1124444	24.46264	8.3325926	3613.250000	7972.285714
## 5151	2004-12-21	3.0797778	24.46849	8.1193333	445.821429	552.500000
## 5152	2004-12-22	3.8540444	24.62828	7.9197333	24.750000	30.750000
## 5153	2004-12-23	4.6283111	24.78808	7.7201333	6016.000000	6025.000000
## 5154	2004-12-24	5.4025778	24.94788	7.5205333	12000.000000	12000.000000
## 5155	2004-12-25	6.1768444	25.10767	7.3209333	833.333333	1990.000000
## 5156	2004-12-26	6.9511111	25.26747	7.1213333	344.642857	1347.500000
## 5157	2004-12-27	10.1193778	25.13742	7.4403556	4.500000	7.500000
## 5158	2004-12-28	13.2876444	25.00738	7.7593778	1596.000000	5416.000000
## 5159	2004-12-29	16.4559111	24.87733	8.0784000	2784.000000	11200.000000
## 5160	2004-12-30	19.6241778	24.74729	8.3974222	4085.000000	5126.666667
## 5161	2004-12-31	22.7924444	24.61724	8.7164444	667.500000	917.892857
## 5162	2005-01-01	22.0953778	24.65476	8.4858667	5.250000	6.500000
## 5163	2005-01-02	21.3983111	24.69227	8.2552889	4680.000000	4246.666667
## 5164	2005-01-03	20.7012444	24.72978	8.0247111	5858.400000	12000.000000
## 5165	2005-01-04	20.0041778	24.76729	7.7941333	6140.000000	12000.000000
## 5166	2005-01-05	19.3071111	24.80480	7.5635556	70.178571	200.321429
## 5167	2005-01-06	16.0908000	24.80648	7.4271556	11.750000	2.000000
## 5168	2005-01-07	12.8744889	24.80817	7.2907556	3800.000000	7040.000000
## 5169	2005-01-08	9.6581778	24.80985	7.1543556	20.000000	20.000000
## 5170	2005-01-09	6.4418667	24.81154	7.0179556	12000.000000	12000.000000
## 5171	2005-01-10	3.2255556	24.81322	6.8815556	6002.750000	6006.125000
## 5172	2005-01-11	3.2258222	24.78948	6.7380000	5.500000	12.250000
## 5173	2005-01-12	3.2260889	24.76574	6.5944444	2616.800000	3171.000000
## 5174	2005-01-13	3.2263556	24.74200	6.4508889	4004.000000	3601.000000
## 5175	2005-01-14	3.2266222	24.71825	6.3073333	30.000000	14.000000
## 5176	2005-01-15	3.2268889	24.69451	6.1637778	4.933333	4.044444
## 5177	2005-01-16	2.5882626	25.15728	5.3982525	84.909091	92.545455
## 5178	2005-01-17	1.9496364	25.62005	4.6327273	6.920635	7.000000
## 5179	2005-01-18	2.8181818	25.51007	4.9459091	15.733333	132.785714
## 5180	2005-01-19	2.8826190	25.32898	4.9795238	10.190476	258.571429
## 5181	2005-01-20	3.4722222	24.85829	5.6962222	356.035714	384.357143
## 5182	2005-01-21	1.5212121	25.01785	6.0675758	2.206897	2.758621
## 5183	2005-01-22	1.8919444	25.05964	6.0969444	661.800000	635.133333
## 5184	2005-01-23	2.6700000	25.03440	5.3593333	1257.222222	1390.555556
## 5185	2005-01-24	2.3973333	25.08162	5.7505556	2433.333333	2413.333333
## 5186	2005-01-25	2.1246667	25.12884	6.1417778	7.071429	7.107143
## 5187	2005-01-26	1.7987778	25.06720	6.2872222	2.500000	3.250000
## 5188	2005-01-27	1.4728889	25.00556	6.4326667	223.714286	231.000000
## 5189	2005-01-28	1.7310667	24.91248	6.6239111	3.000000	8.250000
## 5190	2005-01-29	1.9892444	24.81940	6.8151556	9200.000000	12000.000000

##	5191	2005-01-30	2.2474222	24.72632	7.0064000	7500.000000	12000.000000
##	5192	2005-01-31	2.5056000	24.63324	7.1976444	4501.000000	2800.000000
##	5193	2005-02-01	2.7637778	24.54016	7.3888889	8.071429	9.535714
##	5194	2005-02-02	2.7724444	24.67337	7.0468148	2.000000	11.250000
##	5195	2005-02-03	2.7811111	24.80659	6.7047407	10.000000	10.000000
##	5196	2005-02-04	2.7897778	24.93980	6.3626667	237.357143	369.892857
##	5197	2005-02-05	2.8773333	24.86385	6.6578667	4.000000	4.000000
##	5198	2005-02-06	2.9648889	24.78791	6.9530667	6866.666667	11000.000000
##	5199	2005-02-07	3.0524444	24.71196	7.2482667	6393.333333	12000.000000
##	5200	2005-02-08	3.1400000	24.63601	7.5434667	9800.000000	12000.000000
##	5201	2005-02-09	3.2275556	24.56007	7.8386667	504.178571	573.500000
##	5202	2005-02-10	3.0083889	24.60156	7.6838333	3.500000	5.500000
##	5203	2005-02-11	2.7892222	24.64306	7.5290000	77.500000	19.000000
##	5204	2005-02-12	2.5700556	24.68455	7.3741667	12000.000000	12.566667
##	5205	2005-02-13	2.3508889	24.72604	7.2193333	68.304348	6.133333
##	5206	2005-02-14	2.5871111	24.66595	7.3344000	1447.090909	1420.909091
##	5207	2005-02-15	2.8233333	24.60586	7.4494667	2.500000	14.250000
##	5208	2005-02-16	3.0595556	24.54576	7.5645333	8200.000000	8866.666667
##	5209	2005-02-17	3.2957778	24.48567	7.6796000	7766.666667	8173.333333
##	5210	2005-02-18	3.5320000	24.42558	7.7946667	259.416667	257.666667
##	5211	2005-02-19	3.5711111	24.55944	7.5368889	1159.818182	1170.545455
##	5212	2005-02-20	3.6102222	24.69331	7.2791111	2.000000	2.250000
##	5213	2005-02-21	3.6493333	24.82718	7.0213333	540.000000	960.000000
##	5214	2005-02-22	3.6884444	24.96104	6.7635556	12000.000000	12000.000000
##	5215	2005-02-23	3.7275556	25.09491	6.5057778	12000.000000	12000.000000
##	5216	2005-02-24	3.7666667	25.22878	6.2480000	201.857143	115.857143
##	5217	2005-02-25	3.5532000	25.19973	6.4254667	5.000000	15.250000
##	5218	2005-02-26	3.3397333	25.17068	6.6029333	501.000000	301.000000
##	5219	2005-02-27	3.1262667	25.14163	6.7804000	12000.000000	12000.000000
##	5220	2005-02-28	2.9128000	25.11258	6.9578667	100.000000	220.000000
##	5221	2005-03-01	2.6993333	25.08353	7.1353333	228.821429	232.000000
##	5222	2005-03-02	3.0784444	24.98248	7.2444444	2.250000	3.250000
##	5223	2005-03-03	3.4575556	24.88142	7.3535556	171.000000	301.000000
##	5224	2005-03-04	3.8366667	24.78037	7.4626667	14.000000	4.000000
##	5225	2005-03-05	4.2157778	24.67931	7.5717778	334.928571	1133.392857
##	5226	2005-03-06	4.2342222	24.71048	7.4556296	4.500000	9.500000
##	5227	2005-03-07	4.2526667	24.74165	7.3394815	6.000000	41.200000
##	5228	2005-03-08	4.2711111	24.77282	7.2233333	4.285714	3.428571
##	5229	2005-03-09	3.1306667	24.87111	7.4506667	2.000000	2.000000
##	5230	2005-03-10	1.9902222	24.96940	7.6780000	2.000000	2.933333
##	5231	2005-03-11	0.6885455	25.06769	6.0690909	36.151515	162.000000
##	5232	2005-03-12	1.6223810	24.41833	7.2323810	8.600000	19.750000
##	5233	2005-03-13	0.7379545	24.79030	6.4093182	23.409091	300.000000
##	5234	2005-03-14	2.4375000	24.19239	7.8683333	2.000000	2.000000
##	5235	2005-03-15	3.0040000	24.12740	8.0486667	14.076923	13.615385
##	5236	2005-03-16	2.2751515	24.40579	7.7236364	2.000000	2.827586
##	5237	2005-03-17	2.2177778	24.44864	7.8020000	2.000000	4.222222
##	5238	2005-03-18	2.4280000	24.70769	7.6528889	2.177778	2.888889
##	5239	2005-03-19	2.2462222	24.45642	7.6980000	43.818182	63.818182
##	5240	2005-03-20	2.0644444	24.20516	7.7431111	7.750000	8.750000
##	5241	2005-03-21	1.8826667	23.95389	7.7882222	6.875000	7.000000
##	5242	2005-03-22	2.1178519	24.04459	7.7838519	6.000000	5.250000
##	5243	2005-03-23	2.3530370	24.13530	7.7794815	5.666667	10.666667
##	5244	2005-03-24	2.5882222	24.22600	7.7751111	2.000000	2.000000

## 5245	2005-03-25	2.4355556	24.28564	7.6751852	72.181818	56.909091
## 5246	2005-03-26	2.2828889	24.34529	7.5752593	5.750000	6.000000
## 5247	2005-03-27	2.1302222	24.40493	7.4753333	2.400000	2.000000
## 5248	2005-03-28	1.9334815	24.27907	7.4620741	81.090909	87.454545
## 5249	2005-03-29	1.7367407	24.15321	7.4488148	3.500000	3.250000
## 5250	2005-03-30	1.5400000	24.02736	7.4355556	2.088889	2.044444
## 5251	2005-03-31	1.8810370	24.02499	7.5029630	60.363636	159.454545
## 5252	2005-04-01	2.2220741	24.02263	7.5703704	5.250000	8.250000
## 5253	2005-04-02	2.5631111	24.02027	7.6377778	2.888889	3.111111
## 5254	2005-04-03	2.4945000	24.12034	7.4689444	10.909091	23.272727
## 5255	2005-04-04	2.4258889	24.22041	7.3001111	20.750000	12.750000
## 5256	2005-04-05	2.3572778	24.32048	7.1312778	6.000000	36.107143
## 5257	2005-04-06	2.2886667	24.42056	6.9624444	16.285714	59.464286
## 5258	2005-04-07	2.2401111	24.41943	6.9076667	8.000000	11.250000
## 5259	2005-04-08	2.1915556	24.41831	6.8528889	23.750000	127.714286
## 5260	2005-04-09	2.2665926	24.46699	6.6917778	2.000000	13.000000
## 5261	2005-04-10	2.3416296	24.51567	6.5306667	96.181818	160.000000
## 5262	2005-04-11	2.4166667	24.56436	6.3695556	2.679245	2.905660
## 5263	2005-04-12	2.4013333	24.33871	7.3844444	3.466667	2.133333
## 5264	2005-04-13	2.3212121	24.48833	7.4612121	199.437500	375.000000
## 5265	2005-04-14	2.1536111	24.52733	7.3055556	2.571429	4.400000
## 5266	2005-04-15	2.2730000	24.47840	7.1166667	2.000000	2.533333
## 5267	2005-04-16	0.4369091	25.31507	5.5134545	255.696970	3091.636364
## 5268	2005-04-17	1.3846667	24.93460	6.3291111	2.977778	75.866667
## 5269	2005-04-18	1.2192857	24.99979	6.4038095	13.102525	78.727273
## 5270	2005-04-19	0.8434091	25.13355	6.1245455	23.227273	44.363636
## 5271	2005-04-20	1.5941490	25.04926	6.5379394	14.274351	10.000000
## 5272	2005-04-21	2.3448889	24.96498	6.9513333	5.321429	5.928571
## 5273	2005-04-22	2.3018889	24.98251	6.8314444	4.000000	3.250000
## 5274	2005-04-23	2.2588889	25.00004	6.7115556	2.188679	2.264151
## 5275	2005-04-24	1.9267778	25.00590	6.6647778	1094.909091	1095.272727
## 5276	2005-04-25	1.5946667	25.01176	6.6180000	3.714286	4.321429
## 5277	2005-04-26	1.9276667	24.98227	7.0231111	14.500000	18.250000
## 5278	2005-04-27	2.2606667	24.95278	7.4282222	2.000000	2.133333
## 5279	2005-04-28	2.1171852	24.90598	7.4426667	1100.727273	1105.454545
## 5280	2005-04-29	1.9737037	24.85918	7.4571111	28.250000	20.000000
## 5281	2005-04-30	1.8302222	24.81238	7.4715556	119.535714	167.250000
## 5282	2005-05-01	1.9610000	24.92278	7.2574444	3.500000	4.750000
## 5283	2005-05-02	2.0917778	25.03318	7.0433333	2.044444	2.044444
## 5284	2005-05-03	2.1073333	25.02741	7.1841481	1114.909091	1312.363636
## 5285	2005-05-04	2.1228889	25.02164	7.3249630	2.250000	6.750000
## 5286	2005-05-05	2.1384444	25.01587	7.4657778	2.622222	4.800000
## 5287	2005-05-06	2.0129024	25.05568	7.2382458	420.363636	404.909091
## 5288	2005-05-07	1.8873603	25.09549	7.0107138	4.000000	11.500000
## 5289	2005-05-08	1.7618182	25.13530	6.7831818	424.428571	1080.357143
## 5290	2005-05-09	1.8669966	25.14114	6.8376515	3.750000	3.250000
## 5291	2005-05-10	1.9721751	25.14697	6.8921212	8933.333333	10933.333333
## 5292	2005-05-11	2.0773535	25.15281	6.9465909	8466.666667	10800.000000
## 5293	2005-05-12	2.1825320	25.15865	7.0010606	5033.333333	7733.333333
## 5294	2005-05-13	2.2877104	25.16449	7.0555303	457.090909	854.000000
## 5295	2005-05-14	2.3928889	25.17033	7.1100000	27.320755	159.245283
## 5296	2005-05-15	2.2572222	25.07266	7.3724444	78.000000	180.000000
## 5297	2005-05-16	2.1215556	24.97498	7.6348889	87.535714	204.250000
## 5298	2005-05-17	1.8431111	25.00107	7.5085185	2.250000	3.000000

##	5299	2005-05-18	1.5646667	25.02717	7.3821481	1431.272727	1423.636364
##	5300	2005-05-19	1.2862222	25.05327	7.2557778	67.169811	141.811321
##	5301	2005-05-20	1.8465185	25.00910	7.4121481	610.000000	2020.000000
##	5302	2005-05-21	2.4068148	24.96494	7.5685185	1650.000000	2470.000000
##	5303	2005-05-22	2.9671111	24.92078	7.7248889	338.042553	627.829787
##	5304	2005-05-23	2.8844444	24.93307	7.6785333	1904.181818	3080.181818
##	5305	2005-05-24	2.8017778	24.94536	7.6321778	4.000000	4.250000
##	5306	2005-05-25	2.7191111	24.95764	7.5858222	10600.000000	12000.000000
##	5307	2005-05-26	2.6364444	24.96993	7.5394667	600.000000	2100.000000
##	5308	2005-05-27	2.5537778	24.98222	7.4931111	335.404255	493.063830
##	5309	2005-05-28	2.2015152	25.06670	7.3787879	778.625000	825.187500
##	5310	2005-05-29	1.4397222	25.07061	7.2658333	17.885714	56.342857
##	5311	2005-05-30	2.8610000	25.03423	7.7486667	32.526316	143.473684
##	5312	2005-05-31	2.9914222	25.03609	7.6680889	446.000000	2120.000000
##	5313	2005-06-01	3.1218444	25.03795	7.5875111	3200.000000	10000.000000
##	5314	2005-06-02	3.2522667	25.03981	7.5069333	2855.272727	5629.818182
##	5315	2005-06-03	3.3826889	25.04167	7.4263556	2.250000	2.750000
##	5316	2005-06-04	3.5131111	25.04353	7.3457778	408.640000	840.200000
##	5317	2005-06-05	2.7317778	25.18136	6.7551111	5266.666667	12000.000000
##	5318	2005-06-06	1.9504444	25.31918	6.1644444	545.916667	580.666667
##	5319	2005-06-07	0.6318182	25.76440	5.0676364	318.363636	2761.454545
##	5320	2005-06-08	1.2340476	25.43707	6.1380952	12.840000	9.750000
##	5321	2005-06-09	0.8427273	25.60580	5.4495455	57.416667	1698.000000
##	5322	2005-06-10	1.1541145	25.43060	6.0999933	220.000000	60.000000
##	5323	2005-06-11	1.4655017	25.25541	6.7504411	9.000000	32.821429
##	5324	2005-06-12	1.7768889	25.08022	7.4008889	3.214286	5.642857
##	5325	2005-06-13	2.6173333	24.98057	7.8320000	2.500000	5.000000
##	5326	2005-06-14	3.4577778	24.88091	8.2631111	14.444444	319.022222
##	5327	2005-06-15	3.2765000	24.95883	7.9461667	1444.727273	2529.272727
##	5328	2005-06-16	3.0952222	25.03674	7.6292222	2.750000	9.500000
##	5329	2005-06-17	2.9139444	25.11465	7.3122778	12000.000000	8100.000000
##	5330	2005-06-18	2.7326667	25.19257	6.9953333	950.000000	6055.000000
##	5331	2005-06-19	2.5513889	25.27048	6.6783889	12000.000000	12000.000000
##	5332	2005-06-20	2.3701111	25.34839	6.3614444	3624.000000	3537.272727
##	5333	2005-06-21	2.1888333	25.42631	6.0445000	2.500000	2.250000
##	5334	2005-06-22	2.0075556	25.50422	5.7275556	507.333333	1028.750000
##	5335	2005-06-23	2.4940556	25.50934	5.9170000	11133.333333	12000.000000
##	5336	2005-06-24	2.9805556	25.51447	6.1064444	8800.000000	9333.333333
##	5337	2005-06-25	3.4670556	25.51959	6.2958889	3351.454545	3415.272727
##	5338	2005-06-26	3.9535556	25.52471	6.4853333	3.924528	4.867925
##	5339	2005-06-27	3.4544889	25.47149	6.5401333	4036.666667	4063.333333
##	5340	2005-06-28	2.9554222	25.41828	6.5949333	620.000000	2800.000000
##	5341	2005-06-29	2.4563556	25.36506	6.6497333	4400.000000	4200.000000
##	5342	2005-06-30	1.9572889	25.31184	6.7045333	1607.090909	2396.181818
##	5343	2005-07-01	1.4582222	25.25862	6.7593333	706.474576	691.118644
##	5344	2005-07-02	1.7529630	25.23615	6.7722963	7203.200000	7208.000000
##	5345	2005-07-03	2.0477037	25.21367	6.7852593	9800.000000	9266.666667
##	5346	2005-07-04	2.3424444	25.19120	6.7982222	260.142857	371.571429
##	5347	2005-07-05	2.5396889	25.15709	6.8743111	2.250000	2.000000
##	5348	2005-07-06	2.7369333	25.12299	6.9504000	4018.000000	4010.000000
##	5349	2005-07-07	2.9341778	25.08888	7.0264889	340.000000	1100.000000
##	5350	2005-07-08	3.1314222	25.05477	7.1025778	12000.000000	12000.000000
##	5351	2005-07-09	3.3286667	25.02067	7.1786667	1100.307692	1093.923077
##	5352	2005-07-10	3.7330000	25.01598	7.1710000	2.250000	2.750000

##	5353	2005-07-11	4.1373333	25.01130	7.1633333	743.176471	380.750000
##	5354	2005-07-12	3.6331852	25.07826	6.9723704	4001.333333	12000.000000
##	5355	2005-07-13	3.1290370	25.14522	6.7814074	12000.000000	6200.000000
##	5356	2005-07-14	2.6248889	25.21218	6.5904444	138.535714	92.750000
##	5357	2005-07-15	2.5791852	25.28227	6.4755556	2.250000	5.250000
##	5358	2005-07-16	2.5334815	25.35236	6.3606667	14.000000	49.107143
##	5359	2005-07-17	2.4877778	25.42244	6.2457778	31.892857	92.964286
##	5360	2005-07-18	3.9761111	25.13313	7.1451111	6.750000	4.000000
##	5361	2005-07-19	5.4644444	24.84382	8.0444444	43.777778	51.644444
##	5362	2005-07-20	4.2451515	25.15761	7.4924242	248.812500	197.625000
##	5363	2005-07-21	6.0086667	25.06167	8.1376667	2.608696	2.956522
##	5364	2005-07-22	4.0280556	25.16233	7.3477778	2.296296	2.148148
##	5365	2005-07-23	4.5104444	24.64018	8.6591111	3.866667	2.844444
##	5366	2005-07-24	0.9443636	25.52529	6.0703636	60.757576	120.909091
##	5367	2005-07-25	2.4723810	25.09933	7.4511905	2.520000	2.500000
##	5368	2005-07-26	1.1788636	25.34666	6.5170455	48.227273	34.696429
##	5369	2005-07-27	2.3026667	25.06709	6.8075556	81.285714	66.892857
##	5370	2005-07-28	2.2265000	25.05334	6.8456111	5.000000	5.250000
##	5371	2005-07-29	2.1503333	25.03959	6.8836667	16.181818	41.818182
##	5372	2005-07-30	2.0741667	25.02584	6.9217222	4.500000	15.000000
##	5373	2005-07-31	1.9980000	25.01209	6.9597778	3.066667	3.955556
##	5374	2005-08-01	2.8008889	24.69678	8.1275556	9.892857	12.500000
##	5375	2005-08-02	3.6085556	24.53961	8.7396667	2.000000	3.500000
##	5376	2005-08-03	4.4162222	24.38244	9.3517778	84.285714	72.678571
##	5377	2005-08-04	3.9209630	24.54143	8.6138519	2.250000	2.500000
##	5378	2005-08-05	3.4257037	24.70041	7.8759259	4.000000	13.785714
##	5379	2005-08-06	2.9304444	24.85940	7.1380000	23.178571	25.071429
##	5380	2005-08-07	3.0667778	24.59592	7.3383333	2.500000	3.750000
##	5381	2005-08-08	3.2031111	24.33244	7.5386667	17.821429	9.500000
##	5382	2005-08-09	2.8324444	24.36129	7.6621111	5.000000	6.500000
##	5383	2005-08-10	2.4617778	24.39013	7.7855556	4.857143	5.178571
##	5384	2005-08-11	2.2948889	24.41798	7.8504444	3.750000	4.250000
##	5385	2005-08-12	2.1280000	24.44582	7.9153333	2.000000	2.821429
##	5386	2005-08-13	1.6780000	24.28167	7.8190000	7.000000	3.750000
##	5387	2005-08-14	1.2280000	24.11751	7.7226667	2.000000	2.088889
##	5388	2005-08-15	1.4674815	24.25520	7.8465926	12.000000	6.750000
##	5389	2005-08-16	1.7069630	24.39289	7.9705185	65.636364	84.909091
##	5390	2005-08-17	1.9464444	24.53058	8.0944444	2.000000	2.113208
##	5391	2005-08-18	3.8311111	24.43164	7.9057778	2.000000	2.088889
##	5392	2005-08-19	3.5630370	24.65559	7.6960000	10.545455	131.454545
##	5393	2005-08-20	3.2949630	24.87953	7.4862222	3.500000	15.500000
##	5394	2005-08-21	3.0268889	25.10347	7.2764444	2.000000	2.000000
##	5395	2005-08-22	2.7260606	25.12761	7.0927273	11.562500	24.125000
##	5396	2005-08-23	4.0522222	25.20758	7.0911111	3.085714	3.314286
##	5397	2005-08-24	5.0553333	25.19903	7.2390000	2.000000	2.000000
##	5398	2005-08-25	2.8675556	24.46100	8.3913333	8.888889	4.622222
##	5399	2005-08-26	1.1496364	25.27269	5.8850909	53.909091	9.818182
##	5400	2005-08-27	1.8444186	24.86379	7.0762791	8.240000	38.750000
##	5401	2005-08-28	1.0445455	25.16955	6.0215909	74.454545	36.238095
##	5402	2005-08-29	1.7211616	24.64873	7.1031288	14.000000	33.726190
##	5403	2005-08-30	2.3977778	24.12791	8.1846667	4.535714	31.214286
##	5404	2005-08-31	2.6057778	24.39237	7.7740000	3.250000	3.250000
##	5405	2005-09-01	2.8137778	24.65682	7.3633333	18.714286	84.535714
##	5406	2005-09-02	2.9372222	24.72782	7.5260000	2.250000	3.000000

## 5407	2005-09-03	3.0606667	24.79882	7.6886667	10.785714	8.678571
## 5408	2005-09-04	2.5212222	24.60022	7.7406667	3.000000	2.750000
## 5409	2005-09-05	1.9817778	24.40162	7.7926667	366.071429	138.964286
## 5410	2005-09-06	1.6733333	24.55507	7.4675556	7.250000	4.500000
## 5411	2005-09-07	1.3648889	24.70851	7.1424444	2.044444	2.000000
## 5412	2005-09-08	1.4563889	24.69992	7.3608889	56.181818	37.090909
## 5413	2005-09-09	1.5478889	24.69132	7.5793333	2.250000	2.250000
## 5414	2005-09-10	1.6393889	24.68273	7.7977778	166.181818	111.090909
## 5415	2005-09-11	1.7308889	24.67413	8.0162222	2.226415	4.377358
## 5416	2005-09-12	3.6862222	24.50947	7.9128889	77.571429	79.285714
## 5417	2005-09-13	3.0314444	24.48493	7.8678889	2.000000	3.250000
## 5418	2005-09-14	2.3766667	24.46040	7.8228889	2.088889	2.066667
## 5419	2005-09-15	2.2282963	24.47993	7.7065926	940.363636	1140.545455
## 5420	2005-09-16	2.0799259	24.49947	7.5902963	15.250000	15.250000
## 5421	2005-09-17	1.9315556	24.51900	7.4740000	2.000000	2.488889
## 5422	2005-09-18	1.8128889	24.53472	7.4893333	37.090909	73.272727
## 5423	2005-09-19	1.6942222	24.55043	7.5046667	2.000000	3.500000
## 5424	2005-09-20	1.5755556	24.56615	7.5200000	15.818182	14.727273
## 5425	2005-09-21	1.4568889	24.58187	7.5353333	3.396226	2.339623
## 5426	2005-09-22	1.4320000	24.73480	7.1941111	103.818182	171.636364
## 5427	2005-09-23	1.4071111	24.88773	6.8528889	3.924528	10.679245
## 5428	2005-09-24	2.2462222	24.62031	7.4717778	6.490566	4.075472
## 5429	2005-09-25	1.5960000	24.84630	7.1513333	5.565217	4.347826
## 5430	2005-09-26	1.1083333	24.79314	7.1611111	2.222222	2.592593
## 5431	2005-09-27	1.2021212	24.72279	7.2769697	2.285714	2.857143
## 5432	2005-09-28	1.3906667	24.65613	7.3815556	3.245283	2.716981
## 5433	2005-09-29	0.6169091	25.15278	5.9663636	37.424242	63.636364
## 5434	2005-09-30	0.9950000	24.90671	6.8864286	4.523810	43.364719
## 5435	2005-10-01	0.6561364	25.12484	6.1713636	62.090909	23.093074
## 5436	2005-10-02	2.1324444	24.56878	7.9331111	3.535714	2.821429
## 5437	2005-10-03	1.9108889	24.67141	7.6784444	4.000000	4.500000
## 5438	2005-10-04	1.6893333	24.77404	7.4237778	2.113208	2.641509
## 5439	2005-10-05	1.9208889	24.69307	7.7282222	14.545455	13.272727
## 5440	2005-10-06	2.1524444	24.61209	8.0326667	19.000000	21.750000
## 5441	2005-10-07	1.7639259	24.61350	7.8335556	10.000000	5.500000
## 5442	2005-10-08	1.3754074	24.61492	7.6344444	1905.272727	2356.363636
## 5443	2005-10-09	0.9868889	24.61633	7.4353333	15.849057	12.641509
## 5444	2005-10-10	0.9043333	24.68802	7.3908889	173.000000	48.500000
## 5445	2005-10-11	0.8217778	24.75971	7.3464444	10.916667	42.222222
## 5446	2005-10-12	1.5595556	24.93376	7.0766667	92.250000	152.392857
## 5447	2005-10-13	1.5875556	24.83102	7.3957778	14.750000	5.750000
## 5448	2005-10-14	1.6155556	24.72829	7.7148889	125.644444	288.711111
## 5449	2005-10-15	1.6155556	24.72829	7.7148889	3616.363636	4477.818182
## 5450	2005-10-16	1.6155556	24.72829	7.7148889	4.500000	5.000000
## 5451	2005-10-17	NA	NA	NA	NA	NA
## 5452	2005-10-18	NA	NA	NA	NA	NA
## 5453	2005-10-19	NA	NA	NA	NA	NA
## 5454	2005-10-20	NA	NA	NA	NA	NA
## 5455	2005-10-21	NA	NA	NA	NA	NA
## 5456	2005-10-22	NA	NA	NA	NA	NA
## 5457	2005-10-23	NA	NA	NA	NA	NA
## 5458	2005-10-24	NA	NA	NA	NA	NA
## 5459	2005-10-25	NA	NA	NA	NA	NA
## 5460	2005-10-26	NA	NA	NA	NA	NA

## 5461	2005-10-27	NA	NA	NA	NA	NA
## 5462	2005-10-28	NA	NA	NA	NA	NA
## 5463	2005-10-29	NA	NA	NA	NA	NA
## 5464	2005-10-30	NA	NA	NA	NA	NA
## 5465	2005-10-31	NA	NA	NA	NA	NA
## 5466	2005-11-01	NA	NA	NA	NA	NA
## 5467	2005-11-02	NA	NA	NA	NA	NA
## 5468	2005-11-03	NA	NA	NA	NA	NA
## 5469	2005-11-04	NA	NA	NA	NA	NA
## 5470	2005-11-05	NA	NA	NA	NA	NA
## 5471	2005-11-06	NA	NA	NA	NA	NA
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## 5473	2005-11-08	NA	NA	NA	NA	NA
## 5474	2005-11-09	NA	NA	NA	NA	NA
## 5475	2005-11-10	NA	NA	NA	NA	NA
## 5476	2005-11-11	NA	NA	NA	NA	NA
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## 5480	2005-11-15	NA	NA	NA	NA	NA
## 5481	2005-11-16	NA	NA	NA	NA	NA
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## 5483	2005-11-18	NA	NA	NA	NA	NA
## 5484	2005-11-19	NA	NA	NA	NA	NA
## 5485	2005-11-20	NA	NA	NA	NA	NA
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## 5487	2005-11-22	NA	NA	NA	NA	NA
## 5488	2005-11-23	NA	NA	NA	NA	NA
## 5489	2005-11-24	NA	NA	NA	NA	NA
## 5490	2005-11-25	NA	NA	NA	NA	NA
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## 6248	2007-12-23	NA	NA	NA	NA	NA
## 6249	2007-12-24	NA	NA	NA	NA	NA
## 6250	2007-12-25	NA	NA	NA	NA	NA
## 6251	2007-12-26	NA	NA	NA	NA	NA
## 6252	2007-12-27	NA	NA	NA	NA	NA
## 6253	2007-12-28	NA	NA	NA	NA	NA
## 6254	2007-12-29	NA	NA	NA	NA	NA
## 6255	2007-12-30	NA	NA	NA	NA	NA
## 6256	2007-12-31	NA	NA	NA	NA	NA
## 6257	2008-01-01	NA	NA	NA	NA	NA
## 6258	2008-01-02	NA	NA	NA	NA	NA
## 6259	2008-01-03	NA	NA	NA	NA	NA
## 6260	2008-01-04	NA	NA	NA	NA	NA
## 6261	2008-01-05	NA	NA	NA	NA	NA
## 6262	2008-01-06	NA	NA	NA	NA	NA
## 6263	2008-01-07	NA	NA	NA	NA	NA
## 6264	2008-01-08	NA	NA	NA	NA	NA
## 6265	2008-01-09	NA	NA	NA	NA	NA
## 6266	2008-01-10	NA	NA	NA	NA	NA
## 6267	2008-01-11	NA	NA	NA	NA	NA
## 6268	2008-01-12	NA	NA	NA	NA	NA
## 6269	2008-01-13	NA	NA	NA	NA	NA
## 6270	2008-01-14	NA	NA	NA	NA	NA

## 6271	2008-01-15	NA	NA	NA	NA	NA
## 6272	2008-01-16	NA	NA	NA	NA	NA
## 6273	2008-01-17	NA	NA	NA	NA	NA
## 6274	2008-01-18	NA	NA	NA	NA	NA
## 6275	2008-01-19	NA	NA	NA	NA	NA
## 6276	2008-01-20	NA	NA	NA	NA	NA
## 6277	2008-01-21	NA	NA	NA	NA	NA
## 6278	2008-01-22	NA	NA	NA	NA	NA
## 6279	2008-01-23	NA	NA	NA	NA	NA
## 6280	2008-01-24	NA	NA	NA	NA	NA
## 6281	2008-01-25	NA	NA	NA	NA	NA
## 6282	2008-01-26	NA	NA	NA	NA	NA
## 6283	2008-01-27	NA	NA	NA	NA	NA
## 6284	2008-01-28	NA	NA	NA	NA	NA
## 6285	2008-01-29	NA	NA	NA	NA	NA
## 6286	2008-01-30	NA	NA	NA	NA	NA
## 6287	2008-01-31	NA	NA	NA	NA	NA
## 6288	2008-02-01	NA	NA	NA	NA	NA
## 6289	2008-02-02	NA	NA	NA	NA	NA
## 6290	2008-02-03	NA	NA	NA	NA	NA
## 6291	2008-02-04	NA	NA	NA	NA	NA
## 6292	2008-02-05	NA	NA	NA	NA	NA
## 6293	2008-02-06	NA	NA	NA	NA	NA
## 6294	2008-02-07	NA	NA	NA	NA	NA
## 6295	2008-02-08	NA	NA	NA	NA	NA
## 6296	2008-02-09	NA	NA	NA	NA	NA
## 6297	2008-02-10	NA	NA	NA	NA	NA
## 6298	2008-02-11	NA	NA	NA	NA	NA
## 6299	2008-02-12	NA	NA	NA	NA	NA
## 6300	2008-02-13	NA	NA	NA	NA	NA
## 6301	2008-02-14	NA	NA	NA	NA	NA
## 6302	2008-02-15	NA	NA	NA	NA	NA
## 6303	2008-02-16	NA	NA	NA	NA	NA
## 6304	2008-02-17	NA	NA	NA	NA	NA
## 6305	2008-02-18	NA	NA	NA	NA	NA
## 6306	2008-02-19	NA	NA	NA	NA	NA
## 6307	2008-02-20	NA	NA	NA	NA	NA
## 6308	2008-02-21	NA	NA	NA	NA	NA
## 6309	2008-02-22	NA	NA	NA	NA	NA
## 6310	2008-02-23	NA	NA	NA	NA	NA
## 6311	2008-02-24	NA	NA	NA	NA	NA
## 6312	2008-02-25	NA	NA	NA	NA	NA
## 6313	2008-02-26	NA	NA	NA	NA	NA
## 6314	2008-02-27	NA	NA	NA	NA	NA
## 6315	2008-02-28	NA	NA	NA	NA	NA
## 6316	2008-02-29	NA	NA	NA	NA	NA
## 6317	2008-03-01	NA	NA	NA	NA	NA
## 6318	2008-03-02	NA	NA	NA	NA	NA
## 6319	2008-03-03	NA	NA	NA	NA	NA
## 6320	2008-03-04	NA	NA	NA	NA	NA
## 6321	2008-03-05	NA	NA	NA	NA	NA
## 6322	2008-03-06	NA	NA	NA	NA	NA
## 6323	2008-03-07	NA	NA	NA	NA	NA
## 6324	2008-03-08	NA	NA	NA	NA	NA

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## 6326	2008-03-10	NA	NA	NA	NA	NA
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## 6329	2008-03-13	NA	NA	NA	NA	NA
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## 6334	2008-03-18	NA	NA	NA	NA	NA
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## 6336	2008-03-20	NA	NA	NA	NA	NA
## 6337	2008-03-21	NA	NA	NA	NA	NA
## 6338	2008-03-22	NA	NA	NA	NA	NA
## 6339	2008-03-23	NA	NA	NA	NA	NA
## 6340	2008-03-24	NA	NA	NA	NA	NA
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## 6342	2008-03-26	NA	NA	NA	NA	NA
## 6343	2008-03-27	NA	NA	NA	NA	NA
## 6344	2008-03-28	NA	NA	NA	NA	NA
## 6345	2008-03-29	NA	NA	NA	NA	NA
## 6346	2008-03-30	NA	NA	NA	NA	NA
## 6347	2008-03-31	NA	NA	NA	NA	NA
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## 6349	2008-04-02	NA	NA	NA	NA	NA
## 6350	2008-04-03	NA	NA	NA	NA	NA
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## 6353	2008-04-06	NA	NA	NA	NA	NA
## 6354	2008-04-07	NA	NA	NA	NA	NA
## 6355	2008-04-08	NA	NA	NA	NA	NA
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## 6365	2008-04-18	NA	NA	NA	NA	NA
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## 6368	2008-04-21	NA	NA	NA	NA	NA
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## 6370	2008-04-23	NA	NA	NA	NA	NA
## 6371	2008-04-24	NA	NA	NA	NA	NA
## 6372	2008-04-25	NA	NA	NA	NA	NA
## 6373	2008-04-26	NA	NA	NA	NA	NA
## 6374	2008-04-27	NA	NA	NA	NA	NA
## 6375	2008-04-28	NA	NA	NA	NA	NA
## 6376	2008-04-29	NA	NA	NA	NA	NA
## 6377	2008-04-30	NA	NA	NA	NA	NA
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## 6383	2008-05-06	NA	NA	NA	NA	NA
## 6384	2008-05-07	NA	NA	NA	NA	NA
## 6385	2008-05-08	NA	NA	NA	NA	NA
## 6386	2008-05-09	NA	NA	NA	NA	NA
## 6387	2008-05-10	NA	NA	NA	NA	NA
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## 6390	2008-05-13	NA	NA	NA	NA	NA
## 6391	2008-05-14	NA	NA	NA	NA	NA
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## 6393	2008-05-16	NA	NA	NA	NA	NA
## 6394	2008-05-17	NA	NA	NA	NA	NA
## 6395	2008-05-18	NA	NA	NA	NA	NA
## 6396	2008-05-19	NA	NA	NA	NA	NA
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## 6400	2008-05-23	NA	NA	NA	NA	NA
## 6401	2008-05-24	NA	NA	NA	NA	NA
## 6402	2008-05-25	NA	NA	NA	NA	NA
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## 6406	2008-05-29	NA	NA	NA	NA	NA
## 6407	2008-05-30	NA	NA	NA	NA	NA
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## 6410	2008-06-02	NA	NA	NA	NA	NA
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## 6414	2008-06-06	NA	NA	NA	NA	NA
## 6415	2008-06-07	NA	NA	NA	NA	NA
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## 6418	2008-06-10	NA	NA	NA	NA	NA
## 6419	2008-06-11	NA	NA	NA	NA	NA
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## 6424	2008-06-16	NA	NA	NA	NA	NA
## 6425	2008-06-17	NA	NA	NA	NA	NA
## 6426	2008-06-18	NA	NA	NA	NA	NA
## 6427	2008-06-19	NA	NA	NA	NA	NA
## 6428	2008-06-20	NA	NA	NA	NA	NA
## 6429	2008-06-21	NA	NA	NA	NA	NA
## 6430	2008-06-22	NA	NA	NA	NA	NA
## 6431	2008-06-23	NA	NA	NA	NA	NA
## 6432	2008-06-24	NA	NA	NA	NA	NA

## 6433	2008-06-25	NA	NA	NA	NA	NA
## 6434	2008-06-26	NA	NA	NA	NA	NA
## 6435	2008-06-27	NA	NA	NA	NA	NA
## 6436	2008-06-28	NA	NA	NA	NA	NA
## 6437	2008-06-29	NA	NA	NA	NA	NA
## 6438	2008-06-30	NA	NA	NA	NA	NA
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## 6444	2008-07-06	NA	NA	NA	NA	NA
## 6445	2008-07-07	NA	NA	NA	NA	NA
## 6446	2008-07-08	NA	NA	NA	NA	NA
## 6447	2008-07-09	NA	NA	NA	NA	NA
## 6448	2008-07-10	NA	NA	NA	NA	NA
## 6449	2008-07-11	NA	NA	NA	NA	NA
## 6450	2008-07-12	NA	NA	NA	NA	NA
## 6451	2008-07-13	NA	NA	NA	NA	NA
## 6452	2008-07-14	NA	NA	NA	NA	NA
## 6453	2008-07-15	NA	NA	NA	NA	NA
## 6454	2008-07-16	NA	NA	NA	NA	NA
## 6455	2008-07-17	NA	NA	NA	NA	NA
## 6456	2008-07-18	NA	NA	NA	NA	NA
## 6457	2008-07-19	NA	NA	NA	NA	NA
## 6458	2008-07-20	NA	NA	NA	NA	NA
## 6459	2008-07-21	NA	NA	NA	NA	NA
## 6460	2008-07-22	NA	NA	NA	NA	NA
## 6461	2008-07-23	NA	NA	NA	NA	NA
## 6462	2008-07-24	NA	NA	NA	NA	NA
## 6463	2008-07-25	NA	NA	NA	NA	NA
## 6464	2008-07-26	NA	NA	NA	NA	NA
## 6465	2008-07-27	NA	NA	NA	NA	NA
## 6466	2008-07-28	NA	NA	NA	NA	NA
## 6467	2008-07-29	NA	NA	NA	NA	NA
## 6468	2008-07-30	NA	NA	NA	NA	NA
## 6469	2008-07-31	NA	NA	NA	NA	NA
## 6470	2008-08-01	NA	NA	NA	NA	NA
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## 6472	2008-08-03	NA	NA	NA	NA	NA
## 6473	2008-08-04	NA	NA	NA	NA	NA
## 6474	2008-08-05	NA	NA	NA	NA	NA
## 6475	2008-08-06	NA	NA	NA	NA	NA
## 6476	2008-08-07	NA	NA	NA	NA	NA
## 6477	2008-08-08	NA	NA	NA	NA	NA
## 6478	2008-08-09	NA	NA	NA	NA	NA
## 6479	2008-08-10	NA	NA	NA	NA	NA
## 6480	2008-08-11	NA	NA	NA	NA	NA
## 6481	2008-08-12	NA	NA	NA	NA	NA
## 6482	2008-08-13	NA	NA	NA	NA	NA
## 6483	2008-08-14	NA	NA	NA	NA	NA
## 6484	2008-08-15	NA	NA	NA	NA	NA
## 6485	2008-08-16	NA	NA	NA	NA	NA
## 6486	2008-08-17	NA	NA	NA	NA	NA

## 6487	2008-08-18	NA	NA	NA	NA	NA
## 6488	2008-08-19	NA	NA	NA	NA	NA
## 6489	2008-08-20	NA	NA	NA	NA	NA
## 6490	2008-08-21	NA	NA	NA	NA	NA
## 6491	2008-08-22	NA	NA	NA	NA	NA
## 6492	2008-08-23	NA	NA	NA	NA	NA
## 6493	2008-08-24	NA	NA	NA	NA	NA
## 6494	2008-08-25	NA	NA	NA	NA	NA
## 6495	2008-08-26	NA	NA	NA	NA	NA
## 6496	2008-08-27	NA	NA	NA	NA	NA
## 6497	2008-08-28	NA	NA	NA	NA	NA
## 6498	2008-08-29	NA	NA	NA	NA	NA
## 6499	2008-08-30	NA	NA	NA	NA	NA
## 6500	2008-08-31	NA	NA	NA	NA	NA
## 6501	2008-09-01	NA	NA	NA	NA	NA
## 6502	2008-09-02	NA	NA	NA	NA	NA
## 6503	2008-09-03	NA	NA	NA	NA	NA
## 6504	2008-09-04	NA	NA	NA	NA	NA
## 6505	2008-09-05	NA	NA	NA	NA	NA
## 6506	2008-09-06	NA	NA	NA	NA	NA
## 6507	2008-09-07	NA	NA	NA	NA	NA
## 6508	2008-09-08	NA	NA	NA	NA	NA
## 6509	2008-09-09	NA	NA	NA	NA	NA
## 6510	2008-09-10	NA	NA	NA	NA	NA
## 6511	2008-09-11	NA	NA	NA	NA	NA
## 6512	2008-09-12	NA	NA	NA	NA	NA
## 6513	2008-09-13	NA	NA	NA	NA	NA
## 6514	2008-09-14	NA	NA	NA	NA	NA
## 6515	2008-09-15	NA	NA	NA	NA	NA
## 6516	2008-09-16	NA	NA	NA	NA	NA
## 6517	2008-09-17	NA	NA	NA	NA	NA
## 6518	2008-09-18	NA	NA	NA	NA	NA
## 6519	2008-09-19	NA	NA	NA	NA	NA
## 6520	2008-09-20	NA	NA	NA	NA	NA
## 6521	2008-09-21	NA	NA	NA	NA	NA
## 6522	2008-09-22	NA	NA	NA	NA	NA
## 6523	2008-09-23	NA	NA	NA	NA	NA
## 6524	2008-09-24	NA	NA	NA	NA	NA
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## 6526	2008-09-26	NA	NA	NA	NA	NA
## 6527	2008-09-27	NA	NA	NA	NA	NA
## 6528	2008-09-28	NA	NA	NA	NA	NA
## 6529	2008-09-29	NA	NA	NA	NA	NA
## 6530	2008-09-30	NA	NA	NA	NA	NA
## 6531	2008-10-01	NA	NA	NA	NA	NA
## 6532	2008-10-02	NA	NA	NA	NA	NA
## 6533	2008-10-03	NA	NA	NA	NA	NA
## 6534	2008-10-04	NA	NA	NA	NA	NA
## 6535	2008-10-05	NA	NA	NA	NA	NA
## 6536	2008-10-06	NA	NA	NA	NA	NA
## 6537	2008-10-07	NA	NA	NA	NA	NA
## 6538	2008-10-08	NA	NA	NA	NA	NA
## 6539	2008-10-09	NA	NA	NA	NA	NA
## 6540	2008-10-10	NA	NA	NA	NA	NA

## 6541	2008-10-11	NA	NA	NA	NA	NA
## 6542	2008-10-12	NA	NA	NA	NA	NA
## 6543	2008-10-13	NA	NA	NA	NA	NA
## 6544	2008-10-14	NA	NA	NA	NA	NA
## 6545	2008-10-15	NA	NA	NA	NA	NA
## 6546	2008-10-16	NA	NA	NA	NA	NA
## 6547	2008-10-17	NA	NA	NA	NA	NA
## 6548	2008-10-18	NA	NA	NA	NA	NA
## 6549	2008-10-19	NA	NA	NA	NA	NA
## 6550	2008-10-20	NA	NA	NA	NA	NA
## 6551	2008-10-21	NA	NA	NA	NA	NA
## 6552	2008-10-22	NA	NA	NA	NA	NA
## 6553	2008-10-23	NA	NA	NA	NA	NA
## 6554	2008-10-24	NA	NA	NA	NA	NA
## 6555	2008-10-25	NA	NA	NA	NA	NA
## 6556	2008-10-26	NA	NA	NA	NA	NA
## 6557	2008-10-27	NA	NA	NA	NA	NA
## 6558	2008-10-28	NA	NA	NA	NA	NA
## 6559	2008-10-29	NA	NA	NA	NA	NA
## 6560	2008-10-30	NA	NA	NA	NA	NA
## 6561	2008-10-31	NA	NA	NA	NA	NA
## 6562	2008-11-01	NA	NA	NA	NA	NA
## 6563	2008-11-02	NA	NA	NA	NA	NA
## 6564	2008-11-03	NA	NA	NA	NA	NA
## 6565	2008-11-04	NA	NA	NA	NA	NA
## 6566	2008-11-05	NA	NA	NA	NA	NA
## 6567	2008-11-06	NA	NA	NA	NA	NA
## 6568	2008-11-07	NA	NA	NA	NA	NA
## 6569	2008-11-08	NA	NA	NA	NA	NA
## 6570	2008-11-09	NA	NA	NA	NA	NA
## 6571	2008-11-10	NA	NA	NA	NA	NA
## 6572	2008-11-11	NA	NA	NA	NA	NA
## 6573	2008-11-12	NA	NA	NA	NA	NA
## 6574	2008-11-13	NA	NA	NA	NA	NA
## 6575	2008-11-14	NA	NA	NA	NA	NA
## 6576	2008-11-15	NA	NA	NA	NA	NA
## 6577	2008-11-16	NA	NA	NA	NA	NA
## 6578	2008-11-17	NA	NA	NA	NA	NA
## 6579	2008-11-18	NA	NA	NA	NA	NA
## 6580	2008-11-19	NA	NA	NA	NA	NA
## 6581	2008-11-20	NA	NA	NA	NA	NA
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## 6584	2008-11-23	NA	NA	NA	NA	NA
## 6585	2008-11-24	NA	NA	NA	NA	NA
## 6586	2008-11-25	NA	NA	NA	NA	NA
## 6587	2008-11-26	NA	NA	NA	NA	NA
## 6588	2008-11-27	NA	NA	NA	NA	NA
## 6589	2008-11-28	NA	NA	NA	NA	NA
## 6590	2008-11-29	NA	NA	NA	NA	NA
## 6591	2008-11-30	NA	NA	NA	NA	NA
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## 6599	2008-12-08	NA	NA	NA	NA	NA
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## 6615	2008-12-24	NA	NA	NA	NA	NA
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## 6622	2008-12-31	NA	NA	NA	NA	NA
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## 6624	2009-01-02	NA	NA	NA	NA	NA
## 6625	2009-01-03	NA	NA	NA	NA	NA
## 6626	2009-01-04	NA	NA	NA	NA	NA
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## 6628	2009-01-06	NA	NA	NA	NA	NA
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## 6630	2009-01-08	NA	NA	NA	NA	NA
## 6631	2009-01-09	NA	NA	NA	NA	NA
## 6632	2009-01-10	NA	NA	NA	NA	NA
## 6633	2009-01-11	NA	NA	NA	NA	NA
## 6634	2009-01-12	NA	NA	NA	NA	NA
## 6635	2009-01-13	NA	NA	NA	NA	NA
## 6636	2009-01-14	NA	NA	NA	NA	NA
## 6637	2009-01-15	NA	NA	NA	NA	NA
## 6638	2009-01-16	NA	NA	NA	NA	NA
## 6639	2009-01-17	NA	NA	NA	NA	NA
## 6640	2009-01-18	NA	NA	NA	NA	NA
## 6641	2009-01-19	NA	NA	NA	NA	NA
## 6642	2009-01-20	NA	NA	NA	NA	NA
## 6643	2009-01-21	NA	NA	NA	NA	NA
## 6644	2009-01-22	NA	NA	NA	NA	NA
## 6645	2009-01-23	NA	NA	NA	NA	NA
## 6646	2009-01-24	NA	NA	NA	NA	NA
## 6647	2009-01-25	NA	NA	NA	NA	NA
## 6648	2009-01-26	NA	NA	NA	NA	NA

## 6649	2009-01-27	NA	NA	NA	NA	NA
## 6650	2009-01-28	NA	NA	NA	NA	NA
## 6651	2009-01-29	NA	NA	NA	NA	NA
## 6652	2009-01-30	NA	NA	NA	NA	NA
## 6653	2009-01-31	NA	NA	NA	NA	NA
## 6654	2009-02-01	NA	NA	NA	NA	NA
## 6655	2009-02-02	NA	NA	NA	NA	NA
## 6656	2009-02-03	NA	NA	NA	NA	NA
## 6657	2009-02-04	NA	NA	NA	NA	NA
## 6658	2009-02-05	NA	NA	NA	NA	NA
## 6659	2009-02-06	NA	NA	NA	NA	NA
## 6660	2009-02-07	NA	NA	NA	NA	NA
## 6661	2009-02-08	NA	NA	NA	NA	NA
## 6662	2009-02-09	NA	NA	NA	NA	NA
## 6663	2009-02-10	NA	NA	NA	NA	NA
## 6664	2009-02-11	NA	NA	NA	NA	NA
## 6665	2009-02-12	NA	NA	NA	NA	NA
## 6666	2009-02-13	NA	NA	NA	NA	NA
## 6667	2009-02-14	NA	NA	NA	NA	NA
## 6668	2009-02-15	NA	NA	NA	NA	NA
## 6669	2009-02-16	NA	NA	NA	NA	NA
## 6670	2009-02-17	NA	NA	NA	NA	NA
## 6671	2009-02-18	NA	NA	NA	NA	NA
## 6672	2009-02-19	NA	NA	NA	NA	NA
## 6673	2009-02-20	NA	NA	NA	NA	NA
## 6674	2009-02-21	NA	NA	NA	NA	NA
## 6675	2009-02-22	NA	NA	NA	NA	NA
## 6676	2009-02-23	NA	NA	NA	NA	NA
## 6677	2009-02-24	NA	NA	NA	NA	NA
## 6678	2009-02-25	NA	NA	NA	NA	NA
## 6679	2009-02-26	NA	NA	NA	NA	NA
## 6680	2009-02-27	NA	NA	NA	NA	NA
## 6681	2009-02-28	NA	NA	NA	NA	NA
## 6682	2009-03-01	NA	NA	NA	NA	NA
## 6683	2009-03-02	NA	NA	NA	NA	NA
## 6684	2009-03-03	NA	NA	NA	NA	NA
## 6685	2009-03-04	NA	NA	NA	NA	NA
## 6686	2009-03-05	NA	NA	NA	NA	NA
## 6687	2009-03-06	NA	NA	NA	NA	NA
## 6688	2009-03-07	NA	NA	NA	NA	NA
## 6689	2009-03-08	NA	NA	NA	NA	NA
## 6690	2009-03-09	NA	NA	NA	NA	NA
## 6691	2009-03-10	NA	NA	NA	NA	NA
## 6692	2009-03-11	NA	NA	NA	NA	NA
## 6693	2009-03-12	NA	NA	NA	NA	NA
## 6694	2009-03-13	NA	NA	NA	NA	NA
## 6695	2009-03-14	NA	NA	NA	NA	NA
## 6696	2009-03-15	NA	NA	NA	NA	NA
## 6697	2009-03-16	NA	NA	NA	NA	NA
## 6698	2009-03-17	NA	NA	NA	NA	NA
## 6699	2009-03-18	NA	NA	NA	NA	NA
## 6700	2009-03-19	NA	NA	NA	NA	NA
## 6701	2009-03-20	NA	NA	NA	NA	NA
## 6702	2009-03-21	NA	NA	NA	NA	NA

## 6703	2009-03-22	NA	NA	NA	NA	NA
## 6704	2009-03-23	NA	NA	NA	NA	NA
## 6705	2009-03-24	NA	NA	NA	NA	NA
## 6706	2009-03-25	NA	NA	NA	NA	NA
## 6707	2009-03-26	NA	NA	NA	NA	NA
## 6708	2009-03-27	NA	NA	NA	NA	NA
## 6709	2009-03-28	NA	NA	NA	NA	NA
## 6710	2009-03-29	NA	NA	NA	NA	NA
## 6711	2009-03-30	NA	NA	NA	NA	NA
## 6712	2009-03-31	NA	NA	NA	NA	NA
## 6713	2009-04-01	NA	NA	NA	NA	NA
## 6714	2009-04-02	NA	NA	NA	NA	NA
## 6715	2009-04-03	NA	NA	NA	NA	NA
## 6716	2009-04-04	NA	NA	NA	NA	NA
## 6717	2009-04-05	NA	NA	NA	NA	NA
## 6718	2009-04-06	NA	NA	NA	NA	NA
## 6719	2009-04-07	NA	NA	NA	NA	NA
## 6720	2009-04-08	NA	NA	NA	NA	NA
## 6721	2009-04-09	NA	NA	NA	NA	NA
## 6722	2009-04-10	NA	NA	NA	NA	NA
## 6723	2009-04-11	NA	NA	NA	NA	NA
## 6724	2009-04-12	NA	NA	NA	NA	NA
## 6725	2009-04-13	NA	NA	NA	NA	NA
## 6726	2009-04-14	NA	NA	NA	NA	NA
## 6727	2009-04-15	NA	NA	NA	NA	NA
## 6728	2009-04-16	NA	NA	NA	NA	NA
## 6729	2009-04-17	NA	NA	NA	NA	NA
## 6730	2009-04-18	NA	NA	NA	NA	NA
## 6731	2009-04-19	NA	NA	NA	NA	NA
## 6732	2009-04-20	NA	NA	NA	NA	NA
## 6733	2009-04-21	NA	NA	NA	NA	NA
## 6734	2009-04-22	NA	NA	NA	NA	NA
## 6735	2009-04-23	NA	NA	NA	NA	NA
## 6736	2009-04-24	NA	NA	NA	NA	NA
## 6737	2009-04-25	NA	NA	NA	NA	NA
## 6738	2009-04-26	NA	NA	NA	NA	NA
## 6739	2009-04-27	NA	NA	NA	NA	NA
## 6740	2009-04-28	NA	NA	NA	NA	NA
## 6741	2009-04-29	NA	NA	NA	NA	NA
## 6742	2009-04-30	NA	NA	NA	NA	NA
## 6743	2009-05-01	NA	NA	NA	NA	NA
## 6744	2009-05-02	NA	NA	NA	NA	NA
## 6745	2009-05-03	NA	NA	NA	NA	NA
## 6746	2009-05-04	NA	NA	NA	NA	NA
## 6747	2009-05-05	NA	NA	NA	NA	NA
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## 6749	2009-05-07	NA	NA	NA	NA	NA
## 6750	2009-05-08	NA	NA	NA	NA	NA
## 6751	2009-05-09	NA	NA	NA	NA	NA
## 6752	2009-05-10	NA	NA	NA	NA	NA
## 6753	2009-05-11	NA	NA	NA	NA	NA
## 6754	2009-05-12	NA	NA	NA	NA	NA
## 6755	2009-05-13	NA	NA	NA	NA	NA
## 6756	2009-05-14	NA	NA	NA	NA	NA

## 6757	2009-05-15	NA	NA	NA	NA	NA
## 6758	2009-05-16	NA	NA	NA	NA	NA
## 6759	2009-05-17	NA	NA	NA	NA	NA
## 6760	2009-05-18	NA	NA	NA	NA	NA
## 6761	2009-05-19	NA	NA	NA	NA	NA
## 6762	2009-05-20	NA	NA	NA	NA	NA
## 6763	2009-05-21	NA	NA	NA	NA	NA
## 6764	2009-05-22	NA	NA	NA	NA	NA
## 6765	2009-05-23	NA	NA	NA	NA	NA
## 6766	2009-05-24	NA	NA	NA	NA	NA
## 6767	2009-05-25	NA	NA	NA	NA	NA
## 6768	2009-05-26	NA	NA	NA	NA	NA
## 6769	2009-05-27	NA	NA	NA	NA	NA
## 6770	2009-05-28	NA	NA	NA	NA	NA
## 6771	2009-05-29	NA	NA	NA	NA	NA
## 6772	2009-05-30	NA	NA	NA	NA	NA
## 6773	2009-05-31	NA	NA	NA	NA	NA
## 6774	2009-06-01	NA	NA	NA	NA	NA
## 6775	2009-06-02	NA	NA	NA	NA	NA
## 6776	2009-06-03	NA	NA	NA	NA	NA
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## 6778	2009-06-05	NA	NA	NA	NA	NA
## 6779	2009-06-06	NA	NA	NA	NA	NA
## 6780	2009-06-07	NA	NA	NA	NA	NA
## 6781	2009-06-08	NA	NA	NA	NA	NA
## 6782	2009-06-09	NA	NA	NA	NA	NA
## 6783	2009-06-10	NA	NA	NA	NA	NA
## 6784	2009-06-11	NA	NA	NA	NA	NA
## 6785	2009-06-12	NA	NA	NA	NA	NA
## 6786	2009-06-13	NA	NA	NA	NA	NA
## 6787	2009-06-14	NA	NA	NA	NA	NA
## 6788	2009-06-15	NA	NA	NA	NA	NA
## 6789	2009-06-16	NA	NA	NA	NA	NA
## 6790	2009-06-17	NA	NA	NA	NA	NA
## 6791	2009-06-18	NA	NA	NA	NA	NA
## 6792	2009-06-19	NA	NA	NA	NA	NA
## 6793	2009-06-20	NA	NA	NA	NA	NA
## 6794	2009-06-21	NA	NA	NA	NA	NA
## 6795	2009-06-22	NA	NA	NA	NA	NA
## 6796	2009-06-23	NA	NA	NA	NA	NA
## 6797	2009-06-24	NA	NA	NA	NA	NA
## 6798	2009-06-25	NA	NA	NA	NA	NA
## 6799	2009-06-26	NA	NA	NA	NA	NA
## 6800	2009-06-27	NA	NA	NA	NA	NA
## 6801	2009-06-28	NA	NA	NA	NA	NA
## 6802	2009-06-29	NA	NA	NA	NA	NA
## 6803	2009-06-30	NA	NA	NA	NA	NA
## 6804	2009-07-01	NA	NA	NA	NA	NA
## 6805	2009-07-02	NA	NA	NA	NA	NA
## 6806	2009-07-03	NA	NA	NA	NA	NA
## 6807	2009-07-04	NA	NA	NA	NA	NA
## 6808	2009-07-05	NA	NA	NA	NA	NA
## 6809	2009-07-06	NA	NA	NA	NA	NA
## 6810	2009-07-07	NA	NA	NA	NA	NA

## 6811	2009-07-08	NA	NA	NA	NA	NA
## 6812	2009-07-09	NA	NA	NA	NA	NA
## 6813	2009-07-10	NA	NA	NA	NA	NA
## 6814	2009-07-11	NA	NA	NA	NA	NA
## 6815	2009-07-12	NA	NA	NA	NA	NA
## 6816	2009-07-13	NA	NA	NA	NA	NA
## 6817	2009-07-14	NA	NA	NA	NA	NA
## 6818	2009-07-15	NA	NA	NA	NA	NA
## 6819	2009-07-16	NA	NA	NA	NA	NA
## 6820	2009-07-17	NA	NA	NA	NA	NA
## 6821	2009-07-18	NA	NA	NA	NA	NA
## 6822	2009-07-19	NA	NA	NA	NA	NA
## 6823	2009-07-20	NA	NA	NA	NA	NA
## 6824	2009-07-21	NA	NA	NA	NA	NA
## 6825	2009-07-22	NA	NA	NA	NA	NA
## 6826	2009-07-23	NA	NA	NA	NA	NA
## 6827	2009-07-24	NA	NA	NA	NA	NA
## 6828	2009-07-25	NA	NA	NA	NA	NA
## 6829	2009-07-26	NA	NA	NA	NA	NA
## 6830	2009-07-27	NA	NA	NA	NA	NA
## 6831	2009-07-28	NA	NA	NA	NA	NA
## 6832	2009-07-29	NA	NA	NA	NA	NA
## 6833	2009-07-30	NA	NA	NA	NA	NA
## 6834	2009-07-31	NA	NA	NA	NA	NA
## 6835	2009-08-01	NA	NA	NA	NA	NA
## 6836	2009-08-02	NA	NA	NA	NA	NA
## 6837	2009-08-03	NA	NA	NA	NA	NA
## 6838	2009-08-04	NA	NA	NA	NA	NA
## 6839	2009-08-05	NA	NA	NA	NA	NA
## 6840	2009-08-06	NA	NA	NA	NA	NA
## 6841	2009-08-07	NA	NA	NA	NA	NA
## 6842	2009-08-08	NA	NA	NA	NA	NA
## 6843	2009-08-09	NA	NA	NA	NA	NA
## 6844	2009-08-10	NA	NA	NA	NA	NA
## 6845	2009-08-11	NA	NA	NA	NA	NA
## 6846	2009-08-12	NA	NA	NA	NA	NA
## 6847	2009-08-13	NA	NA	NA	NA	NA
## 6848	2009-08-14	NA	NA	NA	NA	NA
## 6849	2009-08-15	NA	NA	NA	NA	NA
## 6850	2009-08-16	NA	NA	NA	NA	NA
## 6851	2009-08-17	NA	NA	NA	NA	NA
## 6852	2009-08-18	NA	NA	NA	NA	NA
## 6853	2009-08-19	NA	NA	NA	NA	NA
## 6854	2009-08-20	NA	NA	NA	NA	NA
## 6855	2009-08-21	NA	NA	NA	NA	NA
## 6856	2009-08-22	NA	NA	NA	NA	NA
## 6857	2009-08-23	NA	NA	NA	NA	NA
## 6858	2009-08-24	NA	NA	NA	NA	NA
## 6859	2009-08-25	NA	NA	NA	NA	NA
## 6860	2009-08-26	NA	NA	NA	NA	NA
## 6861	2009-08-27	NA	NA	NA	NA	NA
## 6862	2009-08-28	NA	NA	NA	NA	NA
## 6863	2009-08-29	NA	NA	NA	NA	NA
## 6864	2009-08-30	NA	NA	NA	NA	NA

## 6865	2009-08-31	NA	NA	NA	NA	NA
## 6866	2009-09-01	NA	NA	NA	NA	NA
## 6867	2009-09-02	NA	NA	NA	NA	NA
## 6868	2009-09-03	NA	NA	NA	NA	NA
## 6869	2009-09-04	NA	NA	NA	NA	NA
## 6870	2009-09-05	NA	NA	NA	NA	NA
## 6871	2009-09-06	NA	NA	NA	NA	NA
## 6872	2009-09-07	NA	NA	NA	NA	NA
## 6873	2009-09-08	NA	NA	NA	NA	NA
## 6874	2009-09-09	NA	NA	NA	NA	NA
## 6875	2009-09-10	NA	NA	NA	NA	NA
## 6876	2009-09-11	NA	NA	NA	NA	NA
## 6877	2009-09-12	NA	NA	NA	NA	NA
## 6878	2009-09-13	NA	NA	NA	NA	NA
## 6879	2009-09-14	NA	NA	NA	NA	NA
## 6880	2009-09-15	NA	NA	NA	NA	NA
## 6881	2009-09-16	NA	NA	NA	NA	NA
## 6882	2009-09-17	NA	NA	NA	NA	NA
## 6883	2009-09-18	NA	NA	NA	NA	NA
## 6884	2009-09-19	NA	NA	NA	NA	NA
## 6885	2009-09-20	NA	NA	NA	NA	NA
## 6886	2009-09-21	NA	NA	NA	NA	NA
## 6887	2009-09-22	NA	NA	NA	NA	NA
## 6888	2009-09-23	NA	NA	NA	NA	NA
## 6889	2009-09-24	NA	NA	NA	NA	NA
## 6890	2009-09-25	NA	NA	NA	NA	NA
## 6891	2009-09-26	NA	NA	NA	NA	NA
## 6892	2009-09-27	NA	NA	NA	NA	NA
## 6893	2009-09-28	NA	NA	NA	NA	NA
## 6894	2009-09-29	NA	NA	NA	NA	NA
## 6895	2009-09-30	NA	NA	NA	NA	NA
## 6896	2009-10-01	NA	NA	NA	NA	NA
## 6897	2009-10-02	NA	NA	NA	NA	NA
## 6898	2009-10-03	NA	NA	NA	NA	NA
## 6899	2009-10-04	NA	NA	NA	NA	NA
## 6900	2009-10-05	NA	NA	NA	NA	NA
## 6901	2009-10-06	NA	NA	NA	NA	NA
## 6902	2009-10-07	NA	NA	NA	NA	NA
## 6903	2009-10-08	NA	NA	NA	NA	NA
## 6904	2009-10-09	NA	NA	NA	NA	NA
## 6905	2009-10-10	NA	NA	NA	NA	NA
## 6906	2009-10-11	NA	NA	NA	NA	NA
## 6907	2009-10-12	NA	NA	NA	NA	NA
## 6908	2009-10-13	NA	NA	NA	NA	NA
## 6909	2009-10-14	NA	NA	NA	NA	NA
## 6910	2009-10-15	NA	NA	NA	NA	NA
## 6911	2009-10-16	NA	NA	NA	NA	NA
## 6912	2009-10-17	NA	NA	NA	NA	NA
## 6913	2009-10-18	NA	NA	NA	NA	NA
## 6914	2009-10-19	NA	NA	NA	NA	NA
## 6915	2009-10-20	NA	NA	NA	NA	NA
## 6916	2009-10-21	NA	NA	NA	NA	NA
## 6917	2009-10-22	NA	NA	NA	NA	NA
## 6918	2009-10-23	NA	NA	NA	NA	NA

## 6919	2009-10-24	NA	NA	NA	NA	NA
## 6920	2009-10-25	NA	NA	NA	NA	NA
## 6921	2009-10-26	NA	NA	NA	NA	NA
## 6922	2009-10-27	NA	NA	NA	NA	NA
## 6923	2009-10-28	NA	NA	NA	NA	NA
## 6924	2009-10-29	NA	NA	NA	NA	NA
## 6925	2009-10-30	NA	NA	NA	NA	NA
## 6926	2009-10-31	NA	NA	NA	NA	NA
## 6927	2009-11-01	NA	NA	NA	NA	NA
## 6928	2009-11-02	NA	NA	NA	NA	NA
## 6929	2009-11-03	NA	NA	NA	NA	NA
## 6930	2009-11-04	NA	NA	NA	NA	NA
## 6931	2009-11-05	NA	NA	NA	NA	NA
## 6932	2009-11-06	NA	NA	NA	NA	NA
## 6933	2009-11-07	NA	NA	NA	NA	NA
## 6934	2009-11-08	NA	NA	NA	NA	NA
## 6935	2009-11-09	NA	NA	NA	NA	NA
## 6936	2009-11-10	NA	NA	NA	NA	NA
## 6937	2009-11-11	NA	NA	NA	NA	NA
## 6938	2009-11-12	NA	NA	NA	NA	NA
## 6939	2009-11-13	NA	NA	NA	NA	NA
## 6940	2009-11-14	NA	NA	NA	NA	NA
## 6941	2009-11-15	NA	NA	NA	NA	NA
## 6942	2009-11-16	NA	NA	NA	NA	NA
## 6943	2009-11-17	NA	NA	NA	NA	NA
## 6944	2009-11-18	NA	NA	NA	NA	NA
## 6945	2009-11-19	NA	NA	NA	NA	NA
## 6946	2009-11-20	NA	NA	NA	NA	NA
## 6947	2009-11-21	NA	NA	NA	NA	NA
## 6948	2009-11-22	NA	NA	NA	NA	NA
## 6949	2009-11-23	NA	NA	NA	NA	NA
## 6950	2009-11-24	NA	NA	NA	NA	NA
## 6951	2009-11-25	NA	NA	NA	NA	NA
## 6952	2009-11-26	NA	NA	NA	NA	NA
## 6953	2009-11-27	NA	NA	NA	NA	NA
## 6954	2009-11-28	NA	NA	NA	NA	NA
## 6955	2009-11-29	NA	NA	NA	NA	NA
## 6956	2009-11-30	NA	NA	NA	NA	NA
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## 6958	2009-12-02	NA	NA	NA	NA	NA
## 6959	2009-12-03	NA	NA	NA	NA	NA
## 6960	2009-12-04	NA	NA	NA	NA	NA
## 6961	2009-12-05	NA	NA	NA	NA	NA
## 6962	2009-12-06	NA	NA	NA	NA	NA
## 6963	2009-12-07	NA	NA	NA	NA	NA
## 6964	2009-12-08	NA	NA	NA	NA	NA
## 6965	2009-12-09	NA	NA	NA	NA	NA
## 6966	2009-12-10	NA	NA	NA	NA	NA
## 6967	2009-12-11	NA	NA	NA	NA	NA
## 6968	2009-12-12	NA	NA	NA	NA	NA
## 6969	2009-12-13	NA	NA	NA	NA	NA
## 6970	2009-12-14	NA	NA	NA	NA	NA
## 6971	2009-12-15	NA	NA	NA	NA	NA
## 6972	2009-12-16	NA	NA	NA	NA	NA

## 6973	2009-12-17	NA	NA	NA	NA	NA
## 6974	2009-12-18	NA	NA	NA	NA	NA
## 6975	2009-12-19	NA	NA	NA	NA	NA
## 6976	2009-12-20	NA	NA	NA	NA	NA
## 6977	2009-12-21	NA	NA	NA	NA	NA
## 6978	2009-12-22	NA	NA	NA	NA	NA
## 6979	2009-12-23	NA	NA	NA	NA	NA
## 6980	2009-12-24	NA	NA	NA	NA	NA
## 6981	2009-12-25	NA	NA	NA	NA	NA
## 6982	2009-12-26	NA	NA	NA	NA	NA
## 6983	2009-12-27	NA	NA	NA	NA	NA
## 6984	2009-12-28	NA	NA	NA	NA	NA
## 6985	2009-12-29	NA	NA	NA	NA	NA
## 6986	2009-12-30	NA	NA	NA	NA	NA
## 6987	2009-12-31	NA	NA	NA	NA	NA
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## 6993	2010-01-06	NA	NA	NA	NA	NA
## 6994	2010-01-07	NA	NA	NA	NA	NA
## 6995	2010-01-08	NA	NA	NA	NA	NA
## 6996	2010-01-09	NA	NA	NA	NA	NA
## 6997	2010-01-10	NA	NA	NA	NA	NA
## 6998	2010-01-11	NA	NA	NA	NA	NA
## 6999	2010-01-12	NA	NA	NA	NA	NA
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## 7001	2010-01-14	NA	NA	NA	NA	NA
## 7002	2010-01-15	NA	NA	NA	NA	NA
## 7003	2010-01-16	NA	NA	NA	NA	NA
## 7004	2010-01-17	NA	NA	NA	NA	NA
## 7005	2010-01-18	NA	NA	NA	NA	NA
## 7006	2010-01-19	NA	NA	NA	NA	NA
## 7007	2010-01-20	NA	NA	NA	NA	NA
## 7008	2010-01-21	NA	NA	NA	NA	NA
## 7009	2010-01-22	NA	NA	NA	NA	NA
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## 7011	2010-01-24	NA	NA	NA	NA	NA
## 7012	2010-01-25	NA	NA	NA	NA	NA
## 7013	2010-01-26	NA	NA	NA	NA	NA
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## 7018	2010-01-31	NA	NA	NA	NA	NA
## 7019	2010-02-01	NA	NA	NA	NA	NA
## 7020	2010-02-02	NA	NA	NA	NA	NA
## 7021	2010-02-03	NA	NA	NA	NA	NA
## 7022	2010-02-04	NA	NA	NA	NA	NA
## 7023	2010-02-05	NA	NA	NA	NA	NA
## 7024	2010-02-06	NA	NA	NA	NA	NA
## 7025	2010-02-07	NA	NA	NA	NA	NA
## 7026	2010-02-08	NA	NA	NA	NA	NA

##	7027	2010-02-09	NA	NA	NA	NA	NA
##	7028	2010-02-10	NA	NA	NA	NA	NA
##	7029	2010-02-11	NA	NA	NA	NA	NA
##	7030	2010-02-12	NA	NA	NA	NA	NA
##	7031	2010-02-13	NA	NA	NA	NA	NA
##	7032	2010-02-14	NA	NA	NA	NA	NA
##	7033	2010-02-15	NA	NA	NA	NA	NA
##	7034	2010-02-16	NA	NA	NA	NA	NA
##	7035	2010-02-17	NA	NA	NA	NA	NA
##	7036	2010-02-18	NA	NA	NA	NA	NA
##	7037	2010-02-19	NA	NA	NA	NA	NA
##	7038	2010-02-20	NA	NA	NA	NA	NA
##	7039	2010-02-21	NA	NA	NA	NA	NA
##	7040	2010-02-22	NA	NA	NA	NA	NA
##	7041	2010-02-23	NA	NA	NA	NA	NA
##	7042	2010-02-24	NA	NA	NA	NA	NA
##	7043	2010-02-25	NA	NA	NA	NA	NA
##	7044	2010-02-26	NA	NA	NA	NA	NA
##	7045	2010-02-27	NA	NA	NA	NA	NA
##	7046	2010-02-28	NA	NA	NA	NA	NA
##	7047	2010-03-01	NA	NA	NA	NA	NA
##	7048	2010-03-02	NA	NA	NA	NA	NA
##	7049	2010-03-03	NA	NA	NA	NA	NA
##	7050	2010-03-04	NA	NA	NA	NA	NA
##	7051	2010-03-05	NA	NA	NA	NA	NA
##	7052	2010-03-06	NA	NA	NA	NA	NA
##	7053	2010-03-07	NA	NA	NA	NA	NA
##	7054	2010-03-08	NA	NA	NA	NA	NA
##	7055	2010-03-09	NA	NA	NA	NA	NA
##	7056	2010-03-10	NA	NA	NA	NA	NA
##	7057	2010-03-11	NA	NA	NA	NA	NA
##	7058	2010-03-12	NA	NA	NA	NA	NA
##	7059	2010-03-13	NA	NA	NA	NA	NA
##	7060	2010-03-14	NA	NA	NA	NA	NA
##	7061	2010-03-15	NA	NA	NA	NA	NA
##	7062	2010-03-16	NA	NA	NA	NA	NA
##	7063	2010-03-17	NA	NA	NA	NA	NA
##	7064	2010-03-18	NA	NA	NA	NA	NA
##	7065	2010-03-19	NA	NA	NA	NA	NA
##	7066	2010-03-20	NA	NA	NA	NA	NA
##	7067	2010-03-21	NA	NA	NA	NA	NA
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##	7069	2010-03-23	NA	NA	NA	NA	NA
##	7070	2010-03-24	NA	NA	NA	NA	NA
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##	7075	2010-03-29	NA	NA	NA	NA	NA
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##	7079	2010-04-02	NA	NA	NA	NA	NA
##	7080	2010-04-03	NA	NA	NA	NA	NA

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##	7083	2010-04-06	NA	NA	NA	NA	NA
##	7084	2010-04-07	NA	NA	NA	NA	NA
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##	7087	2010-04-10	NA	NA	NA	NA	NA
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##	7091	2010-04-14	NA	NA	NA	NA	NA
##	7092	2010-04-15	NA	NA	NA	NA	NA
##	7093	2010-04-16	NA	NA	NA	NA	NA
##	7094	2010-04-17	NA	NA	NA	NA	NA
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##	7097	2010-04-20	NA	NA	NA	NA	NA
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##	7101	2010-04-24	NA	NA	NA	NA	NA
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##	7117	2010-05-10	NA	NA	NA	NA	NA
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##	7119	2010-05-12	NA	NA	NA	NA	NA
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##	7125	2010-05-18	NA	NA	NA	NA	NA
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##	7131	2010-05-24	NA	NA	NA	NA	NA
##	7132	2010-05-25	NA	NA	NA	NA	NA
##	7133	2010-05-26	NA	NA	NA	NA	NA
##	7134	2010-05-27	NA	NA	NA	NA	NA

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## 7136	2010-05-29	NA	NA	NA	NA	NA
## 7137	2010-05-30	NA	NA	NA	NA	NA
## 7138	2010-05-31	NA	NA	NA	NA	NA
## 7139	2010-06-01	NA	NA	NA	NA	NA
## 7140	2010-06-02	NA	NA	NA	NA	NA
## 7141	2010-06-03	NA	NA	NA	NA	NA
## 7142	2010-06-04	NA	NA	NA	NA	NA
## 7143	2010-06-05	NA	NA	NA	NA	NA
## 7144	2010-06-06	NA	NA	NA	NA	NA
## 7145	2010-06-07	NA	NA	NA	NA	NA
## 7146	2010-06-08	NA	NA	NA	NA	NA
## 7147	2010-06-09	NA	NA	NA	NA	NA
## 7148	2010-06-10	NA	NA	NA	NA	NA
## 7149	2010-06-11	NA	NA	NA	NA	NA
## 7150	2010-06-12	NA	NA	NA	NA	NA
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## 7153	2010-06-15	NA	NA	NA	NA	NA
## 7154	2010-06-16	NA	NA	NA	NA	NA
## 7155	2010-06-17	NA	NA	NA	NA	NA
## 7156	2010-06-18	NA	NA	NA	NA	NA
## 7157	2010-06-19	NA	NA	NA	NA	NA
## 7158	2010-06-20	NA	NA	NA	NA	NA
## 7159	2010-06-21	NA	NA	NA	NA	NA
## 7160	2010-06-22	NA	NA	NA	NA	NA
## 7161	2010-06-23	NA	NA	NA	NA	NA
## 7162	2010-06-24	NA	NA	NA	NA	NA
## 7163	2010-06-25	NA	NA	NA	NA	NA
## 7164	2010-06-26	NA	NA	NA	NA	NA
## 7165	2010-06-27	NA	NA	NA	NA	NA
## 7166	2010-06-28	NA	NA	NA	NA	NA
## 7167	2010-06-29	NA	NA	NA	NA	NA
## 7168	2010-06-30	NA	NA	NA	NA	NA
## 7169	2010-07-01	NA	NA	NA	NA	NA
## 7170	2010-07-02	NA	NA	NA	NA	NA
## 7171	2010-07-03	NA	NA	NA	NA	NA
## 7172	2010-07-04	NA	NA	NA	NA	NA
## 7173	2010-07-05	NA	NA	NA	NA	NA
## 7174	2010-07-06	NA	NA	NA	NA	NA
## 7175	2010-07-07	NA	NA	NA	NA	NA
## 7176	2010-07-08	NA	NA	NA	NA	NA
## 7177	2010-07-09	NA	NA	NA	NA	NA
## 7178	2010-07-10	NA	NA	NA	NA	NA
## 7179	2010-07-11	NA	NA	NA	NA	NA
## 7180	2010-07-12	NA	NA	NA	NA	NA
## 7181	2010-07-13	NA	NA	NA	NA	NA
## 7182	2010-07-14	NA	NA	NA	NA	NA
## 7183	2010-07-15	NA	NA	NA	NA	NA
## 7184	2010-07-16	NA	NA	NA	NA	NA
## 7185	2010-07-17	NA	NA	NA	NA	NA
## 7186	2010-07-18	NA	NA	NA	NA	NA
## 7187	2010-07-19	NA	NA	NA	NA	NA
## 7188	2010-07-20	NA	NA	NA	NA	NA

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##	7190	2010-07-22	NA	NA	NA	NA	NA
##	7191	2010-07-23	NA	NA	NA	NA	NA
##	7192	2010-07-24	NA	NA	NA	NA	NA
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##	7201	2010-08-02	NA	NA	NA	NA	NA
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##	7206	2010-08-07	NA	NA	NA	NA	NA
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##	7217	2010-08-18	NA	NA	NA	NA	NA
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##	7220	2010-08-21	NA	NA	NA	NA	NA
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##	7222	2010-08-23	NA	NA	NA	NA	NA
##	7223	2010-08-24	NA	NA	NA	NA	NA
##	7224	2010-08-25	NA	NA	NA	NA	NA
##	7225	2010-08-26	NA	NA	NA	NA	NA
##	7226	2010-08-27	NA	NA	NA	NA	NA
##	7227	2010-08-28	NA	NA	NA	NA	NA
##	7228	2010-08-29	NA	NA	NA	NA	NA
##	7229	2010-08-30	NA	NA	NA	NA	NA
##	7230	2010-08-31	NA	NA	NA	NA	NA
##	7231	2010-09-01	NA	NA	NA	NA	NA
##	7232	2010-09-02	NA	NA	NA	NA	NA
##	7233	2010-09-03	NA	NA	NA	NA	NA
##	7234	2010-09-04	NA	NA	NA	NA	NA
##	7235	2010-09-05	NA	NA	NA	NA	NA
##	7236	2010-09-06	NA	NA	NA	NA	NA
##	7237	2010-09-07	NA	NA	NA	NA	NA
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##	7239	2010-09-09	NA	NA	NA	NA	NA
##	7240	2010-09-10	NA	NA	NA	NA	NA
##	7241	2010-09-11	NA	NA	NA	NA	NA
##	7242	2010-09-12	NA	NA	NA	NA	NA

##	7243	2010-09-13	NA	NA	NA	NA	NA
##	7244	2010-09-14	NA	NA	NA	NA	NA
##	7245	2010-09-15	NA	NA	NA	NA	NA
##	7246	2010-09-16	NA	NA	NA	NA	NA
##	7247	2010-09-17	NA	NA	NA	NA	NA
##	7248	2010-09-18	NA	NA	NA	NA	NA
##	7249	2010-09-19	NA	NA	NA	NA	NA
##	7250	2010-09-20	NA	NA	NA	NA	NA
##	7251	2010-09-21	NA	NA	NA	NA	NA
##	7252	2010-09-22	NA	NA	NA	NA	NA
##	7253	2010-09-23	NA	NA	NA	NA	NA
##	7254	2010-09-24	NA	NA	NA	NA	NA
##	7255	2010-09-25	NA	NA	NA	NA	NA
##	7256	2010-09-26	NA	NA	NA	NA	NA
##	7257	2010-09-27	NA	NA	NA	NA	NA
##	7258	2010-09-28	NA	NA	NA	NA	NA
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##	7260	2010-09-30	NA	NA	NA	NA	NA
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##	7262	2010-10-02	NA	NA	NA	NA	NA
##	7263	2010-10-03	NA	NA	NA	NA	NA
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##	7265	2010-10-05	NA	NA	NA	NA	NA
##	7266	2010-10-06	NA	NA	NA	NA	NA
##	7267	2010-10-07	NA	NA	NA	NA	NA
##	7268	2010-10-08	NA	NA	NA	NA	NA
##	7269	2010-10-09	NA	NA	NA	NA	NA
##	7270	2010-10-10	NA	NA	NA	NA	NA
##	7271	2010-10-11	NA	NA	NA	NA	NA
##	7272	2010-10-12	NA	NA	NA	NA	NA
##	7273	2010-10-13	NA	NA	NA	NA	NA
##	7274	2010-10-14	NA	NA	NA	NA	NA
##	7275	2010-10-15	NA	NA	NA	NA	NA
##	7276	2010-10-16	NA	NA	NA	NA	NA
##	7277	2010-10-17	NA	NA	NA	NA	NA
##	7278	2010-10-18	NA	NA	NA	NA	NA
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##	7282	2010-10-22	NA	NA	NA	NA	NA
##	7283	2010-10-23	NA	NA	NA	NA	NA
##	7284	2010-10-24	NA	NA	NA	NA	NA
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##	7286	2010-10-26	NA	NA	NA	NA	NA
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##	7290	2010-10-30	NA	NA	NA	NA	NA
##	7291	2010-10-31	NA	NA	NA	NA	NA
##	7292	2010-11-01	NA	NA	NA	NA	NA
##	7293	2010-11-02	NA	NA	NA	NA	NA
##	7294	2010-11-03	NA	NA	NA	NA	NA
##	7295	2010-11-04	NA	NA	NA	NA	NA
##	7296	2010-11-05	NA	NA	NA	NA	NA

##	7297	2010-11-06	NA	NA	NA	NA	NA
##	7298	2010-11-07	NA	NA	NA	NA	NA
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##	7305	2010-11-14	NA	NA	NA	NA	NA
##	7306	2010-11-15	NA	NA	NA	NA	NA
##	7307	2010-11-16	NA	NA	NA	NA	NA
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##	7309	2010-11-18	NA	NA	NA	NA	NA
##	7310	2010-11-19	NA	NA	NA	NA	NA
##	7311	2010-11-20	NA	NA	NA	NA	NA
##	7312	2010-11-21	NA	NA	NA	NA	NA
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##	7315	2010-11-24	NA	NA	NA	NA	NA
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##	7318	2010-11-27	NA	NA	NA	NA	NA
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##	7323	2010-12-02	NA	NA	NA	NA	NA
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##	7335	2010-12-14	NA	NA	NA	NA	NA
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##	7337	2010-12-16	NA	NA	NA	NA	NA
##	7338	2010-12-17	NA	NA	NA	NA	NA
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##	7342	2010-12-21	NA	NA	NA	NA	NA
##	7343	2010-12-22	NA	NA	NA	NA	NA
##	7344	2010-12-23	NA	NA	NA	NA	NA
##	7345	2010-12-24	NA	NA	NA	NA	NA
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##	7347	2010-12-26	NA	NA	NA	NA	NA
##	7348	2010-12-27	NA	NA	NA	NA	NA
##	7349	2010-12-28	NA	NA	NA	NA	NA
##	7350	2010-12-29	NA	NA	NA	NA	NA

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##	7352	2010-12-31	NA	NA	NA	NA	NA
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##	7354	2011-01-02	NA	NA	NA	NA	NA
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##	7357	2011-01-05	NA	NA	NA	NA	NA
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##	7362	2011-01-10	NA	NA	NA	NA	NA
##	7363	2011-01-11	NA	NA	NA	NA	NA
##	7364	2011-01-12	NA	NA	NA	NA	NA
##	7365	2011-01-13	NA	NA	NA	NA	NA
##	7366	2011-01-14	NA	NA	NA	NA	NA
##	7367	2011-01-15	NA	NA	NA	NA	NA
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##	7371	2011-01-19	NA	NA	NA	NA	NA
##	7372	2011-01-20	NA	NA	NA	NA	NA
##	7373	2011-01-21	NA	NA	NA	NA	NA
##	7374	2011-01-22	NA	NA	NA	NA	NA
##	7375	2011-01-23	NA	NA	NA	NA	NA
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##	7391	2011-02-08	NA	NA	NA	NA	NA
##	7392	2011-02-09	NA	NA	NA	NA	NA
##	7393	2011-02-10	NA	NA	NA	NA	NA
##	7394	2011-02-11	NA	NA	NA	NA	NA
##	7395	2011-02-12	NA	NA	NA	NA	NA
##	7396	2011-02-13	NA	NA	NA	NA	NA
##	7397	2011-02-14	NA	NA	NA	NA	NA
##	7398	2011-02-15	NA	NA	NA	NA	NA
##	7399	2011-02-16	NA	NA	NA	NA	NA
##	7400	2011-02-17	NA	NA	NA	NA	NA
##	7401	2011-02-18	NA	NA	NA	NA	NA
##	7402	2011-02-19	NA	NA	NA	NA	NA
##	7403	2011-02-20	NA	NA	NA	NA	NA
##	7404	2011-02-21	NA	NA	NA	NA	NA

##	7405	2011-02-22	NA	NA	NA	NA	NA
##	7406	2011-02-23	NA	NA	NA	NA	NA
##	7407	2011-02-24	NA	NA	NA	NA	NA
##	7408	2011-02-25	NA	NA	NA	NA	NA
##	7409	2011-02-26	NA	NA	NA	NA	NA
##	7410	2011-02-27	NA	NA	NA	NA	NA
##	7411	2011-02-28	NA	NA	NA	NA	NA
##	7412	2011-03-01	NA	NA	NA	NA	NA
##	7413	2011-03-02	NA	NA	NA	NA	NA
##	7414	2011-03-03	NA	NA	NA	NA	NA
##	7415	2011-03-04	NA	NA	NA	NA	NA
##	7416	2011-03-05	NA	NA	NA	NA	NA
##	7417	2011-03-06	NA	NA	NA	NA	NA
##	7418	2011-03-07	NA	NA	NA	NA	NA
##	7419	2011-03-08	NA	NA	NA	NA	NA
##	7420	2011-03-09	NA	NA	NA	NA	NA
##	7421	2011-03-10	NA	NA	NA	NA	NA
##	7422	2011-03-11	NA	NA	NA	NA	NA
##	7423	2011-03-12	NA	NA	NA	NA	NA
##	7424	2011-03-13	NA	NA	NA	NA	NA
##	7425	2011-03-14	NA	NA	NA	NA	NA
##	7426	2011-03-15	NA	NA	NA	NA	NA
##	7427	2011-03-16	NA	NA	NA	NA	NA
##	7428	2011-03-17	NA	NA	NA	NA	NA
##	7429	2011-03-18	NA	NA	NA	NA	NA
##	7430	2011-03-19	NA	NA	NA	NA	NA
##	7431	2011-03-20	NA	NA	NA	NA	NA
##	7432	2011-03-21	NA	NA	NA	NA	NA
##	7433	2011-03-22	NA	NA	NA	NA	NA
##	7434	2011-03-23	NA	NA	NA	NA	NA
##	7435	2011-03-24	NA	NA	NA	NA	NA
##	7436	2011-03-25	NA	NA	NA	NA	NA
##	7437	2011-03-26	NA	NA	NA	NA	NA
##	7438	2011-03-27	NA	NA	NA	NA	NA
##	7439	2011-03-28	NA	NA	NA	NA	NA
##	7440	2011-03-29	NA	NA	NA	NA	NA
##	7441	2011-03-30	NA	NA	NA	NA	NA
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##	7443	2011-04-01	NA	NA	NA	NA	NA
##	7444	2011-04-02	NA	NA	NA	NA	NA
##	7445	2011-04-03	NA	NA	NA	NA	NA
##	7446	2011-04-04	NA	NA	NA	NA	NA
##	7447	2011-04-05	NA	NA	NA	NA	NA
##	7448	2011-04-06	NA	NA	NA	NA	NA
##	7449	2011-04-07	NA	NA	NA	NA	NA
##	7450	2011-04-08	NA	NA	NA	NA	NA
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##	7452	2011-04-10	NA	NA	NA	NA	NA
##	7453	2011-04-11	NA	NA	NA	NA	NA
##	7454	2011-04-12	NA	NA	NA	NA	NA
##	7455	2011-04-13	NA	NA	NA	NA	NA
##	7456	2011-04-14	NA	NA	NA	NA	NA
##	7457	2011-04-15	NA	NA	NA	NA	NA
##	7458	2011-04-16	NA	NA	NA	NA	NA

## 7459	2011-04-17	NA	NA	NA	NA	NA
## 7460	2011-04-18	NA	NA	NA	NA	NA
## 7461	2011-04-19	NA	NA	NA	NA	NA
## 7462	2011-04-20	NA	NA	NA	NA	NA
## 7463	2011-04-21	NA	NA	NA	NA	NA
## 7464	2011-04-22	NA	NA	NA	NA	NA
## 7465	2011-04-23	NA	NA	NA	NA	NA
## 7466	2011-04-24	NA	NA	NA	NA	NA
## 7467	2011-04-25	NA	NA	NA	NA	NA
## 7468	2011-04-26	NA	NA	NA	NA	NA
## 7469	2011-04-27	NA	NA	NA	NA	NA
## 7470	2011-04-28	NA	NA	NA	NA	NA
## 7471	2011-04-29	NA	NA	NA	NA	NA
## 7472	2011-04-30	NA	NA	NA	NA	NA
## 7473	2011-05-01	NA	NA	NA	NA	NA
## 7474	2011-05-02	NA	NA	NA	NA	NA
## 7475	2011-05-03	NA	NA	NA	NA	NA
## 7476	2011-05-04	NA	NA	NA	NA	NA
## 7477	2011-05-05	NA	NA	NA	NA	NA
## 7478	2011-05-06	NA	NA	NA	NA	NA
## 7479	2011-05-07	NA	NA	NA	NA	NA
## 7480	2011-05-08	NA	NA	NA	NA	NA
## 7481	2011-05-09	NA	NA	NA	NA	NA
## 7482	2011-05-10	NA	NA	NA	NA	NA
## 7483	2011-05-11	NA	NA	NA	NA	NA
## 7484	2011-05-12	NA	NA	NA	NA	NA
## 7485	2011-05-13	NA	NA	NA	NA	NA
## 7486	2011-05-14	NA	NA	NA	NA	NA
## 7487	2011-05-15	NA	NA	NA	NA	NA
## 7488	2011-05-16	NA	NA	NA	NA	NA
## 7489	2011-05-17	NA	NA	NA	NA	NA
## 7490	2011-05-18	NA	NA	NA	NA	NA
## 7491	2011-05-19	NA	NA	NA	NA	NA
## 7492	2011-05-20	NA	NA	NA	NA	NA
## 7493	2011-05-21	NA	NA	NA	NA	NA
## 7494	2011-05-22	NA	NA	NA	NA	NA
## 7495	2011-05-23	NA	NA	NA	NA	NA
## 7496	2011-05-24	NA	NA	NA	NA	NA
## 7497	2011-05-25	NA	NA	NA	NA	NA
## 7498	2011-05-26	NA	NA	NA	NA	NA
## 7499	2011-05-27	NA	NA	NA	NA	NA
## 7500	2011-05-28	NA	NA	NA	NA	NA
## 7501	2011-05-29	NA	NA	NA	NA	NA
## 7502	2011-05-30	NA	NA	NA	NA	NA
## 7503	2011-05-31	NA	NA	NA	NA	NA
## 7504	2011-06-01	NA	NA	NA	NA	NA
## 7505	2011-06-02	NA	NA	NA	NA	NA
## 7506	2011-06-03	NA	NA	NA	NA	NA
## 7507	2011-06-04	NA	NA	NA	NA	NA
## 7508	2011-06-05	NA	NA	NA	NA	NA
## 7509	2011-06-06	NA	NA	NA	NA	NA
## 7510	2011-06-07	NA	NA	NA	NA	NA
## 7511	2011-06-08	NA	NA	NA	NA	NA
## 7512	2011-06-09	NA	NA	NA	NA	NA

## 7513	2011-06-10	NA	NA	NA	NA	NA
## 7514	2011-06-11	NA	NA	NA	NA	NA
## 7515	2011-06-12	NA	NA	NA	NA	NA
## 7516	2011-06-13	NA	NA	NA	NA	NA
## 7517	2011-06-14	NA	NA	NA	NA	NA
## 7518	2011-06-15	NA	NA	NA	NA	NA
## 7519	2011-06-16	NA	NA	NA	NA	NA
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## 7535	2011-07-02	NA	NA	NA	NA	NA
## 7536	2011-07-03	NA	NA	NA	NA	NA
## 7537	2011-07-04	NA	NA	NA	NA	NA
## 7538	2011-07-05	NA	NA	NA	NA	NA
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## 7541	2011-07-08	NA	NA	NA	NA	NA
## 7542	2011-07-09	NA	NA	NA	NA	NA
## 7543	2011-07-10	NA	NA	NA	NA	NA
## 7544	2011-07-11	NA	NA	NA	NA	NA
## 7545	2011-07-12	NA	NA	NA	NA	NA
## 7546	2011-07-13	NA	NA	NA	NA	NA
## 7547	2011-07-14	NA	NA	NA	NA	NA
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## 7549	2011-07-16	NA	NA	NA	NA	NA
## 7550	2011-07-17	NA	NA	NA	NA	NA
## 7551	2011-07-18	NA	NA	NA	NA	NA
## 7552	2011-07-19	NA	NA	NA	NA	NA
## 7553	2011-07-20	NA	NA	NA	NA	NA
## 7554	2011-07-21	NA	NA	NA	NA	NA
## 7555	2011-07-22	NA	NA	NA	NA	NA
## 7556	2011-07-23	NA	NA	NA	NA	NA
## 7557	2011-07-24	NA	NA	NA	NA	NA
## 7558	2011-07-25	NA	NA	NA	NA	NA
## 7559	2011-07-26	NA	NA	NA	NA	NA
## 7560	2011-07-27	NA	NA	NA	NA	NA
## 7561	2011-07-28	NA	NA	NA	NA	NA
## 7562	2011-07-29	NA	NA	NA	NA	NA
## 7563	2011-07-30	NA	NA	NA	NA	NA
## 7564	2011-07-31	NA	NA	NA	NA	NA
## 7565	2011-08-01	NA	NA	NA	NA	NA
## 7566	2011-08-02	NA	NA	NA	NA	NA

## 7567	2011-08-03	NA	NA	NA	NA	NA
## 7568	2011-08-04	NA	NA	NA	NA	NA
## 7569	2011-08-05	NA	NA	NA	NA	NA
## 7570	2011-08-06	NA	NA	NA	NA	NA
## 7571	2011-08-07	NA	NA	NA	NA	NA
## 7572	2011-08-08	NA	NA	NA	NA	NA
## 7573	2011-08-09	NA	NA	NA	NA	NA
## 7574	2011-08-10	NA	NA	NA	NA	NA
## 7575	2011-08-11	NA	NA	NA	NA	NA
## 7576	2011-08-12	NA	NA	NA	NA	NA
## 7577	2011-08-13	NA	NA	NA	NA	NA
## 7578	2011-08-14	NA	NA	NA	NA	NA
## 7579	2011-08-15	NA	NA	NA	NA	NA
## 7580	2011-08-16	NA	NA	NA	NA	NA
## 7581	2011-08-17	NA	NA	NA	NA	NA
## 7582	2011-08-18	NA	NA	NA	NA	NA
## 7583	2011-08-19	NA	NA	NA	NA	NA
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## 7587	2011-08-23	NA	NA	NA	NA	NA
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## 7589	2011-08-25	NA	NA	NA	NA	NA
## 7590	2011-08-26	NA	NA	NA	NA	NA
## 7591	2011-08-27	NA	NA	NA	NA	NA
## 7592	2011-08-28	NA	NA	NA	NA	NA
## 7593	2011-08-29	NA	NA	NA	NA	NA
## 7594	2011-08-30	NA	NA	NA	NA	NA
## 7595	2011-08-31	NA	NA	NA	NA	NA
## 7596	2011-09-01	NA	NA	NA	NA	NA
## 7597	2011-09-02	NA	NA	NA	NA	NA
## 7598	2011-09-03	NA	NA	NA	NA	NA
## 7599	2011-09-04	NA	NA	NA	NA	NA
## 7600	2011-09-05	NA	NA	NA	NA	NA
## 7601	2011-09-06	NA	NA	NA	NA	NA
## 7602	2011-09-07	NA	NA	NA	NA	NA
## 7603	2011-09-08	NA	NA	NA	NA	NA
## 7604	2011-09-09	NA	NA	NA	NA	NA
## 7605	2011-09-10	NA	NA	NA	NA	NA
## 7606	2011-09-11	NA	NA	NA	NA	NA
## 7607	2011-09-12	NA	NA	NA	NA	NA
## 7608	2011-09-13	NA	NA	NA	NA	NA
## 7609	2011-09-14	NA	NA	NA	NA	NA
## 7610	2011-09-15	NA	NA	NA	NA	NA
## 7611	2011-09-16	NA	NA	NA	NA	NA
## 7612	2011-09-17	NA	NA	NA	NA	NA
## 7613	2011-09-18	NA	NA	NA	NA	NA
## 7614	2011-09-19	NA	NA	NA	NA	NA
## 7615	2011-09-20	NA	NA	NA	NA	NA
## 7616	2011-09-21	NA	NA	NA	NA	NA
## 7617	2011-09-22	NA	NA	NA	NA	NA
## 7618	2011-09-23	NA	NA	NA	NA	NA
## 7619	2011-09-24	NA	NA	NA	NA	NA
## 7620	2011-09-25	NA	NA	NA	NA	NA

## 7621	2011-09-26	NA	NA	NA	NA	NA
## 7622	2011-09-27	NA	NA	NA	NA	NA
## 7623	2011-09-28	NA	NA	NA	NA	NA
## 7624	2011-09-29	NA	NA	NA	NA	NA
## 7625	2011-09-30	NA	NA	NA	NA	NA
## 7626	2011-10-01	NA	NA	NA	NA	NA
## 7627	2011-10-02	NA	NA	NA	NA	NA
## 7628	2011-10-03	NA	NA	NA	NA	NA
## 7629	2011-10-04	NA	NA	NA	NA	NA
## 7630	2011-10-05	NA	NA	NA	NA	NA
## 7631	2011-10-06	NA	NA	NA	NA	NA
## 7632	2011-10-07	NA	NA	NA	NA	NA
## 7633	2011-10-08	NA	NA	NA	NA	NA
## 7634	2011-10-09	NA	NA	NA	NA	NA
## 7635	2011-10-10	NA	NA	NA	NA	NA
## 7636	2011-10-11	NA	NA	NA	NA	NA
## 7637	2011-10-12	NA	NA	NA	NA	NA
## 7638	2011-10-13	NA	NA	NA	NA	NA
## 7639	2011-10-14	NA	NA	NA	NA	NA
## 7640	2011-10-15	NA	NA	NA	NA	NA
## 7641	2011-10-16	NA	NA	NA	NA	NA
## 7642	2011-10-17	NA	NA	NA	NA	NA
## 7643	2011-10-18	NA	NA	NA	NA	NA
## 7644	2011-10-19	NA	NA	NA	NA	NA
## 7645	2011-10-20	NA	NA	NA	NA	NA
## 7646	2011-10-21	NA	NA	NA	NA	NA
## 7647	2011-10-22	NA	NA	NA	NA	NA
## 7648	2011-10-23	NA	NA	NA	NA	NA
## 7649	2011-10-24	NA	NA	NA	NA	NA
## 7650	2011-10-25	NA	NA	NA	NA	NA
## 7651	2011-10-26	NA	NA	NA	NA	NA
## 7652	2011-10-27	NA	NA	NA	NA	NA
## 7653	2011-10-28	NA	NA	NA	NA	NA
## 7654	2011-10-29	NA	NA	NA	NA	NA
## 7655	2011-10-30	NA	NA	NA	NA	NA
## 7656	2011-10-31	NA	NA	NA	NA	NA
## 7657	2011-11-01	NA	NA	NA	NA	NA
## 7658	2011-11-02	NA	NA	NA	NA	NA
## 7659	2011-11-03	NA	NA	NA	NA	NA
## 7660	2011-11-04	NA	NA	NA	NA	NA
## 7661	2011-11-05	NA	NA	NA	NA	NA
## 7662	2011-11-06	NA	NA	NA	NA	NA
## 7663	2011-11-07	NA	NA	NA	NA	NA
## 7664	2011-11-08	NA	NA	NA	NA	NA
## 7665	2011-11-09	NA	NA	NA	NA	NA
## 7666	2011-11-10	NA	NA	NA	NA	NA
## 7667	2011-11-11	NA	NA	NA	NA	NA
## 7668	2011-11-12	NA	NA	NA	NA	NA
## 7669	2011-11-13	NA	NA	NA	NA	NA
## 7670	2011-11-14	NA	NA	NA	NA	NA
## 7671	2011-11-15	NA	NA	NA	NA	NA
## 7672	2011-11-16	NA	NA	NA	NA	NA
## 7673	2011-11-17	NA	NA	NA	NA	NA
## 7674	2011-11-18	NA	NA	NA	NA	NA

## 7675	2011-11-19	NA	NA	NA	NA	NA
## 7676	2011-11-20	NA	NA	NA	NA	NA
## 7677	2011-11-21	NA	NA	NA	NA	NA
## 7678	2011-11-22	NA	NA	NA	NA	NA
## 7679	2011-11-23	NA	NA	NA	NA	NA
## 7680	2011-11-24	NA	NA	NA	NA	NA
## 7681	2011-11-25	NA	NA	NA	NA	NA
## 7682	2011-11-26	NA	NA	NA	NA	NA
## 7683	2011-11-27	NA	NA	NA	NA	NA
## 7684	2011-11-28	NA	NA	NA	NA	NA
## 7685	2011-11-29	NA	NA	NA	NA	NA
## 7686	2011-11-30	NA	NA	NA	NA	NA
## 7687	2011-12-01	NA	NA	NA	NA	NA
## 7688	2011-12-02	NA	NA	NA	NA	NA
## 7689	2011-12-03	NA	NA	NA	NA	NA
## 7690	2011-12-04	NA	NA	NA	NA	NA
## 7691	2011-12-05	NA	NA	NA	NA	NA
## 7692	2011-12-06	NA	NA	NA	NA	NA
## 7693	2011-12-07	NA	NA	NA	NA	NA
## 7694	2011-12-08	NA	NA	NA	NA	NA
## 7695	2011-12-09	NA	NA	NA	NA	NA
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## 7700	2011-12-14	NA	NA	NA	NA	NA
## 7701	2011-12-15	NA	NA	NA	NA	NA
## 7702	2011-12-16	NA	NA	NA	NA	NA
## 7703	2011-12-17	NA	NA	NA	NA	NA
## 7704	2011-12-18	NA	NA	NA	NA	NA
## 7705	2011-12-19	NA	NA	NA	NA	NA
## 7706	2011-12-20	NA	NA	NA	NA	NA
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## 7708	2011-12-22	NA	NA	NA	NA	NA
## 7709	2011-12-23	NA	NA	NA	NA	NA
## 7710	2011-12-24	NA	NA	NA	NA	NA
## 7711	2011-12-25	NA	NA	NA	NA	NA
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## 7713	2011-12-27	NA	NA	NA	NA	NA
## 7714	2011-12-28	NA	NA	NA	NA	NA
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## 7717	2011-12-31	NA	NA	NA	NA	NA
## 7718	2012-01-01	NA	NA	NA	NA	NA
## 7719	2012-01-02	NA	NA	NA	NA	NA
## 7720	2012-01-03	NA	NA	NA	NA	NA
## 7721	2012-01-04	NA	NA	NA	NA	NA
## 7722	2012-01-05	NA	NA	NA	NA	NA
## 7723	2012-01-06	NA	NA	NA	NA	NA
## 7724	2012-01-07	NA	NA	NA	NA	NA
## 7725	2012-01-08	NA	NA	NA	NA	NA
## 7726	2012-01-09	NA	NA	NA	NA	NA
## 7727	2012-01-10	NA	NA	NA	NA	NA
## 7728	2012-01-11	NA	NA	NA	NA	NA

## 7729	2012-01-12	NA	NA	NA	NA	NA
## 7730	2012-01-13	NA	NA	NA	NA	NA
## 7731	2012-01-14	NA	NA	NA	NA	NA
## 7732	2012-01-15	NA	NA	NA	NA	NA
## 7733	2012-01-16	NA	NA	NA	NA	NA
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## 7735	2012-01-18	NA	NA	NA	NA	NA
## 7736	2012-01-19	NA	NA	NA	NA	NA
## 7737	2012-01-20	NA	NA	NA	NA	NA
## 7738	2012-01-21	NA	NA	NA	NA	NA
## 7739	2012-01-22	NA	NA	NA	NA	NA
## 7740	2012-01-23	NA	NA	NA	NA	NA
## 7741	2012-01-24	NA	NA	NA	NA	NA
## 7742	2012-01-25	NA	NA	NA	NA	NA
## 7743	2012-01-26	NA	NA	NA	NA	NA
## 7744	2012-01-27	NA	NA	NA	NA	NA
## 7745	2012-01-28	NA	NA	NA	NA	NA
## 7746	2012-01-29	NA	NA	NA	NA	NA
## 7747	2012-01-30	NA	NA	NA	NA	NA
## 7748	2012-01-31	NA	NA	NA	NA	NA
## 7749	2012-02-01	NA	NA	NA	NA	NA
## 7750	2012-02-02	NA	NA	NA	NA	NA
## 7751	2012-02-03	NA	NA	NA	NA	NA
## 7752	2012-02-04	NA	NA	NA	NA	NA
## 7753	2012-02-05	NA	NA	NA	NA	NA
## 7754	2012-02-06	NA	NA	NA	NA	NA
## 7755	2012-02-07	NA	NA	NA	NA	NA
## 7756	2012-02-08	NA	NA	NA	NA	NA
## 7757	2012-02-09	NA	NA	NA	NA	NA
## 7758	2012-02-10	NA	NA	NA	NA	NA
## 7759	2012-02-11	NA	NA	NA	NA	NA
## 7760	2012-02-12	NA	NA	NA	NA	NA
## 7761	2012-02-13	NA	NA	NA	NA	NA
## 7762	2012-02-14	NA	NA	NA	NA	NA
## 7763	2012-02-15	NA	NA	NA	NA	NA
## 7764	2012-02-16	NA	NA	NA	NA	NA
## 7765	2012-02-17	NA	NA	NA	NA	NA
## 7766	2012-02-18	NA	NA	NA	NA	NA
## 7767	2012-02-19	NA	NA	NA	NA	NA
## 7768	2012-02-20	NA	NA	NA	NA	NA
## 7769	2012-02-21	NA	NA	NA	NA	NA
## 7770	2012-02-22	NA	NA	NA	NA	NA
## 7771	2012-02-23	NA	NA	NA	NA	NA
## 7772	2012-02-24	NA	NA	NA	NA	NA
## 7773	2012-02-25	NA	NA	NA	NA	NA
## 7774	2012-02-26	NA	NA	NA	NA	NA
## 7775	2012-02-27	NA	NA	NA	NA	NA
## 7776	2012-02-28	NA	NA	NA	NA	NA
## 7777	2012-02-29	NA	NA	NA	NA	NA
## 7778	2012-03-01	NA	NA	NA	NA	NA
## 7779	2012-03-02	NA	NA	NA	NA	NA
## 7780	2012-03-03	NA	NA	NA	NA	NA
## 7781	2012-03-04	NA	NA	NA	NA	NA
## 7782	2012-03-05	NA	NA	NA	NA	NA

## 7783	2012-03-06	NA	NA	NA	NA	NA
## 7784	2012-03-07	NA	NA	NA	NA	NA
## 7785	2012-03-08	NA	NA	NA	NA	NA
## 7786	2012-03-09	NA	NA	NA	NA	NA
## 7787	2012-03-10	NA	NA	NA	NA	NA
## 7788	2012-03-11	NA	NA	NA	NA	NA
## 7789	2012-03-12	NA	NA	NA	NA	NA
## 7790	2012-03-13	NA	NA	NA	NA	NA
## 7791	2012-03-14	NA	NA	NA	NA	NA
## 7792	2012-03-15	NA	NA	NA	NA	NA
## 7793	2012-03-16	NA	NA	NA	NA	NA
## 7794	2012-03-17	NA	NA	NA	NA	NA
## 7795	2012-03-18	NA	NA	NA	NA	NA
## 7796	2012-03-19	NA	NA	NA	NA	NA
## 7797	2012-03-20	NA	NA	NA	NA	NA
## 7798	2012-03-21	NA	NA	NA	NA	NA
## 7799	2012-03-22	NA	NA	NA	NA	NA
## 7800	2012-03-23	NA	NA	NA	NA	NA
## 7801	2012-03-24	NA	NA	NA	NA	NA
## 7802	2012-03-25	NA	NA	NA	NA	NA
## 7803	2012-03-26	NA	NA	NA	NA	NA
## 7804	2012-03-27	NA	NA	NA	NA	NA
## 7805	2012-03-28	NA	NA	NA	NA	NA
## 7806	2012-03-29	NA	NA	NA	NA	NA
## 7807	2012-03-30	NA	NA	NA	NA	NA
## 7808	2012-03-31	NA	NA	NA	NA	NA
## 7809	2012-04-01	NA	NA	NA	NA	NA
## 7810	2012-04-02	NA	NA	NA	NA	NA
## 7811	2012-04-03	NA	NA	NA	NA	NA
## 7812	2012-04-04	NA	NA	NA	NA	NA
## 7813	2012-04-05	NA	NA	NA	NA	NA
## 7814	2012-04-06	NA	NA	NA	NA	NA
## 7815	2012-04-07	NA	NA	NA	NA	NA
## 7816	2012-04-08	NA	NA	NA	NA	NA
## 7817	2012-04-09	NA	NA	NA	NA	NA
## 7818	2012-04-10	NA	NA	NA	NA	NA
## 7819	2012-04-11	NA	NA	NA	NA	NA
## 7820	2012-04-12	NA	NA	NA	NA	NA
## 7821	2012-04-13	NA	NA	NA	NA	NA
## 7822	2012-04-14	NA	NA	NA	NA	NA
## 7823	2012-04-15	NA	NA	NA	NA	NA
## 7824	2012-04-16	NA	NA	NA	NA	NA
## 7825	2012-04-17	NA	NA	NA	NA	NA
## 7826	2012-04-18	NA	NA	NA	NA	NA
## 7827	2012-04-19	NA	NA	NA	NA	NA
## 7828	2012-04-20	NA	NA	NA	NA	NA
## 7829	2012-04-21	NA	NA	NA	NA	NA
## 7830	2012-04-22	NA	NA	NA	NA	NA
## 7831	2012-04-23	NA	NA	NA	NA	NA
## 7832	2012-04-24	NA	NA	NA	NA	NA
## 7833	2012-04-25	NA	NA	NA	NA	NA
## 7834	2012-04-26	NA	NA	NA	NA	NA
## 7835	2012-04-27	NA	NA	NA	NA	NA
## 7836	2012-04-28	NA	NA	NA	NA	NA

## 7837	2012-04-29	NA	NA	NA	NA	NA
## 7838	2012-04-30	NA	NA	NA	NA	NA
## 7839	2012-05-01	NA	NA	NA	NA	NA
## 7840	2012-05-02	NA	NA	NA	NA	NA
## 7841	2012-05-03	NA	NA	NA	NA	NA
## 7842	2012-05-04	NA	NA	NA	NA	NA
## 7843	2012-05-05	NA	NA	NA	NA	NA
## 7844	2012-05-06	NA	NA	NA	NA	NA
## 7845	2012-05-07	NA	NA	NA	NA	NA
## 7846	2012-05-08	NA	NA	NA	NA	NA
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## 7848	2012-05-10	NA	NA	NA	NA	NA
## 7849	2012-05-11	NA	NA	NA	NA	NA
## 7850	2012-05-12	NA	NA	NA	NA	NA
## 7851	2012-05-13	NA	NA	NA	NA	NA
## 7852	2012-05-14	NA	NA	NA	NA	NA
## 7853	2012-05-15	NA	NA	NA	NA	NA
## 7854	2012-05-16	NA	NA	NA	NA	NA
## 7855	2012-05-17	NA	NA	NA	NA	NA
## 7856	2012-05-18	NA	NA	NA	NA	NA
## 7857	2012-05-19	NA	NA	NA	NA	NA
## 7858	2012-05-20	NA	NA	NA	NA	NA
## 7859	2012-05-21	NA	NA	NA	NA	NA
## 7860	2012-05-22	NA	NA	NA	NA	NA
## 7861	2012-05-23	NA	NA	NA	NA	NA
## 7862	2012-05-24	NA	NA	NA	NA	NA
## 7863	2012-05-25	NA	NA	NA	NA	NA
## 7864	2012-05-26	NA	NA	NA	NA	NA
## 7865	2012-05-27	NA	NA	NA	NA	NA
## 7866	2012-05-28	NA	NA	NA	NA	NA
## 7867	2012-05-29	NA	NA	NA	NA	NA
## 7868	2012-05-30	NA	NA	NA	NA	NA
## 7869	2012-05-31	NA	NA	NA	NA	NA
## 7870	2012-06-01	NA	NA	NA	NA	NA
## 7871	2012-06-02	NA	NA	NA	NA	NA
## 7872	2012-06-03	NA	NA	NA	NA	NA
## 7873	2012-06-04	NA	NA	NA	NA	NA
## 7874	2012-06-05	NA	NA	NA	NA	NA
## 7875	2012-06-06	NA	NA	NA	NA	NA
## 7876	2012-06-07	NA	NA	NA	NA	NA
## 7877	2012-06-08	NA	NA	NA	NA	NA
## 7878	2012-06-09	NA	NA	NA	NA	NA
## 7879	2012-06-10	NA	NA	NA	NA	NA
## 7880	2012-06-11	NA	NA	NA	NA	NA
## 7881	2012-06-12	NA	NA	NA	NA	NA
## 7882	2012-06-13	NA	NA	NA	NA	NA
## 7883	2012-06-14	NA	NA	NA	NA	NA
## 7884	2012-06-15	NA	NA	NA	NA	NA
## 7885	2012-06-16	NA	NA	NA	NA	NA
## 7886	2012-06-17	NA	NA	NA	NA	NA
## 7887	2012-06-18	NA	NA	NA	NA	NA
## 7888	2012-06-19	NA	NA	NA	NA	NA
## 7889	2012-06-20	NA	NA	NA	NA	NA
## 7890	2012-06-21	NA	NA	NA	NA	NA

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##	7892	2012-06-23	NA	NA	NA	NA	NA
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##	7894	2012-06-25	NA	NA	NA	NA	NA
##	7895	2012-06-26	NA	NA	NA	NA	NA
##	7896	2012-06-27	NA	NA	NA	NA	NA
##	7897	2012-06-28	NA	NA	NA	NA	NA
##	7898	2012-06-29	NA	NA	NA	NA	NA
##	7899	2012-06-30	NA	NA	NA	NA	NA
##	7900	2012-07-01	NA	NA	NA	NA	NA
##	7901	2012-07-02	NA	NA	NA	NA	NA
##	7902	2012-07-03	NA	NA	NA	NA	NA
##	7903	2012-07-04	NA	NA	NA	NA	NA
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##	7906	2012-07-07	NA	NA	NA	NA	NA
##	7907	2012-07-08	NA	NA	NA	NA	NA
##	7908	2012-07-09	NA	NA	NA	NA	NA
##	7909	2012-07-10	NA	NA	NA	NA	NA
##	7910	2012-07-11	NA	NA	NA	NA	NA
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##	7917	2012-07-18	NA	NA	NA	NA	NA
##	7918	2012-07-19	NA	NA	NA	NA	NA
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##	7925	2012-07-26	NA	NA	NA	NA	NA
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##	7932	2012-08-02	NA	NA	NA	NA	NA
##	7933	2012-08-03	NA	NA	NA	NA	NA
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##	7935	2012-08-05	NA	NA	NA	NA	NA
##	7936	2012-08-06	NA	NA	NA	NA	NA
##	7937	2012-08-07	NA	NA	NA	NA	NA
##	7938	2012-08-08	NA	NA	NA	NA	NA
##	7939	2012-08-09	NA	NA	NA	NA	NA
##	7940	2012-08-10	NA	NA	NA	NA	NA
##	7941	2012-08-11	NA	NA	NA	NA	NA
##	7942	2012-08-12	NA	NA	NA	NA	NA
##	7943	2012-08-13	NA	NA	NA	NA	NA
##	7944	2012-08-14	NA	NA	NA	NA	NA

##	7945	2012-08-15	NA	NA	NA	NA	NA
##	7946	2012-08-16	NA	NA	NA	NA	NA
##	7947	2012-08-17	NA	NA	NA	NA	NA
##	7948	2012-08-18	NA	NA	NA	NA	NA
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##	7950	2012-08-20	NA	NA	NA	NA	NA
##	7951	2012-08-21	NA	NA	NA	NA	NA
##	7952	2012-08-22	NA	NA	NA	NA	NA
##	7953	2012-08-23	NA	NA	NA	NA	NA
##	7954	2012-08-24	NA	NA	NA	NA	NA
##	7955	2012-08-25	NA	NA	NA	NA	NA
##	7956	2012-08-26	NA	NA	NA	NA	NA
##	7957	2012-08-27	NA	NA	NA	NA	NA
##	7958	2012-08-28	NA	NA	NA	NA	NA
##	7959	2012-08-29	NA	NA	NA	NA	NA
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##	7978	2012-09-17	NA	NA	NA	NA	NA
##	7979	2012-09-18	NA	NA	NA	NA	NA
##	7980	2012-09-19	NA	NA	NA	NA	NA
##	7981	2012-09-20	NA	NA	NA	NA	NA
##	7982	2012-09-21	NA	NA	NA	NA	NA
##	7983	2012-09-22	NA	NA	NA	NA	NA
##	7984	2012-09-23	NA	NA	NA	NA	NA
##	7985	2012-09-24	NA	NA	NA	NA	NA
##	7986	2012-09-25	NA	NA	NA	NA	NA
##	7987	2012-09-26	NA	NA	NA	NA	NA
##	7988	2012-09-27	NA	NA	NA	NA	NA
##	7989	2012-09-28	NA	NA	NA	NA	NA
##	7990	2012-09-29	NA	NA	NA	NA	NA
##	7991	2012-09-30	NA	NA	NA	NA	NA
##	7992	2012-10-01	NA	NA	NA	NA	NA
##	7993	2012-10-02	NA	NA	NA	NA	NA
##	7994	2012-10-03	NA	NA	NA	NA	NA
##	7995	2012-10-04	NA	NA	NA	NA	NA
##	7996	2012-10-05	NA	NA	NA	NA	NA
##	7997	2012-10-06	NA	NA	NA	NA	NA
##	7998	2012-10-07	NA	NA	NA	NA	NA

## 7999	2012-10-08	NA	NA	NA	NA	NA
## 8000	2012-10-09	NA	NA	NA	NA	NA
## 8001	2012-10-10	NA	NA	NA	NA	NA
## 8002	2012-10-11	NA	NA	NA	NA	NA
## 8003	2012-10-12	NA	NA	NA	NA	NA
## 8004	2012-10-13	NA	NA	NA	NA	NA
## 8005	2012-10-14	NA	NA	NA	NA	NA
## 8006	2012-10-15	NA	NA	NA	NA	NA
## 8007	2012-10-16	NA	NA	NA	NA	NA
## 8008	2012-10-17	NA	NA	NA	NA	NA
## 8009	2012-10-18	NA	NA	NA	NA	NA
## 8010	2012-10-19	NA	NA	NA	NA	NA
## 8011	2012-10-20	NA	NA	NA	NA	NA
## 8012	2012-10-21	NA	NA	NA	NA	NA
## 8013	2012-10-22	NA	NA	NA	NA	NA
## 8014	2012-10-23	NA	NA	NA	NA	NA
## 8015	2012-10-24	NA	NA	NA	NA	NA
## 8016	2012-10-25	NA	NA	NA	NA	NA
## 8017	2012-10-26	NA	NA	NA	NA	NA
## 8018	2012-10-27	NA	NA	NA	NA	NA
## 8019	2012-10-28	NA	NA	NA	NA	NA
## 8020	2012-10-29	NA	NA	NA	NA	NA
## 8021	2012-10-30	NA	NA	NA	NA	NA
## 8022	2012-10-31	NA	NA	NA	NA	NA
## 8023	2012-11-01	NA	NA	NA	NA	NA
## 8024	2012-11-02	NA	NA	NA	NA	NA
## 8025	2012-11-03	NA	NA	NA	NA	NA
## 8026	2012-11-04	NA	NA	NA	NA	NA
## 8027	2012-11-05	NA	NA	NA	NA	NA
## 8028	2012-11-06	NA	NA	NA	NA	NA
## 8029	2012-11-07	NA	NA	NA	NA	NA
## 8030	2012-11-08	NA	NA	NA	NA	NA
## 8031	2012-11-09	NA	NA	NA	NA	NA
## 8032	2012-11-10	NA	NA	NA	NA	NA
## 8033	2012-11-11	NA	NA	NA	NA	NA
## 8034	2012-11-12	NA	NA	NA	NA	NA
## 8035	2012-11-13	NA	NA	NA	NA	NA
## 8036	2012-11-14	NA	NA	NA	NA	NA
## 8037	2012-11-15	NA	NA	NA	NA	NA
## 8038	2012-11-16	NA	NA	NA	NA	NA
## 8039	2012-11-17	NA	NA	NA	NA	NA
## 8040	2012-11-18	NA	NA	NA	NA	NA
## 8041	2012-11-19	NA	NA	NA	NA	NA
## 8042	2012-11-20	NA	NA	NA	NA	NA
## 8043	2012-11-21	NA	NA	NA	NA	NA
## 8044	2012-11-22	NA	NA	NA	NA	NA
## 8045	2012-11-23	NA	NA	NA	NA	NA
## 8046	2012-11-24	NA	NA	NA	NA	NA
## 8047	2012-11-25	NA	NA	NA	NA	NA
## 8048	2012-11-26	NA	NA	NA	NA	NA
## 8049	2012-11-27	NA	NA	NA	NA	NA
## 8050	2012-11-28	NA	NA	NA	NA	NA
## 8051	2012-11-29	NA	NA	NA	NA	NA
## 8052	2012-11-30	NA	NA	NA	NA	NA

## 8053	2012-12-01	NA	NA	NA	NA	NA
## 8054	2012-12-02	NA	NA	NA	NA	NA
## 8055	2012-12-03	NA	NA	NA	NA	NA
## 8056	2012-12-04	NA	NA	NA	NA	NA
## 8057	2012-12-05	NA	NA	NA	NA	NA
## 8058	2012-12-06	NA	NA	NA	NA	NA
## 8059	2012-12-07	NA	NA	NA	NA	NA
## 8060	2012-12-08	NA	NA	NA	NA	NA
## 8061	2012-12-09	NA	NA	NA	NA	NA
## 8062	2012-12-10	NA	NA	NA	NA	NA
## 8063	2012-12-11	NA	NA	NA	NA	NA
## 8064	2012-12-12	NA	NA	NA	NA	NA
## 8065	2012-12-13	NA	NA	NA	NA	NA
## 8066	2012-12-14	NA	NA	NA	NA	NA
## 8067	2012-12-15	NA	NA	NA	NA	NA
## 8068	2012-12-16	NA	NA	NA	NA	NA
## 8069	2012-12-17	NA	NA	NA	NA	NA
## 8070	2012-12-18	NA	NA	NA	NA	NA
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## 8072	2012-12-20	NA	NA	NA	NA	NA
## 8073	2012-12-21	NA	NA	NA	NA	NA
## 8074	2012-12-22	NA	NA	NA	NA	NA
## 8075	2012-12-23	NA	NA	NA	NA	NA
## 8076	2012-12-24	NA	NA	NA	NA	NA
## 8077	2012-12-25	NA	NA	NA	NA	NA
## 8078	2012-12-26	NA	NA	NA	NA	NA
## 8079	2012-12-27	NA	NA	NA	NA	NA
## 8080	2012-12-28	NA	NA	NA	NA	NA
## 8081	2012-12-29	NA	NA	NA	NA	NA
## 8082	2012-12-30	NA	NA	NA	NA	NA
## 8083	2012-12-31	NA	NA	NA	NA	NA
## 8084	2013-01-01	NA	NA	NA	NA	NA
## 8085	2013-01-02	NA	NA	NA	NA	NA
## 8086	2013-01-03	NA	NA	NA	NA	NA
## 8087	2013-01-04	NA	NA	NA	NA	NA
## 8088	2013-01-05	NA	NA	NA	NA	NA
## 8089	2013-01-06	NA	NA	NA	NA	NA
## 8090	2013-01-07	NA	NA	NA	NA	NA
## 8091	2013-01-08	NA	NA	NA	NA	NA
## 8092	2013-01-09	NA	NA	NA	NA	NA
## 8093	2013-01-10	NA	NA	NA	NA	NA
## 8094	2013-01-11	NA	NA	NA	NA	NA
## 8095	2013-01-12	NA	NA	NA	NA	NA
## 8096	2013-01-13	NA	NA	NA	NA	NA
## 8097	2013-01-14	NA	NA	NA	NA	NA
## 8098	2013-01-15	NA	NA	NA	NA	NA
## 8099	2013-01-16	NA	NA	NA	NA	NA
## 8100	2013-01-17	NA	NA	NA	NA	NA
## 8101	2013-01-18	NA	NA	NA	NA	NA
## 8102	2013-01-19	NA	NA	NA	NA	NA
## 8103	2013-01-20	NA	NA	NA	NA	NA
## 8104	2013-01-21	NA	NA	NA	NA	NA
## 8105	2013-01-22	NA	NA	NA	NA	NA
## 8106	2013-01-23	NA	NA	NA	NA	NA

## 8107	2013-01-24	NA	NA	NA	NA	NA
## 8108	2013-01-25	NA	NA	NA	NA	NA
## 8109	2013-01-26	NA	NA	NA	NA	NA
## 8110	2013-01-27	NA	NA	NA	NA	NA
## 8111	2013-01-28	NA	NA	NA	NA	NA
## 8112	2013-01-29	NA	NA	NA	NA	NA
## 8113	2013-01-30	NA	NA	NA	NA	NA
## 8114	2013-01-31	NA	NA	NA	NA	NA
## 8115	2013-02-01	NA	NA	NA	NA	NA
## 8116	2013-02-02	NA	NA	NA	NA	NA
## 8117	2013-02-03	NA	NA	NA	NA	NA
## 8118	2013-02-04	NA	NA	NA	NA	NA
## 8119	2013-02-05	NA	NA	NA	NA	NA
## 8120	2013-02-06	NA	NA	NA	NA	NA
## 8121	2013-02-07	NA	NA	NA	NA	NA
## 8122	2013-02-08	NA	NA	NA	NA	NA
## 8123	2013-02-09	NA	NA	NA	NA	NA
## 8124	2013-02-10	NA	NA	NA	NA	NA
## 8125	2013-02-11	NA	NA	NA	NA	NA
## 8126	2013-02-12	NA	NA	NA	NA	NA
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## 8128	2013-02-14	NA	NA	NA	NA	NA
## 8129	2013-02-15	NA	NA	NA	NA	NA
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## 8133	2013-02-19	NA	NA	NA	NA	NA
## 8134	2013-02-20	NA	NA	NA	NA	NA
## 8135	2013-02-21	NA	NA	NA	NA	NA
## 8136	2013-02-22	NA	NA	NA	NA	NA
## 8137	2013-02-23	NA	NA	NA	NA	NA
## 8138	2013-02-24	NA	NA	NA	NA	NA
## 8139	2013-02-25	NA	NA	NA	NA	NA
## 8140	2013-02-26	NA	NA	NA	NA	NA
## 8141	2013-02-27	NA	NA	NA	NA	NA
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## 8144	2013-03-02	NA	NA	NA	NA	NA
## 8145	2013-03-03	NA	NA	NA	NA	NA
## 8146	2013-03-04	NA	NA	NA	NA	NA
## 8147	2013-03-05	NA	NA	NA	NA	NA
## 8148	2013-03-06	NA	NA	NA	NA	NA
## 8149	2013-03-07	NA	NA	NA	NA	NA
## 8150	2013-03-08	NA	NA	NA	NA	NA
## 8151	2013-03-09	NA	NA	NA	NA	NA
## 8152	2013-03-10	NA	NA	NA	NA	NA
## 8153	2013-03-11	NA	NA	NA	NA	NA
## 8154	2013-03-12	NA	NA	NA	NA	NA
## 8155	2013-03-13	NA	NA	NA	NA	NA
## 8156	2013-03-14	NA	NA	NA	NA	NA
## 8157	2013-03-15	NA	NA	NA	NA	NA
## 8158	2013-03-16	NA	NA	NA	NA	NA
## 8159	2013-03-17	NA	NA	NA	NA	NA
## 8160	2013-03-18	NA	NA	NA	NA	NA

## 8161	2013-03-19	NA	NA	NA	NA	NA
## 8162	2013-03-20	NA	NA	NA	NA	NA
## 8163	2013-03-21	NA	NA	NA	NA	NA
## 8164	2013-03-22	NA	NA	NA	NA	NA
## 8165	2013-03-23	NA	NA	NA	NA	NA
## 8166	2013-03-24	NA	NA	NA	NA	NA
## 8167	2013-03-25	NA	NA	NA	NA	NA
## 8168	2013-03-26	NA	NA	NA	NA	NA
## 8169	2013-03-27	NA	NA	NA	NA	NA
## 8170	2013-03-28	NA	NA	NA	NA	NA
## 8171	2013-03-29	NA	NA	NA	NA	NA
## 8172	2013-03-30	NA	NA	NA	NA	NA
## 8173	2013-03-31	NA	NA	NA	NA	NA
## 8174	2013-04-01	NA	NA	NA	NA	NA
## 8175	2013-04-02	NA	NA	NA	NA	NA
## 8176	2013-04-03	NA	NA	NA	NA	NA
## 8177	2013-04-04	NA	NA	NA	NA	NA
## 8178	2013-04-05	NA	NA	NA	NA	NA
## 8179	2013-04-06	NA	NA	NA	NA	NA
## 8180	2013-04-07	NA	NA	NA	NA	NA
## 8181	2013-04-08	NA	NA	NA	NA	NA
## 8182	2013-04-09	NA	NA	NA	NA	NA
## 8183	2013-04-10	NA	NA	NA	NA	NA
## 8184	2013-04-11	NA	NA	NA	NA	NA
## 8185	2013-04-12	NA	NA	NA	NA	NA
## 8186	2013-04-13	NA	NA	NA	NA	NA
## 8187	2013-04-14	NA	NA	NA	NA	NA
## 8188	2013-04-15	NA	NA	NA	NA	NA
## 8189	2013-04-16	NA	NA	NA	NA	NA
## 8190	2013-04-17	NA	NA	NA	NA	NA
## 8191	2013-04-18	NA	NA	NA	NA	NA
## 8192	2013-04-19	NA	NA	NA	NA	NA
## 8193	2013-04-20	NA	NA	NA	NA	NA
## 8194	2013-04-21	NA	NA	NA	NA	NA
## 8195	2013-04-22	NA	NA	NA	NA	NA
## 8196	2013-04-23	NA	NA	NA	NA	NA
## 8197	2013-04-24	NA	NA	NA	NA	NA
## 8198	2013-04-25	NA	NA	NA	NA	NA
## 8199	2013-04-26	NA	NA	NA	NA	NA
## 8200	2013-04-27	NA	NA	NA	NA	NA
## 8201	2013-04-28	NA	NA	NA	NA	NA
## 8202	2013-04-29	NA	NA	NA	NA	NA
## 8203	2013-04-30	NA	NA	NA	NA	NA
## 8204	2013-05-01	NA	NA	NA	NA	NA
## 8205	2013-05-02	NA	NA	NA	NA	NA
## 8206	2013-05-03	NA	NA	NA	NA	NA
## 8207	2013-05-04	NA	NA	NA	NA	NA
## 8208	2013-05-05	NA	NA	NA	NA	NA
## 8209	2013-05-06	NA	NA	NA	NA	NA
## 8210	2013-05-07	NA	NA	NA	NA	NA
## 8211	2013-05-08	NA	NA	NA	NA	NA
## 8212	2013-05-09	NA	NA	NA	NA	NA
## 8213	2013-05-10	NA	NA	NA	NA	NA
## 8214	2013-05-11	NA	NA	NA	NA	NA

##	8215	2013-05-12	NA	NA	NA	NA	NA
##	8216	2013-05-13	NA	NA	NA	NA	NA
##	8217	2013-05-14	NA	NA	NA	NA	NA
##	8218	2013-05-15	NA	NA	NA	NA	NA
##	8219	2013-05-16	NA	NA	NA	NA	NA
##	8220	2013-05-17	NA	NA	NA	NA	NA
##	8221	2013-05-18	NA	NA	NA	NA	NA
##	8222	2013-05-19	NA	NA	NA	NA	NA
##	8223	2013-05-20	NA	NA	NA	NA	NA
##	8224	2013-05-21	NA	NA	NA	NA	NA
##	8225	2013-05-22	NA	NA	NA	NA	NA
##	8226	2013-05-23	NA	NA	NA	NA	NA
##	8227	2013-05-24	NA	NA	NA	NA	NA
##	8228	2013-05-25	NA	NA	NA	NA	NA
##	8229	2013-05-26	NA	NA	NA	NA	NA
##	8230	2013-05-27	NA	NA	NA	NA	NA
##	8231	2013-05-28	NA	NA	NA	NA	NA
##	8232	2013-05-29	NA	NA	NA	NA	NA
##	8233	2013-05-30	NA	NA	NA	NA	NA
##	8234	2013-05-31	NA	NA	NA	NA	NA
##	8235	2013-06-01	NA	NA	NA	NA	NA
##	8236	2013-06-02	NA	NA	NA	NA	NA
##	8237	2013-06-03	NA	NA	NA	NA	NA
##	8238	2013-06-04	NA	NA	NA	NA	NA
##	8239	2013-06-05	NA	NA	NA	NA	NA
##	8240	2013-06-06	NA	NA	NA	NA	NA
##	8241	2013-06-07	NA	NA	NA	NA	NA
##	8242	2013-06-08	NA	NA	NA	NA	NA
##	8243	2013-06-09	NA	NA	NA	NA	NA
##	8244	2013-06-10	NA	NA	NA	NA	NA
##	8245	2013-06-11	NA	NA	NA	NA	NA
##	8246	2013-06-12	NA	NA	NA	NA	NA
##	8247	2013-06-13	NA	NA	NA	NA	NA
##	8248	2013-06-14	NA	NA	NA	NA	NA
##	8249	2013-06-15	NA	NA	NA	NA	NA
##	8250	2013-06-16	NA	NA	NA	NA	NA
##	8251	2013-06-17	NA	NA	NA	NA	NA
##	8252	2013-06-18	NA	NA	NA	NA	NA
##	8253	2013-06-19	NA	NA	NA	NA	NA
##	8254	2013-06-20	NA	NA	NA	NA	NA
##	8255	2013-06-21	NA	NA	NA	NA	NA
##	8256	2013-06-22	NA	NA	NA	NA	NA
##	8257	2013-06-23	NA	NA	NA	NA	NA
##	8258	2013-06-24	NA	NA	NA	NA	NA
##	8259	2013-06-25	NA	NA	NA	NA	NA
##	8260	2013-06-26	NA	NA	NA	NA	NA
##	8261	2013-06-27	NA	NA	NA	NA	NA
##	8262	2013-06-28	NA	NA	NA	NA	NA
##	8263	2013-06-29	NA	NA	NA	NA	NA
##	8264	2013-06-30	NA	NA	NA	NA	NA
##	8265	2013-07-01	NA	NA	NA	NA	NA
##	8266	2013-07-02	NA	NA	NA	NA	NA
##	8267	2013-07-03	NA	NA	NA	NA	NA
##	8268	2013-07-04	NA	NA	NA	NA	NA

## 8269	2013-07-05	NA	NA	NA	NA	NA
## 8270	2013-07-06	NA	NA	NA	NA	NA
## 8271	2013-07-07	NA	NA	NA	NA	NA
## 8272	2013-07-08	NA	NA	NA	NA	NA
## 8273	2013-07-09	NA	NA	NA	NA	NA
## 8274	2013-07-10	NA	NA	NA	NA	NA
## 8275	2013-07-11	NA	NA	NA	NA	NA
## 8276	2013-07-12	NA	NA	NA	NA	NA
## 8277	2013-07-13	NA	NA	NA	NA	NA
## 8278	2013-07-14	NA	NA	NA	NA	NA
## 8279	2013-07-15	NA	NA	NA	NA	NA
## 8280	2013-07-16	NA	NA	NA	NA	NA
## 8281	2013-07-17	NA	NA	NA	NA	NA
## 8282	2013-07-18	NA	NA	NA	NA	NA
## 8283	2013-07-19	NA	NA	NA	NA	NA
## 8284	2013-07-20	NA	NA	NA	NA	NA
## 8285	2013-07-21	NA	NA	NA	NA	NA
## 8286	2013-07-22	NA	NA	NA	NA	NA
## 8287	2013-07-23	NA	NA	NA	NA	NA
## 8288	2013-07-24	NA	NA	NA	NA	NA
## 8289	2013-07-25	NA	NA	NA	NA	NA
## 8290	2013-07-26	NA	NA	NA	NA	NA
## 8291	2013-07-27	NA	NA	NA	NA	NA
## 8292	2013-07-28	NA	NA	NA	NA	NA
## 8293	2013-07-29	NA	NA	NA	NA	NA
## 8294	2013-07-30	NA	NA	NA	NA	NA
## 8295	2013-07-31	NA	NA	NA	NA	NA
## 8296	2013-08-01	NA	NA	NA	NA	NA
## 8297	2013-08-02	NA	NA	NA	NA	NA
## 8298	2013-08-03	NA	NA	NA	NA	NA
## 8299	2013-08-04	NA	NA	NA	NA	NA
## 8300	2013-08-05	NA	NA	NA	NA	NA
## 8301	2013-08-06	NA	NA	NA	NA	NA
## 8302	2013-08-07	NA	NA	NA	NA	NA
## 8303	2013-08-08	NA	NA	NA	NA	NA
## 8304	2013-08-09	NA	NA	NA	NA	NA
## 8305	2013-08-10	NA	NA	NA	NA	NA
## 8306	2013-08-11	NA	NA	NA	NA	NA
## 8307	2013-08-12	NA	NA	NA	NA	NA
## 8308	2013-08-13	NA	NA	NA	NA	NA
## 8309	2013-08-14	NA	NA	NA	NA	NA
## 8310	2013-08-15	NA	NA	NA	NA	NA
## 8311	2013-08-16	NA	NA	NA	NA	NA
## 8312	2013-08-17	NA	NA	NA	NA	NA
## 8313	2013-08-18	NA	NA	NA	NA	NA
## 8314	2013-08-19	NA	NA	NA	NA	NA
## 8315	2013-08-20	NA	NA	NA	NA	NA
## 8316	2013-08-21	NA	NA	NA	NA	NA
## 8317	2013-08-22	NA	NA	NA	NA	NA
## 8318	2013-08-23	NA	NA	NA	NA	NA
## 8319	2013-08-24	NA	NA	NA	NA	NA
## 8320	2013-08-25	NA	NA	NA	NA	NA
## 8321	2013-08-26	NA	NA	NA	NA	NA
## 8322	2013-08-27	NA	NA	NA	NA	NA

##	8323	2013-08-28	NA	NA	NA	NA	NA
##	8324	2013-08-29	NA	NA	NA	NA	NA
##	8325	2013-08-30	NA	NA	NA	NA	NA
##	8326	2013-08-31	NA	NA	NA	NA	NA
##	8327	2013-09-01	NA	NA	NA	NA	NA
##	8328	2013-09-02	NA	NA	NA	NA	NA
##	8329	2013-09-03	NA	NA	NA	NA	NA
##	8330	2013-09-04	NA	NA	NA	NA	NA
##	8331	2013-09-05	NA	NA	NA	NA	NA
##	8332	2013-09-06	NA	NA	NA	NA	NA
##	8333	2013-09-07	NA	NA	NA	NA	NA
##		OG	PH	SALINITY	SUSO	TEMP	XMS
##	1	0.2000000	8.130000	33.595500	3.9964286	19.370000	60.22500
##	2	0.2000000	8.143000	33.580275	3.9964286	14.507692	80.02564
##	3	0.2000000	8.156000	33.565050	3.9964286	14.392308	83.89744
##	4	0.2000000	8.169000	33.549825	3.9964286	14.541026	78.97436
##	5	0.2000000	8.182000	33.534600	3.9964286	13.430000	80.20000
##	6	0.2000000	8.195000	33.519375	3.9964286	14.268889	86.21111
##	7	0.2000000	8.193333	33.493000	3.9964286	13.750000	80.45833
##	8	0.2000000	8.191667	33.491000	3.9964286	14.384000	84.40000
##	9	0.2000000	8.190000	33.495318	3.9964286	14.512821	72.02564
##	10	0.2000000	8.188333	33.499636	3.9964286	14.576923	68.35897
##	11	0.2000000	8.186667	33.503955	3.9964286	14.507692	76.51282
##	12	0.2000000	8.185000	33.508273	3.9964286	14.069231	78.71053
##	13	0.2000000	8.183333	33.512591	3.9964286	14.294872	82.43590
##	14	0.2000000	8.181667	33.516909	3.9964286	14.174359	81.23077
##	15	0.2000000	8.180000	33.521227	3.9964286	14.461538	72.12821
##	16	0.2000000	8.178333	33.525545	3.9964286	14.461538	69.53846
##	17	0.2000000	8.176667	33.529864	3.9964286	13.825641	79.23077
##	18	0.2000000	8.175000	33.534182	3.9964286	13.790000	80.70000
##	19	0.2000000	8.173333	33.538500	3.9964286	13.698824	77.36471
##	20	0.2000000	8.176481	33.504000	3.9964286	14.387500	77.25000
##	21	0.2000000	8.179630	33.509000	3.9964286	14.330000	81.96667
##	22	0.2000000	8.182778	33.509411	3.9964286	13.738462	78.89189
##	23	0.2000000	8.185926	33.509821	3.9964286	14.376923	80.53846
##	24	0.2000000	8.189074	33.510232	3.9964286	14.053846	82.25641
##	25	0.2000000	8.192222	33.510643	3.9964286	14.430769	82.64103
##	26	0.2000000	8.195370	33.511054	3.9964286	14.415385	63.07692
##	27	0.2000000	8.198519	33.511464	3.9964286	14.720000	64.80000
##	28	0.2000000	8.201667	33.511875	3.9964286	13.148889	80.35556
##	29	0.2000000	8.198148	33.491000	3.9964286	13.694737	66.68421
##	30	0.2000000	8.194630	33.459000	3.9964286	13.693333	77.56667
##	31	0.2000000	8.191111	33.466867	3.9964286	13.297436	75.61538
##	32	0.2000000	8.187593	33.474734	3.9964286	12.942424	72.90909
##	33	0.2000000	8.184074	33.482602	3.9964286	12.700000	58.33333
##	34	0.2000000	8.180556	33.490469	3.9964286	12.784615	73.00000
##	35	0.2000000	8.177037	33.498336	3.9964286	12.947436	71.46154
##	36	0.2000000	8.173519	33.506203	3.9964286	13.110256	69.92308
##	37	0.2000000	8.170000	33.514070	3.9964286	13.273077	68.38462
##	38	0.2000000	8.166481	33.521937	3.9964286	13.435897	66.84615
##	39	0.2000000	8.162963	33.529805	3.9964286	13.433333	75.92105
##	40	0.2000000	8.159444	33.537672	3.9964286	13.500000	74.33333
##	41	0.2000000	8.155926	33.545539	3.9964286	13.125641	82.65789
##	42	0.2000000	8.152407	33.553406	3.9964286	13.194872	81.09818

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## 43 0.2000000 8.148889 33.561273 3.9964286 13.264103 79.53846
## 44 0.2000000 8.145370 33.569141 3.9964286 14.248718 73.56410
## 45 0.2000000 8.141852 33.577008 3.9964286 13.130000 72.90000
## 46 0.2000000 8.138333 33.584875 3.9964286 12.688889 79.80000
## 47 0.2000000 8.133333 33.528000 3.9964286 13.463158 64.52632
## 48 0.2000000 8.128333 33.548500 3.9964286 13.126667 68.93333
## 49 0.2000000 8.123333 33.557292 3.9964286 13.192308 74.42105
## 50 0.2000000 8.118333 33.566083 3.9964286 12.979487 74.71053
## 51 0.2000000 8.113333 33.574875 3.9964286 12.766667 75.00000
## 52 0.2000000 8.108333 33.583667 3.9964286 12.956410 76.56410
## 53 0.2000000 8.103333 33.592458 3.9964286 11.987179 78.68421
## 54 0.2000000 8.098333 33.601250 3.9964286 13.515385 78.25641
## 55 0.2000000 8.093333 33.610042 3.9964286 13.957692 76.98718
## 56 0.2000000 8.088333 33.618833 3.9964286 14.400000 75.71795
## 57 0.2000000 8.083333 33.627625 3.9964286 11.715385 77.64103
## 58 0.2000000 8.078333 33.636417 3.9964286 13.279487 66.82051
## 59 0.2000000 8.073333 33.645208 3.9964286 13.169231 71.84211
## 60 0.2000000 8.068333 33.654000 3.9964286 12.750000 73.10000
## 61 0.2000000 8.063333 33.227857 3.9964286 11.525000 78.65000
## 62 0.2000000 8.083194 33.653000 3.9964286 13.347368 78.15789
## 63 0.2000000 8.103056 33.648500 3.9964286 12.600000 79.41379
## 64 0.2000000 8.122917 33.640075 3.9964286 12.305128 74.56410
## 65 0.2000000 8.142778 33.631650 3.9964286 12.520513 76.51282
## 66 0.2000000 8.162639 33.623225 3.9964286 13.802564 68.28205
## 67 0.2000000 8.182500 33.614800 3.9964286 13.169231 70.34211
## 68 0.2000000 8.202361 33.606375 3.9964286 15.138462 66.94872
## 69 0.2000000 8.222222 33.597950 3.9964286 15.103846 66.15385
## 70 0.2000000 8.242083 33.589525 3.9964286 15.069231 65.35897
## 71 0.2000000 8.261944 33.581100 3.9964286 13.658974 70.64103
## 72 0.2000000 8.281806 33.572675 3.9964286 14.500000 77.50000
## 73 0.2000000 8.301667 33.564250 3.9964286 12.565556 71.36667
## 74 0.2000000 8.294679 33.579000 3.9964286 14.705263 66.57895
## 75 0.2000000 8.287692 33.591000 3.9964286 13.720000 70.89655
## 76 0.2000000 8.280705 33.581391 3.9964286 15.787179 74.25641
## 77 0.2000000 8.273718 33.571782 3.9964286 15.988462 74.60256
## 78 0.2000000 8.266731 33.562174 3.9964286 16.189744 74.94872
## 79 0.2000000 8.259744 33.552565 3.9964286 14.502564 73.61538
## 80 0.2000000 8.252756 33.542956 3.9964286 14.271795 74.79487
## 81 0.2000000 8.245769 33.533347 3.9964286 14.041026 75.97436
## 82 0.2000000 8.238782 33.523738 3.9964286 13.674359 68.76316
## 83 0.2000000 8.231795 33.514130 3.9964286 13.674359 68.76316
## 84 0.2000000 8.224808 33.504521 3.9964286 13.674359 68.76316
## 85 0.2000000 8.217821 33.494912 3.9964286 13.674359 68.76316
## 86 0.2000000 8.210833 33.485303 3.9964286 13.500000 75.70000
## 87 0.2000000 8.203846 33.475694 3.9964286 13.209756 81.04878
## 88 0.2000000 8.211340 33.470000 3.9964286 14.884211 76.94737
## 89 0.2000000 8.218835 33.482000 3.9964286 14.320000 78.53333
## 90 0.2000000 8.226329 33.485425 3.9964286 15.346154 75.60526
## 91 0.2000000 8.233824 33.488851 3.9964286 16.057692 78.61032
## 92 0.2000000 8.241318 33.492276 3.9964286 16.769231 81.61538
## 93 0.2000000 8.248812 33.495702 3.9964286 13.538462 81.78947
## 94 0.2000000 8.256307 33.499127 3.9964286 15.502564 80.15385
## 95 0.2000000 8.263801 33.502553 3.9964286 15.502564 80.15385
## 96 0.2000000 8.271295 33.505978 3.9964286 15.502564 80.15385

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## 97 0.2000000 8.278790 33.509404 3.9964286 15.502564 80.15385
## 98 0.2000000 8.286284 33.512829 3.9964286 16.251282 80.23077
## 99 0.2000000 8.293778 33.516255 3.9964286 15.256410 70.25641
## 100 0.2000000 8.301273 33.519680 3.9964286 14.419231 73.06410
## 101 0.2000000 8.308767 33.523106 3.9964286 13.582051 75.87179
## 102 0.2000000 8.316261 33.526531 3.9964286 14.461538 75.30769
## 103 0.2000000 8.323756 33.529957 3.9964286 15.080000 48.30000
## 104 0.2000000 8.331250 33.533382 3.9964286 13.774359 80.73077
## 105 0.2000000 8.329167 33.509000 3.9964286 16.552632 84.52632
## 106 0.2000000 8.327083 33.483500 3.9964286 14.916667 86.73333
## 107 0.2000000 8.325000 33.476319 3.9964286 16.700000 83.71795
## 108 0.2000000 8.322917 33.469138 3.9964286 16.700000 83.71795
## 109 0.2000000 8.320833 33.461957 3.9964286 16.605128 82.38462
## 110 0.2000000 8.318750 33.454776 3.9964286 16.605128 82.38462
## 111 0.2000000 8.316667 33.447595 3.9964286 15.182051 77.87179
## 112 0.2000000 8.314583 33.440414 3.9964286 15.039744 78.26923
## 113 0.2000000 8.312500 33.433233 3.9964286 14.897436 78.66667
## 114 0.2000000 8.310417 33.426052 3.9964286 14.543590 82.64103
## 115 0.2000000 8.308333 33.418871 3.9964286 15.171795 83.19231
## 116 0.2000000 8.306250 33.411690 3.9964286 15.800000 83.74359
## 117 0.2000000 8.304167 33.404509 3.9964286 15.292308 81.35897
## 118 0.2000000 8.302083 33.397328 3.9964286 14.590000 80.50000
## 119 0.2000000 8.300000 33.390147 3.9964286 14.328205 86.85897
## 120 0.2000000 8.296591 33.370000 3.9964286 15.694737 83.05263
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## 122 0.2000000 8.289773 33.374765 3.9964286 15.643718 84.10000
## 123 0.2000000 8.286364 33.370529 3.9964286 15.864103 81.66667
## 124 0.2000000 8.282955 33.366294 3.9964286 17.715385 76.87179
## 125 0.2000000 8.279545 33.362059 3.9964286 15.933333 80.02564
## 126 0.2000000 8.276136 33.357824 3.9964286 15.807692 80.25641
## 127 0.2000000 8.272727 33.353588 3.9964286 15.682051 80.48718
## 128 0.2000000 8.269318 33.349353 3.9964286 15.258974 79.42105
## 129 0.2000000 8.265909 33.345118 3.9964286 15.830000 83.40000
## 130 0.2000000 8.262500 33.340882 3.9964286 14.119231 85.96154
## 131 0.2000000 8.258929 33.288000 3.9964286 15.378947 81.05263
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## 133 0.2000000 8.251786 33.258341 3.9964286 16.787179 79.00000
## 134 0.2000000 8.248214 33.222181 3.9964286 16.533333 78.02564
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## 136 0.2000000 8.241071 33.149863 3.9964286 17.215385 82.51282
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## 141 0.2000000 8.223214 32.969066 3.9964286 15.602564 78.87179
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## 147 0.2000000 8.120625 33.529111 3.9964286 16.976667 75.63333
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## 149 0.2000000 8.110375 33.591176 3.9964286 15.212000 76.50000
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## 401 0.2000000 8.103472 33.018674 3.9964286 15.117949 70.64103
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## 403 0.2000000 8.079861 33.014011 3.9964286 15.346154 47.12821
## 404 0.2000000 8.068056 33.011679 3.9964286 15.207692 57.66667
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## 407 0.2000000 8.032639 33.004684 3.9964286 14.930000 66.70000
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## 410 0.2000000 8.014103 32.961069 3.9964286 14.194872 58.94872
## 411 0.2000000 8.010737 33.003137 3.9964286 13.938462 60.58974
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## 413 0.2000000 8.004006 33.087275 3.9964286 14.880769 74.11538
## 414 0.2000000 8.000641 33.129343 3.9964286 15.164103 77.30769
## 415 0.2000000 7.997276 33.171412 3.9964286 13.987179 77.71795
## 416 0.2000000 7.993910 33.213480 3.9964286 14.269231 75.07692
## 417 0.2000000 7.990545 33.255549 3.9964286 15.305128 71.79487
## 418 0.2000000 7.987179 33.297618 3.9964286 15.507692 74.76923
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## 420 0.2000000 7.980449 33.381755 3.9964286 13.480000 72.10000

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## 567 0.2059259 8.121486 33.332796 5.0573219 14.993750 79.10417
## 568 0.2051852 8.037368 33.335969 4.9713105 13.962634 90.01344
## 569 0.2044444 8.058358 33.322393 4.8852991 15.282979 84.51064
## 570 0.2037037 8.079347 33.308818 4.7992877 14.605263 76.94737
## 571 0.2029630 8.100337 33.295243 4.7132764 14.464583 80.18750
## 572 0.2022222 8.121327 33.281668 4.6272650 14.247826 80.80435
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## 574 0.2007407 8.163306 33.254518 4.4552422 14.048718 76.35897
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## 588 0.2092308 8.154189 33.297703 4.4999014 14.220513 83.69231
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## 624 0.2370222 8.010924 33.607953 3.9927778 14.882051 79.92308
## 625 0.2402667 7.998437 33.599407 3.9954167 14.988034 80.49573
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## 637 0.2425000 8.051310 33.576783 5.2119048 13.289744 78.28205
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## 658 0.2000000 8.036388 33.598191 4.5025000 16.580567 80.33963
## 659 0.2000000 8.018604 33.590031 4.5450000 16.807692 79.64103
## 660 0.2000000 8.000819 33.581870 4.5875000 14.892308 83.00000
## 661 0.2000000 7.983035 33.573710 4.6300000 14.984312 82.10526
## 662 0.2000000 7.965250 33.565550 4.6725000 15.076316 81.21053
## 663 0.2000000 7.947466 33.557389 4.7150000 15.809953 79.77193
## 664 0.2000000 7.929681 33.549229 4.7575000 16.543590 78.33333
## 665 0.2000000 7.911897 33.541068 4.8000000 12.920652 87.60326
## 666 0.2000000 7.827353 33.535987 4.7138462 12.813102 87.47059
## 667 0.2000000 7.883583 33.524787 4.6276923 15.584756 85.37632
## 668 0.2000000 7.939813 33.513587 4.5415385 18.356410 83.28205
## 669 0.2000000 7.996043 33.502386 4.4553846 18.441841 82.77739
## 670 0.2000000 8.052273 33.491186 4.3692308 18.527273 82.27273
## 671 0.2122222 8.102439 33.442804 3.3571429 17.284146 85.73171
## 672 0.2000000 8.200310 33.449971 4.6692308 18.672414 85.36207
## 673 0.2000000 8.194026 33.463051 4.5753846 19.274359 84.12821
## 674 0.2000000 8.187741 33.476132 4.4815385 19.153846 83.29487
## 675 0.2000000 8.181456 33.489212 4.3876923 19.033333 82.46154
## 676 0.2000000 8.175171 33.502292 4.2938462 18.274621 83.87850
## 677 0.2000000 8.168886 33.515373 4.2000000 17.515909 85.29545
## 678 0.2000000 8.165138 33.522207 4.8200000 19.020690 85.62069
## 679 0.2000000 8.088829 33.502496 4.3958333 16.459756 86.98780
## 680 0.2000000 8.087464 33.452086 3.6000000 16.003571 86.67857
## 681 0.2000000 8.065647 33.458750 4.2155556 19.078378 84.10811
## 682 0.2000000 8.043830 33.465414 4.8311111 18.923077 84.25641
## 683 0.2000000 8.022014 33.472078 5.4466667 18.648381 84.18084
## 684 0.2000000 8.000197 33.478743 6.0622222 18.373684 84.10526
## 685 0.2000000 7.978380 33.485407 6.6777778 16.338755 85.79580
## 686 0.2000000 7.956563 33.492071 7.2933333 14.303825 87.48634
## 687 0.2000000 7.961457 33.496708 6.3761111 17.189744 79.43590
## 688 0.2000000 7.966351 33.501344 5.4588889 14.091573 87.57022
## 689 0.2000000 8.099205 33.504784 4.5416667 17.020455 85.04545
## 690 0.2000000 8.136929 33.517189 4.0444444 17.671429 85.46429

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## 691	0.2528571	8.138741	33.461422	4.9666667	16.875309	86.40741
## 692	0.3250000	8.156833	33.482943	3.8066667	17.286667	84.60000
## 693	0.3041667	8.117075	33.472330	3.9016667	17.584615	82.66667
## 694	0.2833333	8.077317	33.461717	3.9966667	15.730229	84.45552
## 695	0.2625000	8.037559	33.451103	4.0916667	13.875843	86.24438
## 696	0.2416667	8.054685	33.441376	4.1866667	17.715789	78.44737
## 697	0.2208333	8.071812	33.431649	4.2816667	16.048625	82.08323
## 698	0.2000000	8.088938	33.421921	4.3766667	14.381461	85.71910
## 699	0.2166667	8.103069	33.425702	4.5063333	16.873333	82.11111
## 700	0.2333333	8.117199	33.429482	4.6360000	16.444359	78.78632
## 701	0.2500000	8.131330	33.433262	4.7656667	16.015385	75.46154
## 702	0.2666667	8.145460	33.437042	4.8953333	15.661101	79.57168
## 703	0.2833333	8.159591	33.440823	5.0250000	15.306818	83.68182
## 704	0.2444444	8.159611	33.448050	6.7083333	15.355556	77.61111
## 705	0.2055556	8.107890	33.420370	5.2041667	14.664634	85.32927
## 706	0.2000000	8.140161	33.383661	5.3666667	15.219355	84.83871
## 707	0.2000000	8.121602	33.398910	5.2077778	15.900000	79.30769
## 708	0.2000000	8.103042	33.414160	5.0488889	13.673475	87.41071
## 709	0.2000000	8.111396	33.402930	4.8900000	13.287363	88.26374
## 710	0.2014583	8.098588	33.404823	4.7829167	13.925260	86.18450
## 711	0.2029167	8.085780	33.406717	4.6758333	14.563158	84.10526
## 712	0.2043750	8.072972	33.408610	4.5687500	14.274359	79.30769
## 713	0.2058333	8.060164	33.410503	4.4616667	14.155263	84.55263
## 714	0.2072917	8.047356	33.412397	4.3545833	13.943016	83.94298
## 715	0.2087500	8.034548	33.414290	4.2475000	13.730769	83.33333
## 716	0.2102083	8.021740	33.416184	4.1404167	13.694930	84.43939
## 717	0.2116667	8.008932	33.418077	4.0333333	13.659091	85.54545
## 718	0.2444444	7.980707	33.445841	4.5166667	13.339024	85.60976
## 719	0.2000000	7.988500	33.459533	4.6266667	13.363333	81.86667
## 720	0.2000000	8.011038	33.435127	3.6888889	13.453846	81.96154
## 721	0.2272414	7.943956	33.524881	4.5366667	13.083060	86.93443
## 722	0.2239195	7.948711	33.529156	4.8758333	13.807692	69.38462
## 723	0.2205977	7.953465	33.533430	5.2150000	14.014706	74.82353
## 724	0.2172759	7.958220	33.537704	5.5541667	12.940563	84.78592
## 725	0.2139540	7.966275	33.516346	5.8933333	14.415385	75.64103
## 726	0.2106322	7.974330	33.494988	6.2325000	14.392692	73.43718
## 727	0.2073103	7.982385	33.473630	6.5716667	14.370000	71.23333
## 728	0.2039885	7.990440	33.452272	6.9108333	14.707692	65.53846
## 729	0.2006667	7.998495	33.430914	7.2500000	14.030978	66.76630
## 730	0.2000000	7.955318	33.384555	7.7583333	13.702273	69.22727
## 731	0.2055556	7.870532	33.573032	5.9291667	12.676623	75.50649
## 732	0.2000000	7.903741	33.502705	5.8558405	12.874138	76.13793
## 733	0.2010417	7.900257	33.623682	5.7825142	12.307761	80.26866
## 734	0.2020833	7.916960	33.587333	5.7091880	14.293939	67.18182
## 735	0.2031250	7.933664	33.550985	5.6358618	14.310256	66.46154
## 736	0.2041667	7.950367	33.514637	5.5625356	14.276923	80.12821
## 737	0.2052083	7.967071	33.478288	5.4892094	14.248718	81.71795
## 738	0.2062500	7.983775	33.441940	5.4158832	14.243842	80.43318
## 739	0.2072917	8.000478	33.405592	5.3425570	14.238967	79.14841
## 740	0.2083333	8.017182	33.369243	5.2692308	14.234091	77.86364
## 741	0.2038889	7.985359	33.428622	5.8785714	14.067187	78.45312
## 742	0.2000000	8.000827	33.389645	4.9846154	14.516000	78.37333
## 743	0.2000000	7.956373	33.422241	5.6906948	14.913158	75.28947
## 744	0.2000000	7.911918	33.454836	6.3967742	13.802717	84.39130

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## 745 0.2000000 7.929104 33.422903 6.4040199 13.805618 84.89888
## 746 0.2000000 7.963628 33.402264 6.4112655 14.410583 83.47959
## 747 0.2000000 7.998152 33.381625 6.4185112 15.015548 82.06031
## 748 0.2000000 8.032675 33.360987 6.4257568 15.620513 80.64103
## 749 0.2000000 8.067199 33.340348 6.4330025 15.451282 80.75641
## 750 0.2000000 8.101723 33.319709 6.4402481 15.282051 80.87179
## 751 0.2000000 8.136247 33.299071 6.4474938 15.058974 79.46154
## 752 0.2000000 8.170771 33.278432 6.4547395 15.115831 79.88345
## 753 0.2000000 8.205294 33.257793 6.4619851 15.172688 80.30536
## 754 0.2000000 8.239818 33.237155 6.4692308 15.229545 80.72727
## 755 0.2000000 8.086659 33.373506 5.6785714 14.297561 84.28049
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## 758 0.2000000 8.053571 33.518243 5.1857143 13.028571 79.14286
## 759 0.2000000 8.010563 33.530248 5.1035714 16.289744 70.33333
## 760 0.2000000 7.967554 33.542254 5.0214286 15.126496 74.15063
## 761 0.2000000 7.924546 33.554259 4.9392857 13.963248 77.96793
## 762 0.2000000 7.881537 33.566264 4.8571429 12.800000 81.78523
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## 767 0.2000000 7.900550 33.610893 4.9606838 14.530070 76.91026
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## 769 0.2000000 7.896367 33.669153 5.0380342 13.916129 72.93548
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## 771 0.2000000 8.107300 33.634716 5.1153846 12.154000 78.62000
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## 773 0.2000000 7.905503 33.648533 4.7871795 12.033702 86.45856
## 774 0.2000000 7.942647 33.645826 4.7576923 12.752941 76.55882
## 775 0.2000000 7.918954 33.690294 4.7123077 12.966667 68.48485
## 776 0.2000000 7.895260 33.734761 4.6669231 12.872876 70.21539
## 777 0.2000000 7.871567 33.779228 4.6215385 12.779085 71.94593
## 778 0.2000000 7.847873 33.823695 4.5761538 12.685294 73.67647
## 779 0.2000000 7.824180 33.868162 4.5307692 11.276000 79.52000
## 780 0.2000000 8.093030 33.841945 4.2500000 12.248485 66.21212
## 781 0.2000000 7.960293 33.781037 2.8750000 11.763415 79.12195
## 782 0.2000000 7.740793 33.932945 4.0281250 10.811413 85.53261
## 783 0.2000000 7.800949 33.918520 4.2540598 10.976404 86.14326
## 784 0.2000000 7.821753 33.887838 4.4799947 12.033333 72.15152
## 785 0.2000000 7.842557 33.857157 4.7059295 12.834314 72.28164
## 786 0.2000000 7.863361 33.826475 4.9318643 13.635294 72.41176
## 787 0.2000000 7.884165 33.795794 5.1577991 14.967647 78.88235
## 788 0.2000000 7.904969 33.765112 5.3837340 14.676471 83.26471
## 789 0.2000000 7.925772 33.734431 5.6096688 15.489706 80.25000
## 790 0.2000000 7.946576 33.703749 5.8356036 16.302941 77.23529
## 791 0.2000000 7.967380 33.673068 6.0615385 13.768000 80.94000
## 792 0.2000000 8.049220 33.658398 5.1333333 14.029268 80.02439
## 793 0.2000000 8.292147 33.648918 5.6576923 16.935294 70.55882
## 794 0.2000000 8.074959 33.686214 5.2663462 15.550000 74.00000
## 795 0.2000000 7.857772 33.723511 4.8750000 11.596196 86.98370
## 796 0.2000000 7.882716 33.711027 4.8770833 15.717647 77.58824
## 797 0.2000000 7.907660 33.698543 4.8791667 12.036517 88.10955
## 798 0.2000000 7.864572 33.722984 4.8812500 15.014706 83.76471

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## 799	0.2000000	7.821483	33.747424	4.8833333	14.387500	73.33333
## 800	0.2000000	7.778394	33.771865	4.8854167	11.688451	83.41408
## 801	0.2000000	7.873098	33.742086	4.8875000	12.168627	86.84314
## 802	0.2000000	7.904192	33.676832	4.4206731	15.383333	76.00000
## 803	0.2000000	7.935286	33.611579	3.9538462	14.457143	81.57143
## 804	0.2000000	8.017100	33.652090	4.9333333	13.940000	80.00000
## 805	0.2000000	8.100250	33.620742	4.6846154	14.854167	81.87500
## 806	0.2000000	8.097586	33.619405	4.5892728	14.629167	82.33333
## 807	0.2000000	8.094923	33.618068	4.4939303	15.381250	82.85417
## 808	0.2000000	8.092259	33.616731	4.3985877	16.133333	83.37500
## 809	0.2000000	8.089595	33.615394	4.3032452	15.940217	83.03125
## 810	0.2000000	8.086931	33.614057	4.2079026	15.747101	82.68750
## 811	0.2000000	8.084267	33.612720	4.1125601	15.553986	82.34375
## 812	0.2000000	8.081604	33.611383	4.0172175	15.360870	82.00000
## 813	0.2000000	8.078940	33.610046	3.9218750	12.810000	84.88000
## 814	0.2000000	8.180716	33.620536	3.9702524	12.938235	85.15686
## 815	0.2000000	8.223005	33.582356	4.0186298	16.062500	77.58333
## 816	0.2000000	8.265294	33.544176	4.0670072	17.289583	80.37500
## 817	0.2000000	8.307583	33.505996	4.1153846	18.516667	83.16667
## 818	0.2000000	8.266786	33.490957	4.4692308	16.250000	80.92857
## 819	0.2000000	8.277600	33.546100	4.0416667	16.010000	83.00000
## 820	0.2029444	8.229881	33.541765	3.6719017	16.492500	84.22917
## 821	0.2058889	8.182162	33.537431	3.3021368	16.975000	85.45833
## 822	0.2088333	8.134443	33.533096	2.9323718	16.366667	83.08333
## 823	0.2117778	8.086724	33.528762	2.5626068	16.725000	84.25000
## 824	0.2147222	8.039005	33.524427	2.1928419	17.083333	85.41667
## 825	0.2176667	7.991286	33.520093	1.8230769	14.814286	84.57143
## 826	0.2000000	8.040875	33.493767	2.8807692	15.737500	83.83333
## 827	0.2000000	7.901000	33.622300	3.9833333	13.400000	79.70000
## 828	0.2000000	7.886794	33.631330	4.0243056	15.887500	80.91667
## 829	0.2000000	7.872588	33.640361	4.0652778	12.825490	84.11765
## 830	0.2000000	7.903981	33.636946	4.1062500	12.998077	84.86538
## 831	0.2000000	7.895859	33.631526	4.1454688	16.760870	79.56522
## 832	0.2000000	7.887737	33.626105	4.1846875	15.641667	68.16667
## 833	0.2000000	7.879616	33.620684	4.2239062	17.137500	74.20833
## 834	0.2000000	7.871494	33.615264	4.2631250	16.812500	82.08333
## 835	0.2000000	7.863372	33.609843	4.3023438	16.704167	81.43750
## 836	0.2000000	7.855250	33.604423	4.3415625	16.595833	80.79167
## 837	0.2000000	7.847129	33.599002	4.3807813	13.181188	84.27723
## 838	0.2000000	7.842000	33.609521	4.4200000	13.234615	87.05769
## 839	0.2000000	7.943786	33.553439	4.2909615	15.716667	78.37500
## 840	0.2000000	8.045571	33.497357	4.1619231	14.500000	82.14286
## 841	0.2000000	8.012500	33.512820	4.0328846	14.160000	80.70000
## 842	0.2000000	8.119583	33.462017	3.9038462	15.729167	81.25000
## 843	0.2000000	8.116406	33.460247	3.8878846	16.235417	80.37500
## 844	0.2000000	8.113229	33.458477	3.8719231	16.741667	79.50000
## 845	0.2000000	8.110052	33.456707	3.8559615	15.883333	81.87500
## 846	0.2000000	8.106875	33.454937	3.8400000	15.025000	84.25000
## 847	0.2000000	8.198103	33.425103	4.7130435	16.097436	82.61538
## 848	0.2000000	8.150244	33.476867	4.2555707	14.872975	84.86215
## 849	0.2000000	8.102386	33.528631	3.7980978	13.648515	87.10891
## 850	0.2000000	8.109098	33.525378	3.3406250	13.790196	87.33333
## 851	0.2000000	8.100000	33.587000	3.2595853	19.190000	50.05000
## 852	0.2000000	8.105337	33.564961	3.1785457	17.370833	84.25000

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## 853 0.2000000 8.110673 33.542922 3.0975060 17.296286 82.16848
## 854 0.2000000 8.116010 33.520884 3.0164663 17.221739 80.08696
## 855 0.2000000 8.121347 33.498845 2.9354267 15.875000 72.37500
## 856 0.2000000 8.126684 33.476806 2.8543870 15.664583 76.97917
## 857 0.2000000 8.132020 33.454767 2.7733474 15.454167 81.58333
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## 885 0.2000000 7.784090 33.657015 3.8009615 11.984000 86.16000
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## 887 0.2000000 7.809027 33.649643 3.5088942 13.591304 79.91304
## 888 0.2000000 7.857936 33.623363 3.4240385 13.560870 79.56522
## 889 0.2000000 7.906845 33.597083 3.3391827 13.732518 78.94928
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## 893 0.2000000 8.145391 33.510235 3.9000000 14.000000 75.56522
## 894 0.2000000 8.080333 33.505989 3.9392045 13.122222 78.55556
## 895 0.2000000 7.886442 33.641079 3.9784091 11.715385 82.71154
## 896 0.2000000 7.901216 33.639680 4.0176136 11.774510 82.26471
## 897 0.2000000 7.897267 33.658066 4.0568182 12.837255 78.73652
## 898 0.2000000 7.893319 33.676452 4.0960227 13.900000 75.20833
## 899 0.2000000 7.889370 33.694838 4.1352273 14.762500 76.16667
## 900 0.2000000 7.885422 33.713224 4.1744318 14.683333 76.33333
## 901 0.2000000 7.881473 33.731609 4.2136364 14.370833 76.10417
## 902 0.2000000 7.877525 33.749995 4.2528409 14.058333 75.87500
## 903 0.2000000 7.873576 33.768381 4.2920455 13.362500 75.70833
## 904 0.2000000 7.869627 33.786767 4.3312500 11.349020 81.96078
## 905 0.2000000 7.908824 33.818272 5.1208333 11.137255 85.93137
## 906 0.2000000 7.961224 33.768105 5.9104167 12.372794 76.96569

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## 908 0.2000000 7.957375 33.748917 4.8120000 12.512500 75.91667
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## 911 0.2000000 7.956938 33.729043 4.4851667 16.508333 77.37500
## 912 0.2000000 7.956792 33.722419 4.3762222 17.600000 74.08333
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## 915 0.2000000 7.982714 33.692150 3.8538462 14.692857 81.71429
## 916 0.2000000 8.130292 33.820004 3.3576923 16.958333 80.00000
## 917 0.2000000 7.875922 33.900595 3.9725962 12.007843 86.02941
## 918 0.2000000 7.880269 33.917013 4.5875000 12.023077 85.36538
## 919 0.2000000 7.913144 33.895802 4.4500000 15.400000 70.91667
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## 1658 0.2000000 8.021484 33.582690 3.1571429 12.970968 86.45161
## 1659 0.2000000 7.931182 33.655618 2.3172414 12.027273 89.93182
## 1660 0.2000000 8.101167 33.566025 4.0038462 13.383333 79.37500
## 1661 0.2000000 8.084780 33.551463 4.6202190 13.248485 68.30303
## 1662 0.2000000 8.068394 33.536900 5.2365919 13.360606 69.01515

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## 1664 0.2000000 8.035622 33.507776 6.4693376 13.509491 70.68611
## 1665 0.2000000 8.019235 33.493213 7.0857105 13.546255 71.64494
## 1666 0.2000000 8.002849 33.478651 7.7020833 13.583019 72.60377
## 1667 0.2000000 8.040697 33.390252 7.6050000 14.033333 66.30303
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## 1912 0.2000000 7.923439 33.666120 6.1764706 14.234146 83.00000
## 1913 0.2000000 8.063422 33.649727 4.7447368 14.304444 83.88889
## 1914 0.2011000 8.017518 33.659990 4.6514098 15.335556 83.48990
## 1915 0.2022000 7.971614 33.670254 4.5580827 16.366667 83.09091
## 1916 0.2033000 7.925710 33.680517 4.4647556 15.075269 85.28739
## 1917 0.2044000 7.879806 33.690781 4.3714286 13.783871 87.48387
## 1918 0.2055000 8.115917 33.700012 4.9461538 16.937500 85.04167
## 1919 0.2066000 7.797578 33.708033 6.0206897 12.362222 90.00000
## 1920 0.2077000 7.816407 33.717180 6.2161686 17.939394 84.75758
## 1921 0.2088000 7.835236 33.726327 6.4116475 16.777273 83.95455
## 1922 0.2099000 7.854066 33.735474 6.6071264 15.615152 83.15152
## 1923 0.2110000 7.872895 33.744621 6.8026054 13.910127 86.94310
## 1924 0.2121000 7.891724 33.753767 6.9980843 12.205102 90.73469
## 1925 0.2132000 7.903627 33.710488 7.1935632 15.712121 83.03030
## 1926 0.2143000 7.915529 33.667208 7.3890421 15.739394 82.81818
## 1927 0.2154000 7.927431 33.623928 7.5845211 15.587879 81.93939
## 1928 0.2165000 7.939333 33.580648 7.7800000 12.784848 79.30303
## 1929 0.2000000 7.979432 33.563455 6.6736842 13.031818 76.00000
## 1930 0.2000000 7.868805 33.604185 5.5500000 13.187805 83.09756
## 1931 0.2000000 7.822903 33.677894 4.7714286 13.835484 88.19355
## 1932 0.2000000 8.090792 33.694935 6.8769231 15.737500 83.50000

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## 1933 0.2000000 7.852289 33.711976 11.3724138 12.315556 88.62222
## 1934 0.2000000 7.841773 33.713781 10.7856404 14.694141 85.02323
## 1935 0.2000000 7.831258 33.715587 10.1988670 17.072727 81.42424
## 1936 0.2000000 7.820742 33.717393 9.6120936 14.175758 78.21212
## 1937 0.2000000 7.810227 33.719198 9.0253202 13.480570 81.44534
## 1938 0.2000000 7.799712 33.721004 8.4385468 12.785383 84.67855
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## 1943 0.2000000 7.991730 33.571742 8.4565789 18.100000 82.03030
## 1944 0.2000000 7.924548 33.596213 6.8000000 14.106452 89.29032
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## 1959 0.2329308 7.957651 33.408476 3.1599440 15.606061 83.57576
## 1960 0.2310462 7.968968 33.403497 3.2928571 13.290323 88.93548
## 1961 0.2291615 7.912256 33.485895 2.4103448 12.400000 90.23256
## 1962 0.2272769 7.962208 33.375087 2.7038462 14.454167 84.37500
## 1963 0.2253923 7.938166 33.418960 2.8802036 15.042235 83.94508
## 1964 0.2235077 7.914124 33.462832 3.0565611 15.630303 83.51515
## 1965 0.2216231 7.890082 33.506705 3.2329186 15.430303 85.00000
## 1966 0.2197385 7.866040 33.550577 3.4092760 12.450495 89.47525
## 1967 0.2178538 7.904571 33.493638 3.5856335 14.072217 86.14671
## 1968 0.2159692 7.943103 33.436698 3.7619910 15.693939 82.81818
## 1969 0.2140846 7.981635 33.379759 3.9383484 15.475758 83.24242
## 1970 0.2122000 8.020167 33.322819 4.1147059 14.261905 86.04762
## 1971 0.2001667 8.024756 33.310847 4.5131579 14.188889 84.37778
## 1972 0.2191667 8.004152 33.336312 2.4600000 13.903030 83.48485
## 1973 0.2175694 7.942097 33.415845 2.6321429 13.351613 84.16129
## 1974 0.2159722 8.048833 33.392458 4.8923077 15.170833 78.62500
## 1975 0.2143750 7.892795 33.508641 2.8793103 12.870455 89.68182
## 1976 0.2127778 8.120000 33.588000 3.0073402 19.230000 71.80000
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## 1978 0.2095833 8.029368 33.525433 3.2633999 16.106970 77.71111
## 1979 0.2079861 7.984051 33.494150 3.3914297 14.545455 80.66667
## 1980 0.2063889 7.938735 33.462867 3.5194596 13.132353 89.42157
## 1981 0.2047917 7.951485 33.445948 3.6474894 14.793939 78.42424
## 1982 0.2031944 7.964234 33.429030 3.7755193 15.106061 78.16667
## 1983 0.2015972 7.976984 33.412112 3.9035491 15.418182 77.90909
## 1984 0.2000000 7.989733 33.395193 4.0315789 15.733333 82.51111
## 1985 0.2000000 7.993212 33.382530 3.1450000 15.509091 85.15152
## 1986 0.2127000 7.887429 33.382598 3.1382353 15.476190 87.04762

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## 1987 0.2118533 7.983677 33.385184 3.0285714 14.103226 86.25806
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## 1989 0.2101600 7.929867 33.461573 3.3827586 13.108889 87.60000
## 1990 0.2093133 7.931072 33.458876 3.4004454 13.051616 87.52323
## 1991 0.2084667 7.932277 33.456179 3.4181322 12.994343 87.44646
## 1992 0.2076200 7.933482 33.453481 3.4358190 12.937071 87.36970
## 1993 0.2067733 7.934687 33.450784 3.4535057 12.879798 87.29293
## 1994 0.2059267 7.944612 33.435880 3.4711925 14.927273 75.18182
## 1995 0.2050800 7.954538 33.420976 3.4888793 14.642424 73.63636
## 1996 0.2042333 7.964463 33.406072 3.5065661 14.357576 72.09091
## 1997 0.2033867 7.974389 33.391168 3.5242529 14.072727 70.54545
## 1998 0.2025400 7.984314 33.376264 3.5419397 14.108081 71.71717
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## 2006 0.2000000 7.963065 33.401684 1.9035714 13.506452 85.22581
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## 2015 0.2000000 7.981520 33.451611 3.3044444 15.142424 86.33333
## 2016 0.2000000 8.027291 33.418846 3.2622222 15.239394 86.78788
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## 2018 0.2000000 8.072159 33.381552 3.2368421 14.838636 81.63636
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## 2020 0.2000000 7.968524 33.424071 5.7153846 13.142857 90.00000
## 2021 0.2000000 7.969526 33.409932 2.9142857 14.178947 89.00000
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## 2023 0.2000000 8.045000 33.352609 2.1187500 14.513636 90.27273
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## 2028 0.2000000 7.925804 33.511827 2.7156250 15.157576 80.00000
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## 2031 0.2000000 7.932011 33.474097 3.0737500 14.849242 78.55303
## 2032 0.2000000 7.934080 33.461520 3.1931250 14.719697 78.89394
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## 2037 0.2000000 7.944424 33.398636 3.7900000 13.654545 80.57576
## 2038 0.2000000 7.927167 33.444195 3.1764706 13.380952 83.35714
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## 2040 0.2083333 7.798461 33.713014 4.9327530 11.872549 89.85294

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## 2041 0.2166667 7.817179 33.636586 4.7312955 12.117953 86.34804
## 2042 0.2250000 7.835897 33.560159 4.5298381 12.363358 82.84314
## 2043 0.2333333 7.854615 33.483732 4.3283806 12.608762 79.33824
## 2044 0.2416667 7.873333 33.407304 4.1269231 12.854167 75.83333
## 2045 0.2500000 7.819581 33.617658 3.8357143 11.964516 84.09677
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## 2047 0.2666667 7.776308 33.791015 4.1700000 13.106522 77.32609
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## 2061 0.4116667 7.900123 33.777119 5.1952663 13.393939 76.83333
## 2062 0.4206250 7.869014 33.805803 5.3958580 13.239394 77.23485
## 2063 0.4295833 7.837905 33.834488 5.5964497 13.084848 77.63636
## 2064 0.4385417 7.806796 33.863172 5.7970414 12.384848 77.39394
## 2065 0.4475000 7.775687 33.891857 5.9976331 11.538503 82.37834
## 2066 0.4564583 7.744578 33.920541 6.1982249 10.692157 87.36275
## 2067 0.4654167 7.833729 33.816820 6.3988166 12.233333 73.75758
## 2068 0.4743750 7.922880 33.713100 6.5994083 13.769697 64.63636
## 2069 0.4833333 8.012030 33.609379 6.8000000 13.403030 66.00000
## 2070 0.2000000 8.011273 33.573095 5.0552632 13.586364 74.79545
## 2071 0.2000000 7.951643 33.573974 3.6294118 12.978571 85.00000
## 2072 0.2125000 7.784140 33.818279 2.9172414 11.062791 88.11628
## 2073 0.2250000 7.838806 33.763332 3.2285714 12.306452 84.87097
## 2074 0.2375000 7.970792 33.790669 4.0653846 13.400000 81.75000
## 2075 0.2500000 7.885028 33.818005 4.0061589 13.484848 80.34470
## 2076 0.2625000 7.799263 33.845342 3.9469331 13.569697 78.93939
## 2077 0.2750000 7.713499 33.872678 3.8877074 12.340241 83.31283
## 2078 0.2875000 7.627735 33.900015 3.8284816 11.110784 87.68627
## 2079 0.3000000 7.704531 33.841543 3.7692559 12.242543 85.32620
## 2080 0.3125000 7.781327 33.783071 3.7100302 13.374302 82.96613
## 2081 0.3250000 7.858123 33.724599 3.6508044 14.506061 80.60606
## 2082 0.3375000 7.934918 33.666127 3.5915787 14.056602 80.91017
## 2083 0.3500000 8.011714 33.607655 3.5323529 13.607143 81.21429
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## 2089 0.2000000 7.778978 33.759096 2.8000000 11.504444 80.40657
## 2090 0.2000000 7.767128 33.763232 2.8428571 14.093131 80.68813
## 2091 0.2000000 7.755278 33.767369 2.8857143 16.681818 80.96970
## 2092 0.2000000 7.743429 33.771506 2.9285714 11.630612 87.82653
## 2093 0.2000000 7.769200 33.751122 2.9714286 14.009246 84.35266
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## 2095 0.2000000 7.820744 33.710352 3.0571429 13.842424 81.48485
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## 2098 0.2000000 7.761500 33.781550 3.4500000 11.975000 80.12500
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## 2122 0.7055556 7.965970 33.428367 4.3714379 14.900000 78.48485
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## 2129 0.5666667 8.071419 33.377374 7.1187500 17.543434 73.09343
## 2130 0.6888889 8.085588 33.372235 7.2472222 17.586869 73.06187
## 2131 0.8111111 8.099758 33.367097 7.3756944 17.630303 73.03030
## 2132 0.9333333 8.073205 33.351057 7.5041667 16.988636 74.20455
## 2133 1.0555556 8.046652 33.335017 7.6326389 16.346970 75.37879
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## 2135 1.3000000 7.993545 33.302936 7.8895833 15.063636 77.72727
## 2136 1.4222222 8.032364 33.280633 8.0180556 15.203030 71.89394
## 2137 1.5444444 8.071182 33.258330 8.1465278 15.342424 66.06061
## 2138 1.6666667 8.119909 33.269858 8.2750000 15.487879 74.27273
## 2139 0.8250000 8.067044 33.233931 10.4157895 15.062222 69.24444
## 2140 0.2000000 8.117548 33.256450 5.2264706 14.816667 80.66667
## 2141 0.2000000 8.130182 33.299755 5.3114219 16.506061 65.93939
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## 2144 0.2000000 8.010896 33.305450 5.5662760 13.595833 87.77083
## 2145 0.2000000 8.055417 33.315210 5.6512273 14.125000 86.18750
## 2146 0.2000000 8.127490 33.282873 5.7361787 15.367172 81.06439
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## 2149 0.2000000 8.128000 33.404876 5.9910327 17.945455 76.90909
## 2150 0.2000000 8.121439 33.294753 6.0759841 17.234848 79.51515
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## 2163 0.2629371 8.051636 33.166248 4.3554945 14.821212 81.03030
## 2164 0.2524476 8.045561 33.174683 4.3279121 14.962784 81.31439
## 2165 0.2419580 8.039485 33.183118 4.3003297 15.104356 81.59848
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## 2201 0.2200000 8.089002 33.238211 10.4573529 13.427273 77.05303
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## 2683 0.2000000 8.118343 33.415652 6.4243510 16.431313 81.97980
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## 2685 0.2000000 8.120472 33.426623 6.9029650 16.657197 82.17424
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## 2957 0.2000000 8.046061 33.878155 5.7511592 13.842424 77.78788
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## 3443 0.2000000 8.098712 33.201788 5.9419000 14.574924 63.61083
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## 3713 0.3250000 8.067333 33.584956 4.5397368 14.393778 82.05733
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## 4468 0.2000000 8.127889 33.504478 1.5328125 17.809333 75.50900
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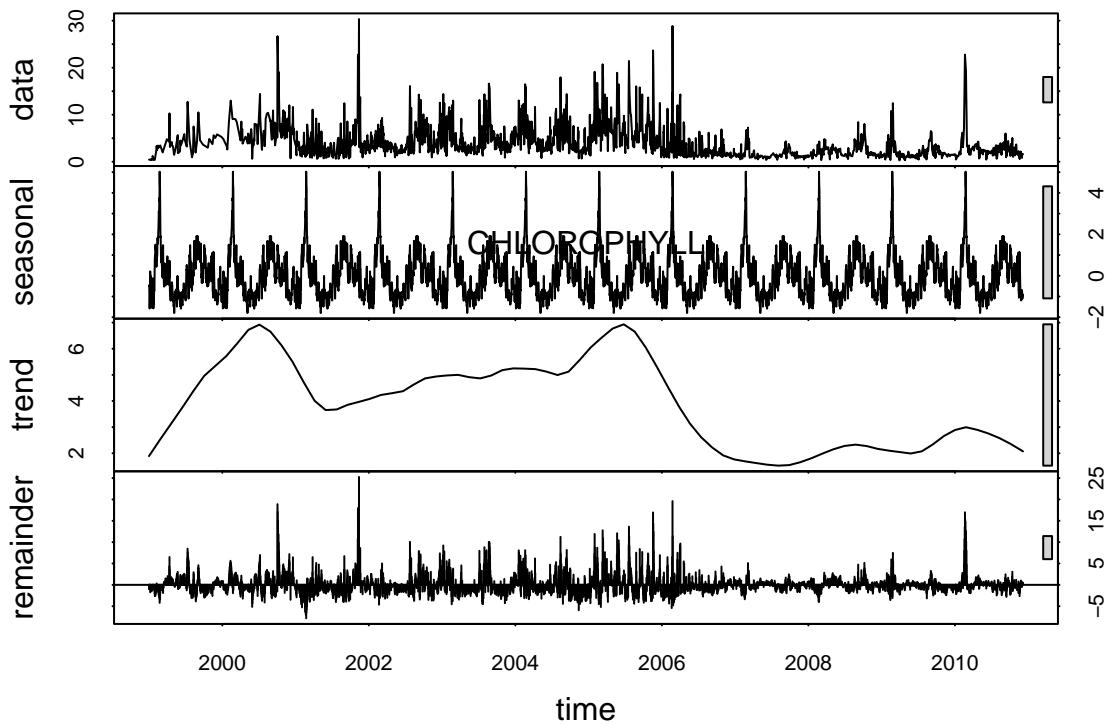
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## [ reached 'max' / getOption("max.print") -- omitted 3035 rows ]
gb04_start <- "1990-11-15"
print(lubridate::yday(ymd(gb04_start)))

## [1] 319

##### 5 YEAR - 1996 - 2001 #####
ts_chlorophyll <- ts(owt_df02_gb04_mrgd$CHLOROPHYLL, start = c(1996, 1), freq = 365)
ts_1996_2001_chl <- window(ts_chlorophyll, start=c(1999, 1))
stl_chl <- stl(ts_1996_2001_chl, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_chl)
mtext("CHLOROPHYLL", side=3, line = -5)

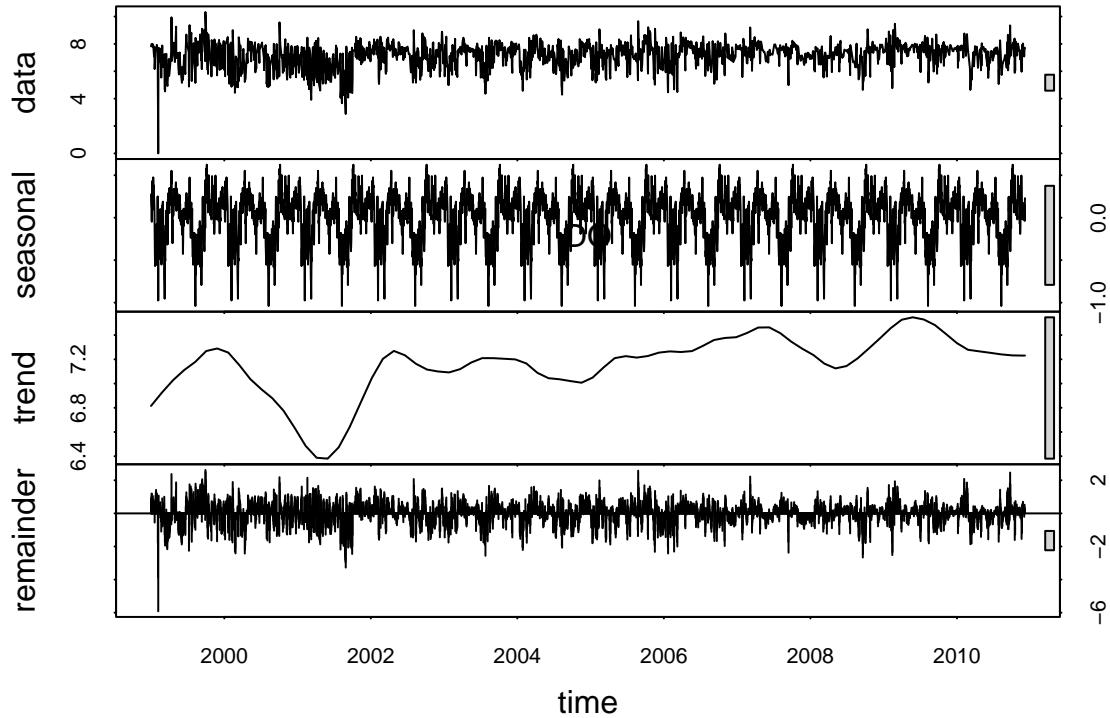
```



```

ts_do <- ts(owt_df02_gb04_mrgd$D0, start = c(1996, 1), freq = 365)
ts_1996_2001_do <- window(ts_do, start=c(1999, 1))
stl_do <- stl(ts_1996_2001_do, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_do)
mtext("D0", side=3, line = -5)

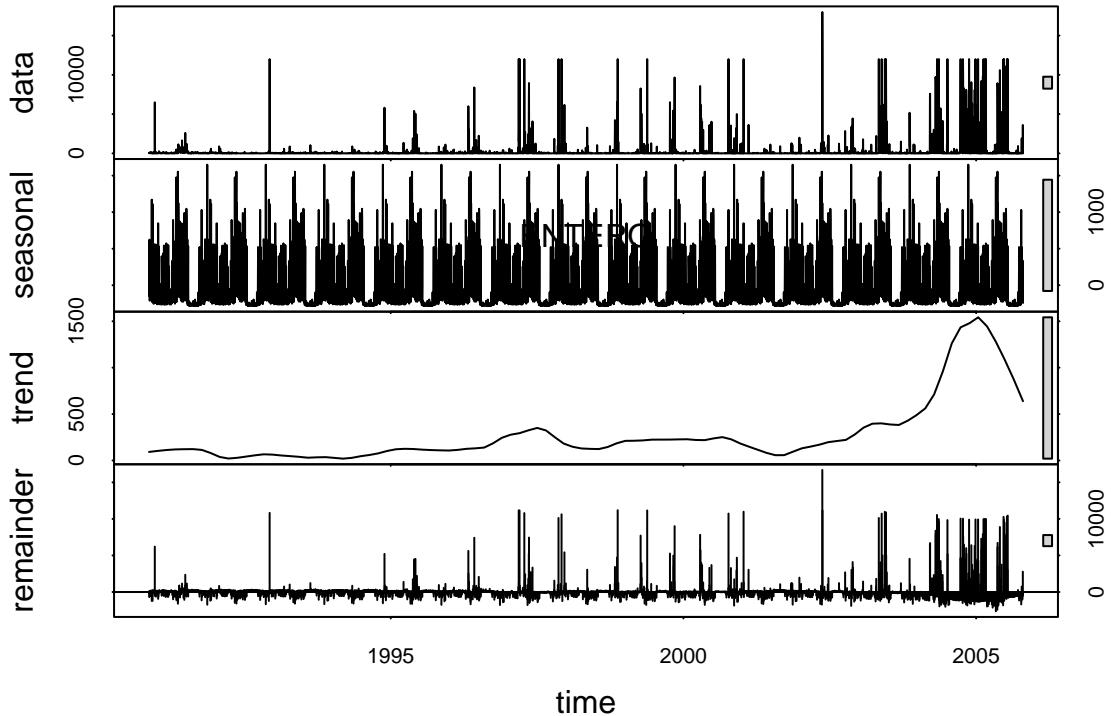
```



```

ts_ent <- ts(owt_df02_gb04_mrgd$ENTERO, start = c(1990, 319), freq = 365)
#ts_1996_2001_ent <- window(ts_ent, start=c(1999, 1))
stl_ent <- stl(ts_ent, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_ent)
mtext("ENTERO", side=3, line = -5)

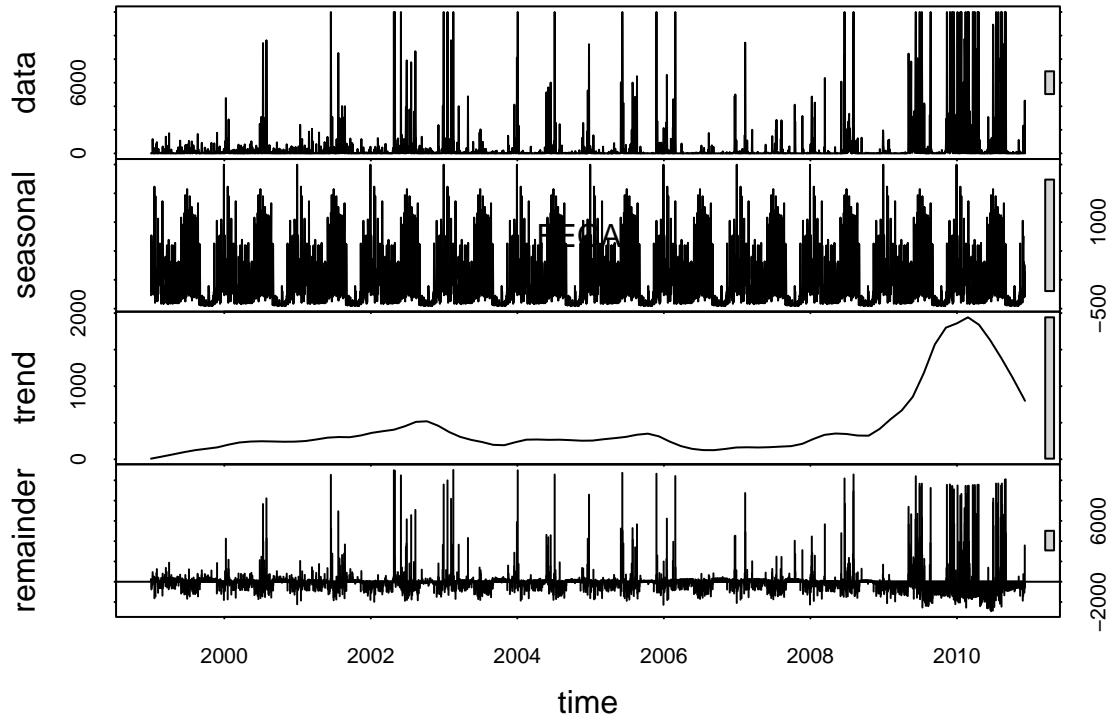
```



```

ts_fecal <- ts(owt_df02_gb04_mrgd$FECAL, start = c(1996, 1), freq = 365)
ts_1996_2001_fecal <- window(ts_fecal, start=c(1999, 1))
stl_fecal <- stl(ts_1996_2001_fecal, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_fecal)
mtext("FECAL", side=3, line = -5)

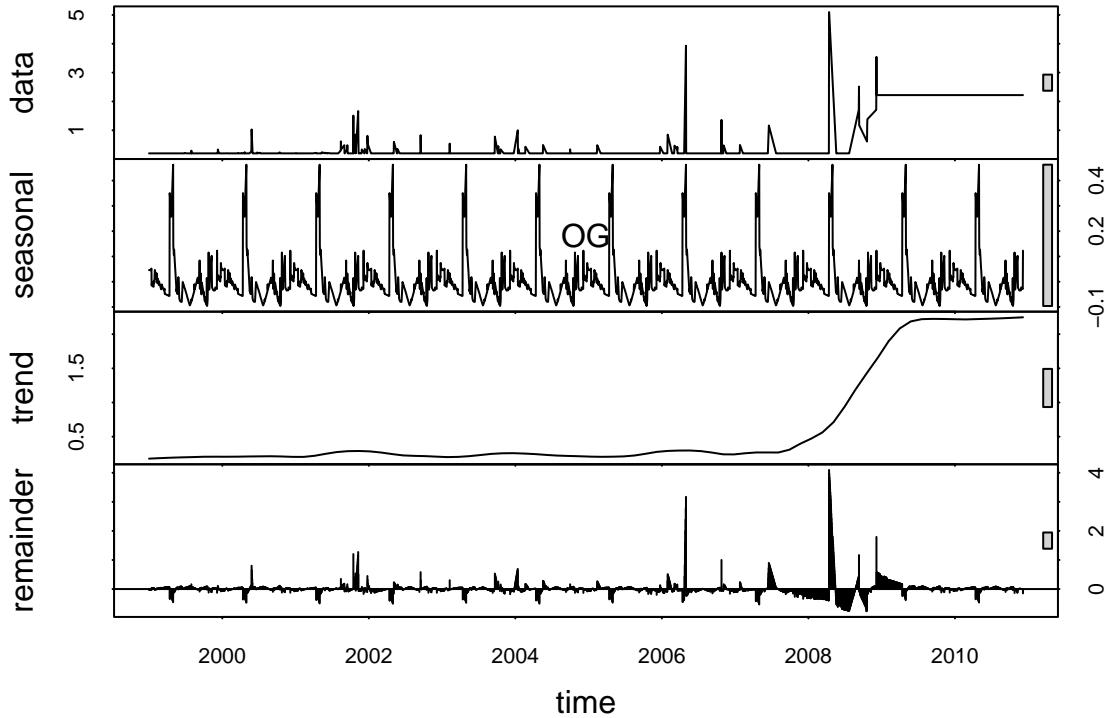
```



```

ts_og <- ts(owt_df02_gb04_mrgd$OG, start = c(1996, 1), freq = 365)
ts_1996_2001_og <- window(ts_og, start=c(1999, 1))
stl_og <- stl(ts_1996_2001_og, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_og)
mtext("OG", side=3, line = -5)

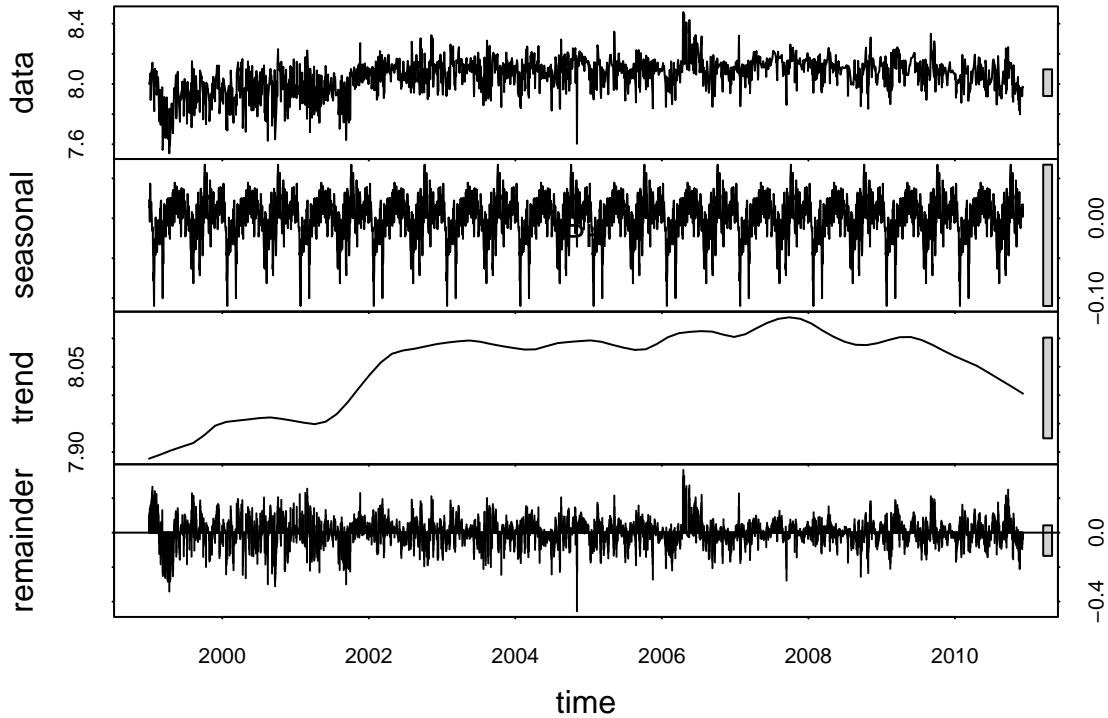
```



```

ts_ph <- ts(owt_df02_gb04_mrgd$PH, start = c(1996, 1), freq = 365)
ts_1996_2001_ph <- window(ts_ph, start=c(1999, 1))
stl_ph <- stl(ts_1996_2001_ph, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_ph)
mtext("PH", side=3, line = -5)

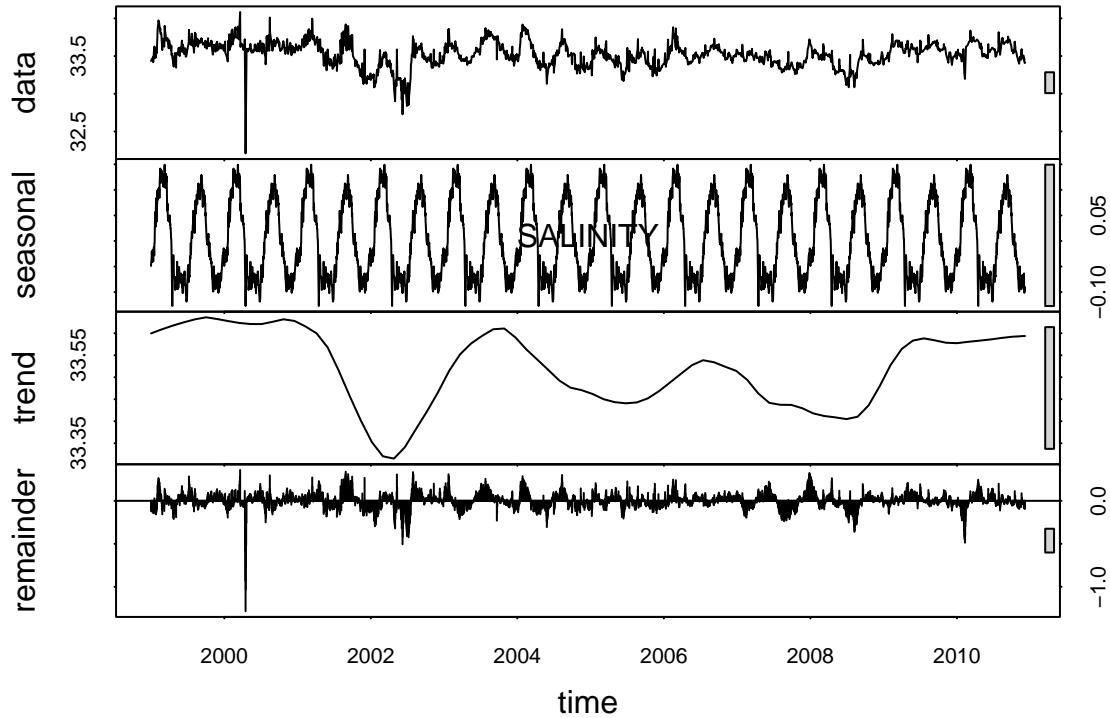
```



```

ts_salinity <- ts(owt_df02_gb04_mrgd$SALINITY, start = c(1996, 1), freq = 365)
ts_1996_2001_salinity <- window(ts_salinity, start=c(1999, 1))
stl_salinity <- stl(ts_1996_2001_salinity, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_salinity)
mtext("SALINITY", side=3, line = -5)

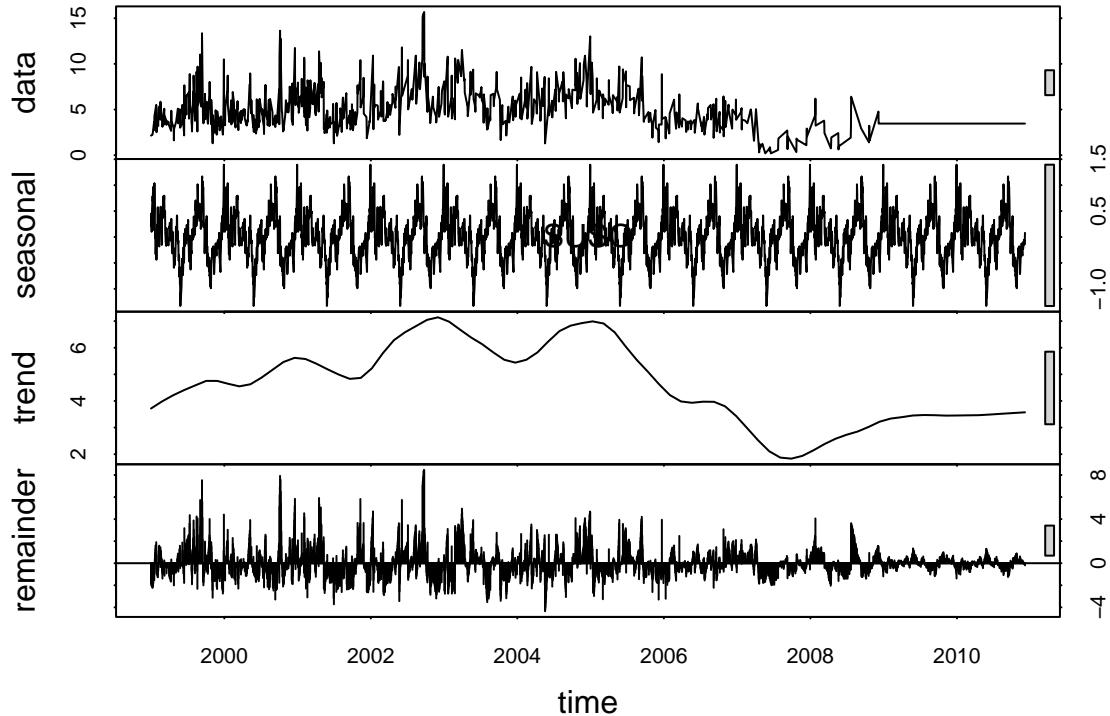
```



```

ts_suso <- ts(owt_df02_gb04_mrgd$SUSO, start = c(1996, 1), freq = 365)
ts_1996_2001_suso <- window(ts_suso, start=c(1999, 1))
stl_suso <- stl(ts_1996_2001_suso, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_suso)
mtext("SUSO", side=3, line = -5)

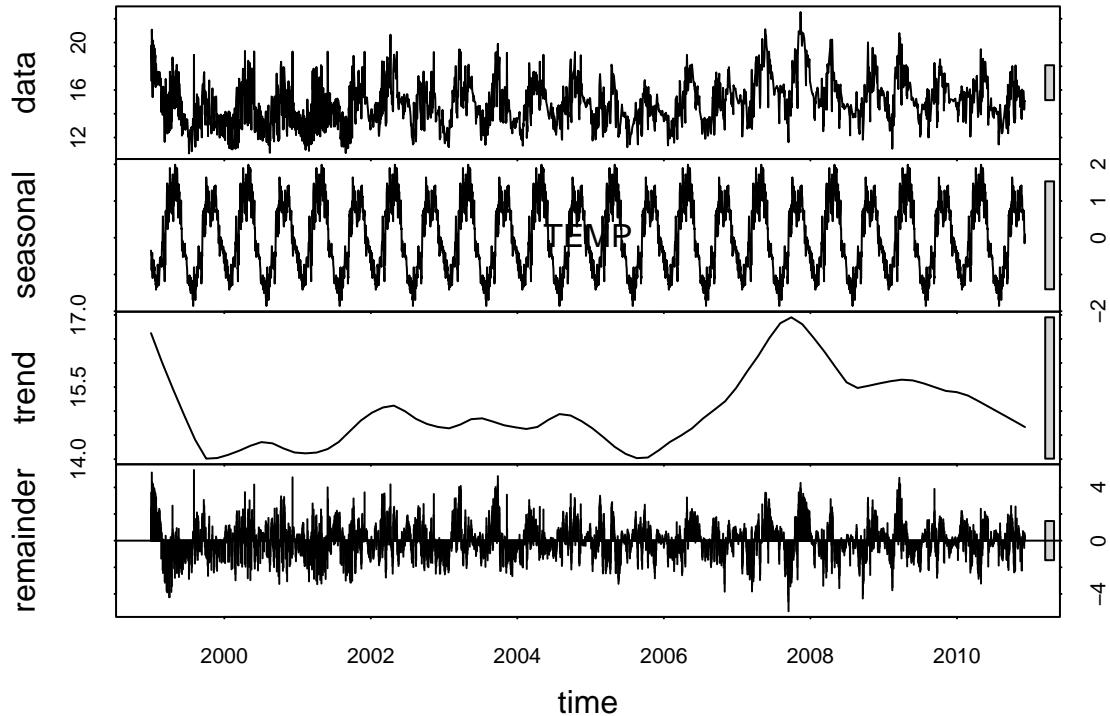
```



```

ts_temp <- ts(owt_df02_gb04_mrgd$TEMP, start = c(1996, 1), freq = 365)
ts_1996_2001_temp <- window(ts_temp, start=c(1999, 1))
stl_temp <- stl(ts_1996_2001_temp, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_temp)
mtext("TEMP", side=3, line = -5)

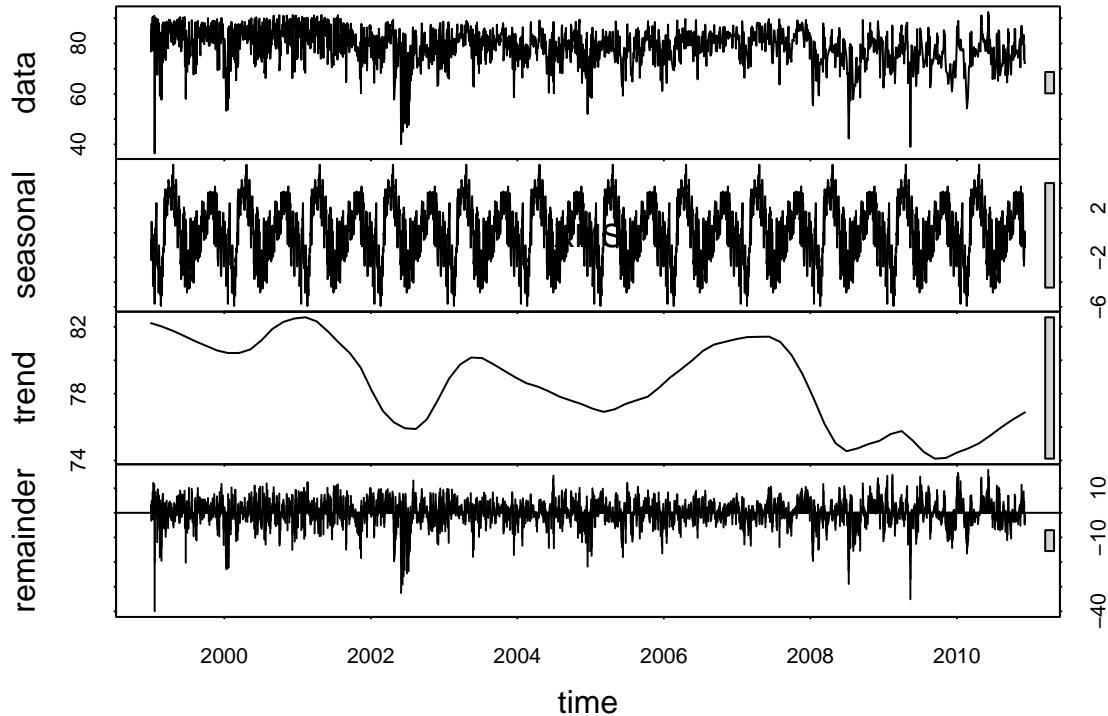
```



```

ts_xms <- ts(owt_df02_gb04_mrgd$XMS, start = c(1996, 1), freq = 365)
ts_1996_2001_xms <- window(ts_xms, start=c(1999, 1))
stl_xms <- stl(ts_1996_2001_xms, s.window="periodic")
#labels.chart = seq(as.Date("1990-11-15"), as.Date("2021-12-29"), by = "weeks")
plot(stl_xms)
mtext("XMS", side=3, line = -5)

```



```
# All parameters exhibited seasonal cycles within a year range, so
# it would make sense to have several years worth of datapoints for the training period.
# This set below can be used for all parameters.
train <- head(owt_df02_gb04_mrgd, round(NROW(owt_df02_gb04_mrgd) * 0.6))
h <- length(owt_df02_gb04_mrgd) - NROW(train)
test <- tail(owt_df02_gb04_mrgd, h)
```

Define custom function to produce scatterplots comparing multiple predictors to one target

```
param_lst03 <- c("CHLOROPHYLL",
                 "DENSITY",
                 "DO",
                 "FECAL",
                 "OG",
                 "PH",
                 "SALINITY",
                 "SUSO",
                 "TEMP",
                 "XMS")

scatr <- function(df = NA,
                  y = NA,
                  x_lst = c()) {
  for (p in x_lst) {
```

```

plot <- ggplot(df, aes(df[, p], df[, y])) +
  geom_point() +
  stat_smooth(method = "lm",
              formula = y ~ x,
              geom = "smooth") +
  labs(x = p,
       y = y,
       title = "Figure",
       subtitle = paste0("Scatterplot of ", p, " and ", y, " Series"))
  print(plot)
}
}

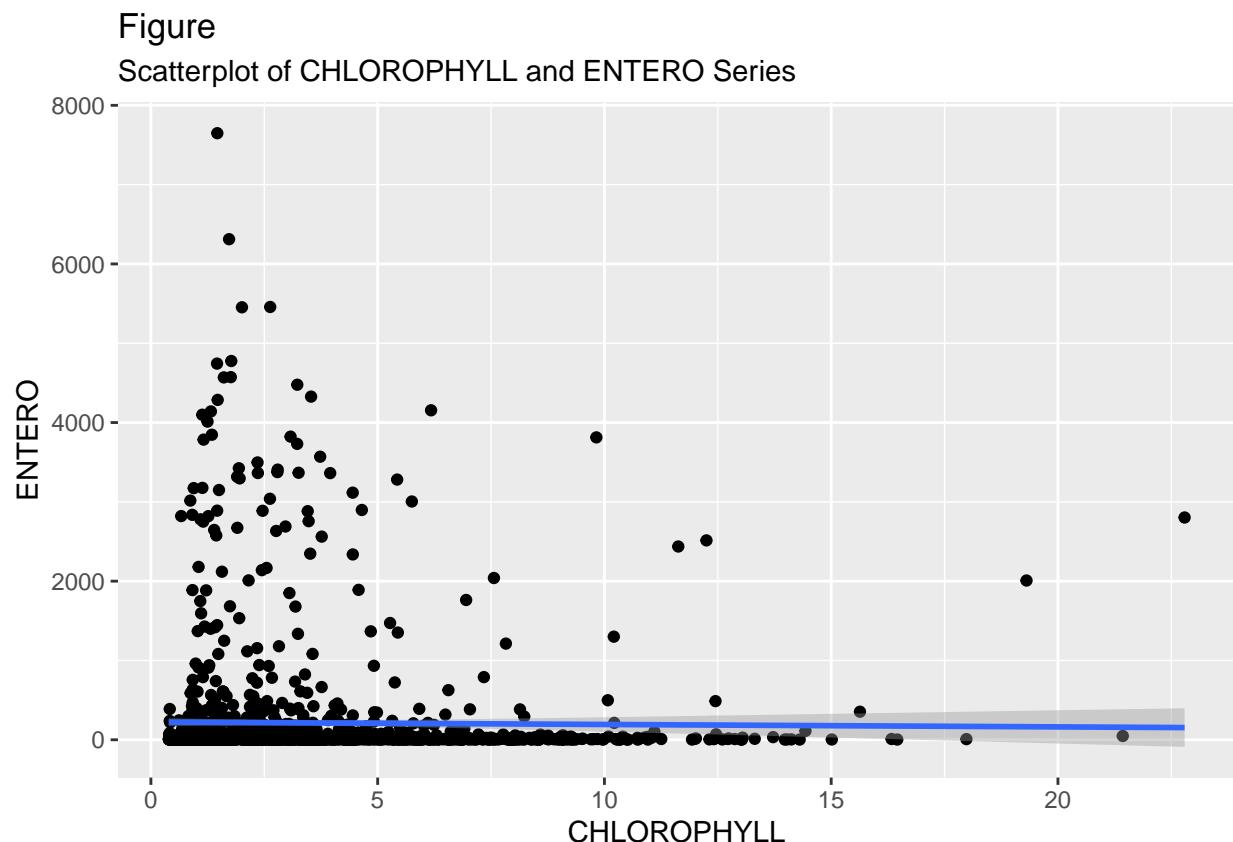
```

Run custom function on data aggregated by date\_sample and parameter

```

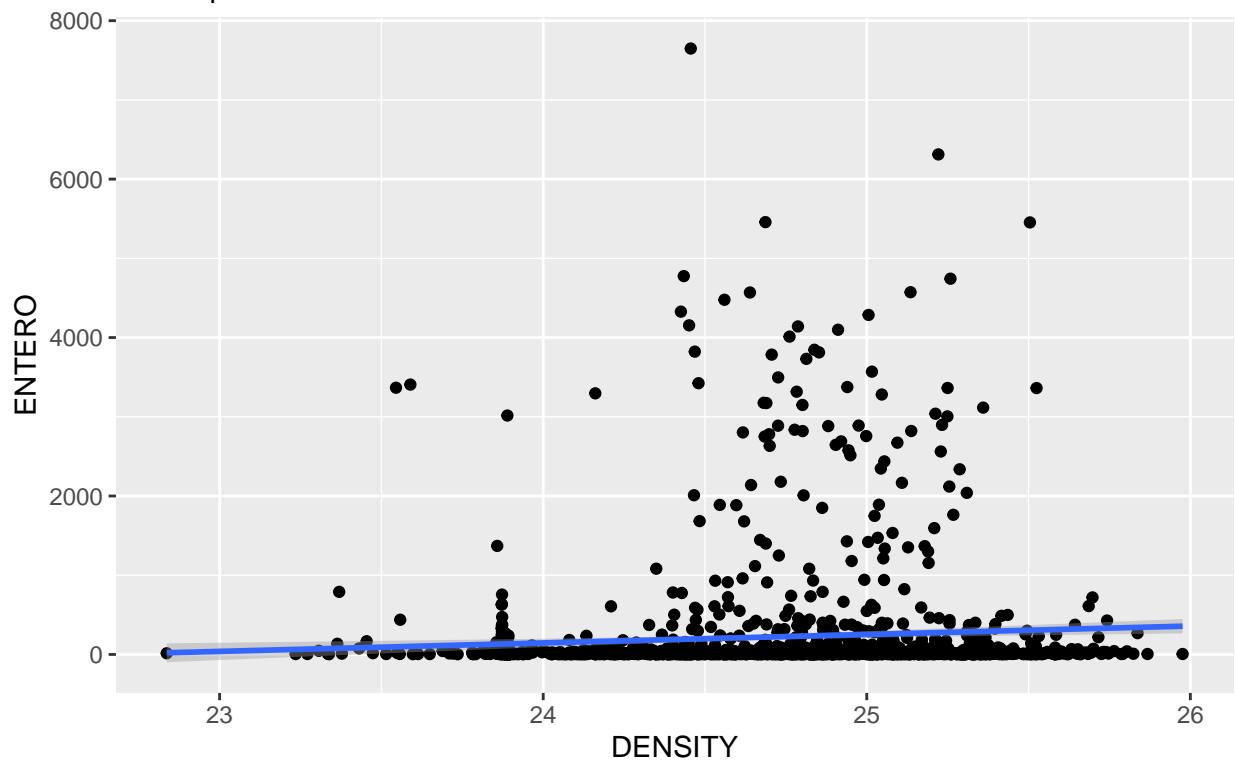
# All data
scatr(df = owt_df02_gb04_wkly,
      y = "ENTERO",
      x_lst = param_lst03)

```



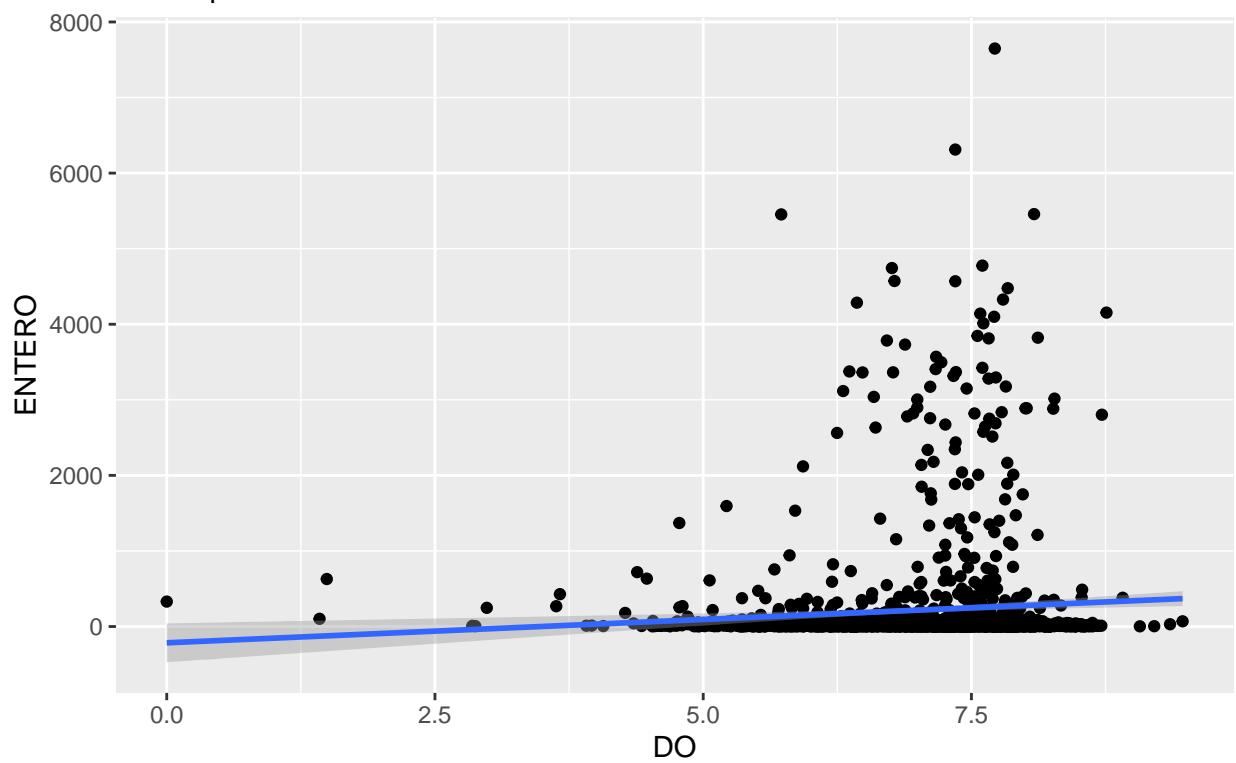
**Figure**

Scatterplot of DENSITY and ENTERO Series



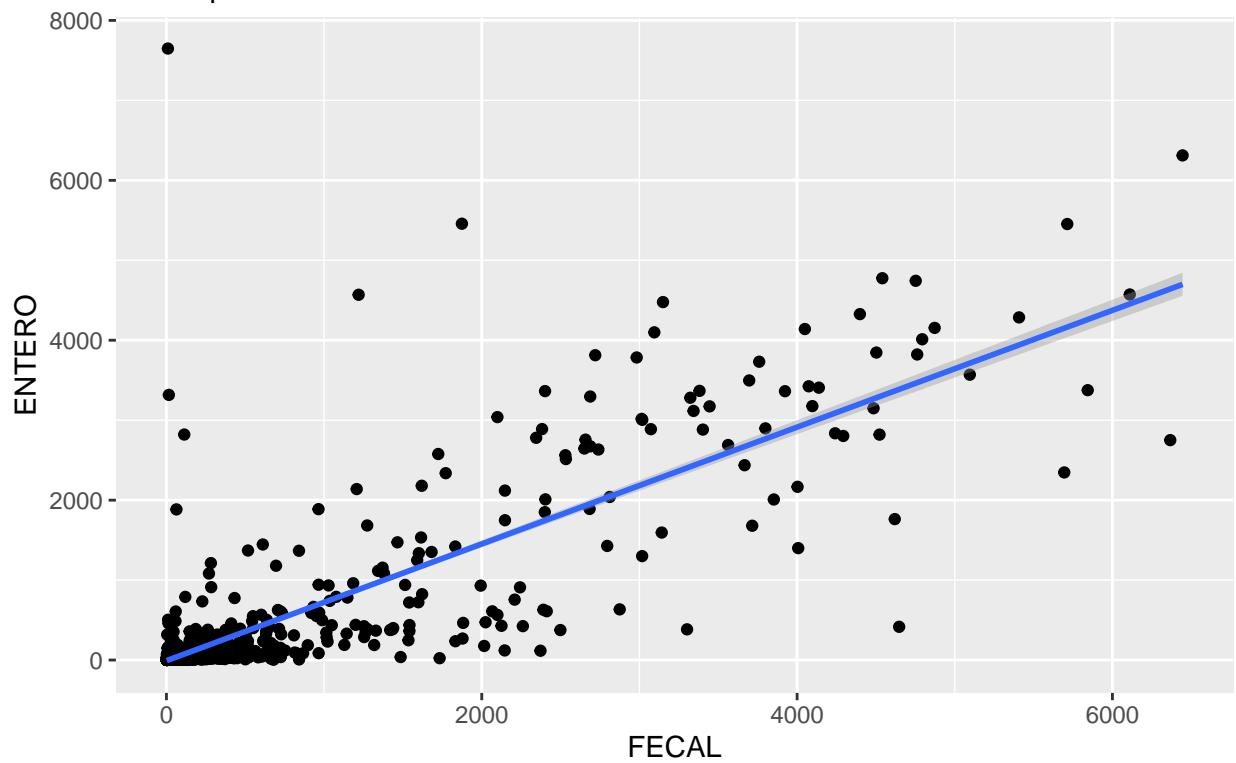
**Figure**

Scatterplot of DO and ENTERO Series



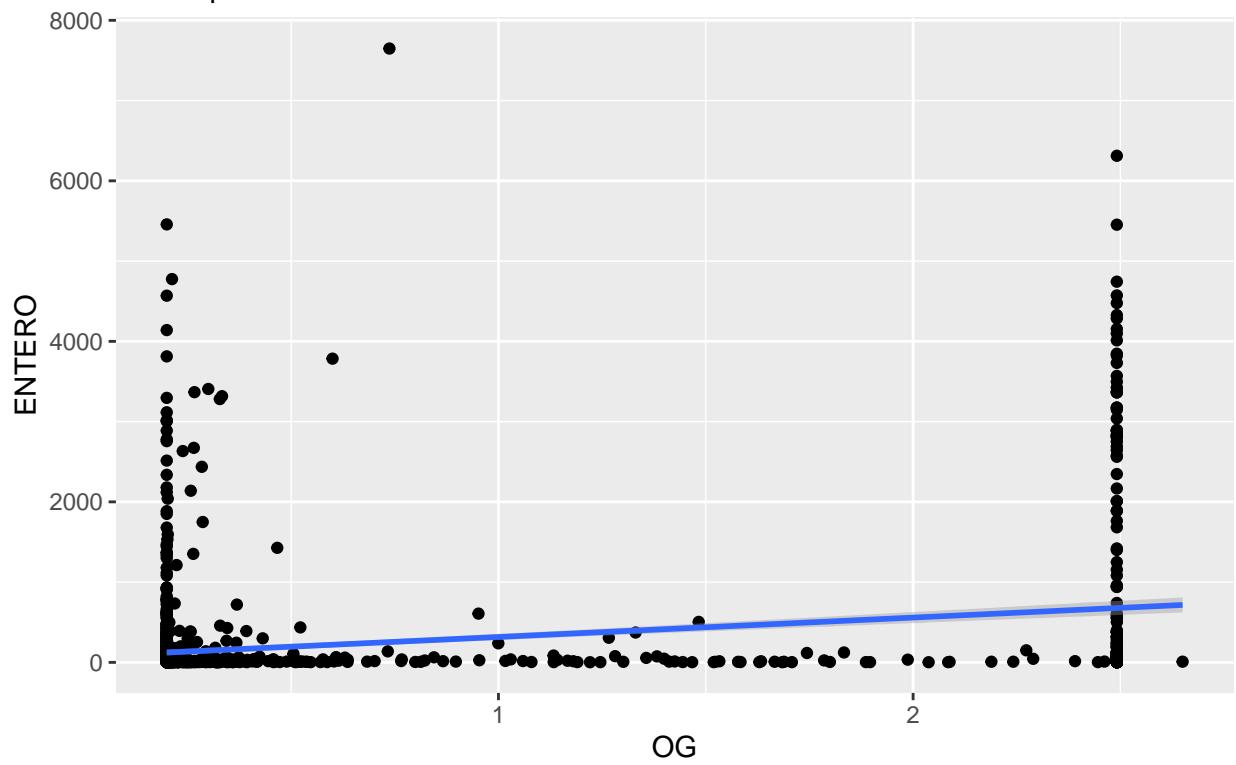
**Figure**

Scatterplot of FECAL and ENTERO Series



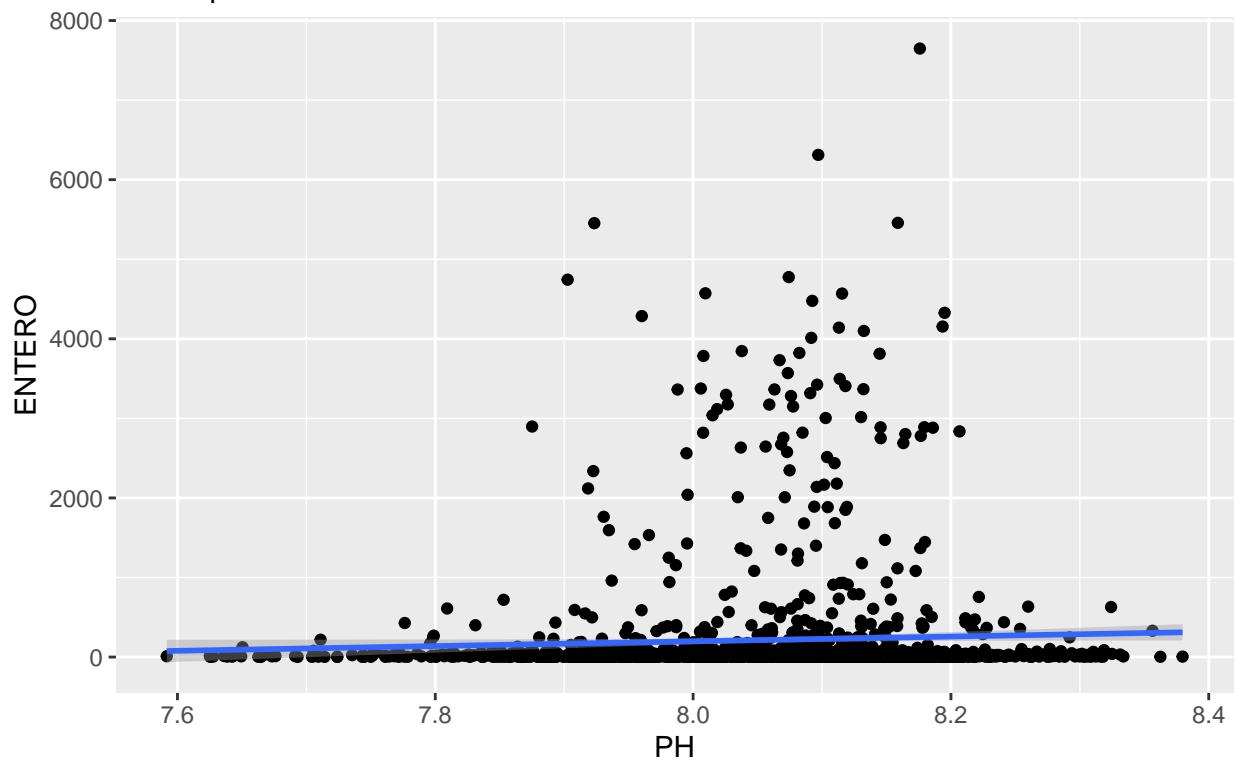
**Figure**

Scatterplot of OG and ENTERO Series

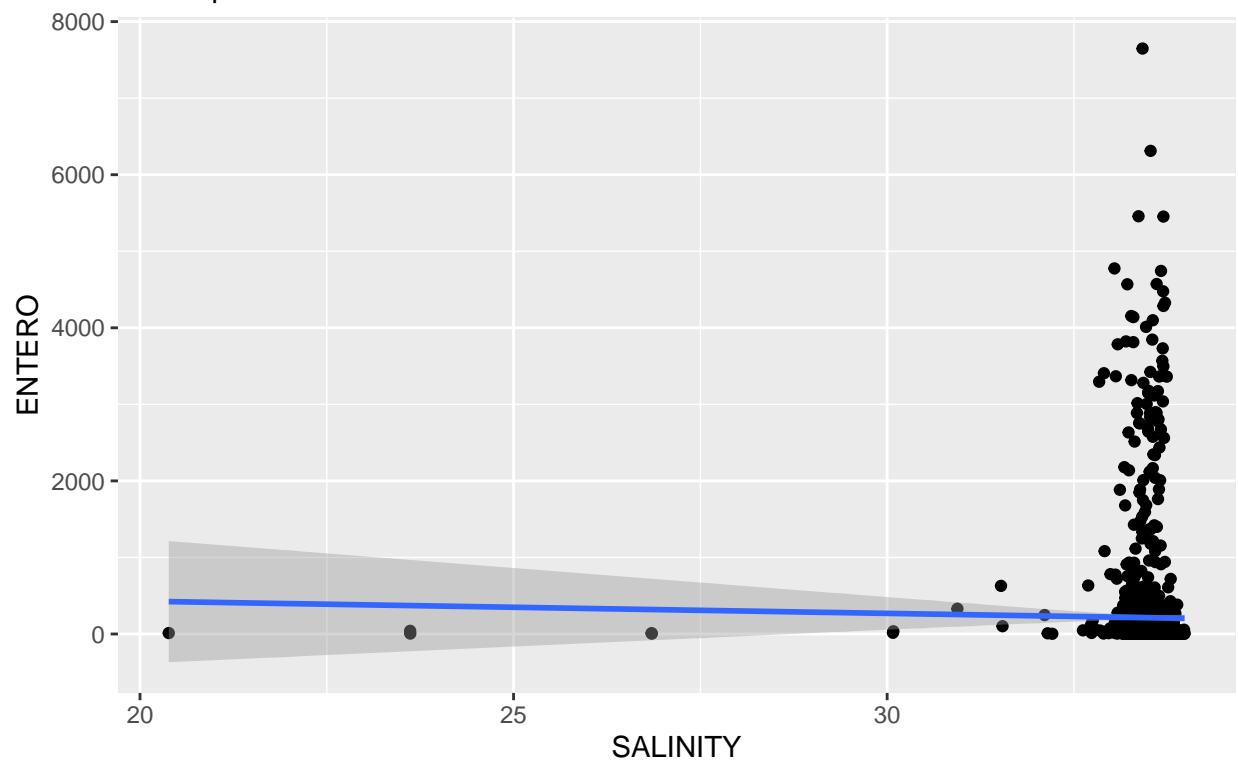


**Figure**

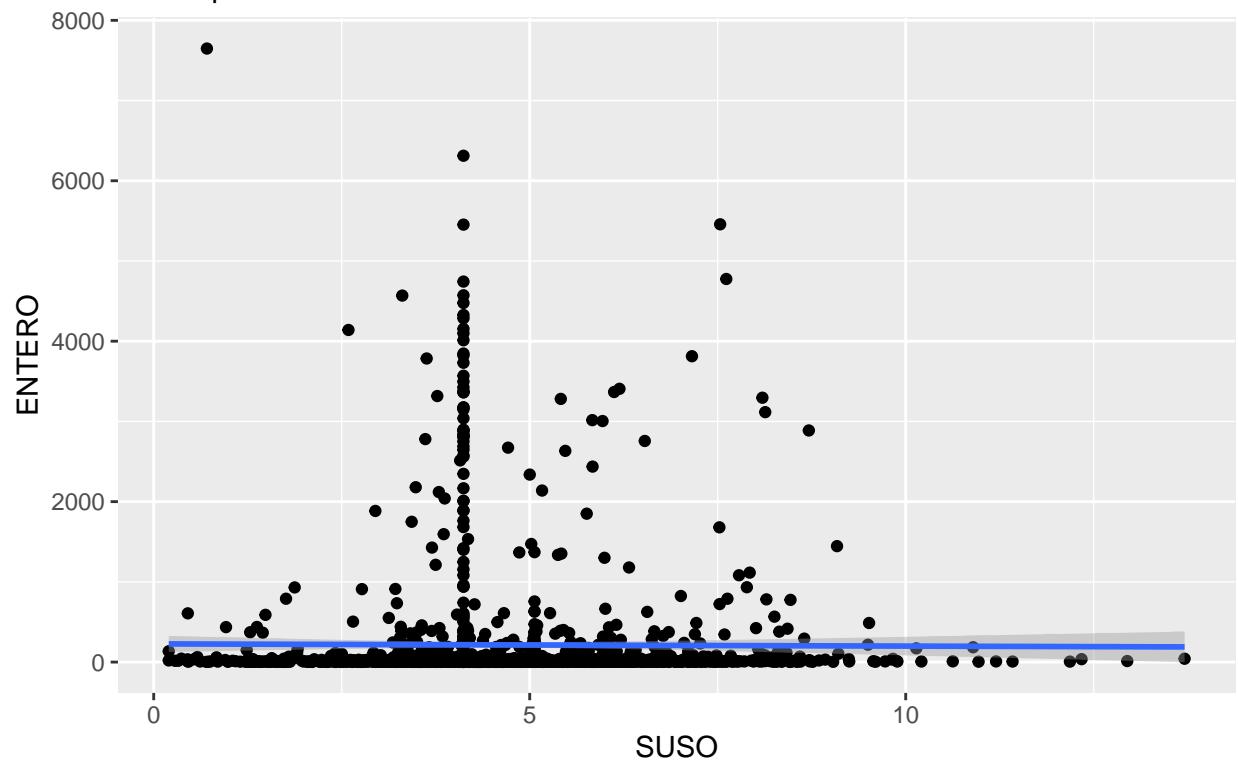
Scatterplot of PH and ENTERO Series



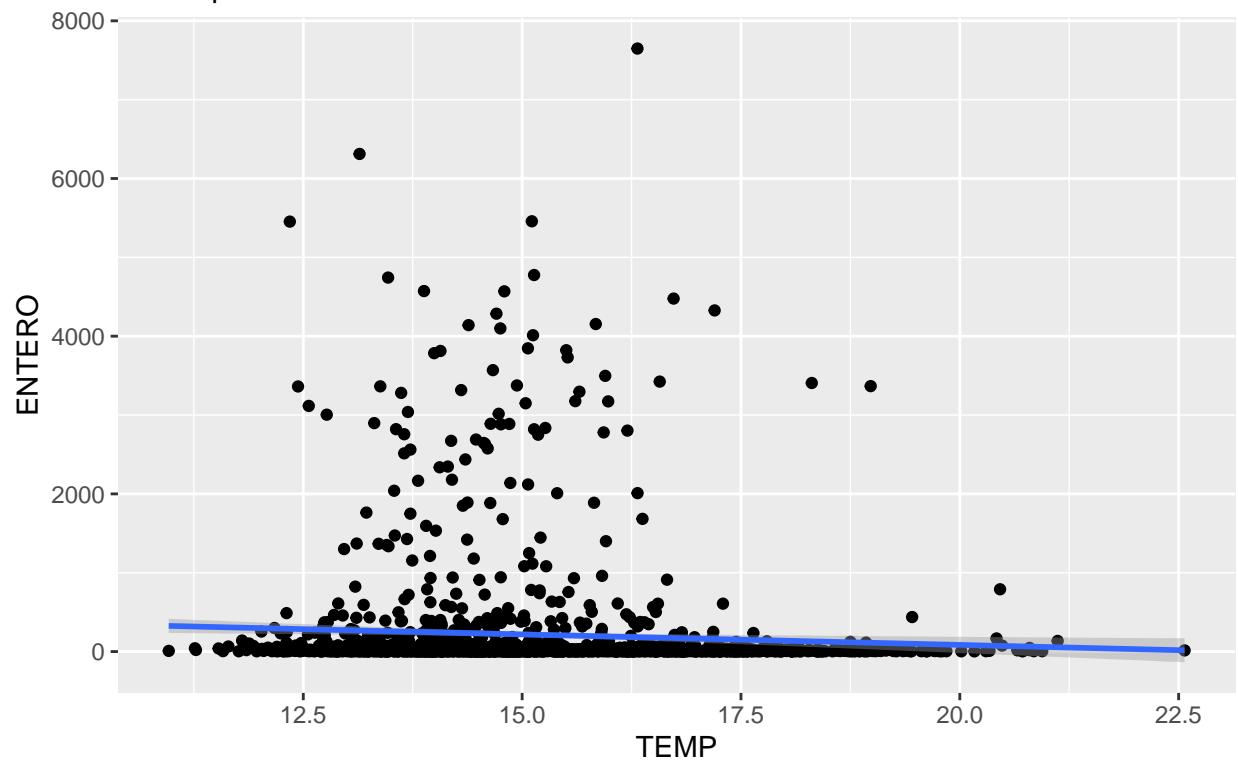
**Figure**  
Scatterplot of SALINITY and ENTERO Series



**Figure**  
Scatterplot of SUSO and ENTERO Series

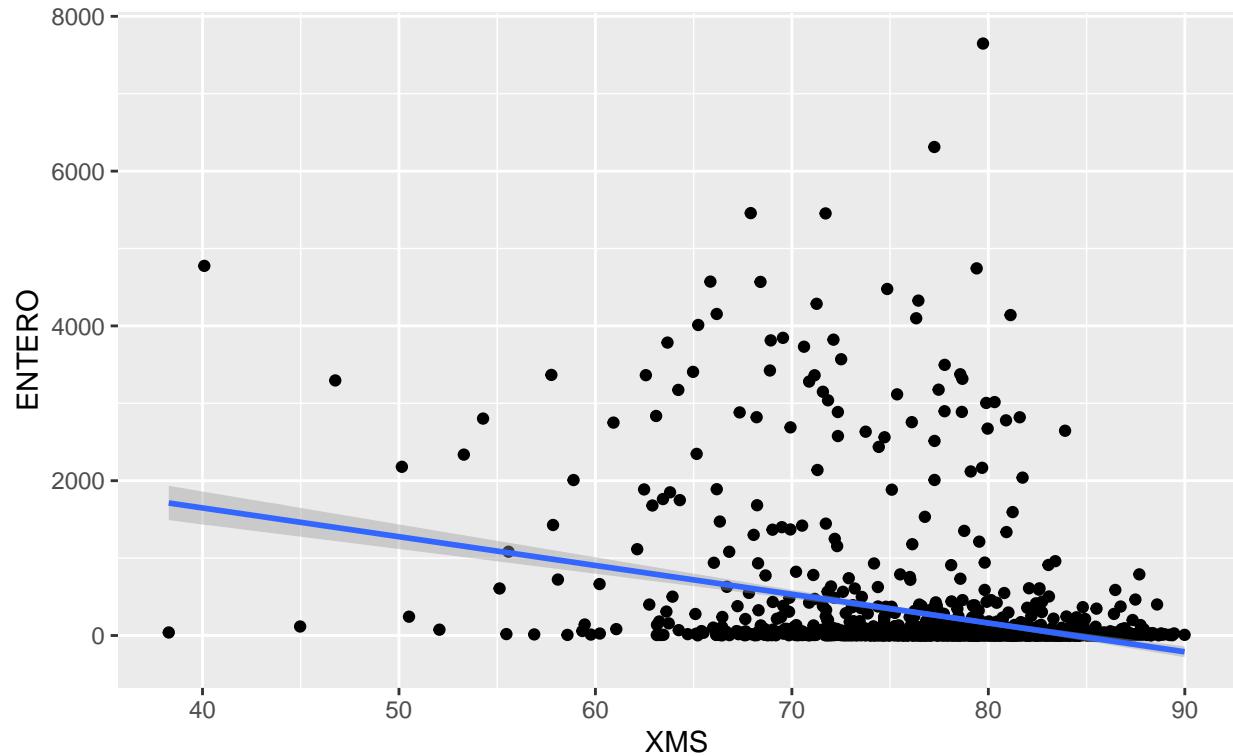


**Figure**  
Scatterplot of TEMP and ENTERO Series



**Figure**

Scatterplot of XMS and ENTERO Series



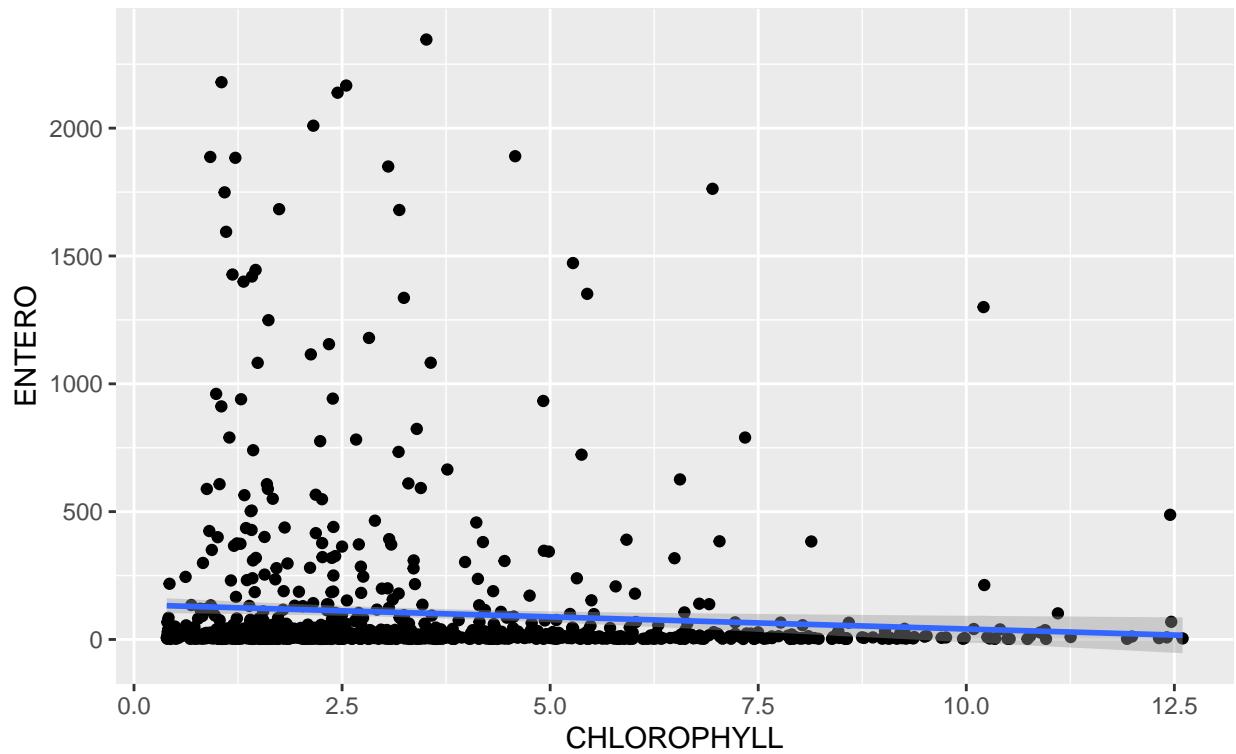
```
# Excluding outliers
print(head(owt_df02_gb04_wkly02, 7))
```

```
##   date_sample CHLOROPHYLL DENSITY      DO     ENTERO    FECAL OG     PH
## 1 1990-11-19       1.07 23.854 6.980000      NA      NA NA 8.130
## 2 1991-01-07        NA     NA      NA 25.38462 88.46154 NA   NA
## 3 1991-01-14        NA     NA 5.445417 58.12973 137.21730 NA 8.195
## 4 1991-01-21        NA     NA      NA 23.20513 59.61538 NA   NA
## 5 1991-01-28        NA     NA      NA 31.81891 69.78365 NA   NA
## 6 1991-02-04        NA     NA      NA 154.23077 428.58974 NA   NA
## 7 1991-02-11        NA     NA      NA      NA 16.83814 14.63141 NA   NA
##   SALINITY SUSO      TEMP      XMS
## 1 33.59550   NA 19.37000 60.22500
## 2      NA   NA 14.45000 81.96154
## 3 33.50113   NA 14.07478 82.04876
## 4      NA   NA 14.54487 70.19231
## 5      NA   NA 14.28846 77.61167
## 6      NA   NA 14.23462 81.83333
## 7      NA   NA 14.46154 70.83333

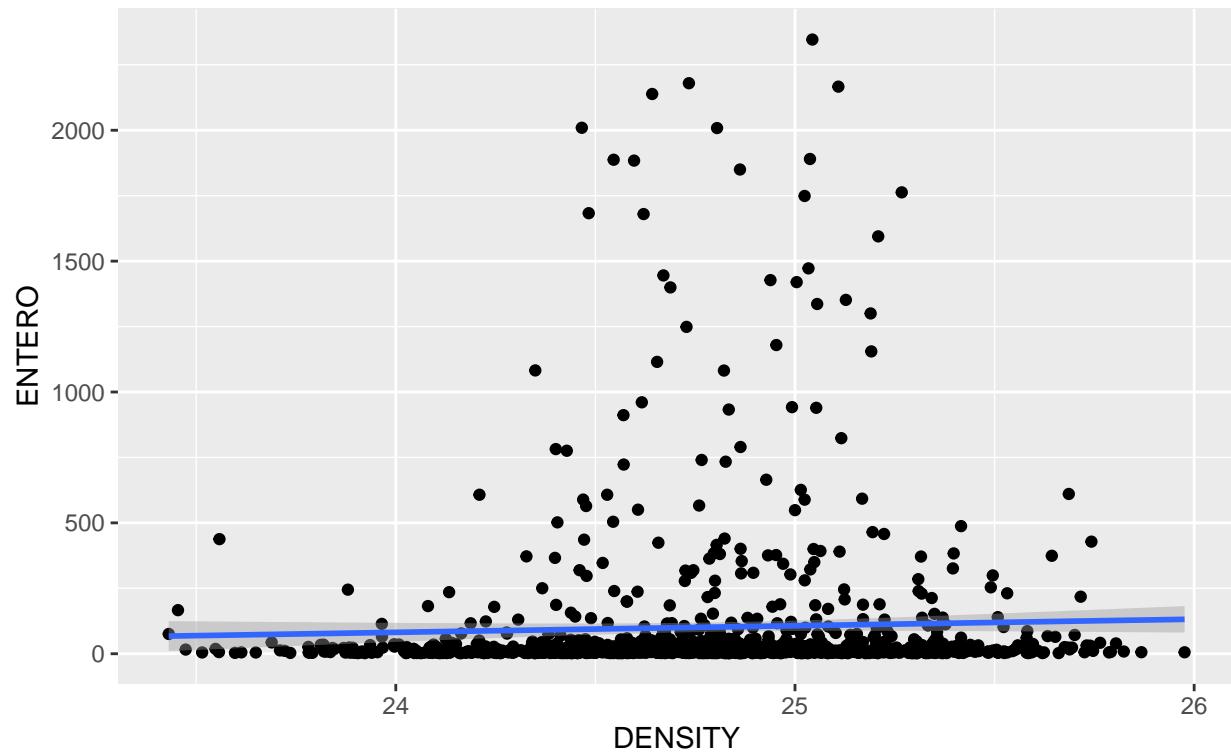
scatr(df = owt_df02_gb04_wkly02,
      y = "ENTERO",
      x_lst = param_lst03)
```

**Figure**

Scatterplot of CHLOROPHYLL and ENTERO Series

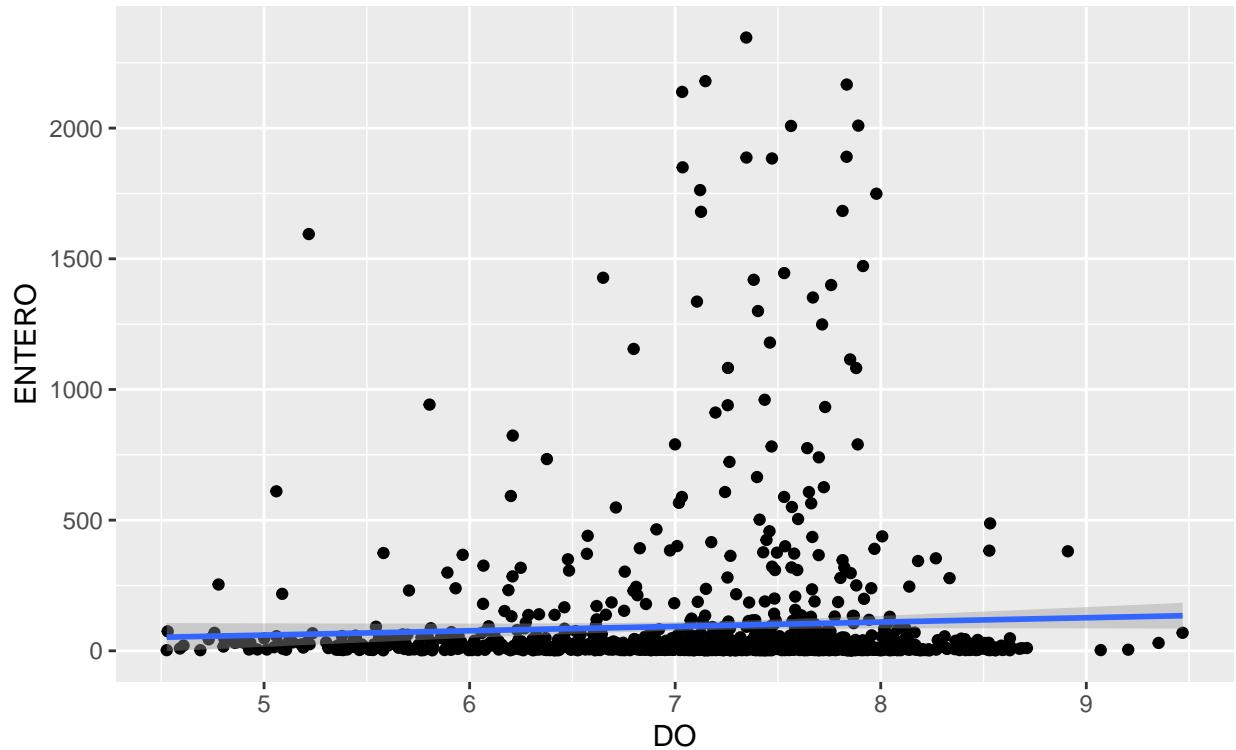


**Figure**  
Scatterplot of DENSITY and ENTERO Series

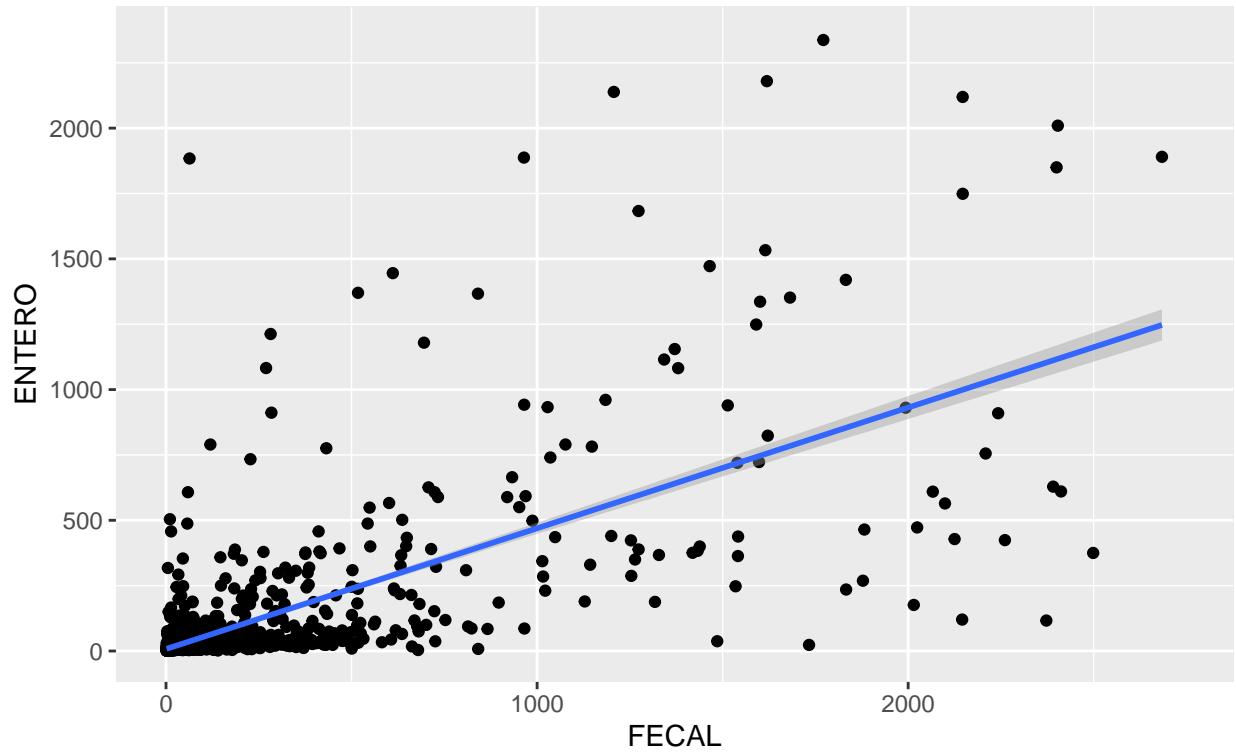


**Figure**

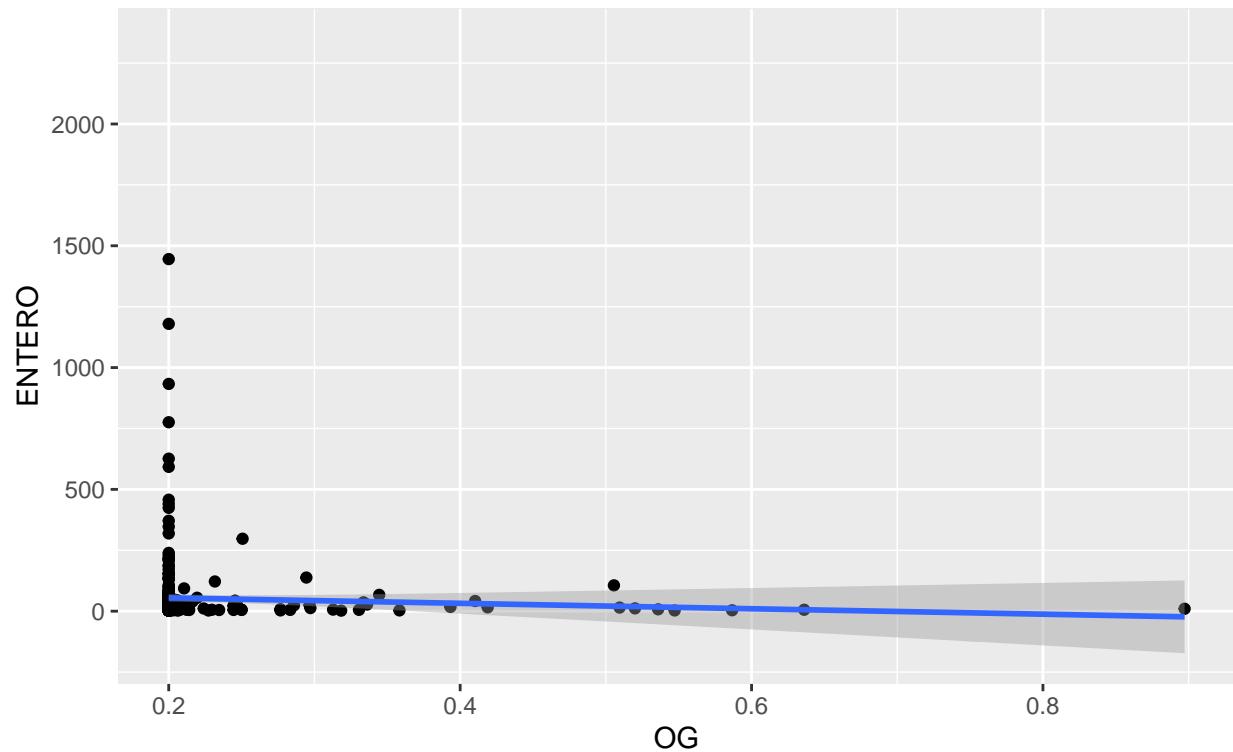
Scatterplot of DO and ENTERO Series



**Figure**  
Scatterplot of FECAL and ENTERO Series

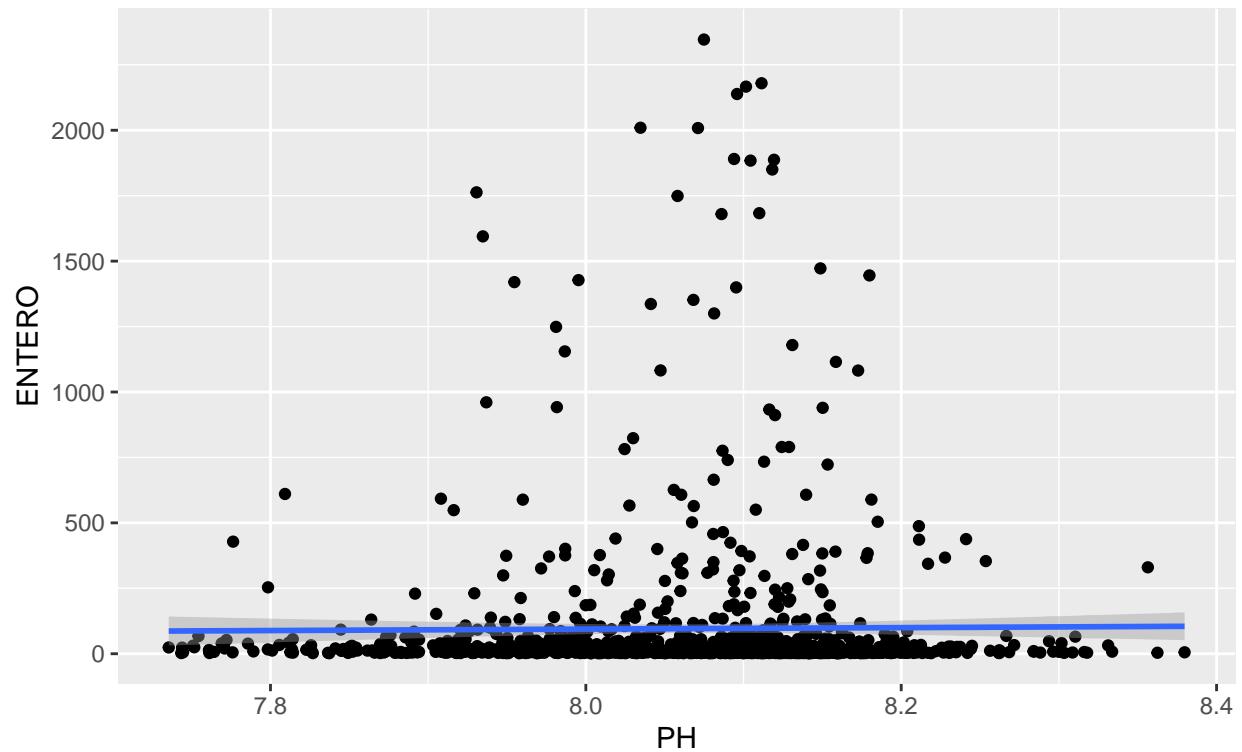


**Figure**  
Scatterplot of OG and ENTERO Series

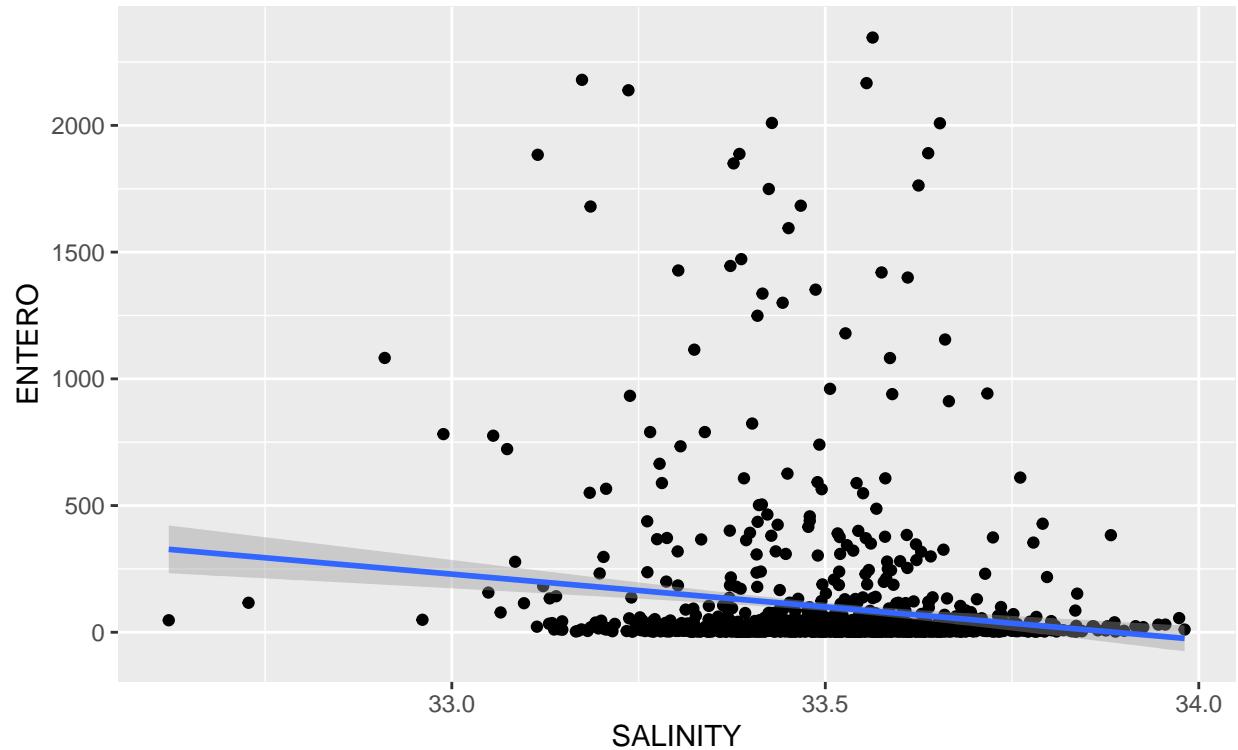


**Figure**

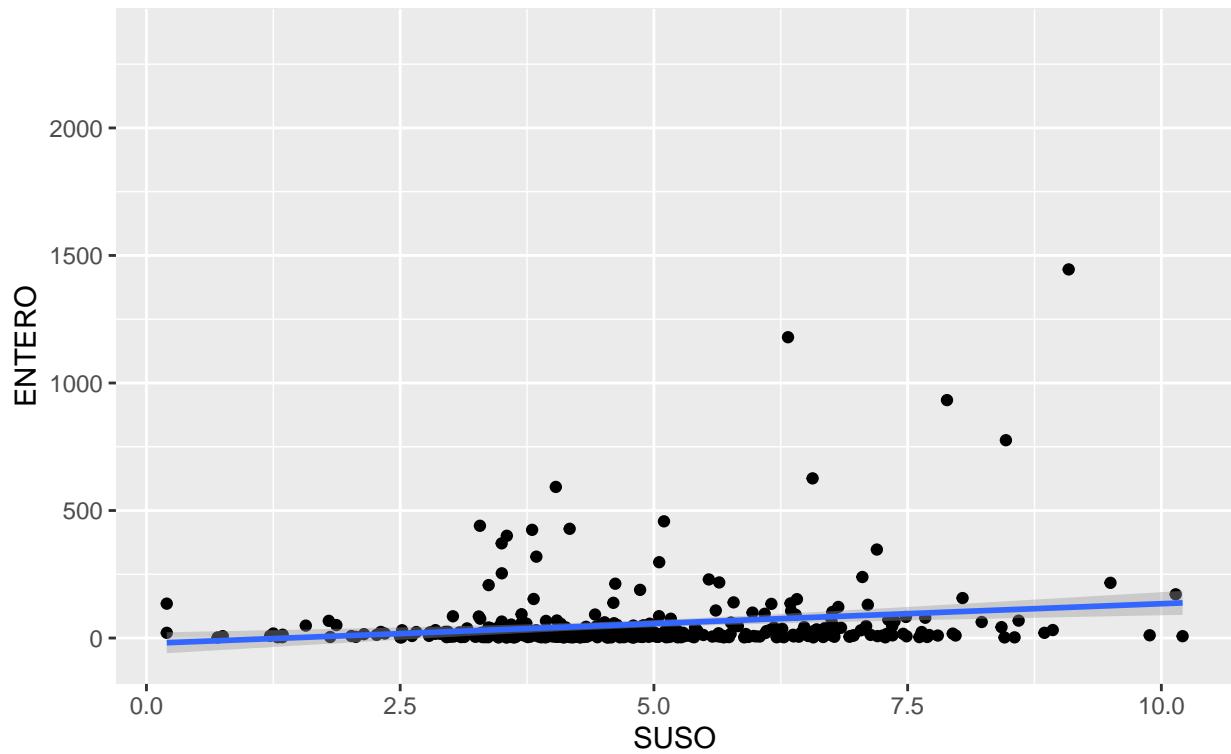
Scatterplot of PH and ENTERO Series



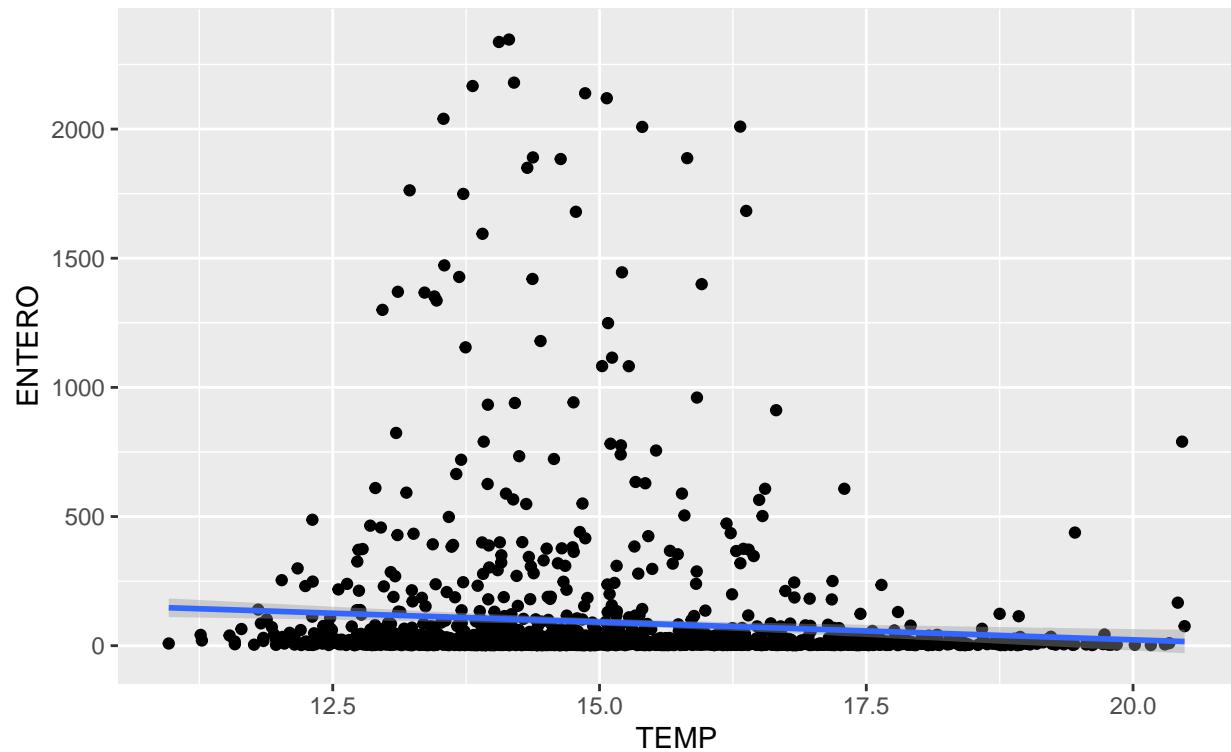
**Figure**  
Scatterplot of SALINITY and ENTERO Series



**Figure**  
Scatterplot of SUSO and ENTERO Series

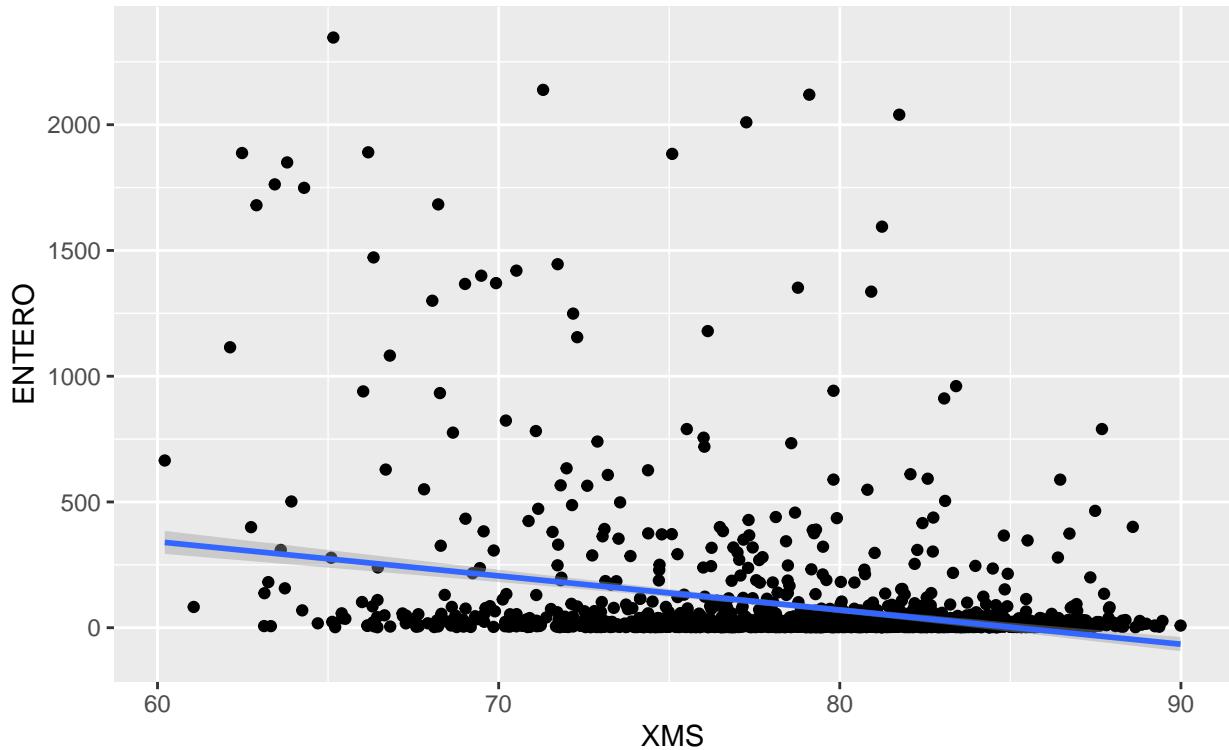


**Figure**  
Scatterplot of TEMP and ENTERO Series



Figure

Scatterplot of XMS and ENTERO Series



Define custom function to display time series plots at multiple agg levels

```
# i = parameter
# j = project
# k = depth
time_plt <- function(df = NA,
                      date = NA,
                      l1 = c(),
                      l2_name = NA,
                      l2 = c(),
                      l3_name = NA,
                      l3 = c()) {
  if(length(l3) == 0 & length(l2) == 0) {
    for(i in l1) {
      df_01a <- df
      par(mar = c(5,5,5,2))
      try(print(acf(df_01a[, i],
                    pl = TRUE,
                    na.action = na.pass,
                    main = paste0("ACF Plot for ", i))))
      plot <- ggplot(df_01a, aes(x = df_01a[, date], y = df_01a[, i], group = 1)) +
        geom_line() +
        labs(x = "Time",
             y = i,
             title = "Figure",
             subtitle = "Time Series Plot") +
        theme_minimal()
      print(plot)
    }
  }
}
```

```

        subtitle = paste0("Time Series Plot for ", i))
    print(plot)
}
}
if(length(13) == 0) {
  for(i in 11) {
    for(j in 12) {
      df_01a <- df[df[, 12_name] == j, ]
      par(mar = c(5,5,5,2))
      try(print(acf(df_01a[, i],
                    pl = TRUE,
                    na.action = na.pass,
                    main = paste0("ACF Plot for ", i, " (", j, ")")))
      plot <- ggplot(df_01a, aes(x = df_01a[, date], y = df_01a[, i], group = 1)) +
        geom_line() +
        labs(x = "Time",
             y = i,
             title = "Figure",
             subtitle = paste0("Time Series Plot for ", i, " (", j, ")"))
      print(plot)
    }
  }
} else {
  for(i in 11) {
    for(j in 12) {
      for(k in 13) {
        df_01a <- df[df[, 12_name] == j & df[, 13_name] == k, ]
        par(mar = c(5,5,5,2))
        try(print(acf(df_01a[, i],
                      pl = TRUE,
                      na.action = na.pass,
                      main = paste0("ACF Plot for ", i, " (", j, ":", k, ")")))
        plot <- ggplot(df_01a, aes(x = df_01a[, date], y = df_01a[, i], group = 1)) +
          geom_line() +
          labs(x = "Time",
               y = i,
               title = "Figure",
               subtitle = paste0("Time Series Plot for ", i, " (", j, ":", k, ")"))
        print(plot)
      }
    }
  }
}
}

```

## Setup reference value lists for time series plotting

```

param_lst04 <- c("CHLOROPHYLL",
                 "DENSITY",
                 "DO",
                 "ENTERO",

```

```

    "FECAL",
    "PH",
    "SALINITY",
    "TEMP",
    "XMS")

param_lst05 <- c("ENTERO")

uniq_proj <- unique(owt_df02_gb07_mrgd$project)
uniq_depth <- unique(owt_df02_gb07_mrgd$depth_m_bin)
uniq_proj

## [1] PL00 SB00
## Levels: PL00 SB00

uniq_depth

## [1] "[8,33)"   "[0,8)"     "[33,47)"   "[47,70)"   "[70,90)"   "Unknown"
## [7] "[112,120]" "[90,112]"

```

## Preprocessing, phase 2

Convert df's to timetk tibbles for data aggregated by date\_sample, project, and parameter

```

# Citation: https://business-science.github.io/timetk/index.html
train_start <- "1999-01-18"
train_end <- "2021-01-04"
test_start <- "2021-01-11"
test_end <- ""

#####
# Convert PL00 data for 01/18/1999 and 01/03/2022 to `timetk` TS tibble
owt_df02_gb09_ploo_wkly03_df01 <- owt_df02_gb09_wkly03[owt_df02_gb09_wkly03$project ==
  & "PL00" & owt_df02_gb09_wkly03$date_sample >= train_start, ]
owt_df02_gb09_ploo_wkly03_df02 <- owt_df02_gb09_ploo_wkly03_df01[, -c(2, 8, 11)]

owt_df02_gb09_ploo_wkly03_tb01 <- tibble(owt_df02_gb09_ploo_wkly03_df02)
owt_df02_gb09_ploo_wkly03_tb02 <- pad_by_time(.data = owt_df02_gb09_ploo_wkly03_tb01,
  .date_var = date_sample,
  .by = "week")

#-----
# Convert PL00 data (excluding outliers) for 01/18/1999 and 01/03/2022 to `timetk` TS
# tibble
owt_df02_gb09_ploo_wkly02_df01 <- owt_df02_gb09_wkly02[owt_df02_gb09_wkly02$project ==
  & "PL00" & owt_df02_gb09_wkly02$date_sample >= train_start, ]
owt_df02_gb09_ploo_wkly02_df02 <- owt_df02_gb09_ploo_wkly02_df01[, -c(2, 8, 11)]

owt_df02_gb09_ploo_wkly02_tb01 <- tibble(owt_df02_gb09_ploo_wkly02_df02)
owt_df02_gb09_ploo_wkly02_tb02 <- pad_by_time(.data = owt_df02_gb09_ploo_wkly02_tb01,
  .date_var = date_sample,
  .by = "week")

```

```

#####
# Convert SBOO data for 01/18/1999 and 01/03/2022 to `timetk` TS tibble
owt_df02_gb09_sboo_wkly03_df01 <- owt_df02_gb09_wkly03[owt_df02_gb09_wkly03$project ==
  "SBOO" & owt_df02_gb09_wkly03$date_sample >= train_start, ]
owt_df02_gb09_sboo_wkly03_df02 <- owt_df02_gb09_sboo_wkly03_df01[, -c(2, 8, 11)]

owt_df02_gb09_sboo_wkly03_tb01 <- tibble(owt_df02_gb09_sboo_wkly03_df02)
owt_df02_gb09_sboo_wkly03_tb02 <- pad_by_time(.data = owt_df02_gb09_sboo_wkly03_tb01,
  .date_var = date_sample,
  .by = "week")

#-----
# Convert SBOO data (excluding outliers) for 01/18/1999 and 01/03/2022 to `timetk` TS
# tibble
owt_df02_gb09_sboo_wkly02_df01 <- owt_df02_gb09_wkly02[owt_df02_gb09_wkly02$project ==
  "SBOO" & owt_df02_gb09_wkly02$date_sample >= train_start, ]
owt_df02_gb09_sboo_wkly02_df02 <- owt_df02_gb09_sboo_wkly02_df01[, -c(2, 8, 11)]

owt_df02_gb09_sboo_wkly02_tb01 <- tibble(owt_df02_gb09_sboo_wkly02_df02)
owt_df02_gb09_sboo_wkly02_tb02 <- pad_by_time(.data = owt_df02_gb09_sboo_wkly02_tb01,
  .date_var = date_sample,
  .by = "week")

```

## Partition tibbles for data aggregated by date\_sample, project, and parameter

```

#####
# PLOO All - Training partition (01/18/1999-01/04/2021)
owt_df02_gb09_ploo_wkly03_train_tb02 <- owt_df02_gb09_ploo_wkly03_tb02 %>%
  filter_by_time(date_sample,
    .end_date = train_end)

# PLOO All - Test partition (01/11/2021-01/03/2022)
owt_df02_gb09_ploo_wkly03_test_tb02 <- owt_df02_gb09_ploo_wkly03_tb02 %>%
  filter_by_time(date_sample,
    .start_date = test_start)

#-----
# PLOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
owt_df02_gb09_ploo_wkly02_train_tb02 <- owt_df02_gb09_ploo_wkly02_tb02 %>%
  filter_by_time(date_sample,
    .end_date = train_end)

# PLOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
owt_df02_gb09_ploo_wkly02_test_tb02 <- owt_df02_gb09_ploo_wkly02_tb02 %>%
  filter_by_time(date_sample,
    .start_date = test_start)

#####
# SBOO All - Training partition (01/18/1999-01/04/2021)
owt_df02_gb09_sboo_wkly03_train_tb02 <- owt_df02_gb09_sboo_wkly03_tb02 %>%
  filter_by_time(date_sample,
    .end_date = train_end)

# SBOO All - Test partition (01/11/2021-01/03/2022)
owt_df02_gb09_sboo_wkly03_test_tb02 <- owt_df02_gb09_sboo_wkly03_tb02 %>%
  filter_by_time(date_sample,
    .start_date = test_start)

```

```

    .end_date = train_end)

# SBOO All - Test partition (01/11/2021-01/03/2022)
owt_df02_gb09_sboo_wkly03_test_tb02 <- owt_df02_gb09_sboo_wkly03_tb02 %>%
  filter_by_time(date_sample,
                 .start_date = test_start)

#-----
# SBOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
owt_df02_gb09_sboo_wkly02_train_tb02 <- owt_df02_gb09_sboo_wkly02_tb02 %>%
  filter_by_time(date_sample,
                 .end_date = train_end)

# SBOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
owt_df02_gb09_sboo_wkly02_test_tb02 <- owt_df02_gb09_sboo_wkly02_tb02 %>%
  filter_by_time(date_sample,
                 .start_date = test_start)

```

## Display tibbles available for modeling

```

# Data sets for modeling
#####
# PLOO All - Training partition (01/18/1999-01/04/2021)
#print(head(owt_df02_gb09_ploo_wkly03_train_tb02, 10))
#print(dim(owt_df02_gb09_ploo_wkly03_train_tb02))

# PLOO All - Test partition (01/11/2021-01/03/2022)
#print(head(owt_df02_gb09_ploo_wkly03_test_tb02, 10))
#print(dim(owt_df02_gb09_ploo_wkly03_test_tb02))

#-----
# PLOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
#print(head(owt_df02_gb09_ploo_wkly02_train_tb02, 10))
#print(dim(owt_df02_gb09_ploo_wkly02_train_tb02))

# PLOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
#print(head(owt_df02_gb09_ploo_wkly02_test_tb02, 10))
#print(dim(owt_df02_gb09_ploo_wkly02_test_tb02))

#####
# SBOO All - Training partition (01/18/1999-01/04/2021)
#print(head(owt_df02_gb09_sboo_wkly03_train_tb02, 10))
#print(dim(owt_df02_gb09_sboo_wkly03_train_tb02))

# SBOO All - Test partition (01/11/2021-01/03/2022)
#print(head(owt_df02_gb09_sboo_wkly03_test_tb02, 10))
#print(dim(owt_df02_gb09_sboo_wkly03_test_tb02))

#-----
# SBOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
#print(head(owt_df02_gb09_sboo_wkly02_train_tb02, 10))
#print(dim(owt_df02_gb09_sboo_wkly02_train_tb02))

```

```
# SBOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
#print(head(owt_df02_gb09_sboo_wkly02_test_tb02, 10))
#print(dim(owt_df02_gb09_sboo_wkly02_test_tb02))
```

## Imputation using timetk ts\_impute\_vec() function

```
# Impute missing values using TS imputation w/ seasonality
qk_imp <- function(df = NA) {
  df$CHLOROPHYLL <- ts_impute_vec(df$CHLOROPHYLL,
                                      period = 3,
                                      lambda = NULL)

  df$DENSITY <- ts_impute_vec(df$DENSITY,
                                period = 3,
                                lambda = NULL)

  df$DO <- ts_impute_vec(df$DO,
                         period = 3,
                         lambda = NULL)

  df$ENTERO <- ts_impute_vec(df$ENTERO,
                            period = 3,
                            lambda = NULL)

  df$FECAL <- ts_impute_vec(df$FECAL,
                            period = 3,
                            lambda = NULL)

  df$PH <- ts_impute_vec(df$PH,
                         period = 3,
                         lambda = NULL)

  df$SALINITY <- ts_impute_vec(df$SALINITY,
                                period = 3,
                                lambda = NULL)

  df$TEMP <- ts_impute_vec(df$TEMP,
                           period = 3,
                           lambda = NULL)

  df$XMS <- ts_impute_vec(df$XMS,
                           period = 3,
                           lambda = NULL)
}

return(df)
}

# PLOO All - Training partition (01/18/1999-01/04/2021)
owt_df02_gb09_ploo_wkly03_train_tb03 <- qk_imp(df = owt_df02_gb09_ploo_wkly03_train_tb02)
#print(head(owt_df02_gb09_ploo_wkly03_train_tb03, 10))

# PLOO All - Test partition (01/11/2021-01/03/2022)
```

```

owt_df02_gb09_ploo_wkly03_test_tb03 <- qk_imp(df = owt_df02_gb09_ploo_wkly03_test_tb02)
#print(head(owt_df02_gb09_ploo_wkly03_test_tb03, 10))

#-----
# PL00 Excluding Outliers - Training partition (01/18/1999-01/04/2021)
owt_df02_gb09_ploo_wkly02_train_tb03 <- qk_imp(df = owt_df02_gb09_ploo_wkly02_train_tb02)
#print(head(owt_df02_gb09_ploo_wkly02_train_tb03, 10))

# PL00 Excluding Outliers - Test partition (01/11/2021-01/03/2022)
owt_df02_gb09_ploo_wkly02_test_tb03 <- qk_imp(df = owt_df02_gb09_ploo_wkly02_test_tb02)
#print(head(owt_df02_gb09_ploo_wkly02_test_tb03, 10))

#####
# SBOO All - Training partition (01/18/1999-01/04/2021)
owt_df02_gb09_sboo_wkly03_train_tb03 <- qk_imp(df = owt_df02_gb09_sboo_wkly03_train_tb02)
#print(head(owt_df02_gb09_sboo_wkly03_train_tb03, 10))

# SBOO All - Test partition (01/11/2021-01/03/2022)
owt_df02_gb09_sboo_wkly03_test_tb03 <- qk_imp(df = owt_df02_gb09_sboo_wkly03_test_tb02)
#print(head(owt_df02_gb09_sboo_wkly03_test_tb03, 10))

#-----
# SBOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
owt_df02_gb09_sboo_wkly02_train_tb03 <- qk_imp(df = owt_df02_gb09_sboo_wkly02_train_tb02)
#print(head(owt_df02_gb09_sboo_wkly02_train_tb03, 10))

# SBOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
owt_df02_gb09_sboo_wkly02_test_tb03 <- qk_imp(df = owt_df02_gb09_sboo_wkly02_test_tb02)
#print(head(owt_df02_gb09_sboo_wkly02_test_tb03, 10))

```

## Modeling and Evaluation

### Holt-Winters Modeling for all Parameters and all tables

```

# convert to time series object ts
params <- c("CHLOROPHYLL", "DENSITY", "DO", "ENTERO", "FECAL", "PH", "SALINITY", "TEMP",
           "XMS")

for (param in params) {
  z <- get(param, owt_df02_gb09_ploo_wkly03_train_tb03)
  ts_owt_df02_gb09_ploo_wkly03_train_tb03 <- ts(z, start = c(1999, 1), freq = 52)
  ts_owt_df02_gb09_ploo_wkly03_test_tb03 <- ts(z, start = c(2021, 1), freq = 52)

  HW1 <- HoltWinters(ts_owt_df02_gb09_ploo_wkly03_train_tb03)

  # forecast library more robust features vs. predict()
  HW1_for <- forecast(HW1, h=52, level=c(80,95))

  #visualize our predictions:
  plot(HW1_for, xlim=c(2017, 2023))
  lines(HW1_for$fitted, lty=2, col="purple")
  mtext(param, side=3, line = -2)
}

```

```

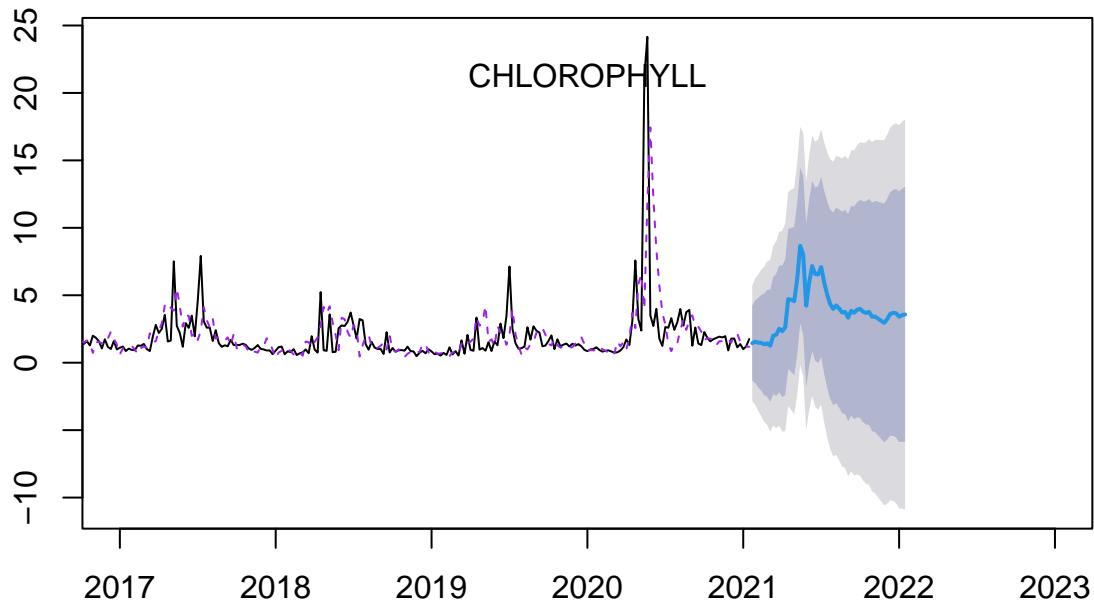
print("Training Set Accuracy: ")
print(param)
#print(accuracy(HW1_for))
print(accuracy(HW1_for, ts_owt_df02_gb09_ploo_wkly03_test_tb03))

#z2 <- get(param, owt_df02_gb09_ploo_wkly03_test_tb03)
#ts_owt_df02_gb09_ploo_wkly03_test_tb03 <- ts(z2, start = c(2021, 1), freq = 52)

#print("MAPE")
#print(MAPE(y_pred = HW1_for$fitted, y_true = ts_owt_df02_gb09_ploo_wkly03_test_tb03))
#print("MAE")
#print(MAE(y_pred = HW1_for$fitted, y_true = ts_owt_df02_gb09_ploo_wkly03_test_tb03))
}

```

## Forecasts from HoltWinters

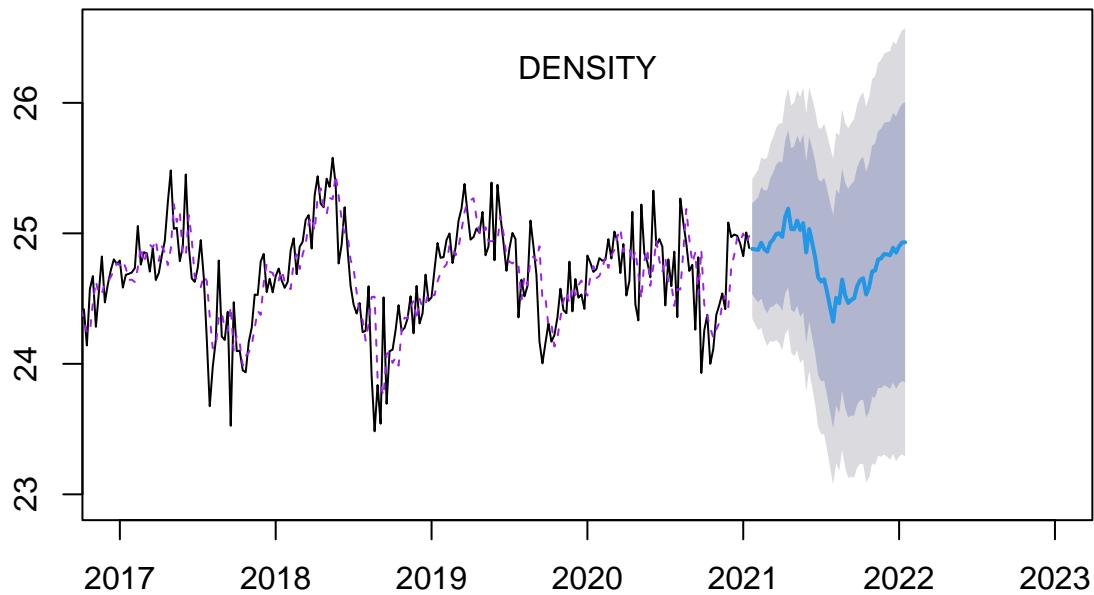


```

## [1] "Training Set Accuracy: "
## [1] "CHLOROPHYLL"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.09843704 2.180400 1.308285 -21.294434 51.71619 0.6397732
## Test set      0.16258431 2.054043 1.653307 -6.472758 47.75021 0.8084948
##          ACF1 Theil's U
## Training set 0.2038780      NA
## Test set     0.8406931  2.145953

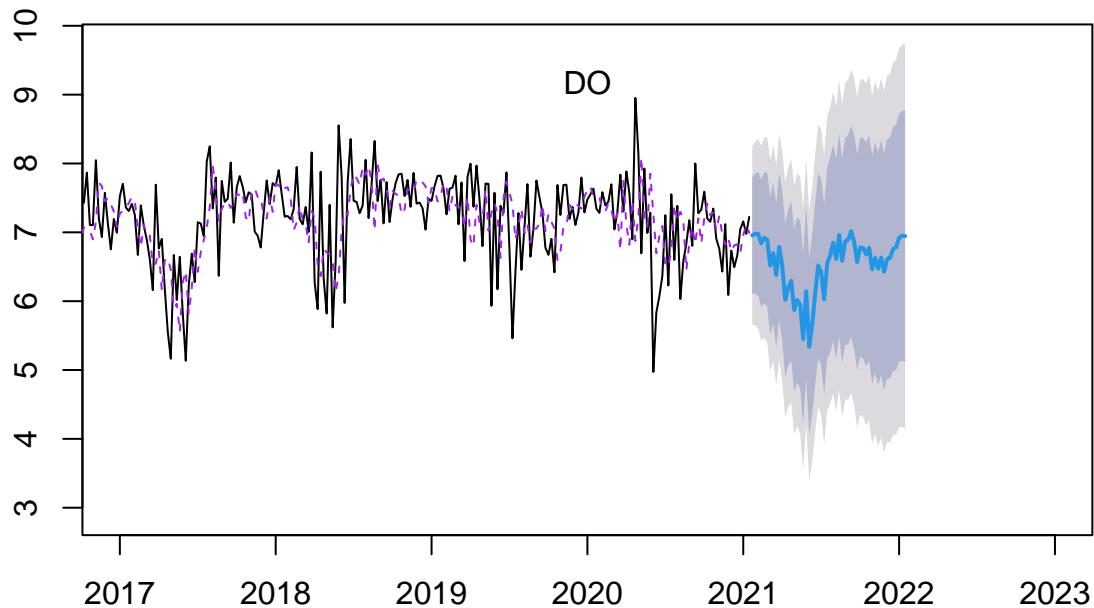
```

## Forecasts from HoltWinters



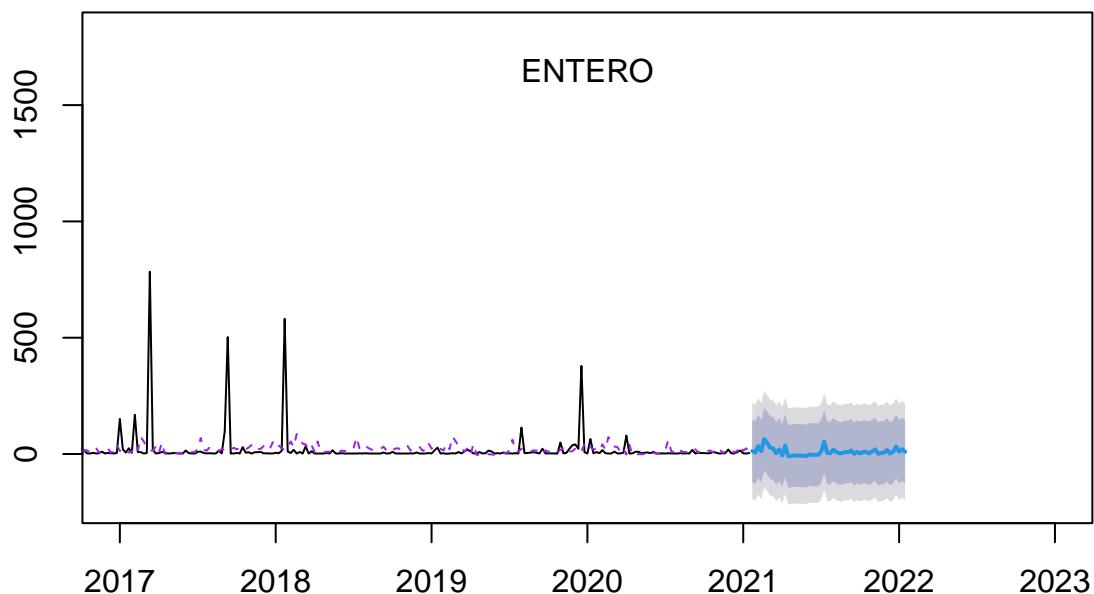
```
## [1] "Training Set Accuracy: "
## [1] "DENSITY"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.00112412 0.2720603 0.2073202 -0.01345529 0.8388695 0.6194478
## Test set      0.47983679 0.5891640 0.5518780  1.88624392 2.1840248 1.6489449
##               ACF1 Theil's U
## Training set 0.1771812        NA
## Test set     0.7860227  2.680946
```

## Forecasts from HoltWinters



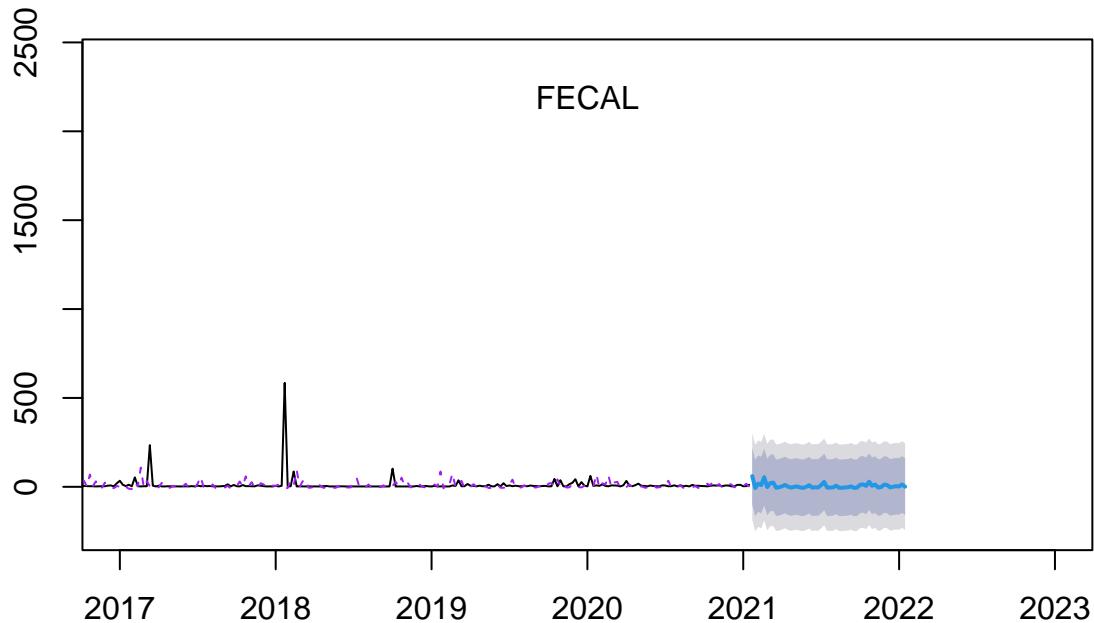
```
## [1] "Training Set Accuracy: "
## [1] "DO"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.0258745 0.6604220 0.4966317 -0.3115491 7.357875 0.6600327
## Test set     0.4134250 0.8891192 0.6746798  5.2426163 9.421445 0.8966620
##          ACF1 Theil's U
## Training set 0.1605063       NA
## Test set     0.8829317  3.938266
```

## Forecasts from HoltWinters



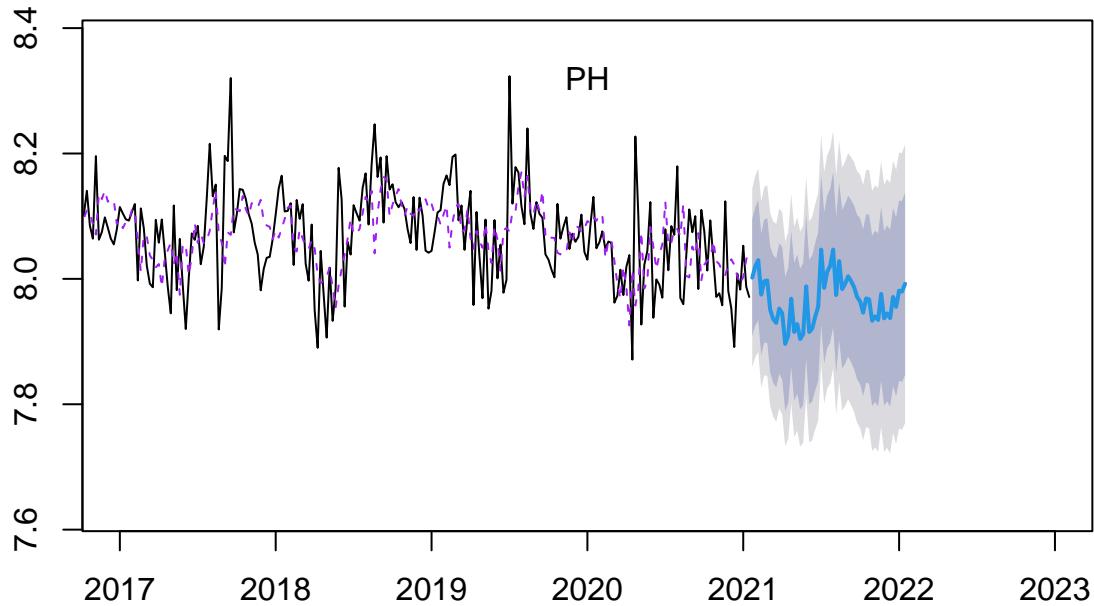
```
## [1] "Training Set Accuracy: "
## [1] "ENTERO"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -3.2046505 105.31660 32.34395 -474.3885 522.7562 0.9910613
## Test set      0.7104022 16.36471 11.20878 -53.5389 211.5065 0.3434518
##               ACF1 Theil's U
## Training set  0.02565651       NA
## Test set      -0.07099528 1.667067
```

## Forecasts from HoltWinters



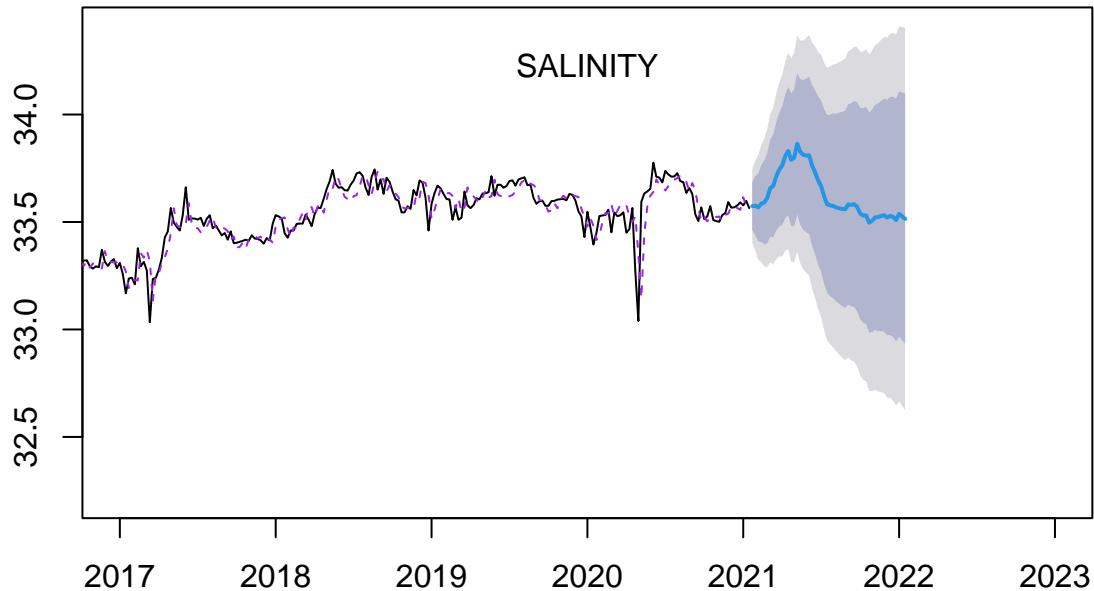
```
## [1] "Training Set Accuracy: "
## [1] "FECAL"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -3.474252 124.1303 44.49475 -376.5720525 568.9474 0.9692438
## Test set     65.223857 121.6356 71.26946    0.8179895 207.6003 1.5524860
##          ACF1 Theil's U
## Training set 0.0009713377       NA
## Test set     -0.2023185473 0.975268
```

## Forecasts from HoltWinters



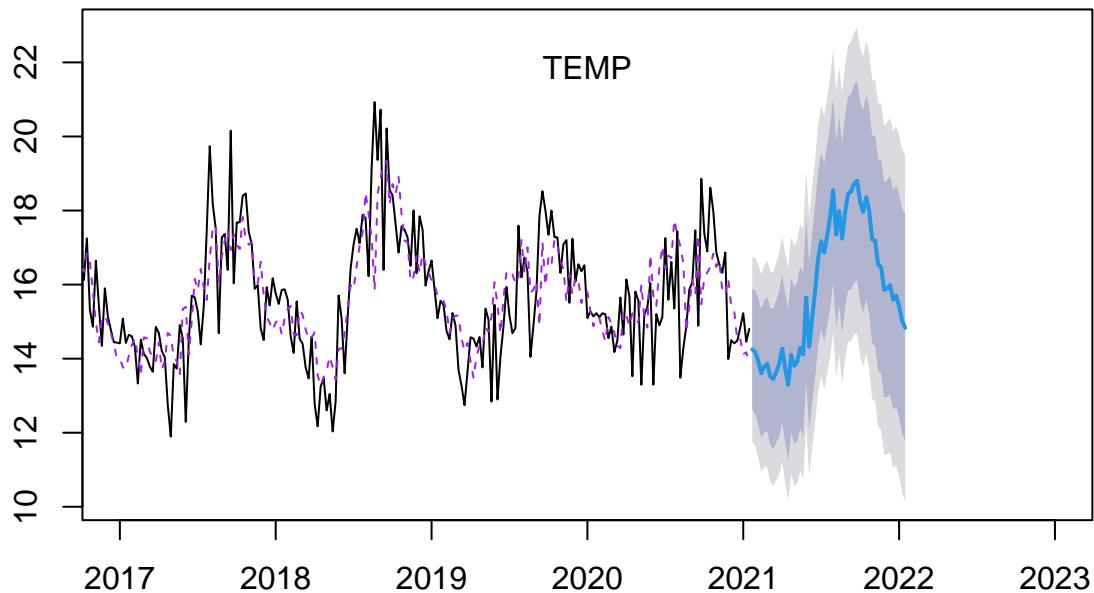
```
## [1] "Training Set Accuracy: "
## [1] "PH"
##               ME        RMSE       MAE       MPE       MAPE       MASE
## Training set 0.00285767 0.07267275 0.05446864 0.02974103 0.6761781 0.684549
## Test set     -0.05082892 0.09895746 0.08224903 -0.64988867 1.0407910 1.033686
##               ACF1 Theil's U
## Training set 0.2544343      NA
## Test set     0.8222910 2.455689
```

## Forecasts from HoltWinters



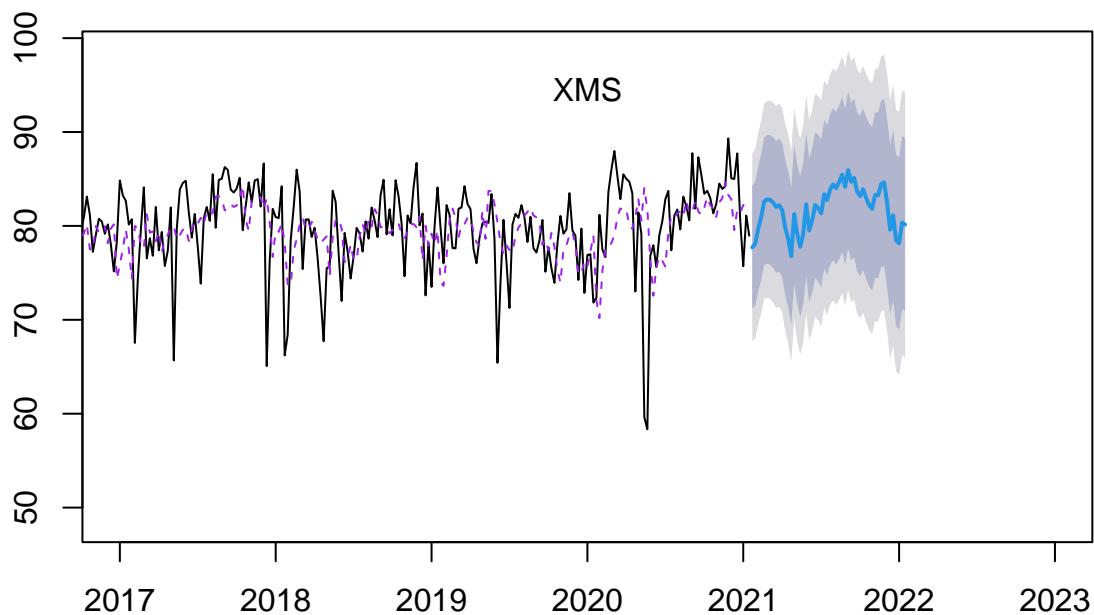
```
## [1] "Training Set Accuracy: "
## [1] "SALINITY"
##               ME        RMSE       MAE       MPE       MAPE       MASE
## Training set 0.001385062 0.08670362 0.05302033 0.003693586 0.1584602 0.4309180
## Test set      0.050533571 0.11827019 0.10982092 0.149994522 0.3260853 0.8925598
##               ACF1 Theil's U
## Training set 0.0629771      NA
## Test set     0.9261584  3.553131
```

## Forecasts from HoltWinters



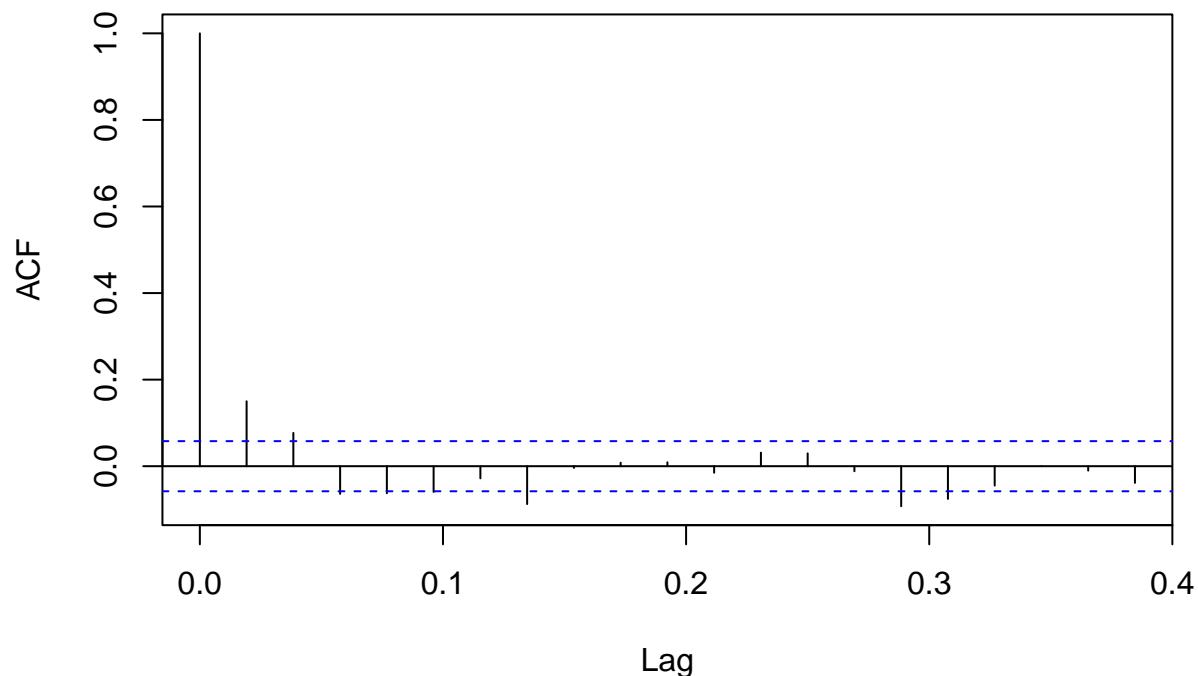
```
## [1] "Training Set Accuracy: "
## [1] "TEMP"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.03670735 1.269100 0.9629089 -0.8010885 6.336469 0.7015829
## Test set     -1.89679587 2.539536 2.1773233 -14.0113180 15.796642 1.5864146
##          ACF1 Theil's U
## Training set 0.1725499       NA
## Test set     0.7074838 1.964391
```

## Forecasts from HoltWinters



```
## [1] "Training Set Accuracy: "
## [1] "XMS"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.1441697 5.093418 3.646157 -0.1597366 4.690327 0.7195253
## Test set     0.2534947 4.553785 3.430603  0.0610891 4.282363 0.6769882
##          ACF1 Theil's U
## Training set 0.1500687       NA
## Test set     0.3510161 0.9311002
acf(HW1_for$residuals, lag.max=20, na.action=na.pass)
```

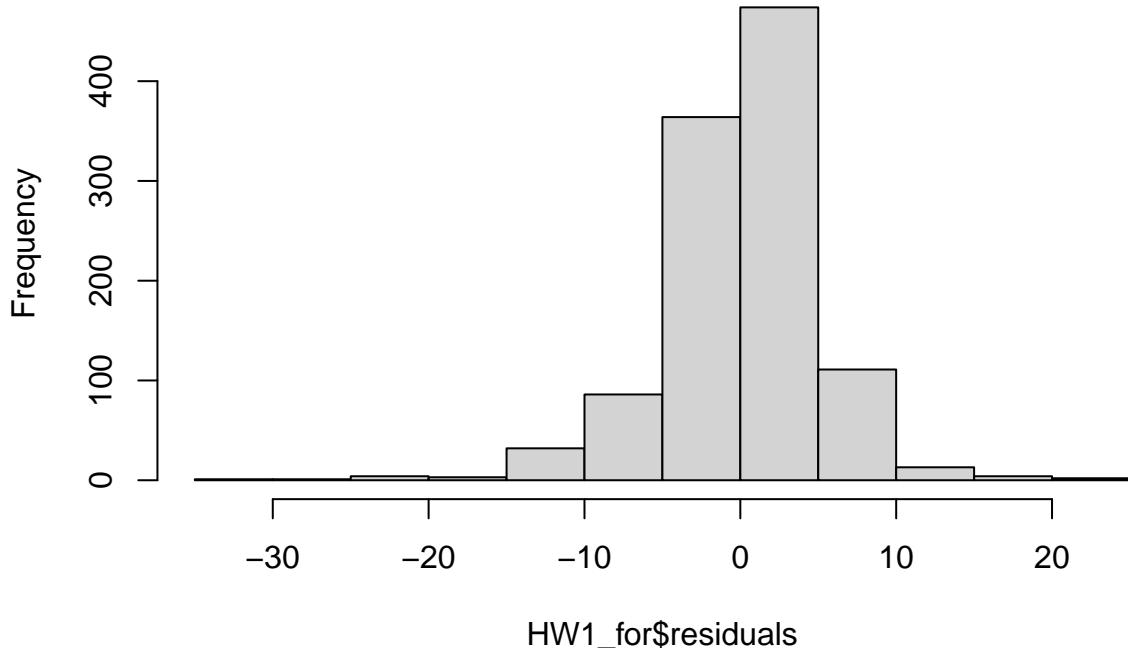
### Series HW1\_for\$residuals



```
Box.test(HW1_for$residuals, lag=20, type="Ljung-Box")
```

```
##  
## Box-Ljung test  
##  
## data: HW1_for$residuals  
## X-squared = 75.799, df = 20, p-value = 2.004e-08  
hist(HW1_for$residuals)
```

## Histogram of HW1\_for\$residuals



```
# convert to time series object ts
params <- c("CHLOROPHYLL", "DENSITY", "DO", "ENTERO", "FECAL", "PH", "SALINITY", "TEMP",
      "XMS")

for (param in params) {
  #print(param)

  z11 <- get(param, owt_df02_gb09_ploo_wkly02_train_tb03)
  ts_owt_df02_gb09_ploo_wkly02_train_tb03 <- ts(z11, start = c(1999, 1), freq = 52)
  ts_owt_df02_gb09_ploo_wkly02_test_tb03 <- ts(z11, start = c(2021, 1), freq = 52)

  HW1 <- HoltWinters(ts_owt_df02_gb09_ploo_wkly02_train_tb03)

  # forecast library more robust features vs. predict()

  HW1_for11 <- forecast(HW1, h=104, level=c(80,95))
  #visualize our predictions:
  plot(HW1_for11, xlim=c(2017, 2023))
  lines(HW1_for11$fitted, lty=2, col="purple")
  mtext(param, side=3, line = -2)

  print("Training Set Accuracy: ")
  print(param)
  #print(accuracy(HW1_for11))
  print(accuracy(HW1_for11, ts_owt_df02_gb09_ploo_wkly02_test_tb03))
```

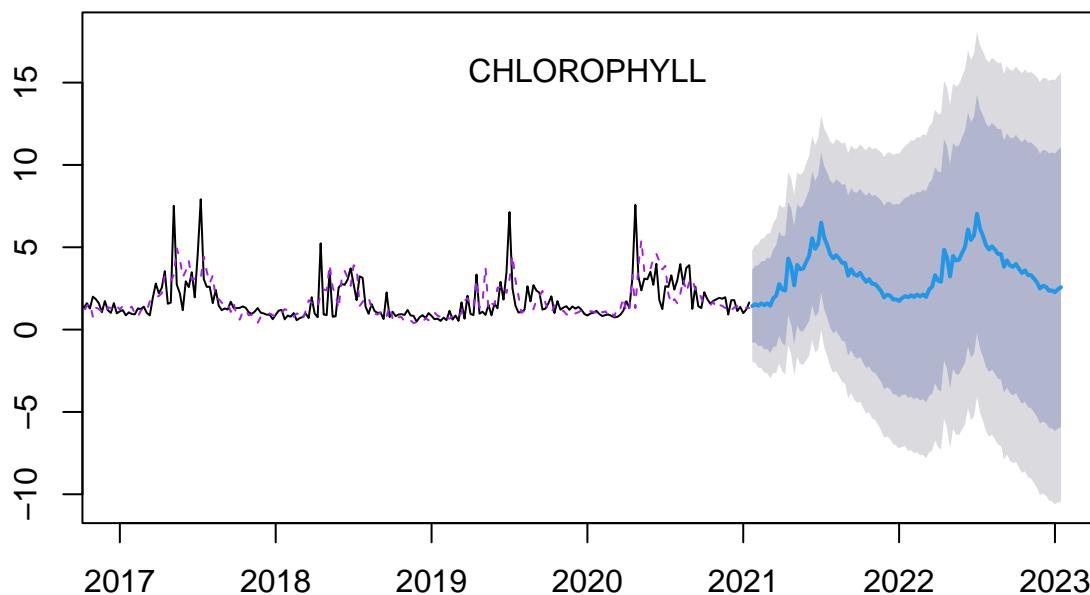
```

#z211 <- get(param, owt_df02_gb09_ploo_wkly02_test_tb03)
#ts_owt_df02_gb09_ploo_wkly02_test_tb03 <- ts(z211, start = c(2021, 1), freq = 52)

#print("Test set: MAPE")
#print(MAPE(y_pred = HW1_for11$fitted, y_true =
#  ts_owt_df02_gb09_ploo_wkly02_test_tb03))
#print("Test Set: MAE")
#print(MAPE(y_pred = HW1_for11$fitted, y_true =
#  ts_owt_df02_gb09_ploo_wkly02_test_tb03))
}

```

## Forecasts from HoltWinters

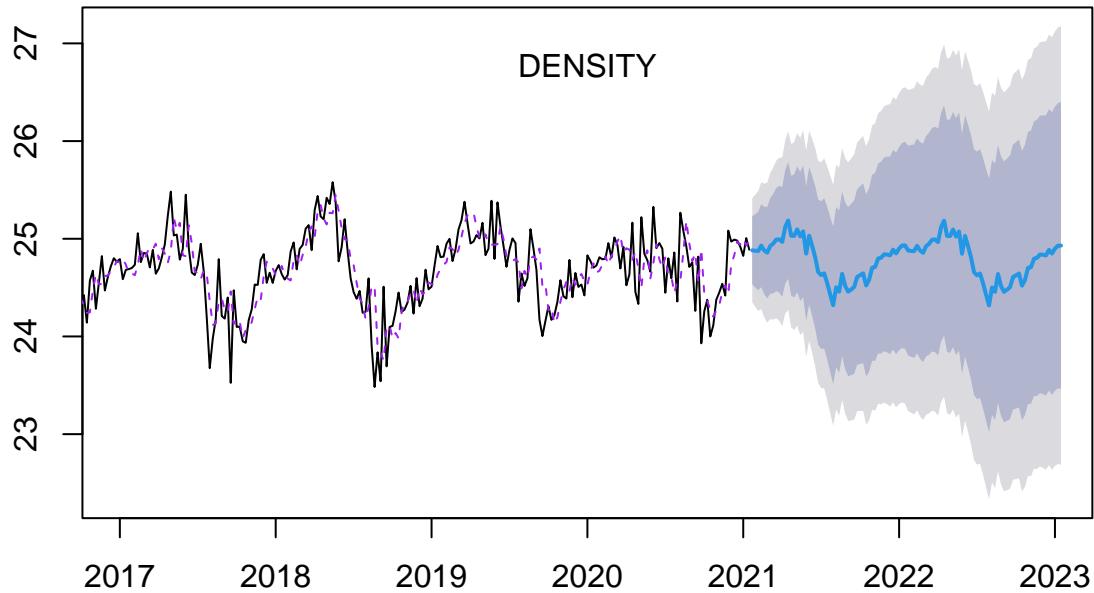


```

## [1] "Training Set Accuracy: "
## [1] "CHLOROPHYLL"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.07230778 1.725906 1.134430 -16.83940 46.75320 0.6076721
## Test set     1.46859743 2.740949 2.012627 15.57971 43.70445 1.0780900
##          ACF1 Theil's U
## Training set 0.2434585      NA
## Test set     0.9008239  0.820493

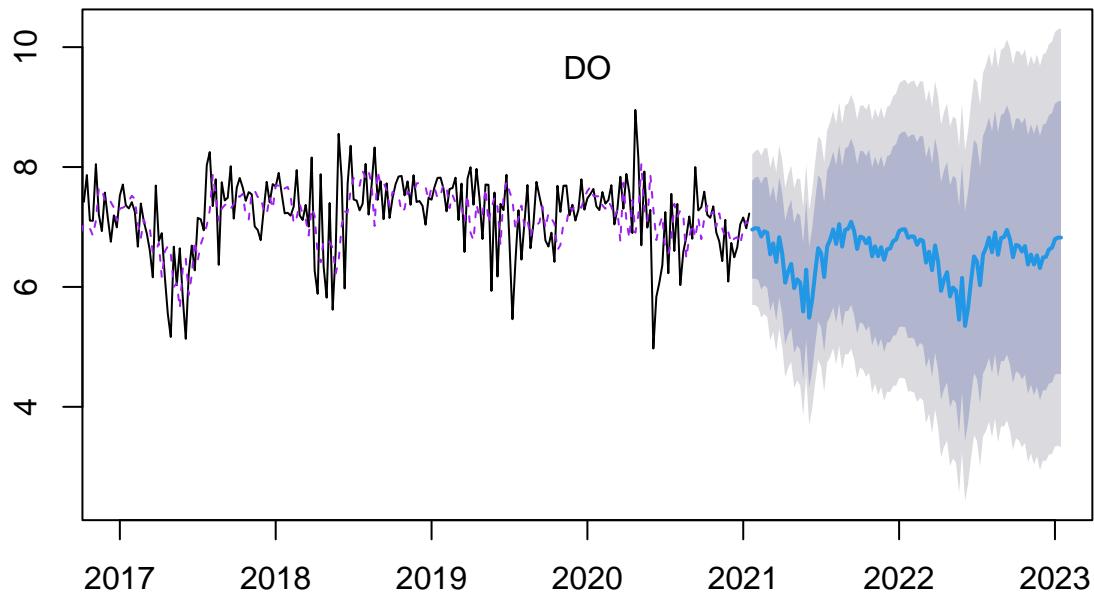
```

## Forecasts from HoltWinters



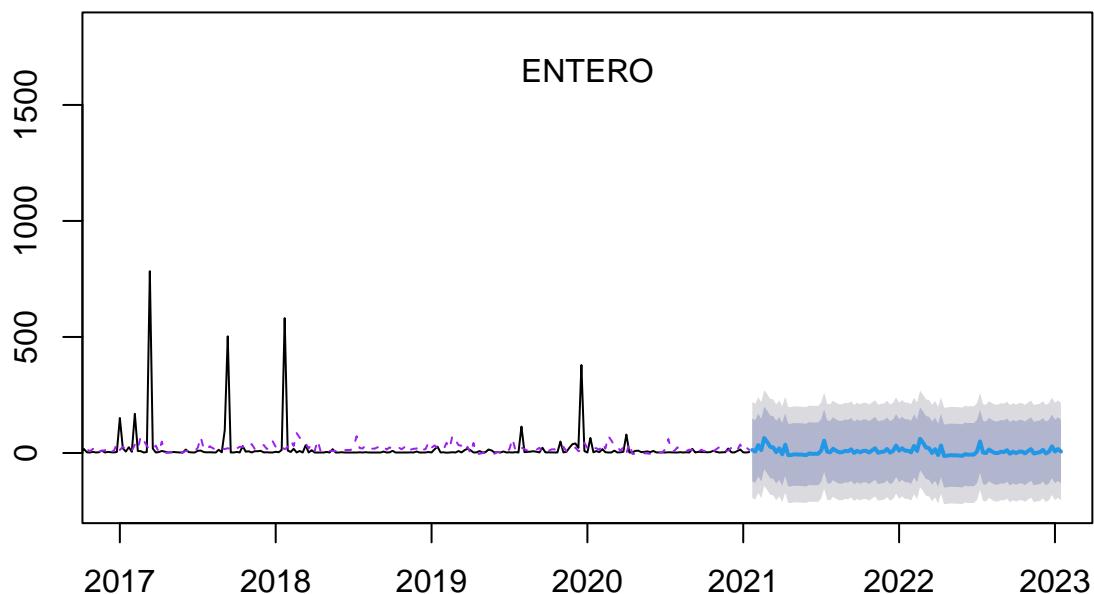
```
## [1] "Training Set Accuracy: "
## [1] "DENSITY"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.001112587 0.2715231 0.2071139 -0.01337993 0.837877 0.6208778
## Test set      0.465221312 0.5774284 0.5399175  1.82521152 2.134650 1.6185433
##          ACF1 Theil's U
## Training set 0.1791689       NA
## Test set     0.7086409  2.218613
```

## Forecasts from HoltWinters



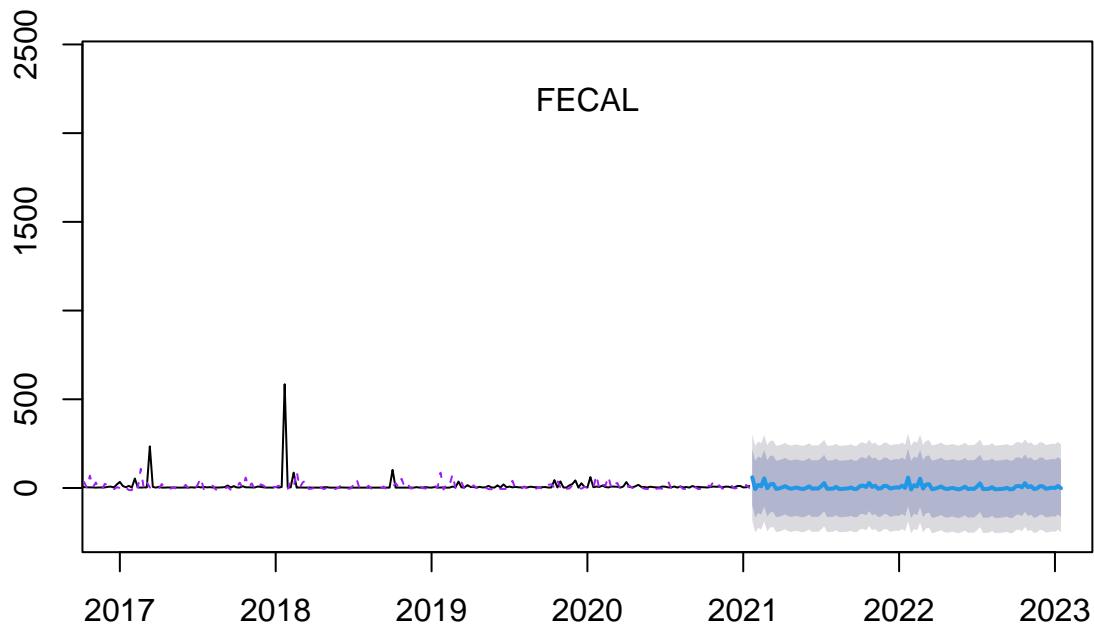
```
## [1] "Training Set Accuracy: "
## [1] "DO"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.02545076 0.6398213 0.4815780 -0.2703567 7.050892 0.6767534
## Test set     0.15675584 0.7675907 0.5989928  1.3562919 8.964217 0.8417544
##          ACF1 Theil's U
## Training set 0.1841093       NA
## Test set     0.6931196 1.591299
```

## Forecasts from HoltWinters



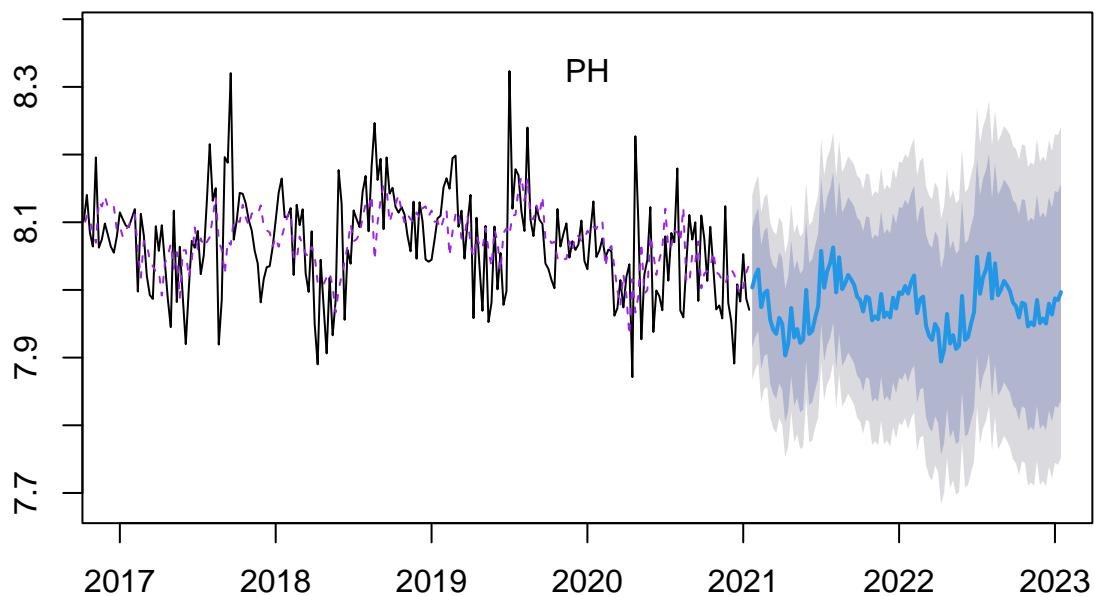
```
## [1] "Training Set Accuracy: "
## [1] "ENTERO"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -3.204651 105.31660 32.34395 -474.38849 522.7562 0.9910613
## Test set     11.352043 67.78757 18.96754   13.89866 193.6654 0.5811905
##          ACF1 Theil's U
## Training set 0.025656510       NA
## Test set     0.005257075  1.023268
```

## Forecasts from HoltWinters



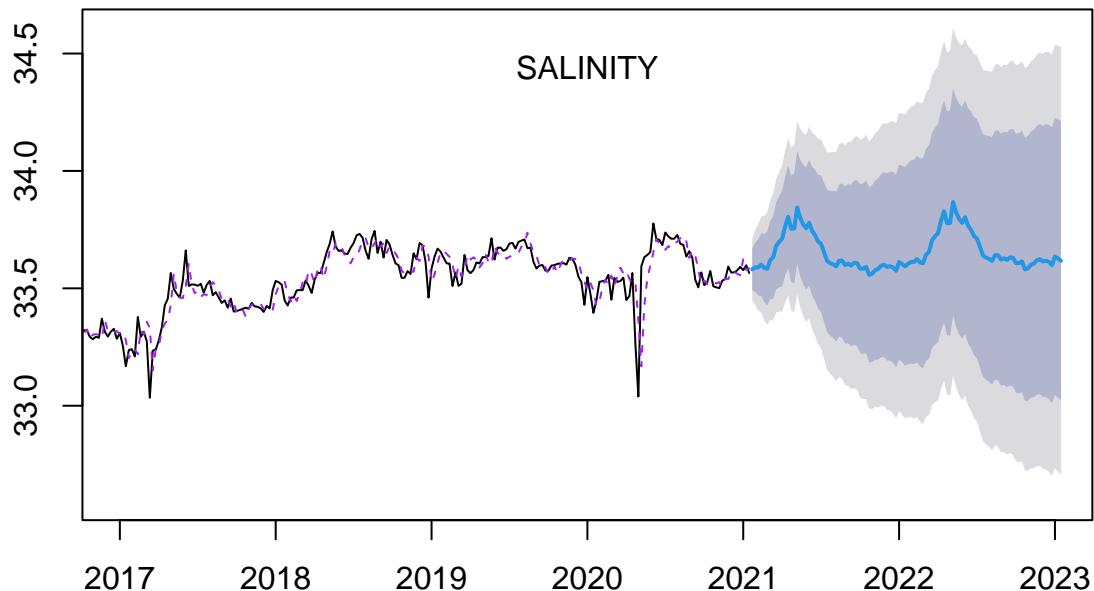
```
## [1] "Training Set Accuracy: "
## [1] "FECAL"
##           ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -3.474252 124.1303 44.49475 -376.5721 568.9474 0.9692438
## Test set     67.346465 123.6525 71.99182   49.9243 179.3118 1.5682215
##           ACF1 Theil's U
## Training set 0.0009713377      NA
## Test set     -0.1457515171 0.9931063
```

## Forecasts from HoltWinters



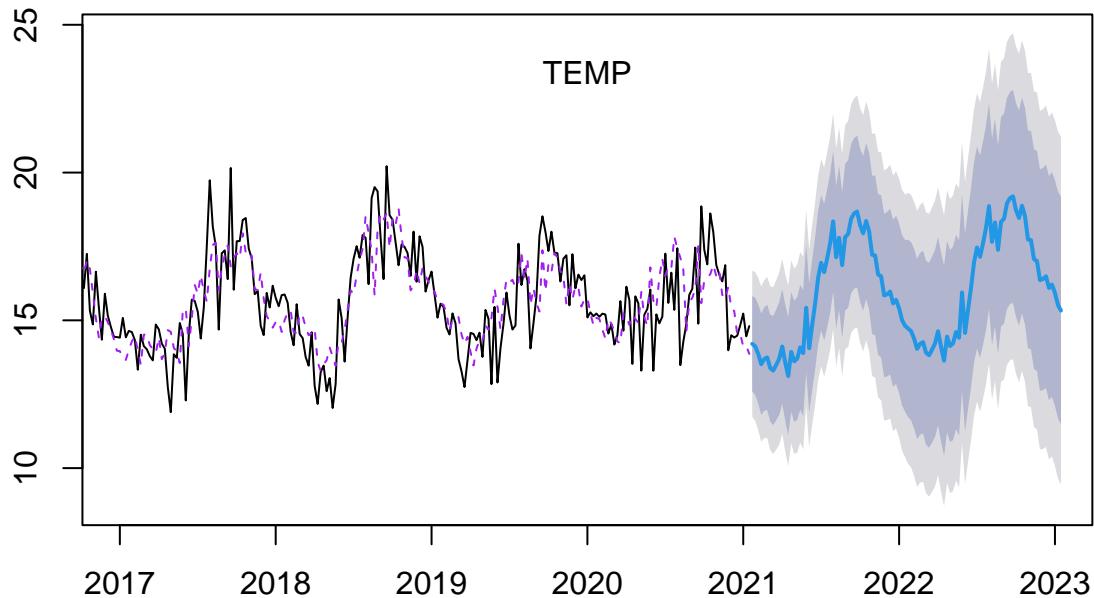
```
## [1] "Training Set Accuracy: "
## [1] "PH"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.001620217 0.06933147 0.05215344 0.01451201 0.6469997 0.6740749
## Test set     -0.064314804 0.10090137 0.08533079 -0.81999341 1.0807314 1.1028868
##               ACF1 Theil's U
## Training set 0.2460483       NA
## Test set     0.6859840 2.022263
```

## Forecasts from HoltWinters



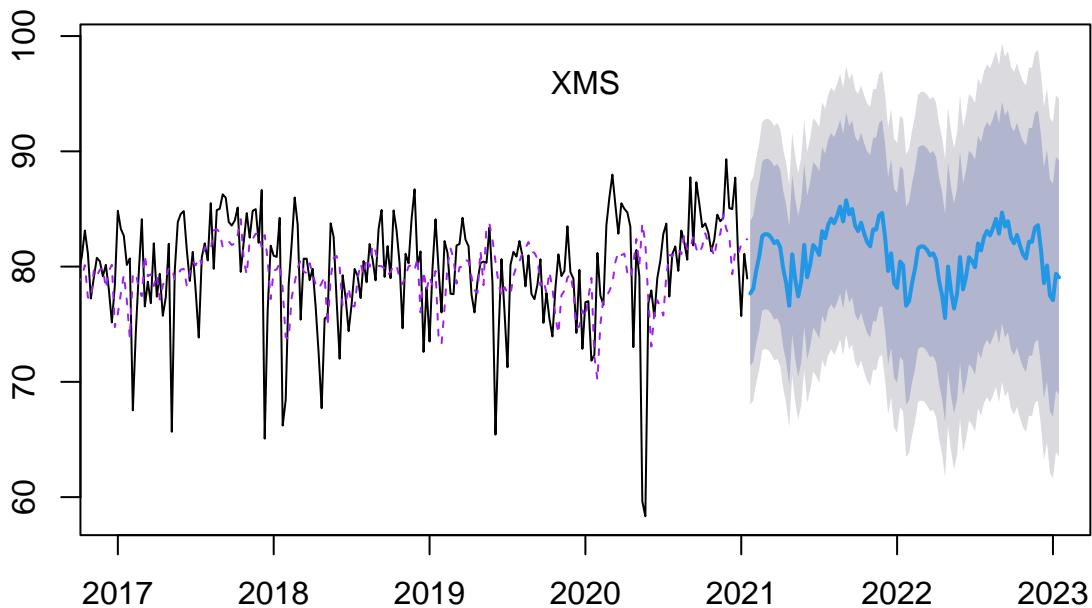
```
## [1] "Training Set Accuracy: "
## [1] "SALINITY"
##               ME      RMSE      MAE      MPE      MAPE
## Training set -0.0007432887 0.06837147 0.04810312 -0.002499238 0.143628
## Test set       0.0252913576 0.07093237 0.05722505  0.074943441 0.169826
##               MASE      ACF1 Theil's U
## Training set 0.4088266 0.05644603        NA
## Test set      0.4863535 0.73566685 1.674141
```

## Forecasts from HoltWinters



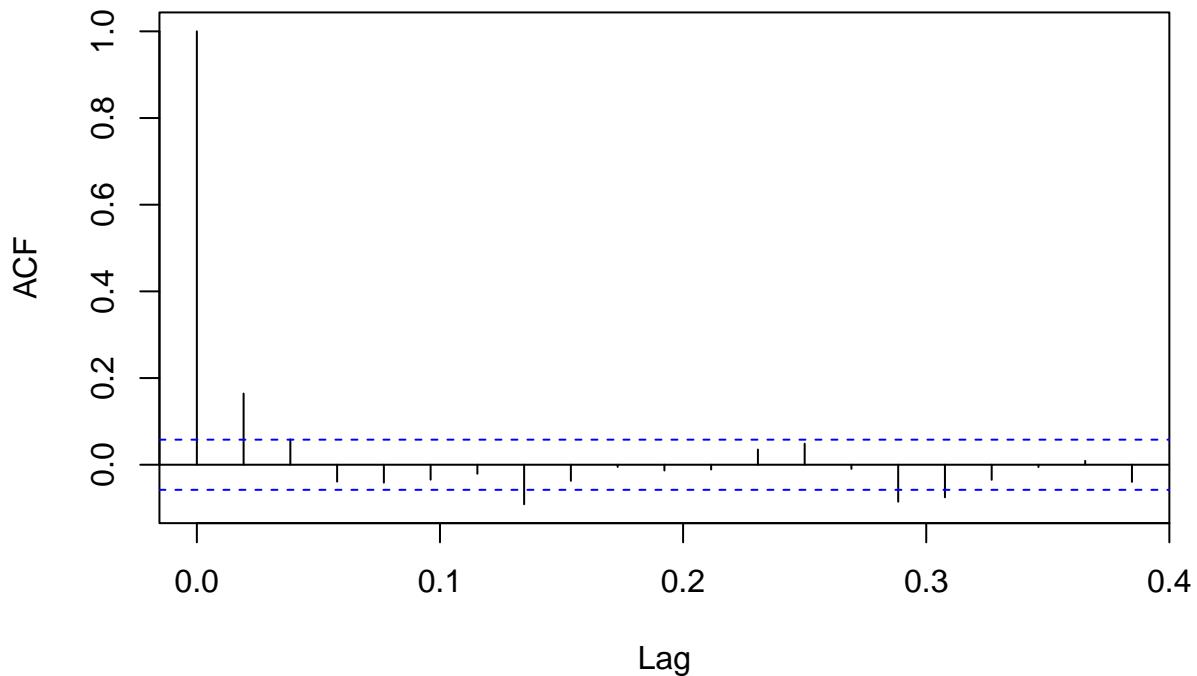
```
## [1] "Training Set Accuracy: "
## [1] "TEMP"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.03940712 1.257878 0.958221 -0.8131094 6.317697 0.7049208
## Test set      -1.75534741 2.349357 2.012914 -12.8461813 14.461637 1.4808119
##               ACF1 Theil's U
## Training set 0.1825240        NA
## Test set     0.4857403 1.501594
```

## Forecasts from HoltWinters



```
## [1] "Training Set Accuracy: "
## [1] "XMS"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.1664348 4.909606 3.580805 -0.09478933 4.566404 0.7202584
## Test set     0.3826506 4.679530 3.531065  0.16848625 4.469536 0.7102536
##          ACF1 Theil's U
## Training set 0.1642423       NA
## Test set     0.1978604 0.7965938
acf(HW1_for11$residuals, lag.max=20, na.action=na.pass)
```

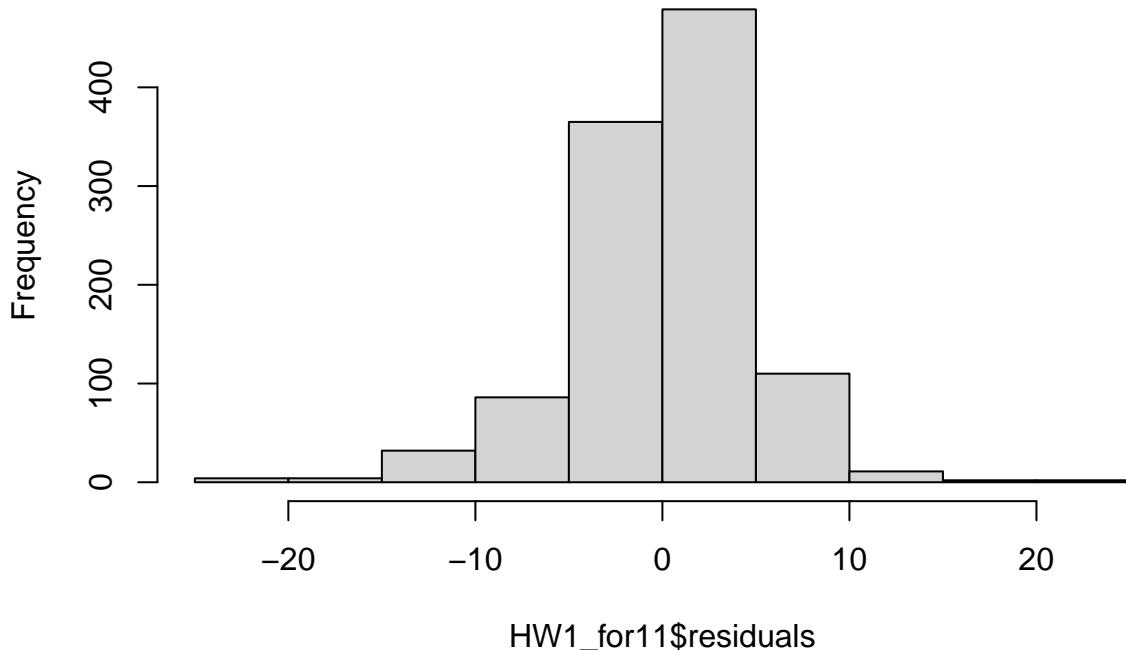
### Series HW1\_for11\$residuals



```
Box.test(HW1_for11$residuals, lag=20, type="Ljung-Box")
```

```
##  
## Box-Ljung test  
##  
## data: HW1_for11$residuals  
## X-squared = 71.463, df = 20, p-value = 1.049e-07  
hist(HW1_for11$residuals)
```

## Histogram of HW1\_for11\$residuals



```
# convert to time series object ts
params <- c("CHLOROPHYLL", "DENSITY", "DO", "ENTERO", "FECAL", "PH", "SALINITY", "TEMP",
          "XMS")

for (param in params) {
  z <- get(param, owt_df02_gb09_sboo_wkly03_train_tb03)
  ts_owt_df02_gb09_sboo_wkly03_train_tb03 <- ts(z, start = c(1999, 1), freq = 52)
  ts_owt_df02_gb09_sboo_wkly03_test_tb03 <- ts(z, start = c(2021, 1), freq = 52)

  HW1 <- HoltWinters(ts_owt_df02_gb09_sboo_wkly03_train_tb03)

  # forecast library more robust features vs. predict()

  HW1_for <- forecast(HW1, h=104, level=c(80,95))
  #visualize our predictions:
  plot(HW1_for, xlim=c(2017, 2023))
  lines(HW1_for$fitted, lty=2, col="purple")
  mtext(param, side=3, line = -2)

  print("Accuracy: ")
  print(param)
  #print(accuracy(HW1_for))
  print(accuracy(HW1_for, ts_owt_df02_gb09_sboo_wkly03_test_tb03))

  # test set
  #z2 <- get(param, owt_df02_gb09_sboo_wkly03_test_tb03)
```

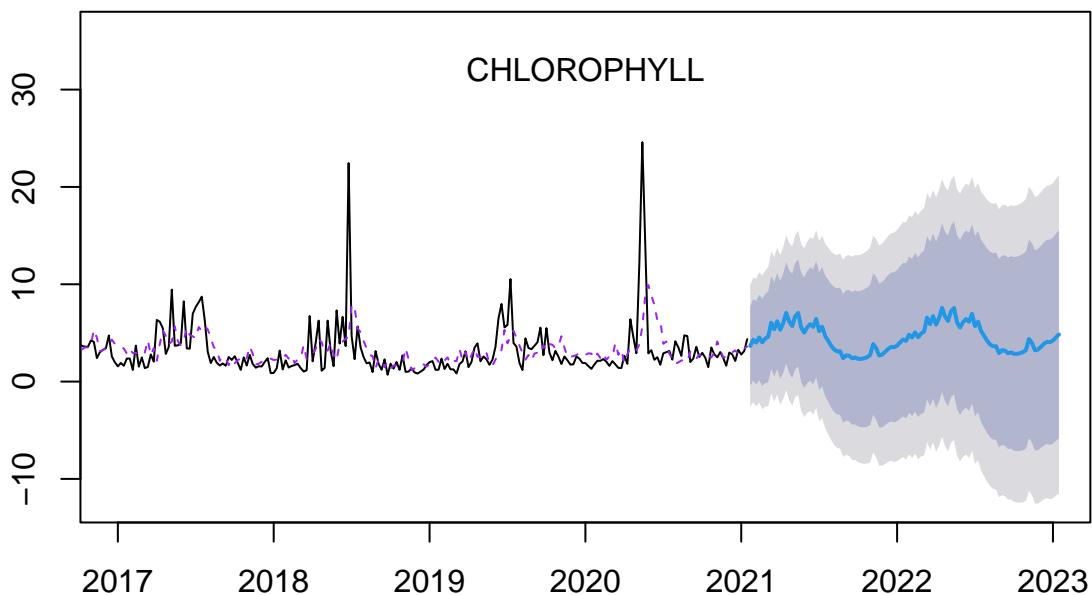
```

#ts_owt_df02_gb09_sboo_wkly03_test_tb03 <- ts(z2, start = c(2021, 1), freq = 52)

#print("Test set: MAPE")
#print(MAPE(y_pred = HW1_for$fitted, y_true = ts_owt_df02_gb09_sboo_wkly03_test_tb03))
#print("Test Set: MAE")
#print(MAE(y_pred = HW1_for$fitted, y_true = ts_owt_df02_gb09_sboo_wkly03_test_tb03))
}

```

## Forecasts from HoltWinters

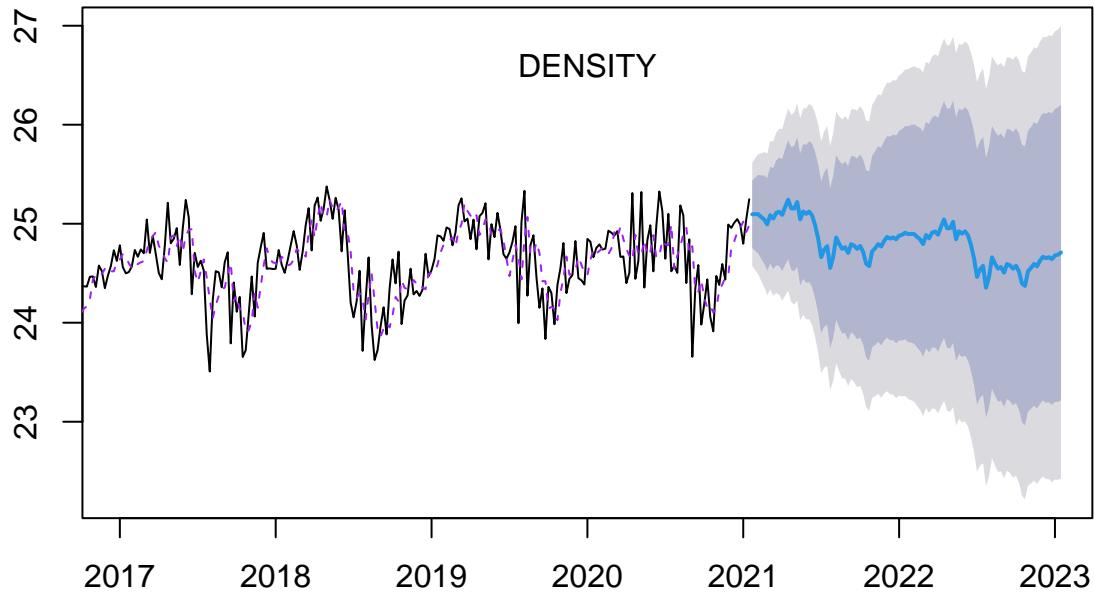


```

## [1] "Accuracy: "
## [1] "CHLOROPHYLL"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.1022793 3.190700 1.971592 -26.97607 48.25139 0.6671699
## Test set      2.2463908 3.116269 2.841425  20.96796 49.37168 0.9615141
##               ACF1 Theil's U
## Training set 0.1393202       NA
## Test set     0.8615906  4.386688

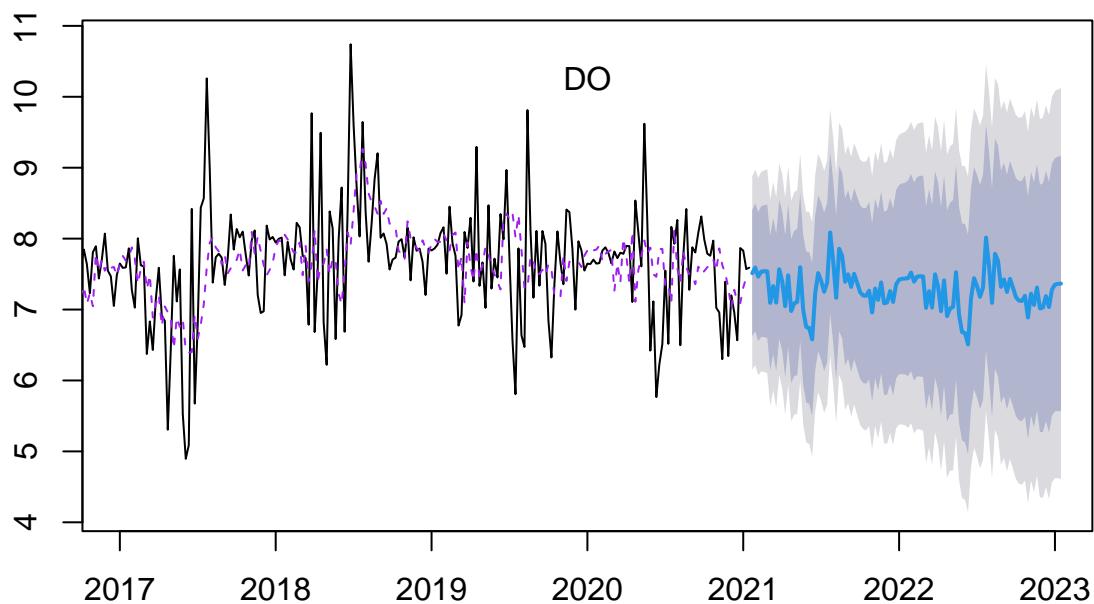
```

## Forecasts from HoltWinters



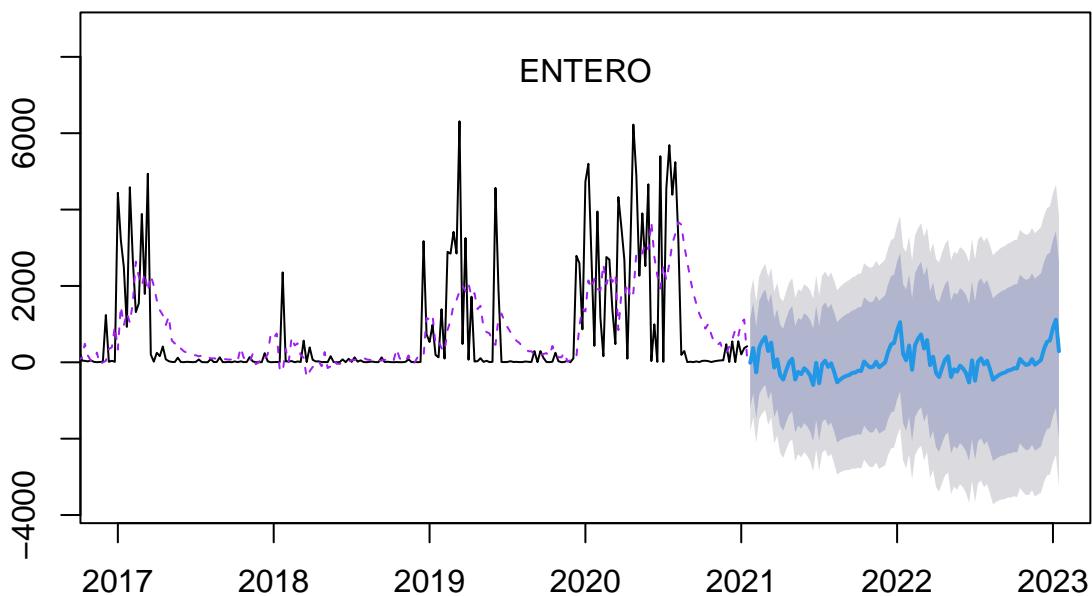
```
## [1] "Accuracy: "
## [1] "DENSITY"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.00868597 0.2661097 0.1956398 0.02645349 0.7947002 0.5767382
## Test set     0.27439396 0.3133471 0.2866552 1.09067922 1.1405087 0.8450478
##          ACF1 Theil's U
## Training set 0.09458735       NA
## Test set     0.79082440 4.18588
```

## Forecasts from HoltWinters



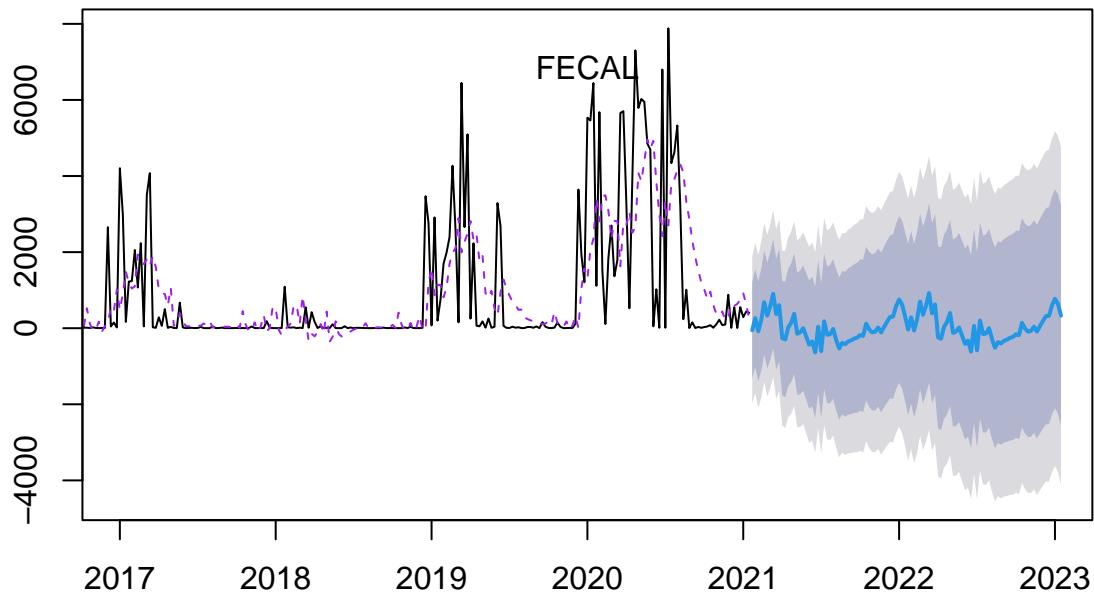
```
## [1] "Accuracy: "
## [1] "DO"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.02593868 0.6952922 0.4998909 -0.3376457 6.742103 0.6979608
## Test set     0.47952239 0.7183909 0.6073764  5.7991563 7.665913 0.8480349
##          ACF1 Theil's U
## Training set 0.1367533       NA
## Test set     0.7973523  3.82567
```

## Forecasts from HoltWinters



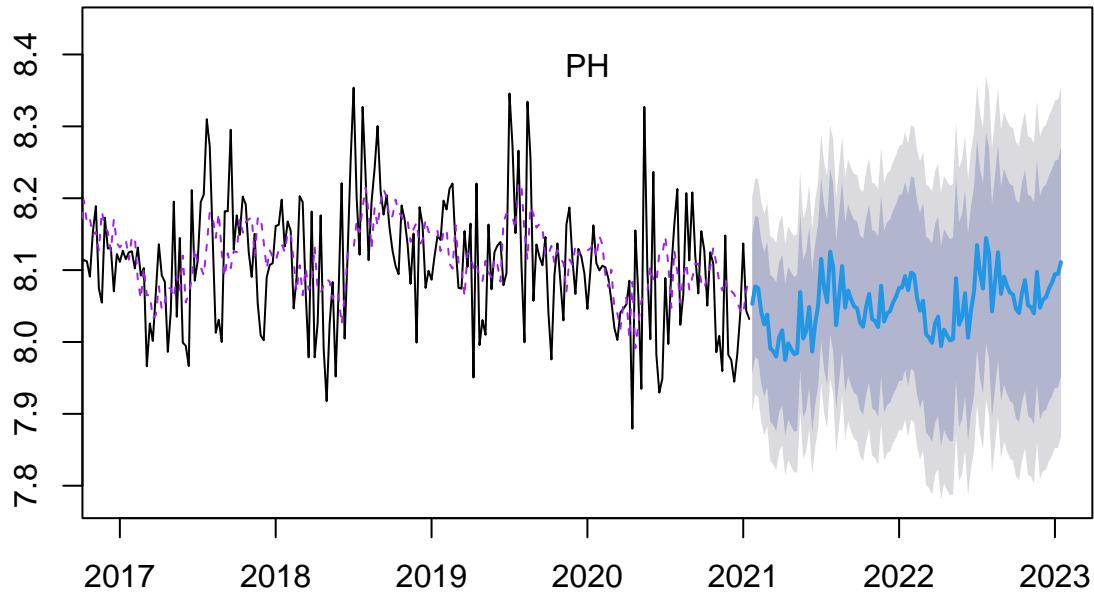
```
## [1] "Accuracy: "
## [1] "ENTERO"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -8.237838 913.6779 433.4422 -1818.639 2346.492 0.8845875
## Test set     88.810647 427.8780 310.5345 1109.308 3379.248 0.6337522
##               ACF1 Theil's U
## Training set 0.07100116       NA
## Test set     0.43072703 3.482345
```

## Forecasts from HoltWinters



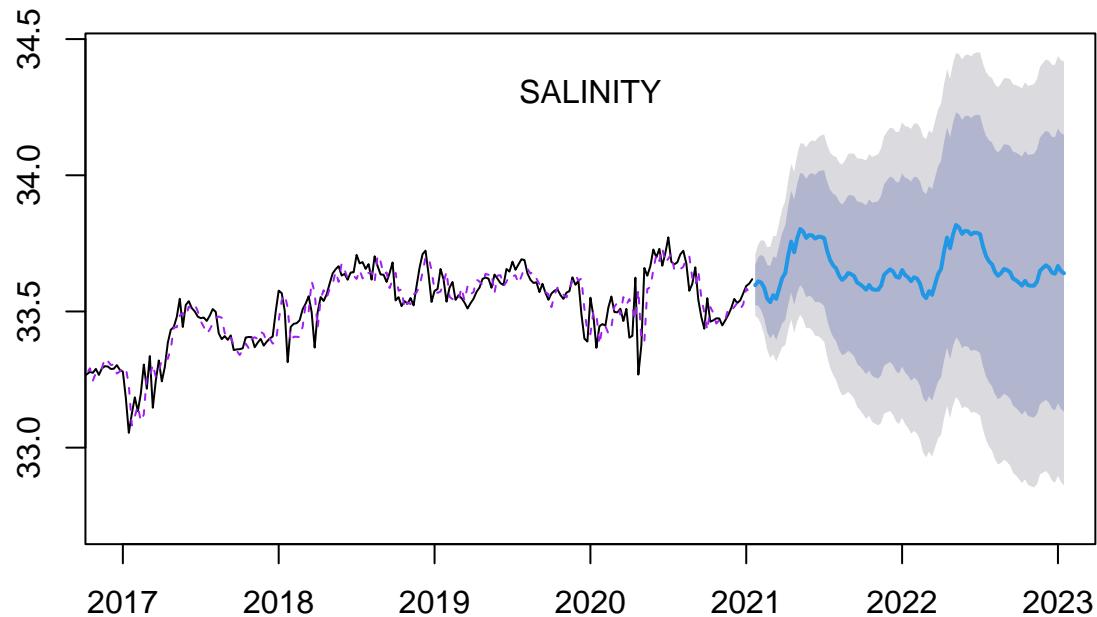
```
## [1] "Accuracy: "
## [1] "FECAL"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -2.423009 986.0725 516.5492 -1721.0533 2728.081 0.8481016
## Test set     124.304142 436.6030 327.8944    760.6152 2377.755 0.5383567
##          ACF1 Theil's U
## Training set 0.08313998       NA
## Test set     0.27502492 1.737434
```

## Forecasts from HoltWinters



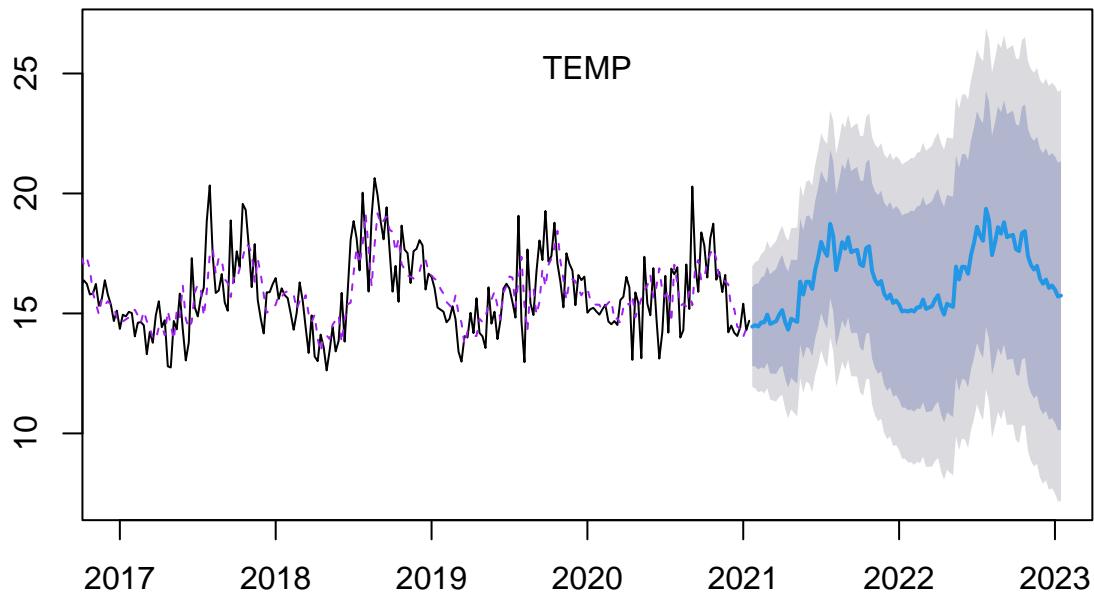
```
## [1] "Accuracy: "
## [1] "PH"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.002480009 0.07616416 0.05771275 -0.03748209 0.7123814 0.7056536
## Test set      -0.070034174 0.08993278 0.07855987 -0.88159567 0.9870175 0.9605513
##               ACF1 Theil's U
## Training set 0.1898242       NA
## Test set     0.7330344 3.832939
```

## Forecasts from HoltWinters



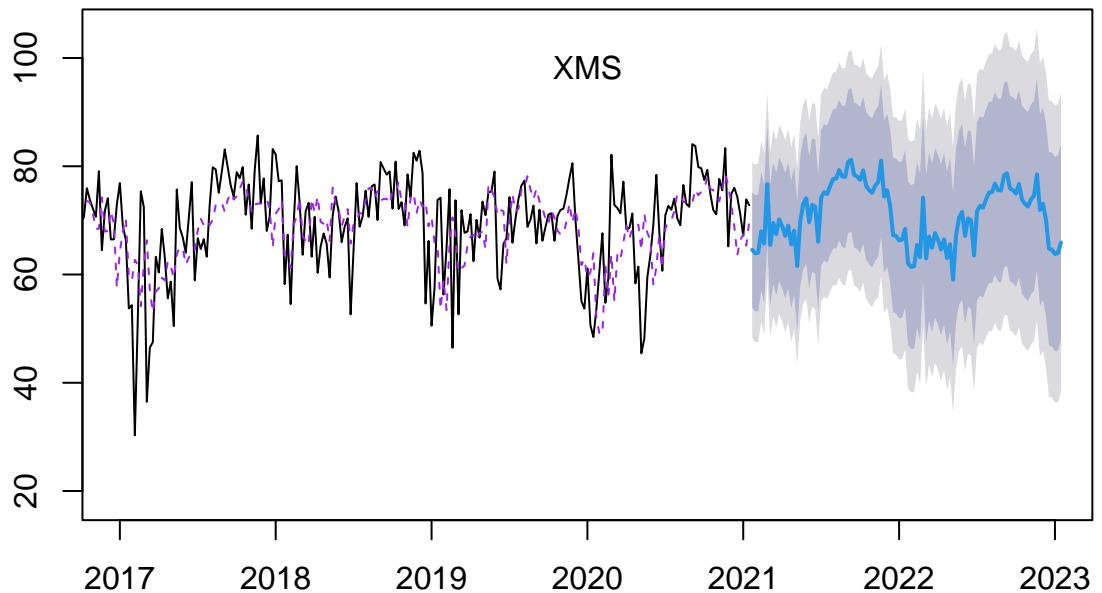
```
## [1] "Accuracy: "
## [1] "SALINITY"
##               ME      RMSE      MAE      MPE      MAPE
## Training set -0.0003848443 0.05763247 0.04015352 -0.00132097 0.1199759
## Test set      -0.0358582292 0.06060877 0.05026666 -0.10671437 0.1495097
##             MASE      ACF1 Theil's U
## Training set 0.3420641 0.07059847       NA
## Test set     0.4282170 0.84038594 3.028187
```

## Forecasts from HoltWinters



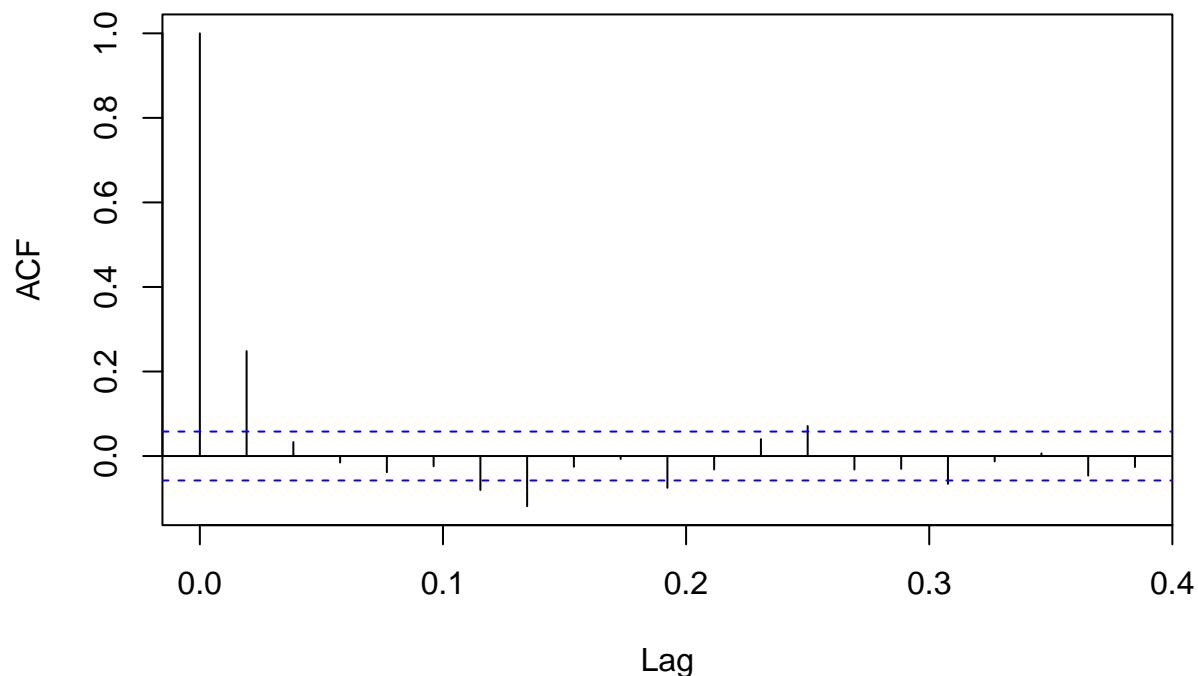
```
## [1] "Accuracy: "
## [1] "TEMP"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.04812992 1.284493 0.9654215 -0.8723829 6.330799 0.6500255
## Test set      -2.01096071 2.299520 2.0576695 -14.4547515 14.730957 1.3854442
##               ACF1 Theil's U
## Training set 0.1110604        NA
## Test set     0.3652595  2.025057
```

## Forecasts from HoltWinters



```
## [1] "Accuracy: "
## [1] "XMS"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.3391581 8.286845 5.843124 -0.9457464 8.95783 0.7447144
## Test set     4.3649706 9.367104 7.762394  4.3315522 11.00968 0.9893282
##          ACF1 Theil's U
## Training set 0.2482904       NA
## Test set     0.4794833 0.9970226
acf(HW1_for$residuals, lag.max=20, na.action=na.pass)
```

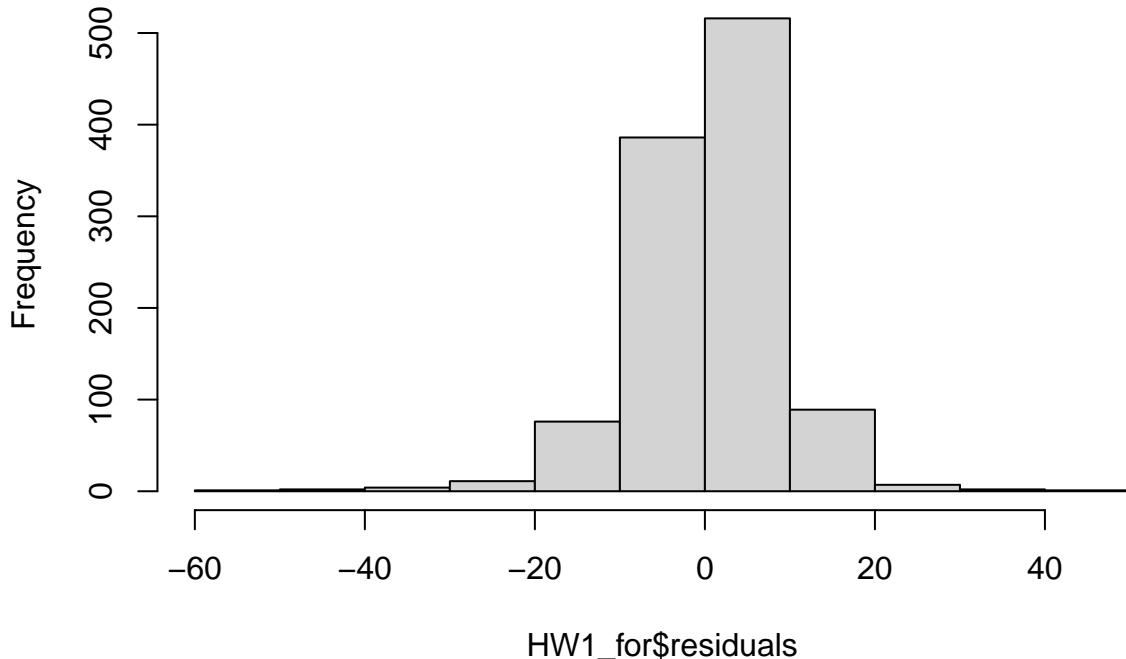
### Series HW1\_for\$residuals



```
Box.test(HW1_for$residuals, lag=20, type="Ljung-Box")
```

```
##  
## Box-Ljung test  
##  
## data: HW1_for$residuals  
## X-squared = 119.98, df = 20, p-value = 3.331e-16  
hist(HW1_for$residuals)
```

## Histogram of HW1\_for\$residuals



```
# convert to time series object ts
params <- c("CHLOROPHYLL", "DENSITY", "DO", "ENTERO", "FECAL", "PH", "SALINITY", "TEMP",
          "XMS")

for (param in params) {
  #print(param)

  z <- get(param, owt_df02_gb09_sboo_wkly02_train_tb03)
  ts_owt_df02_gb09_sboo_wkly02_train_tb03 <- ts(z, start = c(1999, 1), freq = 52)
  ts_owt_df02_gb09_sboo_wkly02_test_tb03 <- ts(z, start = c(2021, 1), freq = 52)

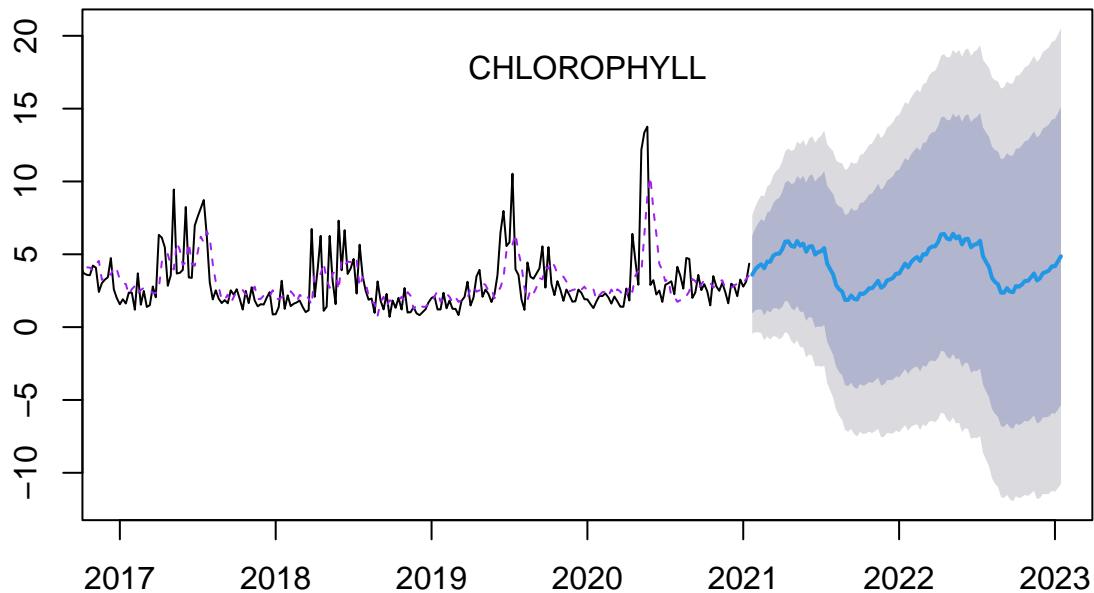
  HW1 <- HoltWinters(ts_owt_df02_gb09_sboo_wkly02_train_tb03)

  # forecast library more robust features vs. predict()

  HW1_for <- forecast(HW1, h=104, level=c(80,95))
  #visualize our predictions:
  plot(HW1_for, xlim=c(2017, 2023))
  lines(HW1_for$fitted, lty=2, col="purple")
  mtext(param, side=3, line = -2)

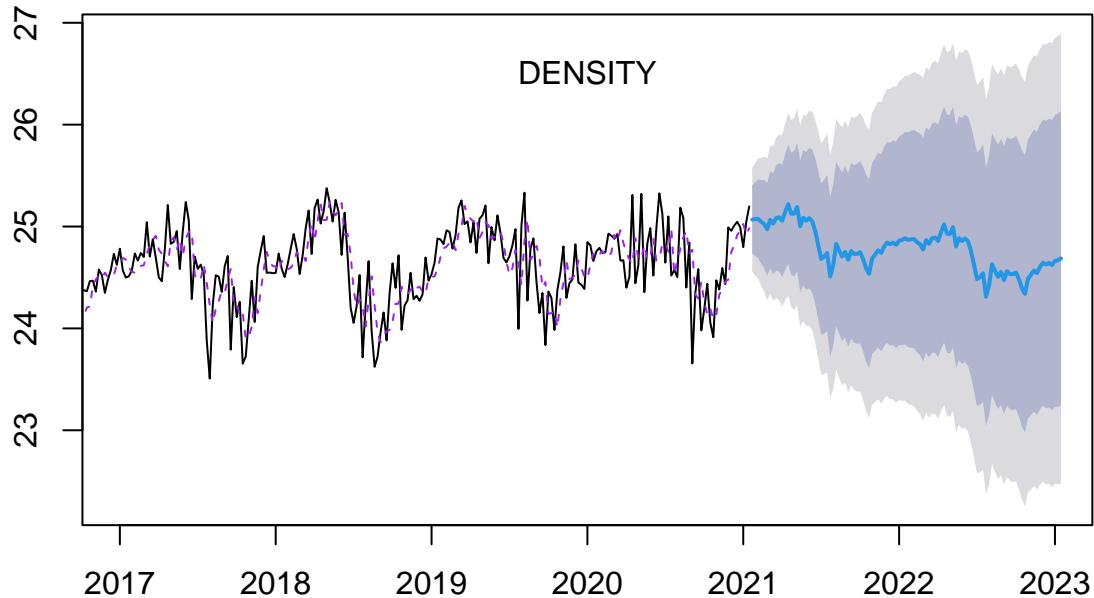
  print("Accuracy: ")
  print(param)
  #print(accuracy(HW1_for))
  print(accuracy(HW1_for, ts_owt_df02_gb09_sboo_wkly02_test_tb03))
}
```

## Forecasts from HoltWinters



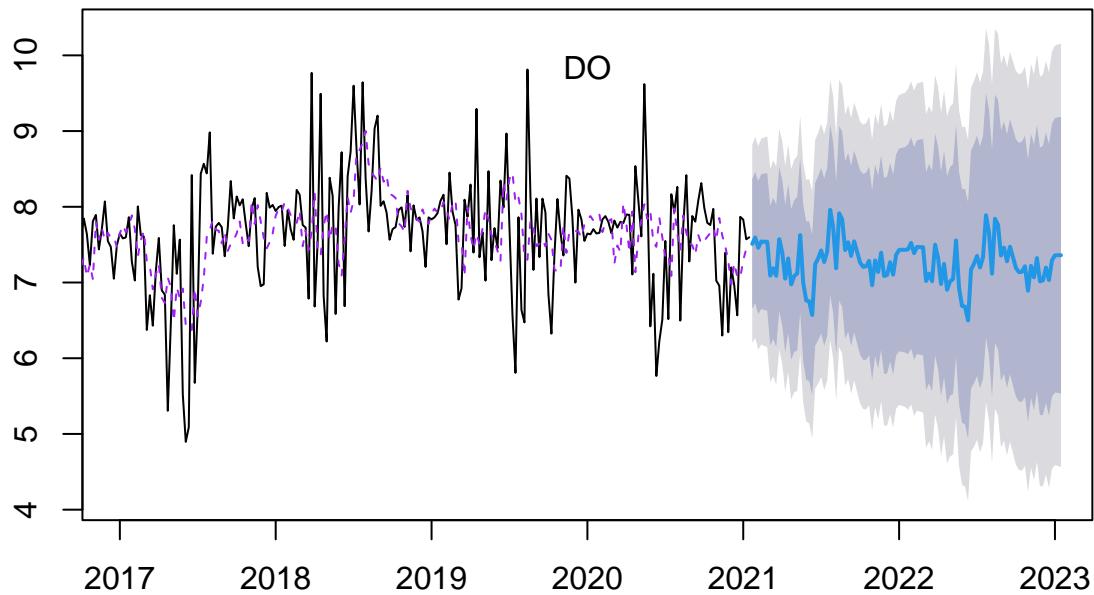
```
## [1] "Accuracy: "
## [1] "CHLOROPHYLL"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.06694596 2.07424 1.446251 -19.13824 39.30235 0.6219099
## Test set      2.58216928 3.26962 3.062433 26.85520 52.02599 1.3168933
##               ACF1 Theil's U
## Training set 0.1182405       NA
## Test set     0.8906571 4.286236
```

## Forecasts from HoltWinters



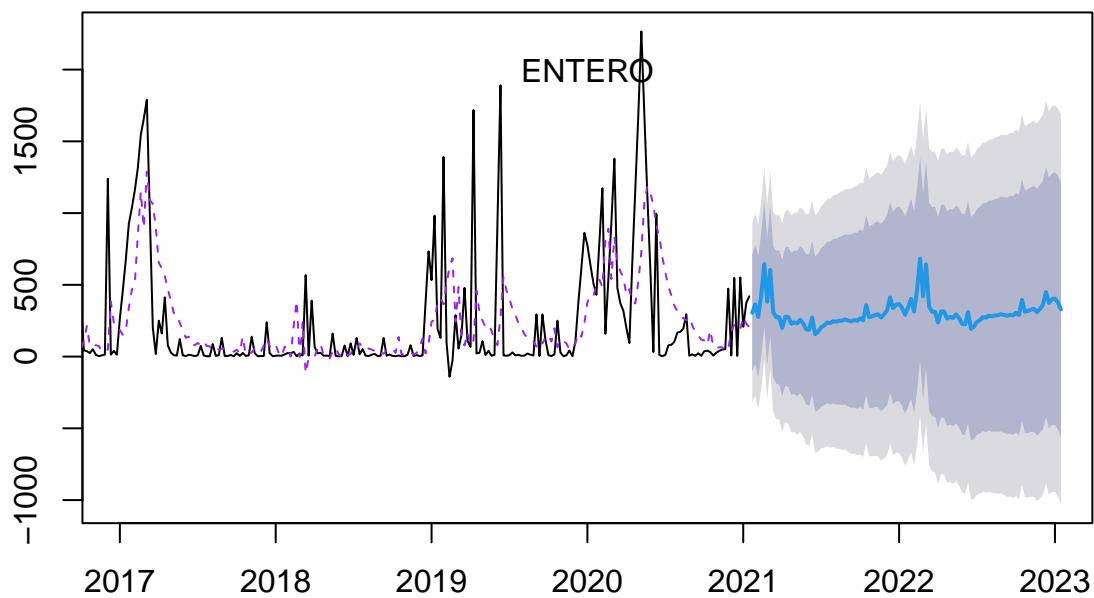
```
## [1] "Accuracy: "
## [1] "DENSITY"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.008688512 0.2608637 0.1927412 0.02679585 0.7821223 0.5777927
## Test set     0.300455960 0.3358497 0.3088433 1.19467905 1.2288210 0.9258395
##               ACF1 Theil's U
## Training set 0.09581955       NA
## Test set     0.77732726 4.435291
```

## Forecasts from HoltWinters



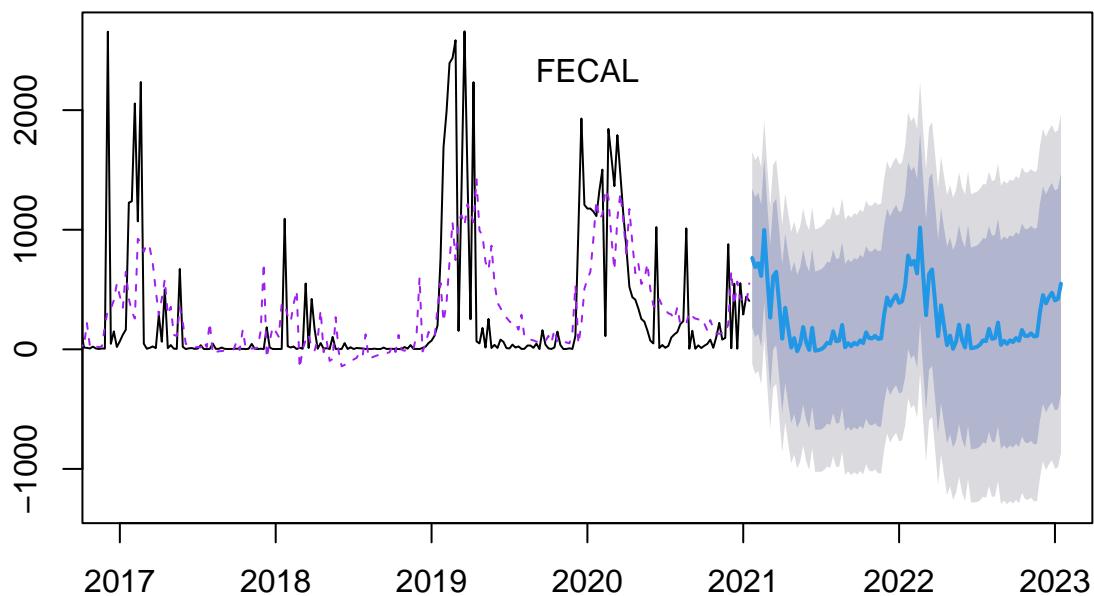
```
## [1] "Accuracy: "
## [1] "DO"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.02467105 0.6680607 0.4898582 -0.3108788 6.644379 0.6989592
## Test set     0.48146070 0.7209477 0.6108443  5.8234369 7.703702 0.8715894
##               ACF1 Theil's U
## Training set 0.1516258       NA
## Test set     0.8095373 3.736292
```

## Forecasts from HoltWinters



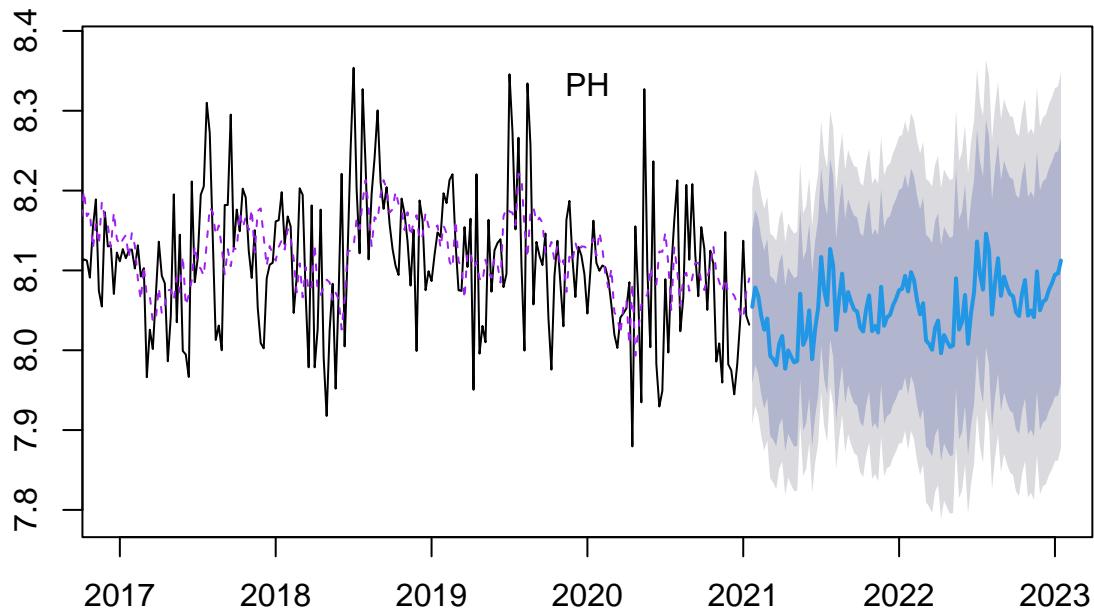
```
## [1] "Accuracy: "
## [1] "ENTERO"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -2.640892 317.5309 168.5037 -947.1598 1027.944 0.8465839
## Test set     -243.884222 293.2887 274.0600 -3284.0870 3286.794 1.3769121
##               ACF1 Theil's U
## Training set 0.1238312        NA
## Test set     0.4393069 3.004776
```

## Forecasts from HoltWinters



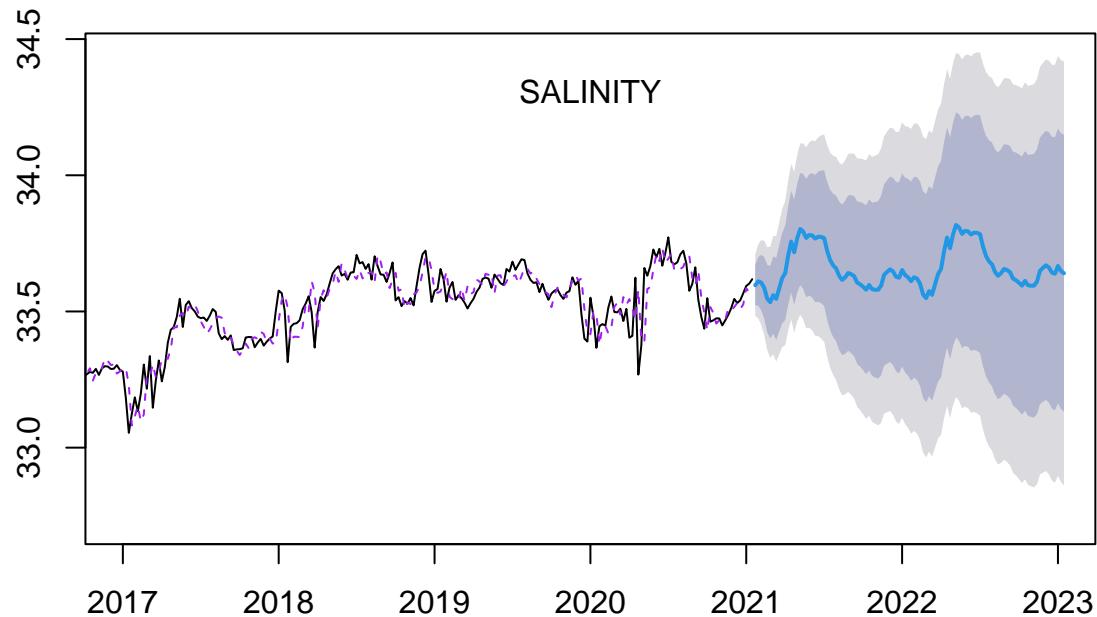
```
## [1] "Accuracy: "
## [1] "FECAL"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -2.411267 453.1053 257.4368 -1237.933 1623.945 0.8751207
## Test set     -95.636725 376.7525 242.4843 -1263.927 1306.991 0.8242916
##               ACF1 Theil's U
## Training set 0.1190698       NA
## Test set     0.1129563  1.18184
```

## Forecasts from HoltWinters



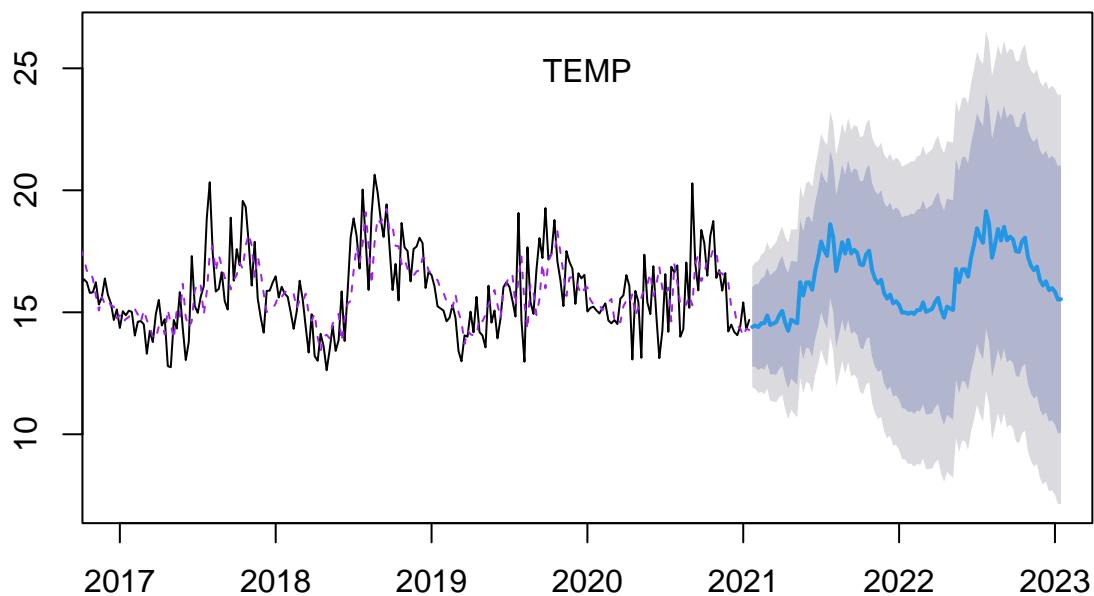
```
## [1] "Accuracy: "
## [1] "PH"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.002574413 0.07509104 0.05699028 -0.03846183 0.7037097 0.7067346
## Test set      -0.070896564 0.09016864 0.07907046 -0.89233246 0.9934076 0.9805502
##               ACF1 Theil's U
## Training set 0.2008171       NA
## Test set     0.7361375 3.900941
```

## Forecasts from HoltWinters



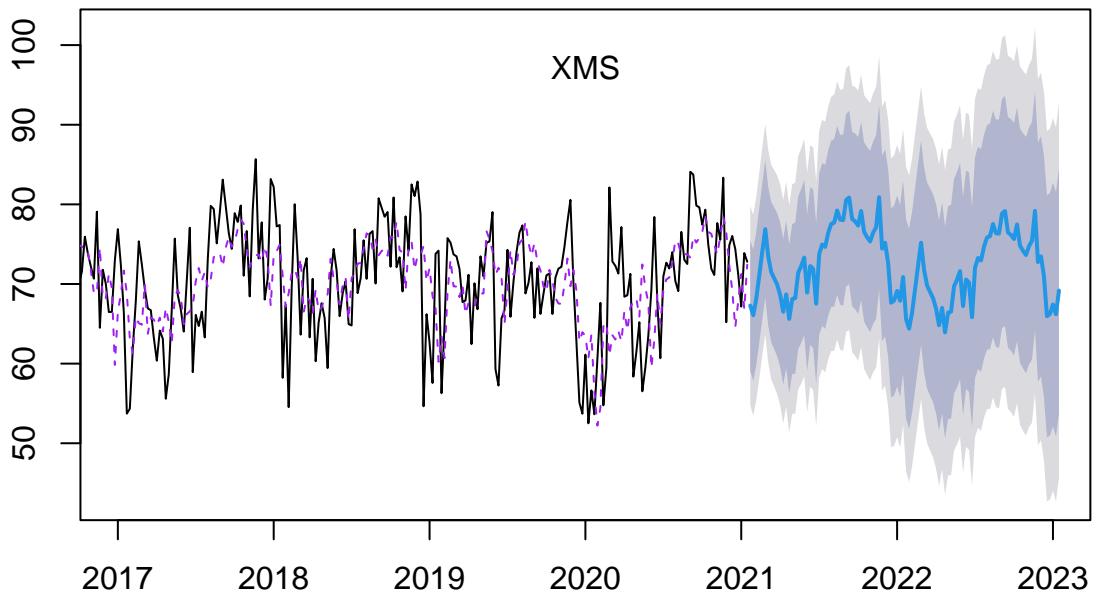
```
## [1] "Accuracy: "
## [1] "SALINITY"
##               ME      RMSE      MAE      MPE      MAPE
## Training set -0.0003848443 0.05763247 0.04015352 -0.00132097 0.1199759
## Test set      -0.0358582292 0.06060877 0.05026666 -0.10671437 0.1495097
##             MASE      ACF1 Theil's U
## Training set 0.3420641 0.07059847       NA
## Test set     0.4282170 0.84038594  3.028187
```

## Forecasts from HoltWinters



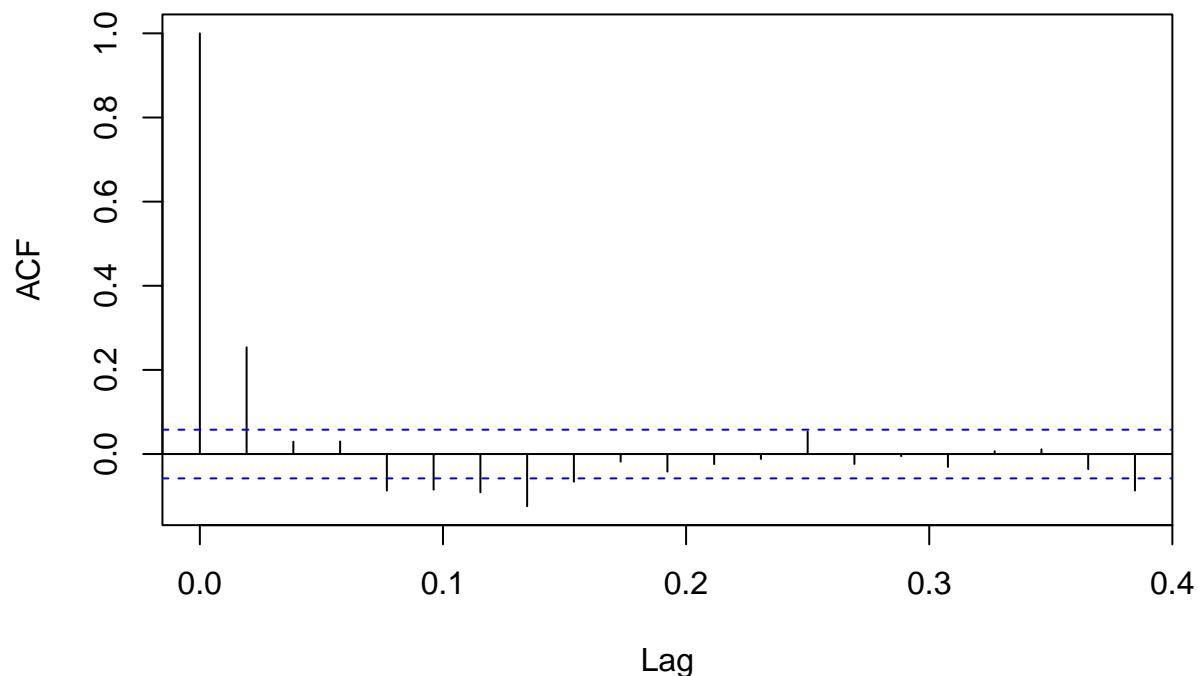
```
## [1] "Accuracy: "
## [1] "TEMP"
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.04561308 1.266222 0.9546388 -0.8460127 6.281475 0.6534357
## Test set      -1.86895425 2.177601 1.9362525 -13.4828783 13.876546 1.3253353
##               ACF1 Theil's U
## Training set 0.1068047       NA
## Test set     0.3822746  1.922185
```

## Forecasts from HoltWinters



```
## [1] "Accuracy: "
## [1] "XMS"
##          ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.1912608 6.364792 4.912165 -0.3472524 6.839092 0.7313659
## Test set     3.6391402 7.886891 6.643305  4.1186290 8.814771 0.9891132
##          ACF1 Theil's U
## Training set 0.2537163       NA
## Test set     0.5227412  1.286813
acf(HW1_for$residuals, lag.max=20, na.action=na.pass)
```

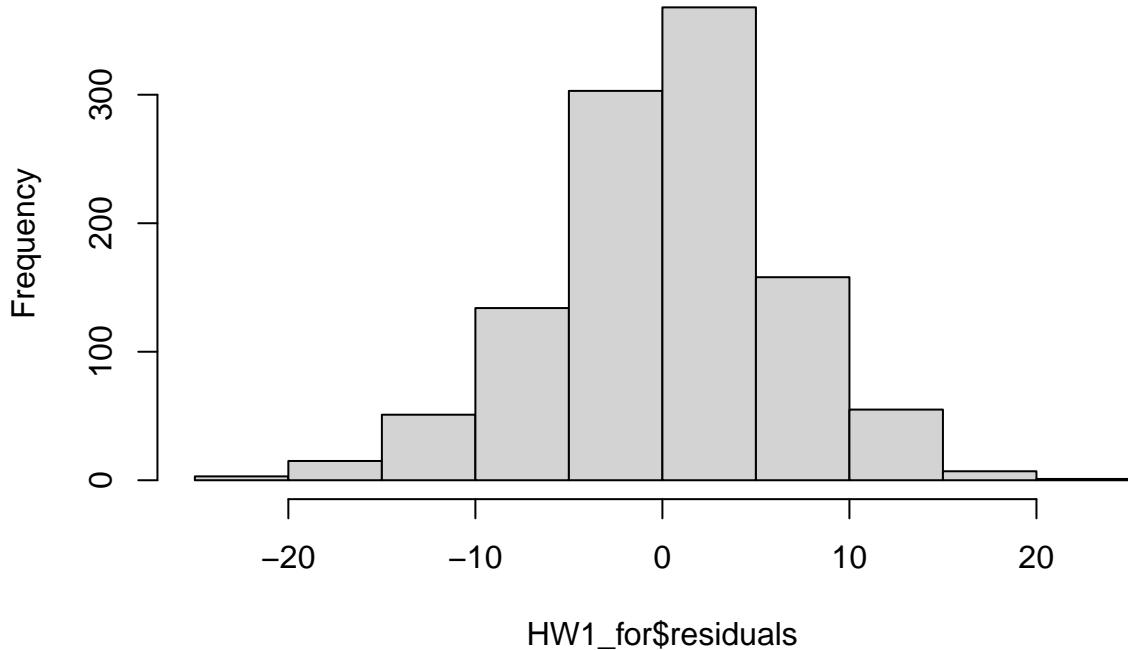
### Series HW1\_for\$residuals



```
Box.test(HW1_for$residuals, lag=20, type="Ljung-Box")
```

```
##  
## Box-Ljung test  
##  
## data: HW1_for$residuals  
## X-squared = 137.71, df = 20, p-value < 2.2e-16  
hist(HW1_for$residuals)
```

### Histogram of HW1\_for\$residuals



```
train_window <- window(ts_owt_df02_gb09_sboo_wkly02_train_tb03, start=c(2013, 1),
  end=c(2021, 1))

fit.mmn <- ets(train_window)
summary(fit.mmn)

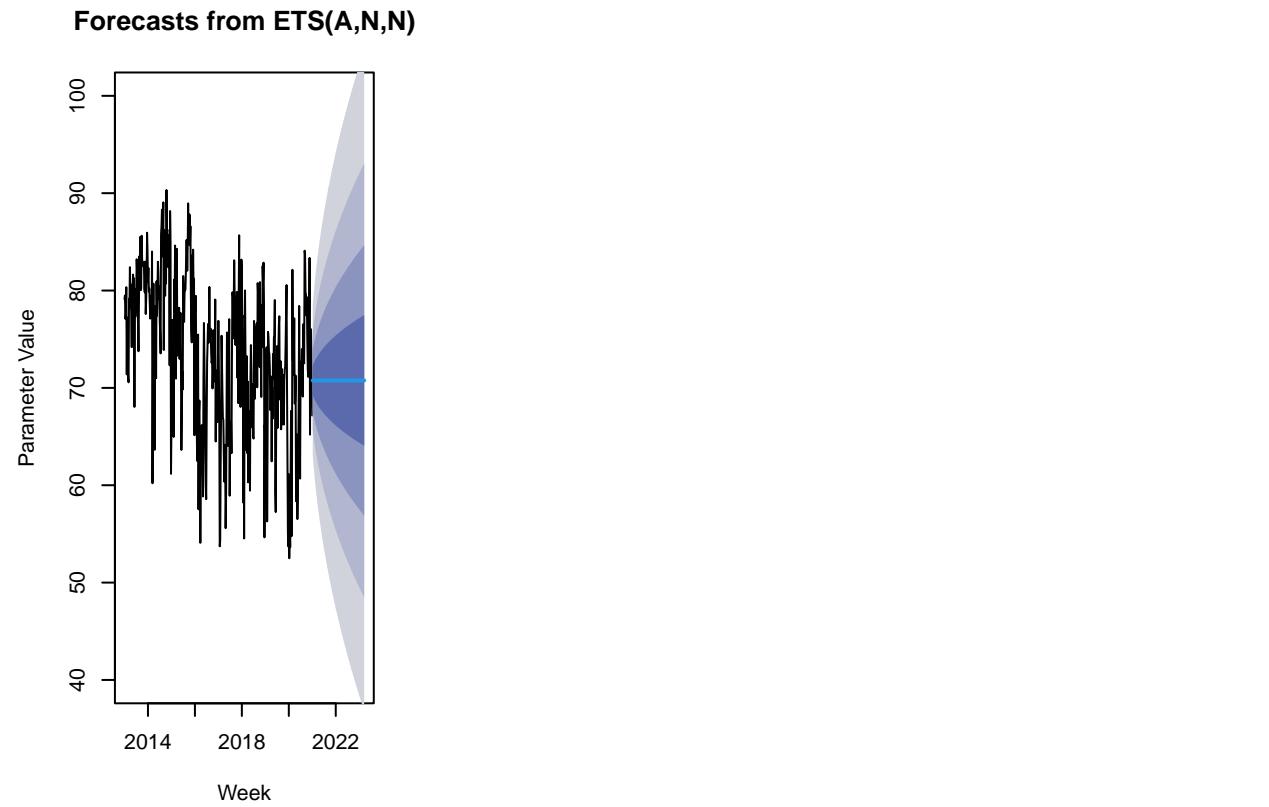
## ETS(A,N,N)
##
## Call:
##   ets(y = train_window)
##
##   Smoothing parameters:
##     alpha = 0.4044
##
##   Initial states:
##     l = 78.4301
##
##   sigma:  5.9761
##
##       AIC      AICc      BIC
## 4010.792 4010.850 4022.891
##
## Training set error measures:
##           ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.04546615 5.961759 4.449106 -0.6486891 6.329285 0.6455445
##           ACF1
```

```

## Training set 0.1009433
people.ets.AAN.pred <- forecast(fit.mmn, h = 115, level = c(0.2, 0.4, 0.6, 0.8))

par(mfrow = c(1, 3)) # This command sets the plot window to show 1 row of 3 plots.
plot(people.ets.AAN.pred, xlab = "Week", ylab = "Parameter Value", ylim = c(40, 100))

```



## Linear Regression Modeling

Create custom function to automate linear regression modeling

```

lr_ts_mod <- function(tb_train = NA,
                      tb_test = NA,
                      date = NA,
                      param = NA,
                      ext_pred = c(),
                      train_start = c(),
                      test_start = c(),
                      freq = NA,
                      h = NA,
                      formula = NA) {
  # Function to perform TS linear regression w/ or w/o external variables
  #print(tb_train)
  #print(tb_test)
  tb_full01 <- rbind(tb_train, tb_test)
  #print(tb_full01)

```

```

ts_full01 <- ts(tb_full01[, 2:10],
                  start = train_start,
                  freq = freq)
#print(ts_full01)

train_ts01 <- window(ts_full01, end = c(2021, 5))
test_ts01 <- window(ts_full01, start = c(2021, 6))
#print(tail(train_ts01))
#print(colnames(train_ts01))
#print(colnames(test_ts01))

#print(train_ts01)
#print(test_ts01)
#print(test_ts01[, ext_pred])

# TSLM Citation:
# https://www.rdocumentation.org/packages/forecast/versions/8.19/topics/tslm
lin_mod_fit <- tslm(formula = as.formula(formula),
                     data = train_ts01)

lin_mod_prd <- forecast(lin_mod_fit,
                        h = h,
                        newdata = data.frame(test_ts01[, ext_pred]))


#print(lin_mod_prd)
#print(tb_test[, param])
print(accuracy(lin_mod_prd,
               as.matrix(tb_test[, param])))

# Multiple Object return() Citation:
# https://www.geeksforgeeks.org/return-value-from-r-function/
return(list(train_ts01[, param],
            test_ts01[, param],
            lin_mod_prd))
}

}

```

### PLOO: Imputed, All - Including External Variables (Forecasting ENTERO)

```

# PLOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly03_train_tb03
# PLOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly03_test_tb03

```

```

owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                   ENTERO)

```

```

owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        ENTERO,
                        .frequency = "auto",
                        .trend = "auto")

```

```

#print(lubridate::isoweek(ymd(train_start)))
#print(lubridate::isoweek(ymd(test_start)))

#print(tail(owt_df02_gb09_ploo_wkly03_train_tb02))
#print(head(owt_df02_gb09_ploo_wkly03_test_tb02))

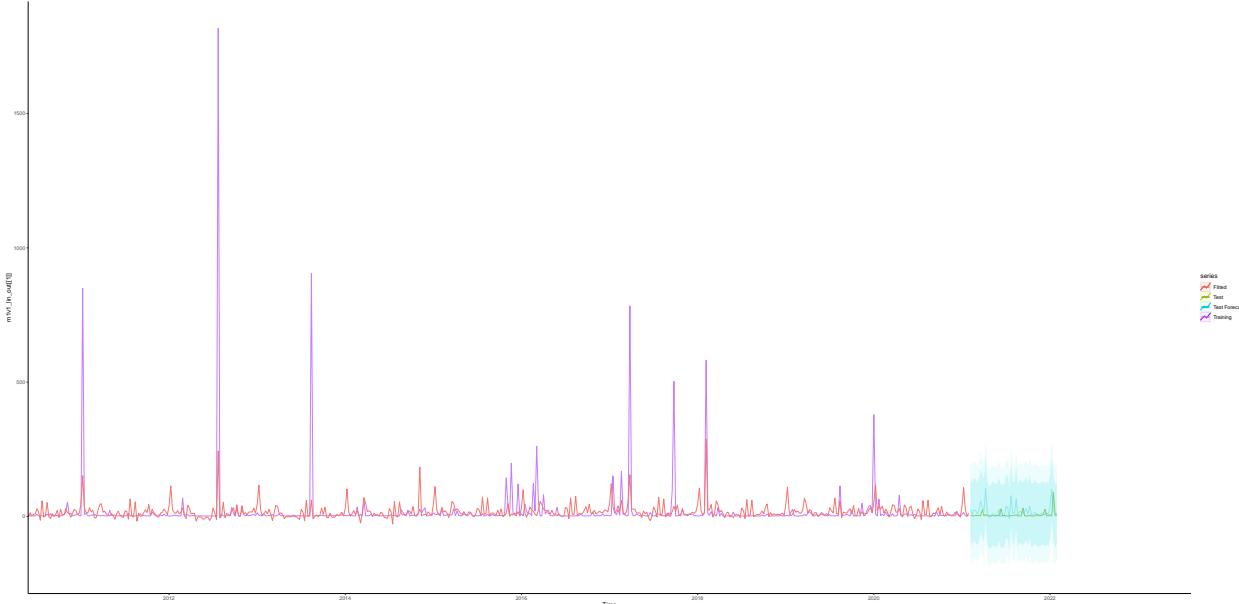
m1v1_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly03_train_tb03,
                           tb_test = owt_df02_gb09_ploo_wkly03_test_tb03,
                           date = "date_sample",
                           param = "ENTERO",
                           ext_pred = c("CHLOROPHYLL",
                                       "DENSITY",
                                       "DO",
                                       "FECAL",
                                       "PH",
                                       "SALINITY",
                                       "TEMP",
                                       "XMS"),
                           train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                           test_start = c(2021, 6),
                           freq = 52,
                           h = 52,
                           formula = "ENTERO ~ trend + season + CHLOROPHYLL + DENSITY + DO
                           ← + FECAL + PH + SALINITY + TEMP + XMS")

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -1.046722e-15 86.77428 28.51601 -201.2632 394.7822 0.8768111
## Test set      -1.359639e+01 30.01797 19.75175 -520.9396 564.2274 0.6073274
##               ACF1
## Training set 0.00946572
## Test set      NA

#print(m1v1_lin_out[[3]])

# Autoplot Citation:
# USD. (n.d.). ADS 506 Lab 3.2.R [Module 3 course materials].
autoplot(m1v1_lin_out[[1]], series = 'Training') +
  autolayer(m1v1_lin_out[[2]], series = 'Test') +
  autolayer(m1v1_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m1v1_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m1v1_lin_out[[3]])
```

```
##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 570.24826   0.02487   66.67114  -21.37696  -36.12629  -29.12206
##   season6    season7    season8    season9    season10   season11
## -14.04468  -29.91413  -21.67273  -29.07968  -40.74223  -25.73621
##   season12   season13   season14   season15   season16   season17
## 11.01291   5.96744  -20.16249  -20.45878  -22.42186  -34.73134
##   season18   season19   season20   season21   season22   season23
## -30.49355  -25.85471  -32.51986  -33.84756  -25.75848  -21.82754
##   season24   season25   season26   season27   season28   season29
## -35.33516  -38.07910  -35.25317  -6.16428  -15.81276  -46.54864
##   season30   season31   season32   season33   season34   season35
## 28.14340  -32.83728  -31.49919  22.09408  -38.20827  -30.32434
##   season36   season37   season38   season39   season40   season41
## -25.65753  -30.56741  -23.12911  -10.87565  -27.90870  -0.39450
##   season42   season43   season44   season45   season46   season47
## -35.55193  -34.93334  -22.74350  -36.29355  -34.33324  -32.74456
##   season48   season49   season50   season51   season52 CHLOROPHYLL
## -29.80809  -28.64711  -23.51158  -24.64886  -32.16327  0.34342
##   DENSITY      DO     FECAL        PH    SALINITY      TEMP
## 38.85919   -0.56045     0.42542    54.67497   -60.46816   8.42882
##   XMS
## -0.71608
```

```

##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -1.046722e-15 86.77428 28.51601 -201.2632 394.7822 0.8737683
##                      ACF1
## Training set 0.00946572
##
## Forecasts:
##             Point Forecast      Lo 80      Hi 80      Lo 95      Hi 95
## 2021.096    29.4680279   -87.97340 146.9095 -150.23415 209.1702
## 2021.115     7.4653502  -109.93365 124.8644 -172.17192 187.1026
## 2021.135    24.3485243   -92.95329 141.6503 -155.14003 203.8371
## 2021.154    23.3998700   -93.96530 140.7650 -156.18563 202.9854
## 2021.173     9.8409381  -107.34956 127.0314 -169.47728 189.1592
## 2021.192    21.6933632   -95.48725 138.8740 -157.60973 200.9965
## 2021.212    58.4282465   -58.86386 175.7204 -121.04545 237.9019
## 2021.231    35.9361707   -81.53464 153.4070 -143.81097 215.6833
## 2021.250    21.6577231   -95.54228 138.8577 -157.67505 200.9905
## 2021.269    104.0456494  -13.41867 221.5100  -75.69157 283.7829
## 2021.288     15.1157139  -102.14898 132.3804  -164.31604 194.5475
## 2021.308     -1.9715247  -119.29318 115.3501  -181.49044 177.5474
## 2021.327     0.7637612  -116.60771 118.1352  -178.83137 180.3589
## 2021.346     9.4352817  -107.81352 126.6841  -169.97216 188.8427
## 2021.365     9.8876088  -107.28083 127.0561  -169.39687 189.1721
## 2021.385     3.0450184  -114.14350 120.2335  -176.27018 182.3602
## 2021.404     7.5140680  -109.80647 124.8346  -172.00314 187.0313
## 2021.423     26.0014362  -91.35884 143.3617  -153.57658 205.5795
## 2021.442     -0.7386557  -117.98935 116.5120  -180.14900 178.6717
## 2021.462     3.7781511  -113.36451 120.9208  -175.46688 183.0232
## 2021.481     0.9642838  -116.41144 118.3400  -178.63736 180.5659
## 2021.500     36.3200348  -80.94624 153.5863  -143.11413 215.7542
## 2021.519     34.1802522  -83.25204 151.6125  -145.50796 213.8685
## 2021.538     -6.9186153  -124.21905 110.3818  -186.40507 172.5678
## 2021.558     77.3585967  -40.11327 194.8305  -102.39017 257.1074
## 2021.577     11.4755034  -105.77118 128.7222  -167.92869 190.8797
## 2021.596     13.2590347  -103.93369 130.4518  -166.06260 192.5807
## 2021.615     64.7489345  -52.39421 181.8921  -114.49684 243.9947
## 2021.635     5.0722820  -112.13887 122.2834  -174.27755 184.4221
## 2021.654     18.6293788  -98.63286 135.8916  -160.79861 198.0574
## 2021.673     17.6142618  -99.87302 135.1015  -162.15809 197.3866
## 2021.692     10.3404587  -107.08947 127.7704  -169.34413 190.0250
## 2021.712     20.3485507  -96.85490 137.5520  -158.98949 199.6866
## 2021.731     29.4222818  -87.87739 146.7220  -150.06300 208.9076
## 2021.750     10.2053873  -107.29138 127.7022  -169.58147 189.9922
## 2021.769     39.3936280  -78.09263 156.8799  -140.37715 219.1644
## 2021.788     4.5437551  -112.93016 122.0177  -175.20815 184.2957
## 2021.808     7.0126751  -110.53367 124.5590  -172.85004 186.8754
## 2021.827     17.1021792  -100.48607 134.6904  -162.82466 197.0290
## 2021.846     8.6768013  -108.90284 126.2564  -171.23687 188.5905
## 2021.865     6.4066977  -111.10639 123.9198  -173.40513 186.2185
## 2021.885     6.8703892  -110.40029 124.1411  -172.57053 186.3113
## 2021.904     12.3824905  -105.31637 130.0814  -167.71361 192.4786
## 2021.923     11.9819734  -105.37078 129.3347  -167.58453 191.5485
## 2021.942     5.5885194  -112.27808 123.4551  -174.76424 185.9413

```

```

## 2021.962      13.5630803 -104.07625 131.2024 -166.44193 193.5681
## 2021.981      6.1574358 -111.34330 123.6582 -173.63550 185.9504
## 2022.000      38.5978583 -79.24010 156.4358 -141.71108 218.9068
## 2022.019     101.5686784 -16.19915 219.3365 -78.63295 281.7703
## 2022.038      28.4714562 -89.04633 145.9892 -151.34757 208.2905
## 2022.058       0.8251637 -116.57631 118.2266 -178.81589 180.4662
## 2022.077     12.6666412 -104.72084 130.0541 -166.95300 192.2863

```

### PLOO: Imputed, Excluding Outliers - Including External Variables (Forecasting ENTERO)

```

# PLOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly02_train_tb03
# PLOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly02_test_tb03

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
                    ENTERO)

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        ENTERO,
                        .frequency = "auto",
                        .trend = "auto")

m2v1_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly02_train_tb03,
                            tb_test = owt_df02_gb09_ploo_wkly02_test_tb03,
                            date = "date_sample",
                            param = "ENTERO",
                            ext_pred = c("CHLOROPHYLL",
                                        "DENSITY",
                                        "DO",
                                        "FECAL",
                                        "PH",
                                        "SALINITY",
                                        "TEMP",
                                        "XMS"),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "ENTERO ~ trend + season + CHLOROPHYLL + DENSITY + DO
                           + FECAL + PH + SALINITY + TEMP + XMS")

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -3.071546e-16 86.77712 28.67443 -201.1468 395.1431 0.8816822
## Test set      -1.247129e+01 29.36381 18.89189 -489.1608 535.6733 0.5808884
##               ACF1
## Training set 0.008521948
## Test set      NA

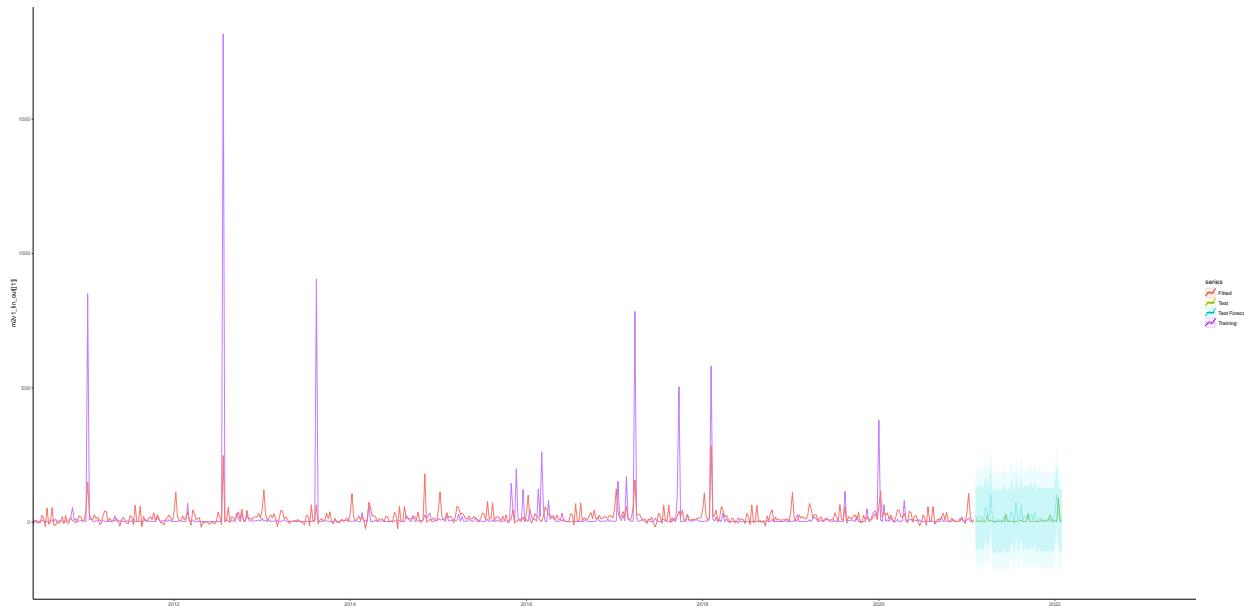
autoplot(m2v1_lin_out[[1]], series = 'Training') +
  autolayer(m2v1_lin_out[[2]], series = 'Test') +
  autolayer(m2v1_lin_out[[3]], series = 'Test Forecast', alpha = .3) +

```

```

autolayer(m2v1_lin_out[[3]]$fitted, series = 'Fitted') +
theme_classic() +
coord_cartesian(#ylim = c(-50, 400),
                xlim = c(2011, 2023))

```



```
summary(m2v1_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 566.52070     0.01909   67.86909  -22.10525  -36.58812  -30.60997
## season6    season7    season8    season9    season10   season11
## -15.42820    -30.86519  -23.29226  -30.79680  -41.70029  -26.92888
## season12   season13   season14   season15   season16   season17
## 10.55011     6.55161  -18.54021  -19.75047  -20.62650  -31.81568
## season18   season19   season20   season21   season22   season23
## -27.18784   -22.71148  -30.11554  -30.27887  -23.13177  -18.84428
## season24   season25   season26   season27   season28   season29
## -33.20013   -33.77937  -30.24041  -3.40619   -12.38781  -42.98687
## season30   season31   season32   season33   season34   season35
## 31.31994   -31.11144  -30.20355  23.67099  -36.19962  -24.34365
## season36   season37   season38   season39   season40   season41
## -21.12460   -28.03628  -20.73011  -9.02166  -26.50083   1.68746
## season42   season43   season44   season45   season46   season47
## -34.03457  -33.75832  -20.19064  -34.22012  -32.25841  -31.69945
## season48   season49   season50   season51   season52 CHLOROPHYLL

```

```

## -28.60027 -28.30176 -23.36001 -24.36158 -32.13873 -1.18342
## DENSITY DO FECAL PH SALINITY TEMP
## 41.73314 2.54420 0.42466 56.87757 -63.89572 8.20753
## XMS
## -0.49305
##
##
## Error measures:
## ME RMSE MAE MPE MAPE MASE
## Training set -3.071546e-16 86.77712 28.67443 -201.1468 395.1431 0.8786224
## ACF1
## Training set 0.008521948
##
## Forecasts:
## Point Forecast Lo 80 Hi 80 Lo 95 Hi 95
## 2021.096 24.2918214 -93.17017 141.7538 -155.44182 204.0255
## 2021.115 4.9027823 -112.51926 122.3248 -174.76974 184.5753
## 2021.135 20.3174627 -96.99865 137.6336 -159.19298 199.8279
## 2021.154 20.3769823 -96.99447 137.7484 -159.21812 199.9721
## 2021.173 8.2850284 -108.91208 125.4821 -171.04332 187.6134
## 2021.192 19.5146098 -97.67703 136.7062 -159.80536 198.8346
## 2021.212 55.1373452 -62.16457 172.4393 -124.35136 234.6260
## 2021.231 33.2545388 -84.24426 150.7533 -146.53543 213.0445
## 2021.250 23.4533801 -93.74827 140.6550 -155.88192 202.7887
## 2021.269 103.3003644 -14.16383 220.7646 -76.43666 283.0374
## 2021.288 12.0106577 -105.26060 129.2819 -167.43115 191.4525
## 2021.308 -5.3522353 -122.68154 111.9771 -184.88286 174.1784
## 2021.327 3.6094779 -113.75807 120.9770 -175.97967 183.1986
## 2021.346 9.6756462 -107.59628 126.9476 -169.76718 189.1185
## 2021.365 7.2843518 -109.88922 124.4579 -172.00798 186.5767
## 2021.385 1.9348547 -115.26357 119.1333 -177.39551 181.2652
## 2021.404 7.3168285 -110.00560 124.6393 -172.20326 186.8369
## 2021.423 22.9862070 -94.35294 140.3254 -156.55947 202.5319
## 2021.442 -0.5008495 -117.76090 116.7592 -179.92550 178.9238
## 2021.462 4.6632922 -112.47928 121.8059 -174.58161 183.9082
## 2021.481 2.6358012 -114.75302 120.0246 -176.98589 182.2575
## 2021.500 37.9537846 -79.33810 155.2457 -141.51957 217.4271
## 2021.519 30.1517554 -87.35057 147.6541 -149.64362 209.9471
## 2021.538 -7.4481895 -124.74606 109.8497 -186.93072 172.0343
## 2021.558 72.4441698 -45.04822 189.9366 -107.33600 252.2243
## 2021.577 9.6889927 -107.56416 126.9421 -169.72511 189.1031
## 2021.596 12.5907657 -104.60866 129.7902 -166.74113 191.9227
## 2021.615 64.0293987 -53.11569 181.1745 -115.21934 243.2781
## 2021.635 5.3048771 -111.90548 122.5152 -174.04374 184.6535
## 2021.654 21.4573252 -95.81112 138.7258 -157.98018 200.8948
## 2021.673 18.8427738 -98.65586 136.3414 -160.94695 198.6325
## 2021.692 9.9949824 -107.43631 127.4263 -169.69170 189.6817
## 2021.712 20.8338278 -96.38546 138.0531 -158.52845 200.1961
## 2021.731 28.1233994 -89.17837 145.4252 -151.36509 207.6119
## 2021.750 8.3785499 -109.15580 125.9129 -171.46582 188.2229
## 2021.769 38.1730304 -79.33998 155.6860 -141.63869 217.9848
## 2021.788 3.3254726 -114.17029 120.8212 -176.45986 183.1108
## 2021.808 7.7254556 -109.82480 125.2757 -172.14326 187.5942
## 2021.827 18.1941473 -99.41124 135.7995 -161.75892 198.1472

```

```

## 2021.846      8.4106520 -109.19158 126.0129 -171.53758 188.3589
## 2021.865      5.8309091 -111.71381 123.3756 -174.02932 185.6911
## 2021.885      7.0293792 -110.25205 124.3108 -172.42798 186.4867
## 2021.904      8.6491917 -109.07817 126.3766 -171.49052 188.7889
## 2021.923      9.8730096 -107.50148 127.2475 -169.72675 189.4728
## 2021.942      4.0254122 -113.87745 121.9283 -176.38283 184.4337
## 2021.962      12.9785344 -104.69052 130.6476 -167.07195 193.0290
## 2021.981      4.7061594 -112.85137 122.2637 -175.17368 184.5860
## 2022.000      35.9851031 -81.93069 153.9009 -144.44293 216.4131
## 2022.019      102.0493988 -15.72552 219.8243 -78.16308 282.2619
## 2022.038      26.2551581 -91.28878 143.7991 -153.60388 206.1142
## 2022.058      -0.7352182 -118.14393 116.6735 -180.38735 178.9169
## 2022.077      11.5191875 -105.89270 128.9311 -168.13780 191.1762

```

### SBOO: Imputed, All - Including External Variables (Forecasting ENTERO)

```

# SBOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly03_train_tb03
# SBOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly03_test_tb03

owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                    ENTERO)

owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        ENTERO,
                        .frequency = "auto",
                        .trend = "auto")

m3v1_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly03_train_tb03,
                            tb_test = owt_df02_gb09_sboo_wkly03_test_tb03,
                            date = "date_sample",
                            param = "ENTERO",
                            ext_pred = c("CHLOROPHYLL",
                                         "DENSITY",
                                         "DO",
                                         "FECAL",
                                         "PH",
                                         "SALINITY",
                                         "TEMP",
                                         "XMS"),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "ENTERO ~ trend + season + CHLOROPHYLL + DENSITY + DO
                           + FECAL + PH + SALINITY + TEMP + XMS")

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -2.998788e-15 506.8252 220.4953 -3.930906 1165.3447 0.5455759
## Test set     -6.012224e+01 558.4625 327.0337 -907.847612 970.4077 0.8091859
##                      ACF1

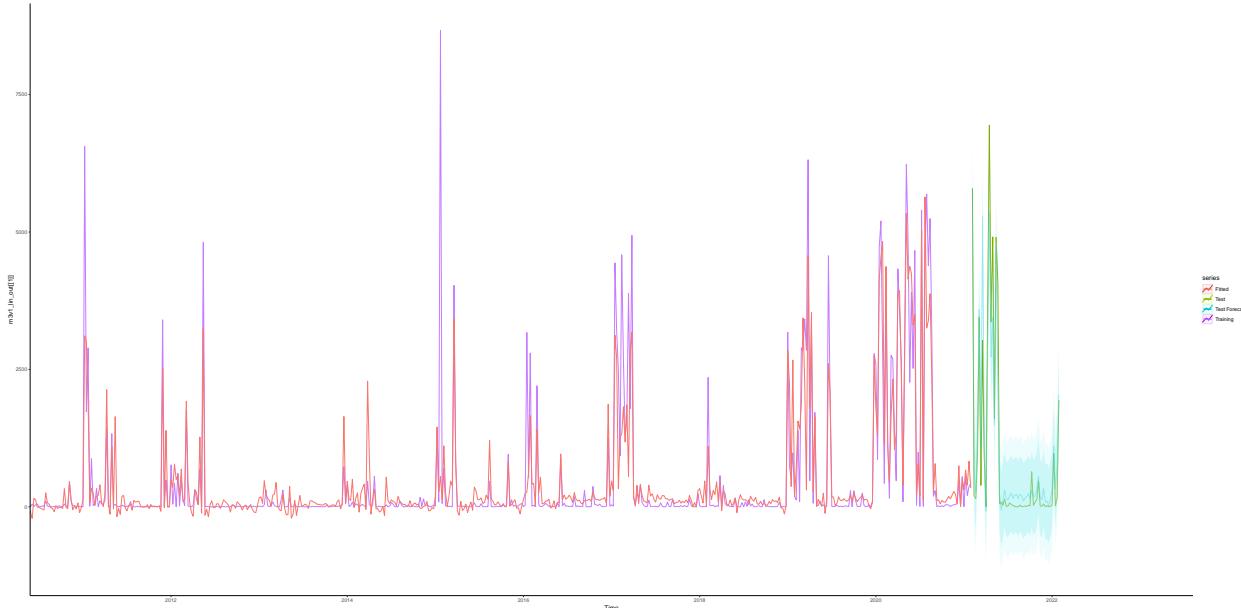
```

```

## Training set 0.009563594
## Test set NA

autoplot(m3v1_lin_out[[1]], series = 'Training') +
  autolayer(m3v1_lin_out[[2]], series = 'Test') +
  autolayer(m3v1_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m3v1_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m3v1_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 9968.5071     0.1491   -32.6756   -128.9393   236.0108  -204.9225
## season6       season7    season8    season9    season10   season11
## -98.4207    -19.3807  -302.6474   -56.2837  -27.8692  179.9122
## season12      season13    season14    season15   season16   season17
## -244.5132   -253.5372  -389.2049  -365.1314  -198.7332 -325.1748
## season18      season19    season20    season21   season22   season23
## -310.9846   -221.5305  -341.7518  -286.6543  -181.6924 -381.3937
## season24      season25    season26    season27   season28   season29
## -131.5418   -59.3853  -165.0153  -144.7574  -123.4365 -145.0994
## season30      season31    season32    season33   season34   season35
## -171.8793   -65.1013  -102.5399  -109.7631  -112.5281 -156.7857

```

```

##    season36      season37      season38      season39      season40      season41
## -176.3867     -150.0919     -154.8852     -164.6777     -167.0776     -179.5270
##    season42      season43      season44      season45      season46      season47
## -190.8826     -172.5472     -169.8456     -176.9456     -201.5565     -173.0299
##    season48      season49      season50      season51      season52      CHLOROPHYLL
## -137.7666     -222.9988     -255.6710     -297.5341     -182.6593     -7.9164
##    DENSITY       DO        FECAL         PH        SALINITY      TEMP
## -65.6198      8.2910      0.7018     -228.9458     -168.0713     -14.6016
##    XMS
## -7.4523
##
##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -2.998788e-15 506.8252 220.4953 -3.930906 1165.345 0.4499963
##                      ACF1
## Training set 0.009563594
##
## Forecasts:
##             Point Forecast      Lo 80      Hi 80      Lo 95      Hi 95
## 2021.096      5801.68275 5103.12390 6500.2416 4732.78777 6870.5777
## 2021.115      613.66951   -71.35680 1298.6958 -434.51874 1661.8578
## 2021.135      256.39699   -428.24078 941.0348 -791.19674 1303.9907
## 2021.154      1434.03951   748.57957 2119.4994 385.18774 2482.8913
## 2021.173      3592.83105 2905.49836 4280.1637 2541.11370 4644.5484
## 2021.192      1034.78148  350.14153 1719.4214 -12.81559 2082.3785
## 2021.212      5293.06731 4598.69367 5987.4409 4230.57631 6355.5583
## 2021.231      1120.00407 433.92651 1806.0816 70.20725 2169.8009
## 2021.250      -76.65877  -761.19533 607.8778 -1124.09763 970.7801
## 2021.269      2982.52536 2294.68036 3670.3704 1930.02410 4035.0266
## 2021.288      5358.63325 4657.35806 6059.9084 4285.58189 6431.6846
## 2021.308      2725.02712 2036.80358 3413.2507 1671.94664 3778.1076
## 2021.327      3443.09651 2750.45638 4135.7366 2383.25802 4502.9350
## 2021.346      1489.33880  804.41493 2174.2627 441.30730 2537.3703
## 2021.365      4740.92494 4048.75430 5433.0956 3681.80484 5800.0450
## 2021.385      2283.04579 1596.79524 2969.2963 1232.98427 3333.1073
## 2021.404      233.97172 -452.64330 920.5867 -816.64748 1284.5909
## 2021.423      -54.75073 -739.72895 630.2275 -1102.86540 993.3639
## 2021.442      121.23137 -567.43501 809.8977 -932.52671 1174.9894
## 2021.462      313.65886 -372.43727 999.7550 -736.16638 1363.4841
## 2021.481      149.02770 -536.13529 834.1907 -899.36969 1197.4251
## 2021.500      130.79897 -553.95266 815.5506 -916.96899 1178.5669
## 2021.519      203.90110 -485.35152 893.1537 -850.75401 1258.5562
## 2021.538      247.58318 -438.40845 933.5748 -802.08214 1297.2485
## 2021.558      155.68109 -529.57563 840.9378 -892.85972 1204.2219
## 2021.577      214.30489 -470.54810 899.1579 -833.61817 1262.2280
## 2021.596      225.17207 -459.80489 910.1490 -822.94067 1273.2848
## 2021.615      155.03140 -529.94171 840.0045 -893.07544 1203.1382
## 2021.635      228.01771 -456.80787 912.8433 -819.86340 1275.8988
## 2021.654      208.03571 -476.57932 892.6507 -839.52323 1255.5947
## 2021.673      107.93657 -578.41147 794.2846 -942.27411 1158.1473
## 2021.692      156.67617 -528.54058 841.8929 -891.80349 1205.1558
## 2021.712      184.43735 -500.67401 869.5487 -863.88104 1232.7557
## 2021.731      246.17742 -438.61660 930.9714 -801.65540 1294.0103

```

```

## 2021.750    156.81105 -528.81650  842.4386 -892.29718 1205.9193
## 2021.769    309.22242 -376.15847  994.6033 -739.50840 1357.9532
## 2021.788    178.40081 -508.88625  865.6879 -873.24672 1230.0483
## 2021.808    211.59358 -474.81162  897.9988 -838.70457 1261.8917
## 2021.827    312.78000 -376.39401 1001.9540 -741.75483 1367.3148
## 2021.846    557.09652 -128.97868 1243.1717 -492.69668 1606.8897
## 2021.865    176.79566 -510.48585  864.0772 -874.84337 1228.4347
## 2021.885    129.77258 -555.07072  814.6159 -918.13564 1177.6808
## 2021.904    341.93195 -345.92050 1029.7844 -710.58071 1394.4446
## 2021.923     94.51956 -594.07779  783.1169 -959.13289 1148.1720
## 2021.942    104.48815 -583.26606  792.2424 -947.87419 1156.8505
## 2021.962     21.49827 -666.41098  709.4075 -1031.10129 1074.0978
## 2021.981    139.22373 -548.18872  826.6362 -912.61566 1191.0631
## 2022.000    309.36129 -378.15401  996.8766 -742.63548 1361.3581
## 2022.019   1100.82360  411.58417 1790.0630    46.18867 2155.4585
## 2022.038    334.23006 -352.43866 1020.8988 -716.47132 1384.9314
## 2022.058     775.02158   87.61685 1462.4263 -276.80600 1826.8492
## 2022.077   2041.32067 1354.89344 2727.7479   990.98880 3091.6525

```

### SBOO: Imputed, Excluding Outliers - Including External Variables (Forecasting ENTERO)

```

# SBOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly02_train_tb03
# SBOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly02_test_tb03

owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
                    ENTERO)

owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        ENTERO,
                        .frequency = "auto",
                        .trend = "auto")

m4v1_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly02_train_tb03,
                            tb_test = owt_df02_gb09_sboo_wkly02_test_tb03,
                            date = "date_sample",
                            param = "ENTERO",
                            ext_pred = c("CHLOROPHYLL",
                                         "DENSITY",
                                         "DO",
                                         "FECAL",
                                         "PH",
                                         "SALINITY",
                                         "TEMP",
                                         "XMS"),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "ENTERO ~ trend + season + CHLOROPHYLL + DENSITY + DO
                                         + FECAL + PH + SALINITY + TEMP + XMS")

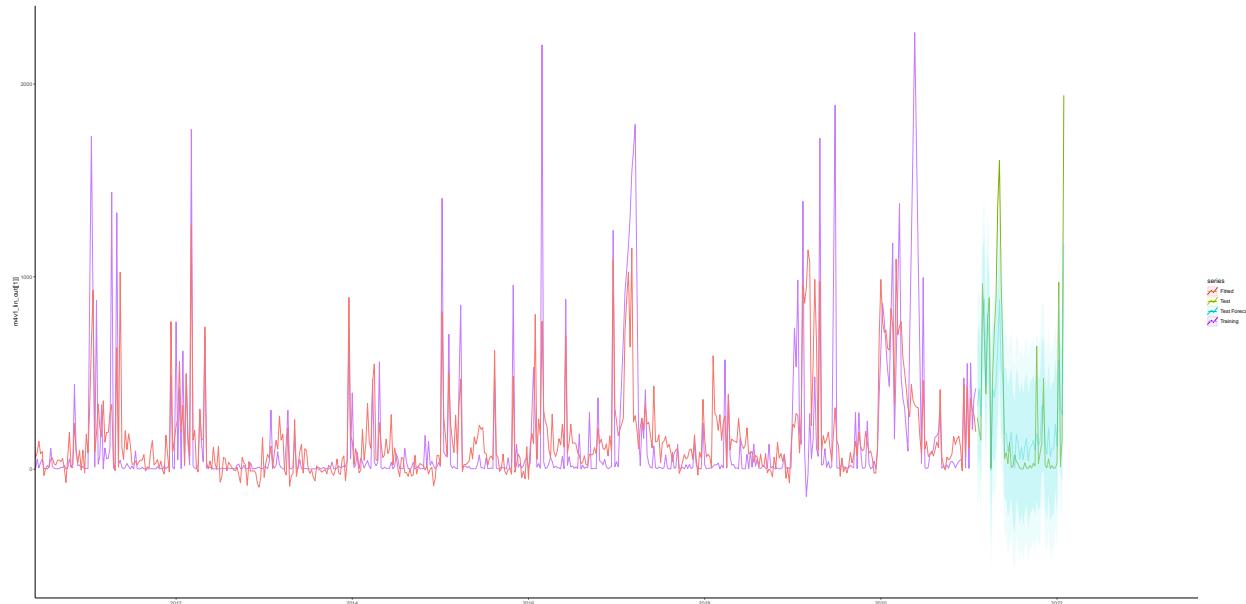
```

```

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 1.257115e-14 252.9268 131.7942 -416.3427 828.0949 0.8154878
## Test set     2.250579e+01 249.7221 176.5312 -573.1820 603.3266 1.0923018
##             ACF1
## Training set 0.3185982
## Test set     NA

autoplot(m4v1_lin_out[[1]], series = 'Training') +
  autolayer(m4v1_lin_out[[2]], series = 'Test') +
  autolayer(m4v1_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m4v1_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m4v1_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
##   1.132e+04    6.964e-02    2.816e+01    7.040e+01    2.186e+01   -4.172e+01
##   season6      season7      season8      season9      season10     season11
##   -6.058e+01   1.317e+02   2.653e+01   3.840e+01   2.094e+02   6.160e+01
##   season12     season13     season14     season15     season16     season17
##   9.932e+01   -3.406e+01  -1.130e+02  -3.840e+00  -9.550e+01  -5.590e+01
##   season18     season19     season20     season21     season22     season23

```

```

## -4.587e+01 -2.817e+00 -2.644e+01 4.028e+01 2.584e+01 4.764e+01
## season24 season25 season26 season27 season28 season29
## 7.138e-01 5.009e+00 6.930e+01 -3.577e+01 -5.507e+01 -2.167e+01
## season30 season31 season32 season33 season34 season35
## -1.513e+01 -5.060e+01 -3.650e+01 -3.183e+01 -2.637e+01 -3.140e+01
## season36 season37 season38 season39 season40 season41
## -4.765e+01 -2.689e+01 -3.760e+01 -4.059e+01 -4.512e+01 -5.418e+01
## season42 season43 season44 season45 season46 season47
## -4.104e+01 -4.196e+01 1.677e+01 -4.208e+01 -5.494e+01 -2.804e+01
## season48 season49 season50 season51 season52 CHLOROPHYLL
## -4.030e+01 -6.690e+01 -6.090e+01 -4.679e+01 1.070e+02 1.390e+00
## DENSITY DO FECAL PH SALINITY TEMP
## -1.081e+02 2.303e+01 3.628e-01 -3.638e+02 -1.492e+02 -1.722e+01
## XMS
## -7.965e+00
##
##
## Error measures:
## ME RMSE MAE MPE MAPE MASE
## Training set 1.257115e-14 252.9268 131.7942 -416.3427 828.0949 0.6621506
## ACF1
## Training set 0.3185982
##
## Forecasts:
## Point Forecast Lo 80 Hi 80 Lo 95 Hi 95
## 2021.096 328.579212 -13.85744 671.0159 -195.39785 852.5563
## 2021.115 415.817329 73.91323 757.7214 -107.34485 938.9795
## 2021.135 276.622148 -64.96889 618.2132 -246.06101 799.3053
## 2021.154 782.226753 439.19071 1125.2628 257.33253 1307.1210
## 2021.173 884.389967 542.47802 1226.3019 361.21578 1407.5642
## 2021.192 433.971340 92.07520 775.8675 -89.17866 957.1213
## 2021.212 804.613955 462.00034 1147.2276 280.36612 1328.8618
## 2021.231 655.836992 313.02120 998.6528 131.27978 1180.3942
## 2021.250 -5.280339 -346.98084 336.4202 -528.13100 517.5703
## 2021.269 415.180072 72.89840 757.4617 -108.55986 938.9200
## 2021.288 374.550579 30.02199 719.0792 -152.62746 901.7286
## 2021.308 444.501128 102.17003 786.8322 -79.31442 968.3167
## 2021.327 643.969930 299.39761 988.5422 116.72499 1171.2149
## 2021.346 879.742355 535.65679 1223.8279 353.24222 1406.2425
## 2021.365 541.970641 199.85146 884.0898 18.47935 1065.4619
## 2021.385 472.606250 130.54437 814.6681 -50.79736 996.0099
## 2021.404 187.129094 -155.37969 529.6379 -336.95834 711.2165
## 2021.423 184.083771 -157.64121 525.8087 -338.80433 706.9719
## 2021.442 91.432632 -252.46972 435.3350 -434.78716 617.6524
## 2021.462 134.631652 -207.85191 477.1152 -389.41720 658.6805
## 2021.481 193.570829 -148.29371 535.4354 -329.53083 716.6725
## 2021.500 56.536691 -285.10934 398.1827 -466.23061 579.3040
## 2021.519 6.176224 -336.00992 348.3624 -517.41753 529.7700
## 2021.538 182.614613 -159.71561 524.9448 -341.19960 706.4288
## 2021.558 137.164301 -204.80048 479.1291 -386.09074 660.4193
## 2021.577 53.421233 -288.32964 395.1721 -469.50649 576.3490
## 2021.596 114.920179 -226.88117 456.7215 -408.08479 637.9251
## 2021.615 48.840847 -292.98721 390.6689 -474.20499 571.8867
## 2021.635 119.293456 -222.43518 461.0221 -403.60024 642.1872

```

```

## 2021.654    159.778854 -182.02297  501.5807 -363.22683  682.7845
## 2021.673    44.292194 -298.21089  386.7953 -479.78653  568.3709
## 2021.692    110.331331 -231.60614  452.2688 -412.88192  633.5446
## 2021.712    124.644389 -217.30221  466.5910 -398.58282  647.8716
## 2021.731    149.272854 -192.45454  491.0002 -373.61894  672.1647
## 2021.750    101.894205 -240.24754  444.0360 -421.63162  625.4200
## 2021.769    184.361732 -157.79508  526.5185 -339.18713  707.9106
## 2021.788    124.461260 -218.50474  467.4273 -400.32579  649.2483
## 2021.808    148.370544 -194.16584  490.9069 -375.75913  672.5002
## 2021.827    327.842739 -16.32666  672.0121 -198.78568  854.4712
## 2021.846    336.676912 -6.02420  679.3780 -187.70482  861.0586
## 2021.865    137.021702 -205.81632  479.8597 -387.56952  661.6129
## 2021.885    79.113959 -262.68863  420.9165 -443.89289  602.1208
## 2021.904    215.443377 -127.77561  558.6624 -309.73078  740.6175
## 2021.923    66.569991 -277.16863  410.3086 -459.39928  592.5393
## 2021.942    106.341905 -236.92140  449.6052 -418.90006  631.5839
## 2021.962    107.611363 -235.86000  451.0827 -417.94897  633.1717
## 2021.981    234.481737 -108.66648  577.6300 -290.58413  759.5476
## 2022.000    120.963269 -222.40221  464.3287 -404.43503  646.3616
## 2022.019    565.273282  220.50373  910.0428   37.72654 1092.8200
## 2022.038    318.880581 -23.60629  661.3675 -205.17333  842.9345
## 2022.058    282.790080 -60.20735  625.7875 -242.04505  807.6252
## 2022.077    1166.493195  820.68563 1512.3008   637.35815 1695.6282

```

---

### PLOO: Imputed, All - Excluding External Variables (Forecasting ENTERO)

```

# PLOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly03_train_tb03
# PLOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly03_test_tb03

owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                    ENTERO)

owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        ENTERO,
                        .frequency = "auto",
                        .trend = "auto")

m1v2_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly03_train_tb03,
                            tb_test = owt_df02_gb09_ploo_wkly03_test_tb03,
                            date = "date_sample",
                            param = "ENTERO",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "ENTERO ~ trend + season")

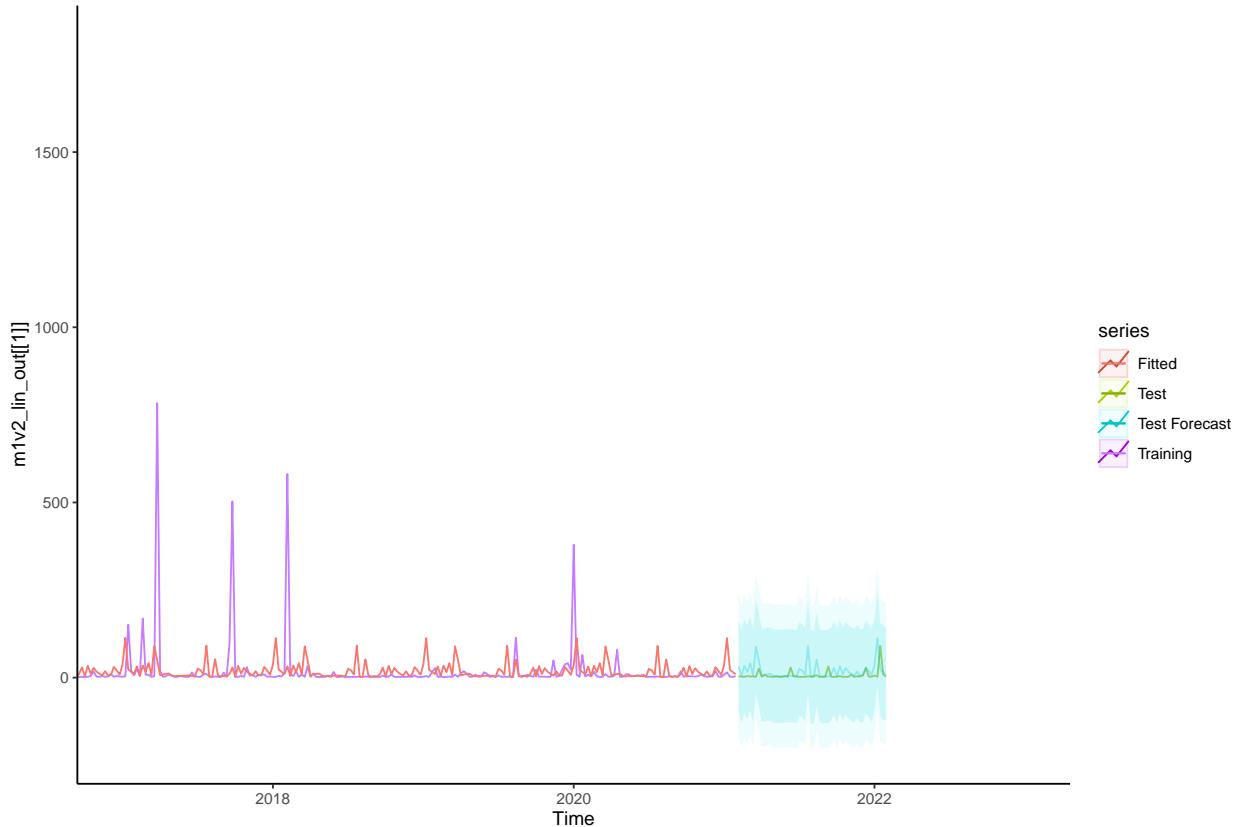
```

```

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 3.739460e-16 98.91472 27.58437 -378.3600 400.8285 0.8481648
## Test set     -1.168561e+01 29.06294 16.71202 -490.5666 509.6556 0.5138615
##             ACF1
## Training set 0.02162603
## Test set      NA

autoplot(m1v2_lin_out[[1]], series = 'Training') +
  autolayer(m1v2_lin_out[[2]], series = 'Test') +
  autolayer(m1v2_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m1v2_lin_out[[3]]$fitted, series = 'Fitted') +
  coord_cartesian(#ylim = c(-50, 400),
                  xlim = c(2017, 2023)) +
  theme_classic()

```



```
summary(m1v2_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
```

```

## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 40.822117     -0.004268   76.649781  -13.521074  -20.219680  -26.377586
## season6       season7    season8    season9    season10   season11
## -4.590507     -31.615742   -2.210463  -20.911339   4.748728  -28.893819
## season12      season13    season14    season15    season16   season17
## 52.622820     13.151594  -29.851194  -27.604926  -25.836072  -25.193009
## season18      season19    season20    season21    season22   season23
## -31.013795    -32.841052  -31.293345  -32.527051  -31.102873  -31.150050
## season24      season25    season26    season27    season28   season29
## -30.420647    -31.575550  -33.733539  -10.931432  -15.780782  -27.699048
## season30      season31    season32    season33    season34   season35
## 54.732247     -34.243870  -34.401081  15.705067  -29.491730  -34.066359
## season36      season37    season38    season39    season40   season41
## -31.631422    -33.608599  -26.303982  -7.834926  -33.407788  -3.131881
## season42      season43    season44    season45    season46   season47
## -25.860403    -9.119190  -19.416854  -25.557574  -30.488701  -18.444005
## season48      season49    season50    season51    season52
## -30.604981    -29.867781  -6.184421  -16.420304  -28.345843
##
##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 3.73946e-16 98.91472 27.58437 -378.36 400.8285 0.8452214
## ACF1
## Training set 0.02162603
##
## Forecasts:
##           Point Forecast      Lo 80      Hi 80      Lo 95      Hi 95
## 2021.096     31.331803 -101.64498 164.3086 -172.14094 234.8045
## 2021.115      4.302301 -128.67448 137.2791 -199.17044 207.7750
## 2021.135     33.703312 -99.27347 166.6801 -169.76943 237.1761
## 2021.154     14.998167 -117.97861 147.9749 -188.47458 218.4709
## 2021.173     40.653966 -92.32282 173.6307 -162.81878 244.1267
## 2021.192      7.007151 -125.96963 139.9839 -196.46559 210.4799
## 2021.212     88.519522 -44.45726 221.4963 -114.95322 291.9923
## 2021.231     49.044027 -83.93275 182.0208 -154.42872 252.5168
## 2021.250      6.036971 -126.93981 139.0138 -197.43577 209.5097
## 2021.269      8.278971 -124.69781 141.2558 -195.19377 211.7517
## 2021.288     10.043557 -122.93322 143.0203 -193.42919 213.5163
## 2021.308     10.682352 -122.29443 143.6591 -192.79039 214.1551
## 2021.327      4.857298 -128.11948 137.8341 -198.61545 208.3300
## 2021.346      3.025773 -129.95101 136.0026 -200.44697 206.4985
## 2021.365      4.569212 -128.40757 137.5460 -198.90353 208.0420
## 2021.385      3.331238 -129.64554 136.3080 -200.14151 206.8040
## 2021.404      4.751147 -128.22563 137.7279 -198.72160 208.2239
## 2021.423      4.699702 -128.27708 137.6765 -198.77304 208.1724
## 2021.442      5.424837 -127.55194 138.4016 -198.04791 208.8976
## 2021.462      4.265666 -128.71112 137.2424 -199.20708 207.7384
## 2021.481      2.103409 -130.87337 135.0802 -201.36934 205.5762
## 2021.500     24.901248 -108.07553 157.8780 -178.57150 228.3740
## 2021.519     20.047630 -112.92915 153.0244 -183.42512 223.5204
## 2021.538      8.125095 -124.85169 141.1019 -195.34765 211.5978
## 2021.558     90.552122 -42.42466 223.5289 -112.92062 294.0249

```

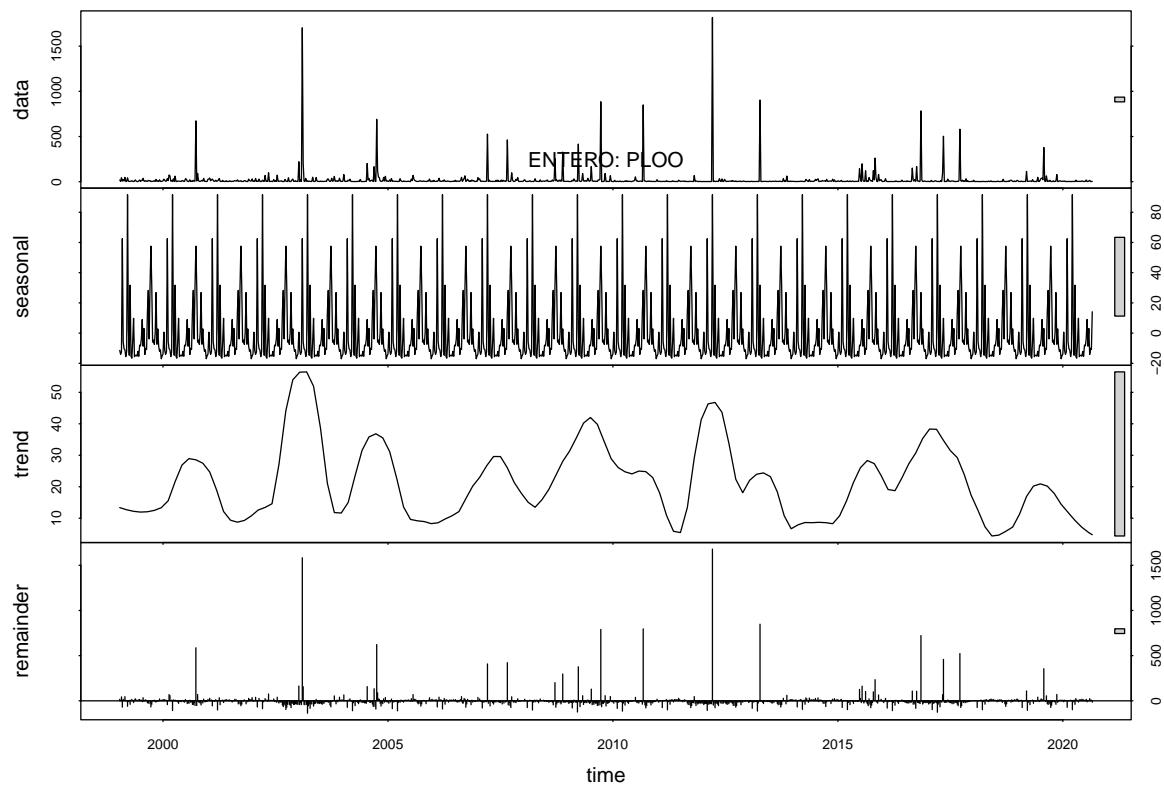
```

## 2021.577      1.571738 -131.40504 134.5485 -201.90101 205.0445
## 2021.596      1.410258 -131.56652 134.3870 -202.06249 204.8830
## 2021.615      51.512138 -81.46464 184.4889 -151.96061 254.9849
## 2021.635      6.311073 -126.66571 139.2879 -197.16167 209.7838
## 2021.654      1.732176 -131.24461 134.7090 -201.74057 205.2049
## 2021.673      4.162844 -128.81394 137.1396 -199.30990 207.6356
## 2021.692      2.181399 -130.79538 135.1582 -201.29135 205.6541
## 2021.712      9.481749 -123.49503 142.4585 -193.99100 212.9545
## 2021.731      27.946536 -105.03025 160.9233 -175.52621 231.4193
## 2021.750      2.369407 -130.60737 135.3462 -201.10334 205.8422
## 2021.769      32.641045 -100.33574 165.6178 -170.83170 236.1138
## 2021.788      9.908255 -123.06853 142.8850 -193.56449 213.3810
## 2021.808      26.645200 -106.33158 159.6220 -176.82754 230.1179
## 2021.827      16.343268 -116.63351 149.3200 -187.12948 219.8160
## 2021.846      10.198280 -122.77850 143.1751 -193.27447 213.6710
## 2021.865      5.262885 -127.71390 138.2397 -198.20986 208.7356
## 2021.885      17.303312 -115.67347 150.2801 -186.16943 220.7761
## 2021.904      5.138069 -127.83871 138.1149 -198.33468 208.6108
## 2021.923      5.871000 -127.10578 138.8478 -197.60174 209.3437
## 2021.942      29.550092 -103.42669 162.5269 -173.92265 233.0228
## 2021.962      19.309940 -113.66684 152.2867 -184.16280 222.7827
## 2021.981      7.380134 -125.59665 140.3569 -196.09261 210.8529
## 2022.000      35.721709 -97.25507 168.6985 -167.75104 239.1945
## 2022.019      112.367221 -20.60956 245.3440 -91.10552 315.8400
## 2022.038      22.192098 -110.67535 155.0595 -181.11335 225.4975
## 2022.058      15.489225 -117.37822 148.3567 -187.81622 218.7947
## 2022.077      9.327051 -123.54039 142.1945 -193.97839 212.6325

ts_full02 <- ts(na.remove(owt_df02_gb09_ploo_wkly03_train_tb02$ENTERO),
                 start = c(1999, lubridate::isoweek(ymd(train_start))),
                 freq = 52)

stl_ent02 <- stl(ts_full02, s.window="periodic")
plot(stl_ent02)
mtext("ENTERO: PLOO", side=3, line = -5)

```

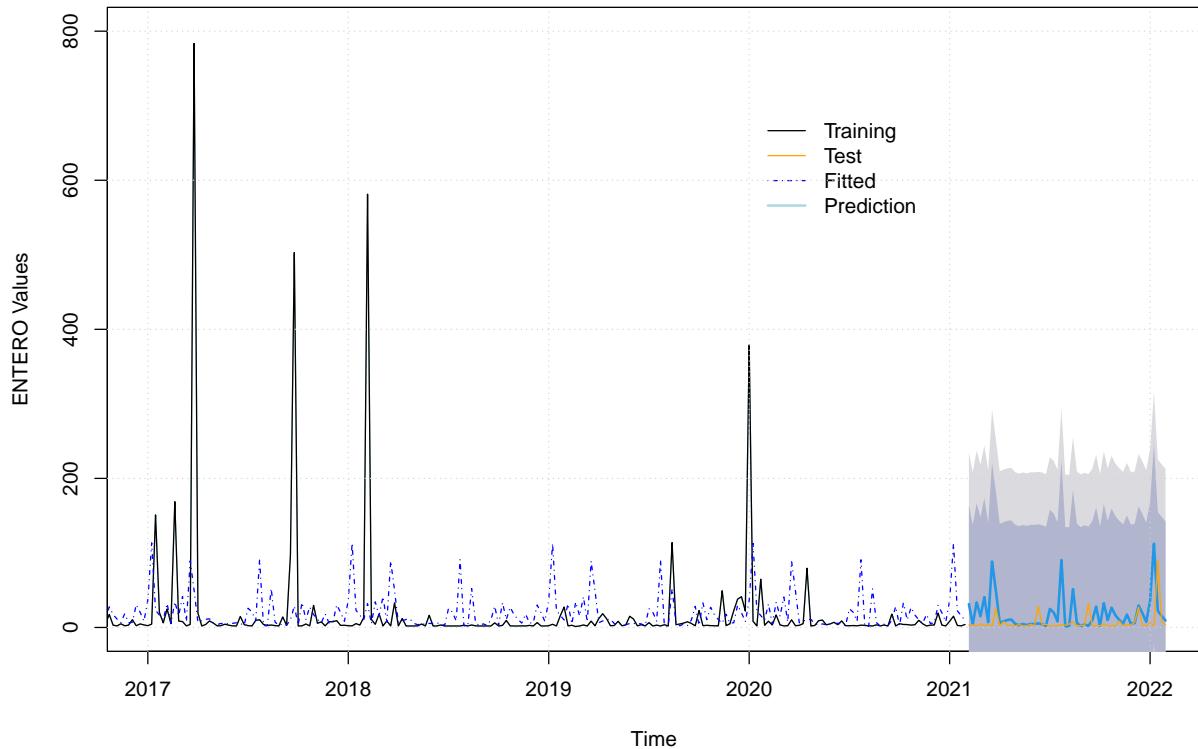


```

plot(m1v2_lin_out[[3]],
      xlim = c(2017, 2022.05),
      ylim = c(0, 800),
      xlab = "Time",
      ylab = "ENTERO Values",
      main = "Predicted ENTERO Levels Over Time - PLOO",
      col = "light blue")
lines(m1v2_lin_out[[1]], lty=1, col="black")
lines(m1v2_lin_out[[2]], lty=1, col="orange")
lines(m1v2_lin_out[[3]]$fitted, lty=4, col="blue")
legend(2020, 700,
      c("Training", "Test", "Fitted", "Prediction"),
      lty = c(1,1,4,1),
      lwd = c(1,1,1,2),
      col = c("black", "orange", "blue", "light blue"),
      bty = "n")
grid()

```

### Predicted ENTERO Levels Over Time – PLOO



#### PLOO: Imputed, Excluding Outliers - Excluding External Variables (Forecasting ENTERO)

```
# PLOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly02_train_tb03
# PLOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly02_test_tb03

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
    ENTERO)

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
    ENTERO,
    .frequency = "auto",
    .trend = "auto")

m2v2_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly02_train_tb03,
  tb_test = owt_df02_gb09_ploo_wkly02_test_tb03,
  date = "date_sample",
  param = "ENTERO",
  ext_pred = c(),
  train_start = c(1999, lubridate::isoweek(ymd(train_start))),
  test_start = c(2021, 6),
  freq = 52,
```

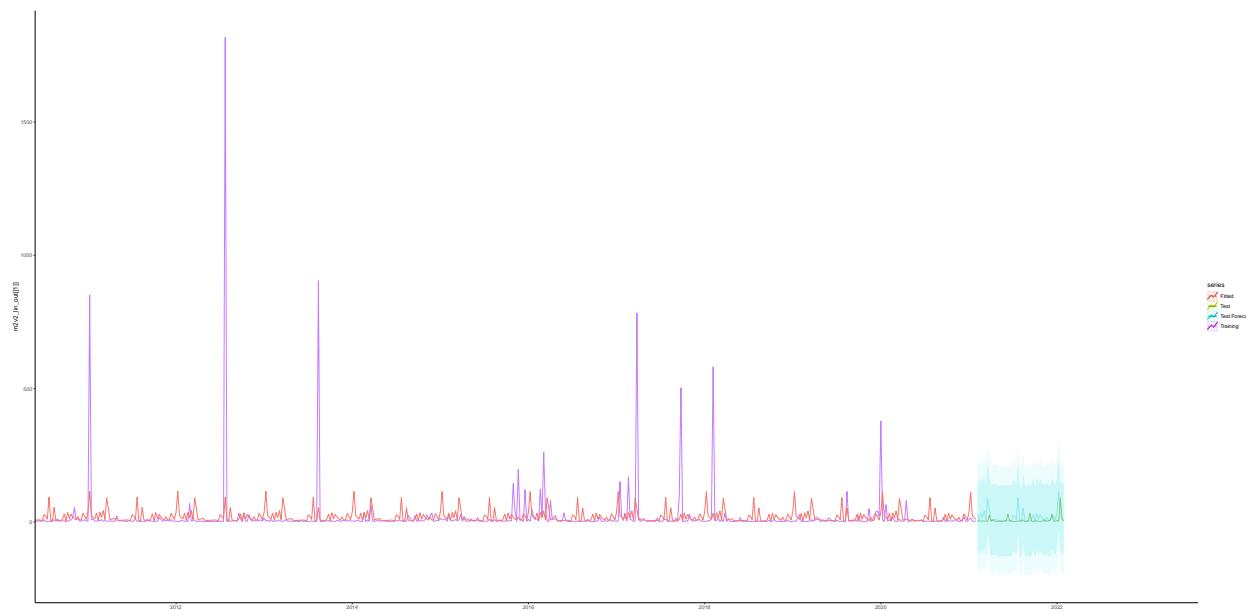
```

            h = 52,
            formula = "ENTERO ~ trend + season")

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 3.739460e-16 98.91472 27.58437 -378.3600 400.8285 0.8481648
## Test set     -1.168561e+01 29.06294 16.71202 -490.5666 509.6556 0.5138615
## ACF1
## Training set 0.02162603
## Test set      NA

autoplot(m2v2_lin_out[[1]], series = 'Training') +
  autolayer(m2v2_lin_out[[2]], series = 'Test') +
  autolayer(m2v2_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m2v2_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m2v2_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
## 40.822117    -0.004268    76.649781   -13.521074   -20.219680   -26.377586
## season6      season7      season8      season9      season10     season11
## -4.590507   -31.615742   -2.210463   -20.911339    4.748728   -28.893819
## season12     season13     season14     season15     season16     season17

```

```

##   52.622820  13.151594 -29.851194 -27.604926 -25.836072 -25.193009
## season18    season19    season20    season21    season22    season23
## -31.013795 -32.841052 -31.293345 -32.527051 -31.102873 -31.150050
## season24    season25    season26    season27    season28    season29
## -30.420647 -31.575550 -33.733539 -10.931432 -15.780782 -27.699048
## season30    season31    season32    season33    season34    season35
## 54.732247 -34.243870 -34.401081 15.705067 -29.491730 -34.066359
## season36    season37    season38    season39    season40    season41
## -31.631422 -33.608599 -26.303982 -7.834926 -33.407788 -3.131881
## season42    season43    season44    season45    season46    season47
## -25.860403 -9.119190 -19.416854 -25.557574 -30.488701 -18.444005
## season48    season49    season50    season51    season52
## -30.604981 -29.867781 -6.184421 -16.420304 -28.345843
##
##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 3.73946e-16 98.91472 27.58437 -378.36 400.8285 0.8452214
##                         ACF1
## Training set 0.02162603
##
## Forecasts:
##             Point Forecast      Lo 80      Hi 80      Lo 95      Hi 95
## 2021.096     31.331803 -101.64498 164.3086 -172.14094 234.8045
## 2021.115      4.302301 -128.67448 137.2791 -199.17044 207.7750
## 2021.135     33.703312 -99.27347 166.6801 -169.76943 237.1761
## 2021.154     14.998167 -117.97861 147.9749 -188.47458 218.4709
## 2021.173     40.653966 -92.32282 173.6307 -162.81878 244.1267
## 2021.192      7.007151 -125.96963 139.9839 -196.46559 210.4799
## 2021.212     88.519522 -44.45726 221.4963 -114.95322 291.9923
## 2021.231     49.044027 -83.93275 182.0208 -154.42872 252.5168
## 2021.250     6.036971 -126.93981 139.0138 -197.43577 209.5097
## 2021.269      8.278971 -124.69781 141.2558 -195.19377 211.7517
## 2021.288     10.043557 -122.93322 143.0203 -193.42919 213.5163
## 2021.308     10.682352 -122.29443 143.6591 -192.79039 214.1551
## 2021.327      4.857298 -128.11948 137.8341 -198.61545 208.3300
## 2021.346     3.025773 -129.95101 136.0026 -200.44697 206.4985
## 2021.365     4.569212 -128.40757 137.5460 -198.90353 208.0420
## 2021.385     3.331238 -129.64554 136.3080 -200.14151 206.8040
## 2021.404     4.751147 -128.22563 137.7279 -198.72160 208.2239
## 2021.423     4.699702 -128.27708 137.6765 -198.77304 208.1724
## 2021.442     5.424837 -127.55194 138.4016 -198.04791 208.8976
## 2021.462     4.265666 -128.71112 137.2424 -199.20708 207.7384
## 2021.481     2.103409 -130.87337 135.0802 -201.36934 205.5762
## 2021.500     24.901248 -108.07553 157.8780 -178.57150 228.3740
## 2021.519     20.047630 -112.92915 153.0244 -183.42512 223.5204
## 2021.538      8.125095 -124.85169 141.1019 -195.34765 211.5978
## 2021.558     90.552122 -42.42466 223.5289 -112.92062 294.0249
## 2021.577      1.571738 -131.40504 134.5485 -201.90101 205.0445
## 2021.596      1.410258 -131.56652 134.3870 -202.06249 204.8830
## 2021.615     51.512138 -81.46464 184.4889 -151.96061 254.9849
## 2021.635      6.311073 -126.66571 139.2879 -197.16167 209.7838
## 2021.654     1.732176 -131.24461 134.7090 -201.74057 205.2049
## 2021.673     4.162844 -128.81394 137.1396 -199.30990 207.6356

```

```

## 2021.692      2.181399 -130.79538 135.1582 -201.29135 205.6541
## 2021.712      9.481749 -123.49503 142.4585 -193.99100 212.9545
## 2021.731     27.946536 -105.03025 160.9233 -175.52621 231.4193
## 2021.750      2.369407 -130.60737 135.3462 -201.10334 205.8422
## 2021.769     32.641045 -100.33574 165.6178 -170.83170 236.1138
## 2021.788      9.908255 -123.06853 142.8850 -193.56449 213.3810
## 2021.808     26.645200 -106.33158 159.6220 -176.82754 230.1179
## 2021.827     16.343268 -116.63351 149.3200 -187.12948 219.8160
## 2021.846     10.198280 -122.77850 143.1751 -193.27447 213.6710
## 2021.865      5.262885 -127.71390 138.2397 -198.20986 208.7356
## 2021.885     17.303312 -115.67347 150.2801 -186.16943 220.7761
## 2021.904      5.138069 -127.83871 138.1149 -198.33468 208.6108
## 2021.923      5.871000 -127.10578 138.8478 -197.60174 209.3437
## 2021.942     29.550092 -103.42669 162.5269 -173.92265 233.0228
## 2021.962     19.309940 -113.66684 152.2867 -184.16280 222.7827
## 2021.981      7.380134 -125.59665 140.3569 -196.09261 210.8529
## 2022.000     35.721709 -97.25507 168.6985 -167.75104 239.1945
## 2022.019    112.367221 -20.60956 245.3440 -91.10552 315.8400
## 2022.038     22.192098 -110.67535 155.0595 -181.11335 225.4975
## 2022.058     15.489225 -117.37822 148.3567 -187.81622 218.7947
## 2022.077     9.327051 -123.54039 142.1945 -193.97839 212.6325

```

### SBOO: Imputed, All - Excluding External Variables (Forecasting ENTERO)

```

# SBOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly03_train_tb03
# SBOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly03_test_tb03

owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                    ENTERO)

owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        ENTERO,
                        .frequency = "auto",
                        .trend = "auto")

m3v2_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly03_train_tb03,
                            tb_test = owt_df02_gb09_sboo_wkly03_test_tb03,
                            date = "date_sample",
                            param = "ENTERO",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "ENTERO ~ trend + season")

##               ME        RMSE       MAE       MPE       MAPE       MASE
## Training set 2.091498e-14 905.3827 482.0386 -2744.347 3518.457 1.192717
## Test set      2.722014e+02 1686.6494 1062.7625 -3264.586 3297.939 2.629614
## ACF1

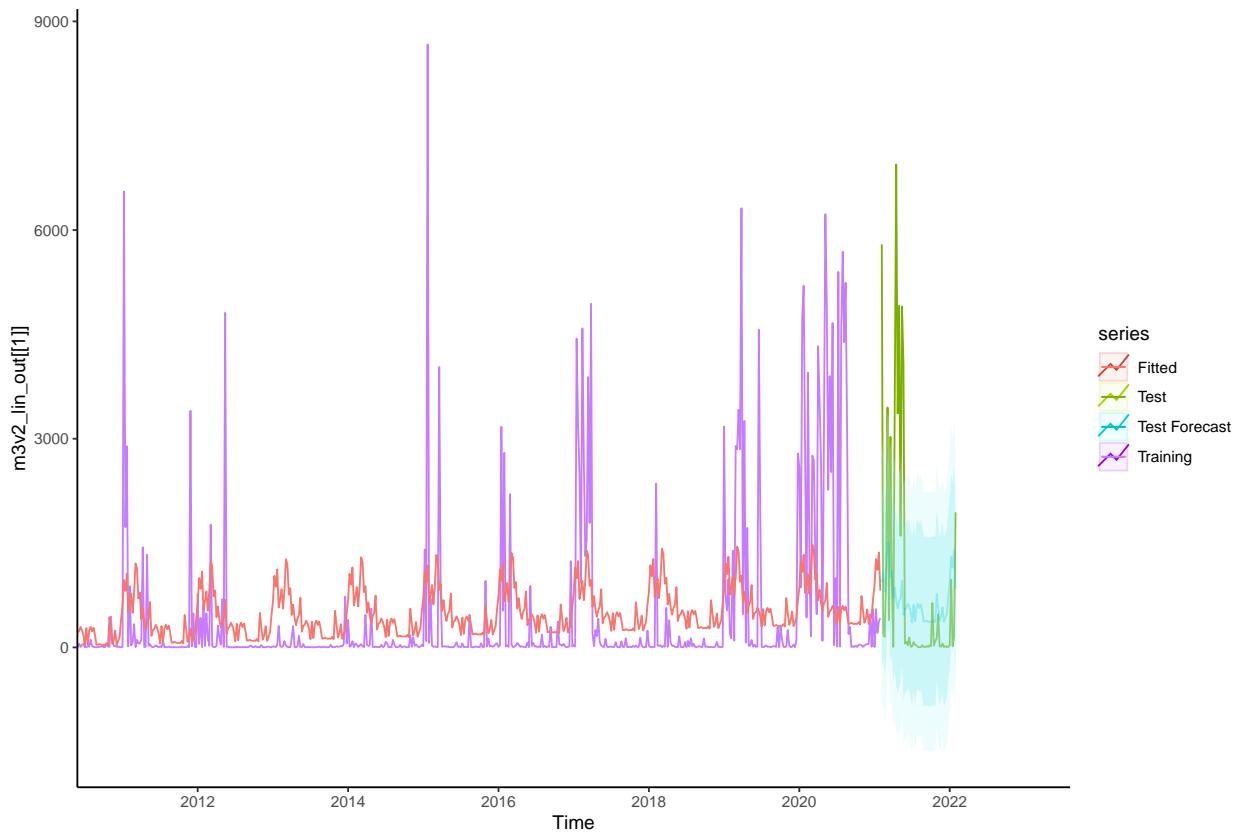
```

```

## Training set 0.3235555
## Test set NA

autoplot(m3v2_lin_out[[1]], series = 'Training') +
  autolayer(m3v2_lin_out[[2]], series = 'Test') +
  autolayer(m3v2_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m3v2_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m3v2_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
##    225.589       0.584     377.402     220.371     468.883     -79.510
##   season6      season7      season8      season9      season10     season11

```

```

##      37.908    182.148   -96.917    179.569    611.742    543.122
## season12    season13    season14    season15    season16    season17
##  107.326    192.044   -192.463   -41.844   -231.977   -341.002
## season18    season19    season20    season21    season22    season23
## -241.934   -197.504    52.943   -435.244   -353.935   -336.785
## season24    season25    season26    season27    season28    season29
## -278.963   -325.793   -402.667   -548.081   -297.207   -532.705
## season30    season31    season32    season33    season34    season35
## -331.355   -282.207   -345.915   -295.453   -401.295   -541.771
## season36    season37    season38    season39    season40    season41
## -542.016   -530.118   -542.174   -549.356   -543.853   -550.093
## season42    season43    season44    season45    season46    season47
## -522.702   -557.171   -149.617   -355.891   -534.109   -474.039
## season48    season49    season50    season51    season52
## -343.716   -554.582   -497.802   -435.141   -191.823
##
##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 2.091498e-14 905.3827 482.0386 -2744.347 3518.457 0.9837651
##          ACF1
## Training set 0.3235555
##
## Forecasts:
##             Point Forecast     Lo 80     Hi 80     Lo 95     Hi 95
## 2021.096      933.9135 -283.24496 2151.072 -928.5062 2796.333
## 2021.115      1078.7367 -138.42179 2295.895 -783.6830 2941.156
## 2021.135       800.2559 -416.90261 2017.414 -1062.1638 2662.676
## 2021.154      1077.3259 -139.83257 2294.484 -785.0938 2939.746
## 2021.173      1510.0825 292.92405 2727.241 -352.3372 3372.502
## 2021.192      1442.0468 224.88834 2659.205 -420.3729 3304.467
## 2021.212      1006.8347 -210.32378 2223.993 -855.5850 2869.254
## 2021.231      1092.1371 -125.02136 2309.296 -770.2826 2954.557
## 2021.250      708.2144 -508.94410 1925.373 -1154.2053 2570.634
## 2021.269      859.4173 -357.74117 2076.576 -1003.0024 2721.837
## 2021.288      669.8676 -547.29088 1887.026 -1192.5521 2532.287
## 2021.308      561.4273 -655.73122 1778.586 -1300.9924 2423.847
## 2021.327      661.0793 -556.07921 1878.238 -1201.3404 2523.499
## 2021.346      706.0926 -511.06583 1923.251 -1156.3270 2568.512
## 2021.365      957.1243 -260.03420 2174.283 -905.2954 2819.544
## 2021.385      469.5212 -747.63727 1686.680 -1392.8985 2331.941
## 2021.404      551.4139 -665.74462 1768.572 -1311.0058 2413.834
## 2021.423      569.1475 -648.01098 1786.306 -1293.2722 2431.567
## 2021.442      627.5533 -589.60514 1844.712 -1234.8664 2489.973
## 2021.462      581.3083 -635.85022 1798.467 -1281.1114 2443.728
## 2021.481      505.0179 -712.14054 1722.176 -1357.4018 2367.438
## 2021.500      360.1879 -856.97056 1577.346 -1502.2318 2222.608
## 2021.519      611.6455 -605.51297 1828.804 -1250.7742 2474.065
## 2021.538      376.7316 -840.42688 1593.890 -1485.6881 2239.151
## 2021.558      578.6659 -638.49255 1795.824 -1283.7538 2441.086
## 2021.577      628.3976 -588.76084 1845.556 -1234.0221 2490.817
## 2021.596      565.2740 -651.88451 1782.432 -1297.1457 2427.694
## 2021.615      616.3201 -600.83841 1833.479 -1246.0996 2478.740
## 2021.635      511.0615 -706.09695 1728.220 -1351.3582 2373.481

```

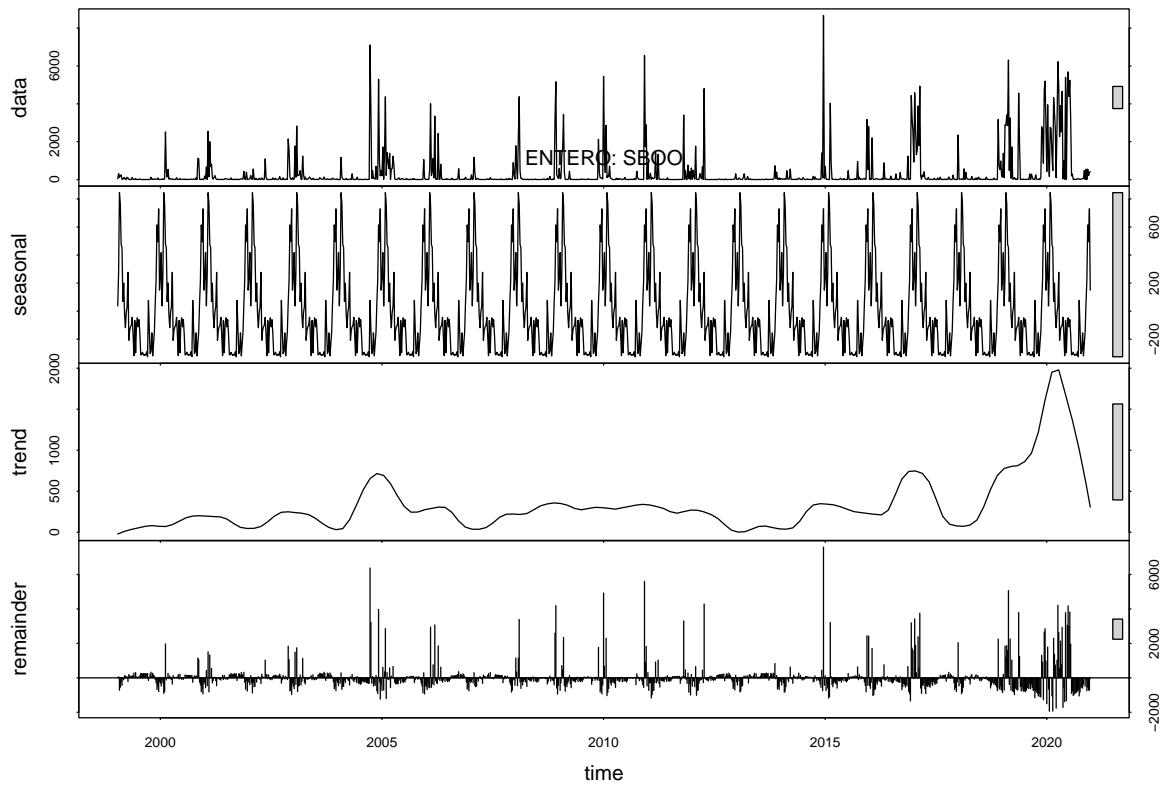
```

## 2021.654      371.1697 -845.98877 1588.328 -1491.2500 2233.589
## 2021.673      371.5091 -845.64940 1588.668 -1490.9106 2233.929
## 2021.692      383.9902 -833.16830 1601.149 -1478.4295 2246.410
## 2021.712      372.5186 -844.63991 1589.677 -1489.9011 2234.938
## 2021.731      365.9208 -851.23764 1583.079 -1496.4989 2228.341
## 2021.750      372.0077 -845.15073 1589.166 -1490.4119 2234.427
## 2021.769      366.3518 -850.80667 1583.510 -1496.0679 2228.771
## 2021.788      394.3269 -822.83160 1611.485 -1468.0928 2256.747
## 2021.808      360.4414 -856.71709 1577.600 -1501.9783 2222.861
## 2021.827      768.5797 -448.57877 1985.738 -1093.8400 2630.999
## 2021.846      562.8895 -654.26893 1780.048 -1299.5301 2425.309
## 2021.865      385.2560 -831.90252 1602.414 -1477.1637 2247.676
## 2021.885      445.9096 -771.24887 1663.068 -1416.5101 2308.329
## 2021.904      576.8165 -640.34200 1793.975 -1285.6032 2439.236
## 2021.923      366.5346 -850.62383 1583.693 -1495.8850 2228.954
## 2021.942      423.8983 -793.26020 1641.057 -1438.5214 2286.318
## 2021.962      487.1430 -730.01543 1704.302 -1375.2766 2349.563
## 2021.981      731.0454 -486.11309 1948.204 -1131.3743 2593.465
## 2022.000      923.4524 -293.70608 2140.611 -938.9673 2785.872
## 2022.019      1301.4385    84.28001 2518.597 -560.9812 3163.858
## 2022.038      1144.9914   -71.16632 2361.149 -715.8970 3005.880
## 2022.058      1394.0872   177.92955 2610.245 -466.8011 3254.976
## 2022.077      846.2787 -369.87902 2062.436 -1014.6097 2707.167

ts_full03 <- ts(na.remove(owt_df02_gb09_sboo_wkly03_train_tb02$ENTERO),
                 start = c(1999, lubridate::isoweek(ymd(train_start))),
                 freq = 52)

stl_ent03 <- stl(ts_full03, s.window="periodic")
plot(stl_ent03)
mtext("ENTERO: SBOO", side=3, line = -5)

```

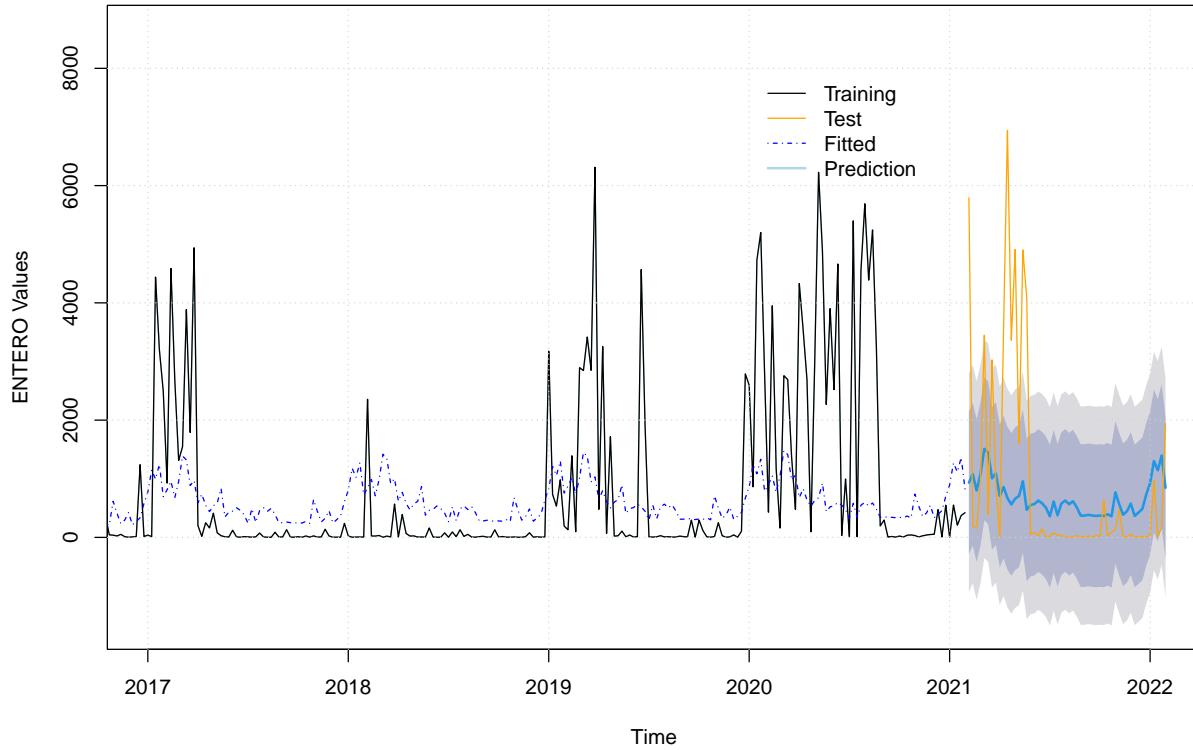


```

plot(m3v2_lin_out[[3]],
      xlim = c(2017, 2022.05),
      #ylim = c(0, 800),
      xlab = "Time",
      ylab = "ENTERO Values",
      main = "Predicted ENTERO Levels Over Time - SBOO",
      col = "light blue")
lines(m3v2_lin_out[[1]], lty=1, col="black")
lines(m3v2_lin_out[[2]], lty=1, col="orange")
lines(m3v2_lin_out[[3]]$fitted, lty=4, col="blue")
legend(2020, 8000,
      c("Training", "Test", "Fitted", "Prediction"),
      lty = c(1,1,4,1),
      lwd = c(1,1,1,2),
      col = c("black", "orange", "blue", "light blue"),
      bty = "n")
grid()

```

### Predicted ENTERO Levels Over Time – SBOO



#### SBOO: Imputed, Excluding Outliers - Excluding External Variables (Forecasting ENTERO)

```
# SBOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly02_train_tb03
# SBOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly02_test_tb03

owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
    ENTERO)

owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
    ENTERO,
    .frequency = "auto",
    .trend = "auto")

m4v2_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly02_train_tb03,
  tb_test = owt_df02_gb09_sboo_wkly02_test_tb03,
  date = "date_sample",
  param = "ENTERO",
  ext_pred = c(),
  train_start = c(1999, lubridate::isoweek(ymd(train_start))),
  test_start = c(2021, 6),
  freq = 52,
```

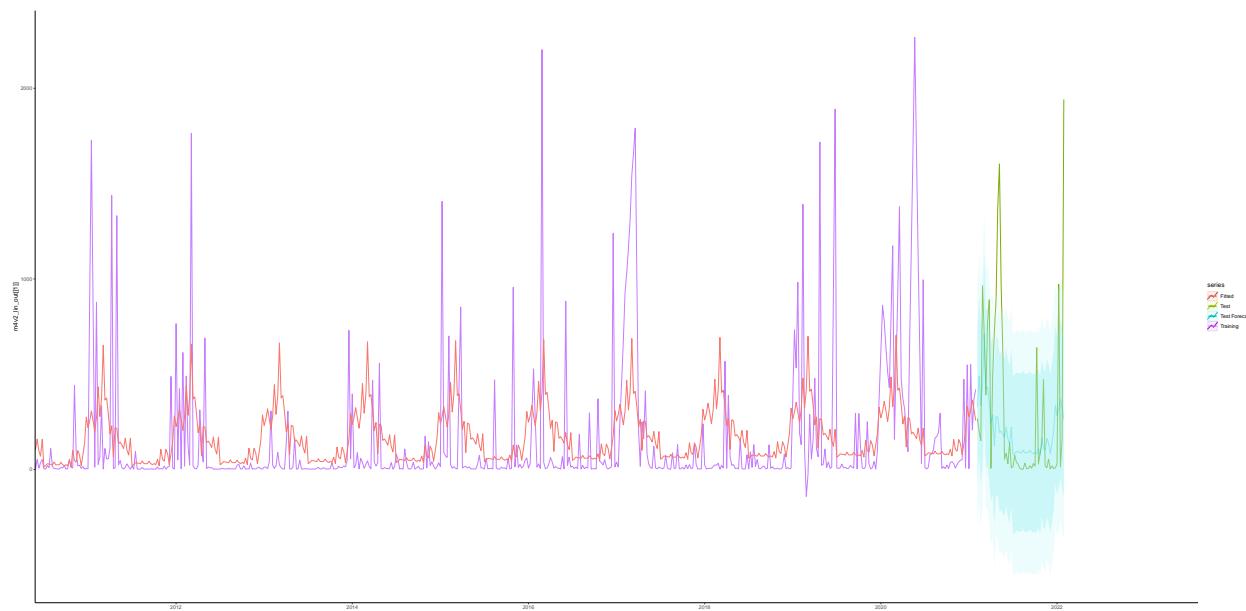
```

          h = 52,
          formula = "ENTERO ~ trend + season")

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 3.250492e-14 308.4913 170.2934 -1106.7267 1236.1387 1.053705
## Test set     1.062070e+02 436.4987 271.1846  -756.8449  795.3771 1.677978
## ACF1
## Training set 0.3150918
## Test set      NA

autoplot(m4v2_lin_out[[1]], series = 'Training') +
  autolayer(m4v2_lin_out[[2]], series = 'Test') +
  autolayer(m4v2_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m4v2_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m4v2_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
## 150.9575      0.1106     33.6051     87.0187     35.7086    -20.6701
## season6      season7      season8      season9      season10     season11
## 50.3431     212.9155     57.8940    154.1038    431.6208   143.4790
## season12     season13     season14     season15     season16     season17

```

```

##   154.6630    70.5984   -33.5729     8.0804   -155.0037   -0.8022
## season18    season19   season20   season21   season22   season23
##  -6.6287   -85.9898   -78.8099   -93.1244  -111.9608  -57.2997
## season24    season25   season26   season27   season28   season29
## -119.6352  -146.6747   -58.2069  -203.1475  -197.0144  -186.8287
## season30    season31   season32   season33   season34   season35
## -188.6234  -190.2536  -193.4259  -178.4375  -192.4056  -193.0506
## season36    season37   season38   season39   season40   season41
## -192.8218  -180.4513  -192.0335  -198.7418  -192.7655  -198.5321
## season42    season43   season44   season45   season46   season47
## -170.6676  -204.6637  -118.7866  -171.1712  -180.1809  -119.6379
## season48    season49   season50   season51   season52
## -142.9127  -199.2341  -141.9810   -78.8469    55.5372
##
##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 3.250492e-14 308.4913 170.2934 -1106.727 1236.139 0.8555755
##          ACF1
## Training set 0.3150918
##
## Forecasts:
##       Point Forecast      Lo 80      Hi 80      Lo 95      Hi 95
## 2021.096    328.27252  -86.450263  742.9953 -306.31032  962.8554
## 2021.115    490.95556   76.232773  905.6783 -143.62728 1125.5384
## 2021.135    336.04459  -78.678190  750.7674 -298.53824  970.6274
## 2021.154    432.36500   17.642222  847.0878 -202.21783 1066.9478
## 2021.173    709.99258  295.269801 1124.7154   75.40975 1344.5754
## 2021.192    421.96145   7.238666  836.6842 -212.62139 1056.5443
## 2021.212    433.25602   18.533242  847.9788 -201.32681 1067.8389
## 2021.231    349.30200  -65.420787  764.0248 -285.28084  983.8848
## 2021.250    245.24129  -169.481492  659.9641 -389.34155  879.8241
## 2021.269    287.00523  -127.717553  701.7280 -347.57761  921.5881
## 2021.288    124.03171  -290.691077  538.7545 -510.55113  758.6145
## 2021.308    278.34388  -136.378897  693.0667 -356.23895  912.9267
## 2021.327    272.62793  -142.094852  687.3507 -361.95490  907.2108
## 2021.346    193.37749  -221.345297  608.1003 -441.20535  827.9603
## 2021.365    200.66792  -214.054862  615.3907 -433.91491  835.2508
## 2021.385    186.46409  -228.258690  601.1869 -448.11874  821.0469
## 2021.404    167.73822  -246.984564  582.4610 -466.84462  802.3211
## 2021.423    222.50992  -192.212867  637.2327 -412.07292  857.0928
## 2021.442    160.28511  -254.437674  575.0079 -474.29773  794.8679
## 2021.462    133.35616  -281.366620  548.0789 -501.22667  767.9390
## 2021.481    221.93456  -192.788224  636.6573 -412.64828  856.5174
## 2021.500    77.10454  -337.618244  491.8273 -557.47830  711.6874
## 2021.519    83.34826  -331.374518  498.0710 -551.23457  717.9311
## 2021.538    93.64455  -321.078231  508.3673 -540.93828  728.2274
## 2021.558    91.96050  -322.762284  506.6833 -542.62234  726.5433
## 2021.577    90.44087  -324.281916  505.1636 -544.14197  725.0237
## 2021.596    87.37918  -327.343607  502.1020 -547.20366  721.9620
## 2021.615    102.47814 -312.244640  517.2009 -532.10469  737.0610
## 2021.635    88.62067  -326.102116  503.3434 -545.96217  723.2035
## 2021.654    88.08633  -326.636455  502.8091 -546.49651  722.6692
## 2021.673    88.42570  -326.297080  503.1485 -546.15713  723.0085

```

```

## 2021.692    100.90680 -313.815983  515.6296 -533.67604  735.4896
## 2021.712    89.43519 -325.287588  504.1580 -545.14764  724.0180
## 2021.731    82.83747 -331.885316  497.5602 -551.74537  717.4203
## 2021.750    88.92437 -325.798412  503.6472 -545.65846  723.5072
## 2021.769    83.26843 -331.454348  497.9912 -551.31440  717.8513
## 2021.788    111.24350 -303.479284  525.9663 -523.33934  745.8263
## 2021.808    77.35802 -337.364767  492.0808 -557.22482  711.9409
## 2021.827    163.34576 -251.377025  578.0685 -471.23708  797.9286
## 2021.846    111.07170 -303.651085  525.7945 -523.51114  745.6545
## 2021.865    102.17259 -312.550196  516.8954 -532.41025  736.7554
## 2021.885    162.82623 -251.896548  577.5490 -471.75660  797.4091
## 2021.904    139.66199 -275.060795  554.3848 -494.92085  774.2448
## 2021.923    83.45127 -331.271508  498.1741 -551.13156  718.0341
## 2021.942    140.81490 -273.907880  555.5377 -493.76793  775.3977
## 2021.962    204.05967 -210.663109  618.7825 -430.52316  838.6425
## 2021.981    338.55431 -76.168468  753.2771 -296.02852  973.1371
## 2022.000    283.12774 -131.595043  697.8505 -351.45510  917.7106
## 2022.019    316.84349 -97.879294  731.5663 -317.73935  951.4263
## 2022.038    370.36768 -44.014108  784.7495 -263.69338  1004.4287
## 2022.058    319.16816 -95.213622  733.5499 -314.89290  953.2292
## 2022.077    262.90003 -151.481756  677.2818 -371.16103  896.9611

```

#### PLOO All: Imputed - Excluding External Variables (Forecasting DENSITY)

```

# PLOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly03_train_tb03
# PLOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly03_test_tb03

owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                    DENSITY)

owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        DENSITY,
                        .frequency = "auto",
                        .trend = "auto")

m1v3_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly03_train_tb03,
                            tb_test = owt_df02_gb09_ploo_wkly03_test_tb03,
                            date = "date_sample",
                            param = "DENSITY",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "DENSITY ~ trend + season")

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -1.556207e-17 0.3503373 0.2742432 -0.02019261 1.110196 1.320782

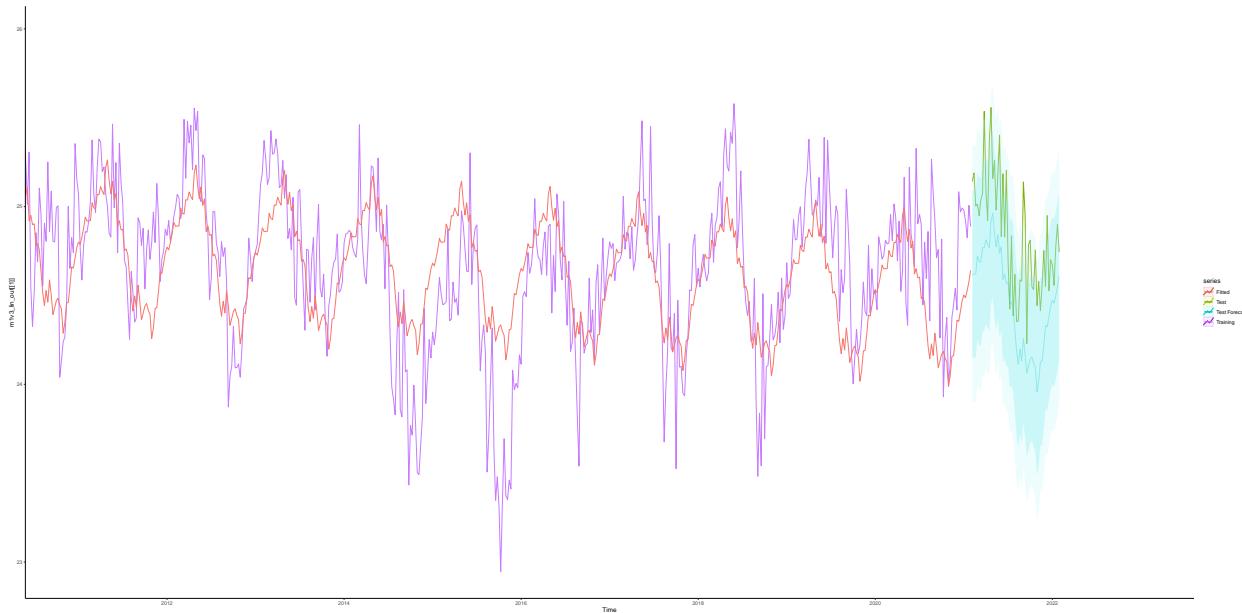
```

```

## Test set      3.777035e-01 0.4351803 0.3804691  1.51503645 1.526371 1.832377
##                      ACF1
## Training set 0.7064924
## Test set       NA

autoplot(m1v3_lin_out[[1]], series = 'Training') +
  autolayer(m1v3_lin_out[[2]], series = 'Test') +
  autolayer(m1v3_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m1v3_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                  xlim = c(2011, 2023))

```



```

summary(m1v3_lin_out[[3]])

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
## 25.1605258   -0.0005763   -0.0139985   0.0277806   0.0773615   0.1416388
##    season6      season7      season8      season9      season10     season11
## 0.1203487    0.1223233   0.1235907   0.2250269   0.1966168   0.1916811
##    season12     season13     season14     season15     season16     season17
## 0.2733601    0.2726401   0.3183751   0.2929450   0.2756329   0.4283849
##    season18     season19     season20     season21     season22     season23
## 0.4714110    0.3565331   0.2824009   0.3510641   0.2477110   0.2844833
##    season24     season25     season26     season27     season28     season29
## 0.1017596    0.1332048   0.0818576   0.0866414   -0.0332705  -0.0234003

```

```

##      season30      season31      season32      season33      season34      season35
## -0.0571402 -0.1796645 -0.2983021 -0.3700808 -0.2852211 -0.3496621
##      season36      season37      season38      season39      season40      season41
## -0.2241718 -0.3097002 -0.4174868 -0.3792932 -0.3384987 -0.3239866
##      season42      season43      season44      season45      season46      season47
## -0.3600467 -0.3826167 -0.5190471 -0.4593628 -0.3477045 -0.3443540
##      season48      season49      season50      season51      season52
## -0.2499449 -0.1436323 -0.1493562 -0.0926189 -0.0328901
##
##
## Error measures:
##               ME        RMSE       MAE       MPE       MAPE       MASE
## Training set -1.556207e-17 0.3503373 0.2742432 -0.02019261 1.110196 0.8194057
##          ACF1
## Training set 0.7064924
##
## Forecasts:
##      Point Forecast     Lo 80     Hi 80     Lo 95     Hi 95
## 2021.096    24.61928 24.14830 25.09026 23.89862 25.33995
## 2021.115    24.62068 24.14970 25.09166 23.90002 25.34134
## 2021.135    24.62137 24.15039 25.09235 23.90071 25.34203
## 2021.154    24.72223 24.25125 25.19321 24.00157 25.44289
## 2021.173    24.69325 24.22227 25.16422 23.97258 25.41391
## 2021.192    24.68773 24.21676 25.15871 23.96707 25.40840
## 2021.212    24.76884 24.29786 25.23982 24.04817 25.48950
## 2021.231    24.76754 24.29656 25.23852 24.04688 25.48820
## 2021.250    24.81270 24.34172 25.28368 24.09204 25.53336
## 2021.269    24.78669 24.31571 25.25767 24.06603 25.50735
## 2021.288    24.76880 24.29783 25.23978 24.04814 25.48947
## 2021.308    24.92098 24.45000 25.39196 24.20032 25.64164
## 2021.327    24.96343 24.49245 25.43441 24.24277 25.68409
## 2021.346    24.84798 24.37700 25.31895 24.12731 25.56864
## 2021.365    24.77327 24.30229 25.24425 24.05261 25.49393
## 2021.385    24.84135 24.37038 25.31233 24.12069 25.56202
## 2021.404    24.73742 24.26645 25.20840 24.01676 25.45809
## 2021.423    24.77362 24.30264 25.24460 24.05296 25.49428
## 2021.442    24.59032 24.11934 25.06130 23.86966 25.31098
## 2021.462    24.62119 24.15021 25.09217 23.90053 25.34185
## 2021.481    24.56927 24.09829 25.04024 23.84860 25.28993
## 2021.500    24.57347 24.10249 25.04445 23.85281 25.29414
## 2021.519    24.45299 23.98201 24.92396 23.73232 25.17365
## 2021.538    24.46228 23.99130 24.93326 23.74162 25.18294
## 2021.558    24.42796 23.95698 24.89894 23.70730 25.14863
## 2021.577    24.30486 23.83388 24.77584 23.58420 25.02552
## 2021.596    24.18565 23.71467 24.65663 23.46499 24.90631
## 2021.615    24.11329 23.64231 24.58427 23.39263 24.83396
## 2021.635    24.19758 23.72660 24.66856 23.47691 24.91824
## 2021.654    24.13256 23.66158 24.60354 23.41190 24.85322
## 2021.673    24.25747 23.78650 24.72845 23.53681 24.97814
## 2021.692    24.17137 23.70039 24.64235 23.45071 24.89203
## 2021.712    24.06301 23.59203 24.53398 23.34234 24.78367
## 2021.731    24.10062 23.62964 24.57160 23.37996 24.82129
## 2021.750    24.14084 23.66986 24.61182 23.42018 24.86150
## 2021.769    24.15478 23.68380 24.62576 23.43412 24.87544

```

```

## 2021.788      24.11814 23.64716 24.58912 23.39748 24.83880
## 2021.808      24.09499 23.62402 24.56597 23.37433 24.81566
## 2021.827      23.95799 23.48701 24.42897 23.23733 24.67865
## 2021.846      24.01710 23.54612 24.48807 23.29643 24.73776
## 2021.865      24.12818 23.65720 24.59916 23.40752 24.84884
## 2021.885      24.13095 23.65997 24.60193 23.41029 24.85161
## 2021.904      24.22479 23.75381 24.69576 23.50412 24.94545
## 2021.923      24.33052 23.85954 24.80150 23.60986 25.05118
## 2021.942      24.32422 23.85324 24.79520 23.60356 25.04488
## 2021.962      24.38038 23.90940 24.85136 23.65972 25.10104
## 2021.981      24.43953 23.96856 24.91051 23.71887 25.16020
## 2022.000      24.47185 24.00087 24.94283 23.75119 25.19251
## 2022.019      24.45727 23.98629 24.92825 23.73661 25.17794
## 2022.038      24.49848 24.02788 24.96907 23.77841 25.21855
## 2022.058      24.54748 24.07689 25.01807 23.82741 25.26755
## 2022.077      24.61118 24.14059 25.08177 23.89111 25.33125

```

### PLOO Excluding Outliers: Imputed - Excluding External Variables (Forecasting DENSITY)

```

# PLOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly02_train_tb03
# PLOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly02_test_tb03

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
                    DENSITY)

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        DENSITY,
                        .frequency = "auto",
                        .trend = "auto")

m2v3_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly02_train_tb03,
                            tb_test = owt_df02_gb09_ploo_wkly02_test_tb03,
                            date = "date_sample",
                            param = "DENSITY",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "DENSITY ~ trend + season")

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 2.796938e-17 0.3485679 0.2736529 -0.01996944 1.107586 1.321202
## Test set     3.761243e-01 0.4336376 0.3789111  1.50865787 1.520078 1.829391
##               ACF1
## Training set 0.7046418
## Test set     NA

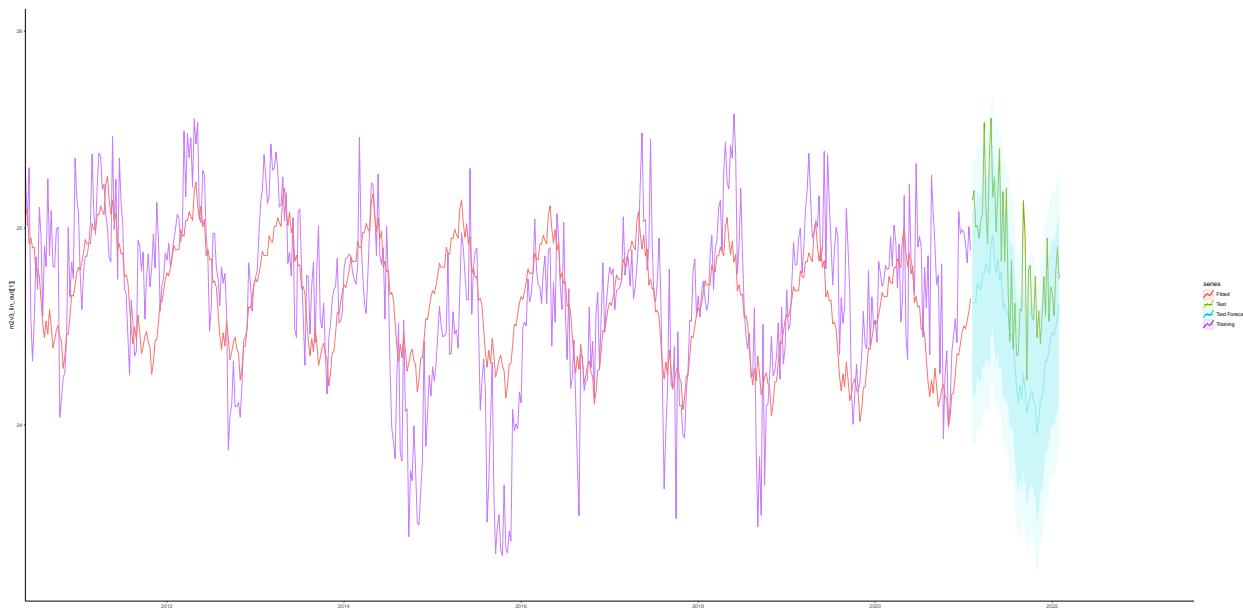
autoplot(m2v3_lin_out[[1]], series = 'Training') +
  autolayer(m2v3_lin_out[[2]], series = 'Test') +

```

```

autolayer(m2v3_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
autolayer(m2v3_lin_out[[3]]$fitted, series = 'Fitted') +
theme_classic() +
coord_cartesian(#ylim = c(-50, 400),
                xlim = c(2011, 2023))

```



```
summary(m2v3_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 25.1592432 -0.0005744 -0.0139648  0.0278971  0.0781413  0.1422164
## season6    season7    season8    season9    season10   season11
## 0.1206828  0.1223464  0.1236649  0.2249494  0.1966133  0.1918159
## season12   season13   season14   season15   season16   season17
## 0.2732921  0.2727331  0.3187065  0.2929821  0.2758615  0.4275024
## season18   season19   season20   season21   season22   season23
## 0.4703928  0.3563714  0.2825144  0.3513254  0.2478709  0.2847145
## season24   season25   season26   season27   season28   season29
## 0.1017506  0.1332591  0.0818842  0.0866295 -0.0333260 -0.0233663
## season30   season31   season32   season33   season34   season35
## -0.0584356 -0.1794493 -0.2979102 -0.3700239 -0.2849689 -0.3496441
## season36   season37   season38   season39   season40   season41
## -0.2239530 -0.3095001 -0.4174060 -0.3790865 -0.3280387 -0.3046191
## season42   season43   season44   season45   season46   season47
## -0.3598039 -0.3822471 -0.5187880 -0.4592765 -0.3478977 -0.3441984

```

```

##      season48      season49      season50      season51      season52
## -0.2496997 -0.1436264 -0.1493883 -0.0927520 -0.0329772
##
##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 2.796938e-17 0.3485679 0.2736529 -0.01996944 1.107586 0.8203458
##          ACF1
## Training set 0.7046418
##
## Forecasts:
##      Point Forecast    Lo 80     Hi 80    Lo 95     Hi 95
## 2021.096      24.62052 24.15192 25.08912 23.90350 25.33755
## 2021.115      24.62161 24.15301 25.09021 23.90459 25.33864
## 2021.135      24.62236 24.15376 25.09096 23.90533 25.33938
## 2021.154      24.72307 24.25447 25.19167 24.00604 25.44009
## 2021.173      24.69416 24.22556 25.16276 23.97713 25.41118
## 2021.192      24.68878 24.22018 25.15738 23.97176 25.40581
## 2021.212      24.76969 24.30109 25.23829 24.05266 25.48671
## 2021.231      24.76855 24.29995 25.23715 24.05153 25.48558
## 2021.250      24.81395 24.34535 25.28255 24.09693 25.53097
## 2021.269      24.78765 24.31905 25.25625 24.07063 25.50468
## 2021.288      24.76996 24.30136 25.23856 24.05294 25.48698
## 2021.308      24.92103 24.45243 25.38963 24.20400 25.63805
## 2021.327      24.96334 24.49474 25.43194 24.24632 25.68036
## 2021.346      24.84875 24.38015 25.31735 24.13172 25.56577
## 2021.365      24.77431 24.30571 25.24291 24.05729 25.49134
## 2021.385      24.84255 24.37395 25.31115 24.12553 25.55957
## 2021.404      24.73852 24.26992 25.20712 24.02150 25.45554
## 2021.423      24.77479 24.30619 25.24339 24.05777 25.49181
## 2021.442      24.59125 24.12265 25.05985 23.87423 25.30827
## 2021.462      24.62219 24.15359 25.09079 23.90516 25.33921
## 2021.481      24.57024 24.10164 25.03884 23.85321 25.28726
## 2021.500      24.57441 24.10581 25.04301 23.85739 25.29143
## 2021.519      24.45388 23.98528 24.92248 23.73686 25.17090
## 2021.538      24.46326 23.99466 24.93186 23.74624 25.18029
## 2021.558      24.42762 23.95902 24.89622 23.71060 25.14464
## 2021.577      24.30603 23.83743 24.77463 23.58901 25.02305
## 2021.596      24.18700 23.71840 24.65560 23.46997 24.90402
## 2021.615      24.11431 23.64571 24.58291 23.39729 24.83133
## 2021.635      24.19879 23.73019 24.66739 23.48177 24.91581
## 2021.654      24.13354 23.66494 24.60214 23.41652 24.85056
## 2021.673      24.25866 23.79006 24.72726 23.54163 24.97568
## 2021.692      24.17253 23.70393 24.64113 23.45551 24.88956
## 2021.712      24.06405 23.59545 24.53265 23.34703 24.78108
## 2021.731      24.10180 23.63320 24.57040 23.38478 24.81882
## 2021.750      24.15227 23.68367 24.62087 23.43525 24.86930
## 2021.769      24.17512 23.70652 24.64372 23.45810 24.89214
## 2021.788      24.11936 23.65076 24.58796 23.40234 24.83638
## 2021.808      24.09634 23.62774 24.56494 23.37932 24.81336
## 2021.827      23.95923 23.49063 24.42783 23.24220 24.67625
## 2021.846      24.01816 23.54956 24.48676 23.30114 24.73519
## 2021.865      24.12897 23.66037 24.59757 23.41195 24.84599
## 2021.885      24.13209 23.66349 24.60069 23.41507 24.84911

```

```

## 2021.904      24.22602 23.75742 24.69462 23.50899 24.94304
## 2021.923      24.33152 23.86292 24.80012 23.61449 25.04854
## 2021.942      24.32518 23.85658 24.79378 23.60816 25.04220
## 2021.962      24.38124 23.91264 24.84984 23.66422 25.09826
## 2021.981      24.44044 23.97184 24.90904 23.72342 25.15746
## 2022.000      24.47284 24.00424 24.94144 23.75582 25.18987
## 2022.019      24.45831 23.98971 24.92691 23.74128 25.17533
## 2022.038      24.49959 24.03138 24.96781 23.78316 25.21603
## 2022.058      24.54926 24.08105 25.01748 23.83283 25.26570
## 2022.077      24.61276 24.14455 25.08098 23.89633 25.32920

```

### SBOO All: Imputed - Excluding External Variables (Forecasting DENSITY)

```

# SBOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly03_train_tb03
# SBOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly03_test_tb03

owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                    DENSITY)

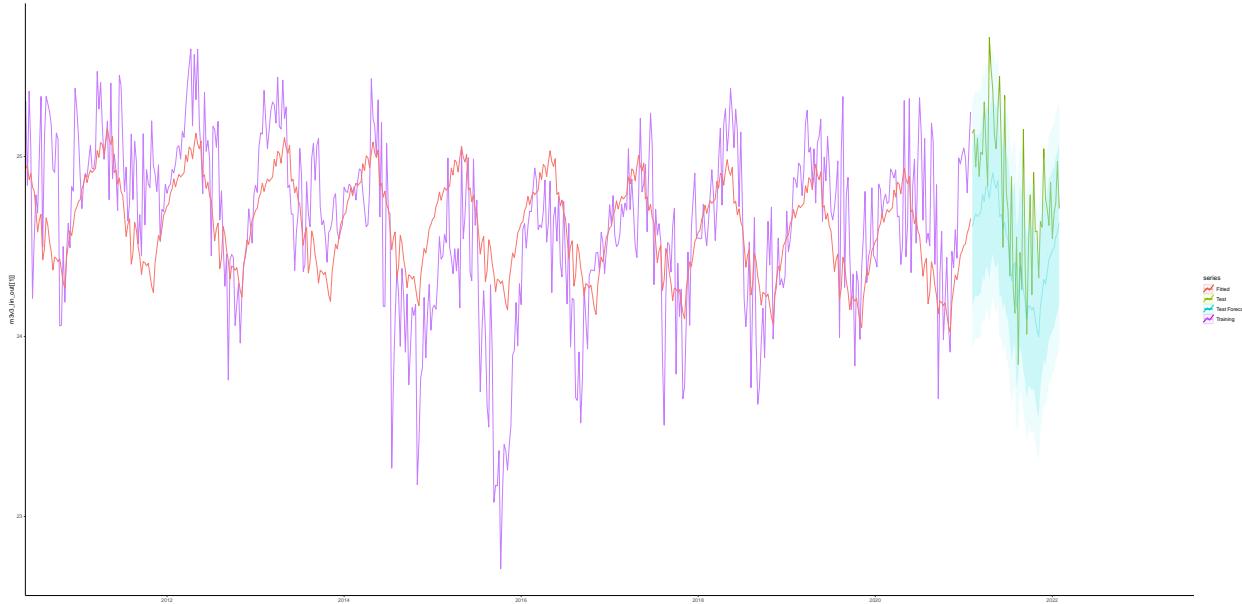
owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        DENSITY,
                        .frequency = "auto",
                        .trend = "auto")

m3v3_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly03_train_tb03,
                            tb_test = owt_df02_gb09_sboo_wkly03_test_tb03,
                            date = "date_sample",
                            param = "DENSITY",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "DENSITY ~ trend + season")

##               ME        RMSE       MAE       MPE       MAPE       MASE
## Training set -2.798007e-17 0.3326557 0.2541997 -0.01841579 1.032368 1.263408
## Test set      3.166582e-01 0.4235576 0.3602488  1.26390269 1.444778 1.790487
##               ACF1
## Training set 0.6520061
## Test set     NA

autoplot(m3v3_lin_out[[1]], series = 'Training') +
  autolayer(m3v3_lin_out[[2]], series = 'Test') +
  autolayer(m3v3_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m3v3_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m3v3_lin_out[[3]])
```

```
##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 25.0417603   -0.0004698   0.0110090   0.0712780   0.0980308   0.1525658
##   season6    season7    season8    season9    season10   season11
## 0.1078284   0.1471860   0.1784557   0.1650903   0.1773321   0.1894318
##   season12   season13   season14   season15   season16   season17
## 0.2886061   0.2512015   0.3338875   0.3233242   0.2689084   0.3502046
##   season18   season19   season20   season21   season22   season23
## 0.4120513   0.3532771   0.3264399   0.3700406   0.1716783   0.1838657
##   season24   season25   season26   season27   season28   season29
## 0.1083453   0.1423525   0.0683264   0.0448021  -0.0636511  -0.1804622
##   season30   season31   season32   season33   season34   season35
## -0.1129465  -0.0813626  -0.3329194  -0.2726196  -0.0988885  -0.1411537
##   season36   season37   season38   season39   season40   season41
## -0.2303418  -0.2876174  -0.3867274  -0.3155147  -0.3218860  -0.3383215
##   season42   season43   season44   season45   season46   season47
## -0.3233811  -0.3860008  -0.4507198  -0.4841374  -0.3174195  -0.2429598
##   season48   season49   season50   season51   season52
## -0.1657881  -0.1907846  -0.1278259  -0.0528468  -0.0307239
##
##
## Error measures:
##               ME        RMSE        MAE        MPE        MAPE        MASE
## Training set -2.798007e-17 0.3326557 0.2541997 -0.01841579 1.032368 0.7493704
```

```

##          ACF1
## Training set 0.6520061
##
## Forecasts:
##      Point Forecast    Lo 80     Hi 80     Lo 95     Hi 95
## 2021.096      24.61029 24.16308 25.05750 23.92600 25.29458
## 2021.115      24.64918 24.20197 25.09639 23.96489 25.33347
## 2021.135      24.67998 24.23277 25.12719 23.99569 25.36427
## 2021.154      24.66614 24.21894 25.11335 23.98185 25.35043
## 2021.173      24.67792 24.23071 25.12512 23.99363 25.36221
## 2021.192      24.68955 24.24234 25.13675 24.00526 25.37384
## 2021.212      24.78825 24.34104 25.23546 24.10396 25.47254
## 2021.231      24.75038 24.30317 25.19758 24.06609 25.43467
## 2021.250      24.83259 24.38538 25.27980 24.14830 25.51688
## 2021.269      24.82156 24.37435 25.26877 24.13727 25.50585
## 2021.288      24.76667 24.31947 25.21388 24.08238 25.45096
## 2021.308      24.84750 24.40029 25.29471 24.16321 25.53179
## 2021.327      24.90888 24.46167 25.35609 24.22459 25.59317
## 2021.346      24.84963 24.40242 25.29684 24.16534 25.53392
## 2021.365      24.82233 24.37512 25.26953 24.13804 25.50662
## 2021.385      24.86546 24.41825 25.31266 24.18117 25.54975
## 2021.404      24.66662 24.21942 25.11383 23.98233 25.35091
## 2021.423      24.67834 24.23113 25.12555 23.99405 25.36263
## 2021.442      24.60235 24.15514 25.04956 23.91806 25.28664
## 2021.462      24.63589 24.18868 25.08310 23.95160 25.32018
## 2021.481      24.56139 24.11419 25.00860 23.87710 25.24568
## 2021.500      24.53740 24.09019 24.98461 23.85311 25.22169
## 2021.519      24.42848 23.98127 24.87568 23.74419 25.11277
## 2021.538      24.31120 23.86399 24.75840 23.62691 24.99549
## 2021.558      24.37824 23.93103 24.82545 23.69395 25.06253
## 2021.577      24.40936 23.96215 24.85656 23.72507 25.09365
## 2021.596      24.15733 23.71012 24.60454 23.47304 24.84162
## 2021.615      24.21716 23.76995 24.66437 23.53287 24.90145
## 2021.635      24.39042 23.94321 24.83763 23.70613 25.07471
## 2021.654      24.34769 23.90048 24.79489 23.66340 25.03198
## 2021.673      24.25803 23.81082 24.70524 23.57374 24.94232
## 2021.692      24.20028 23.75307 24.64749 23.51599 24.88457
## 2021.712      24.10070 23.65349 24.54791 23.41641 24.78499
## 2021.731      24.17145 23.72424 24.61865 23.48716 24.85574
## 2021.750      24.16460 23.71740 24.61181 23.48031 24.84889
## 2021.769      24.14770 23.70049 24.59491 23.46341 24.83199
## 2021.788      24.16217 23.71496 24.60938 23.47788 24.84646
## 2021.808      24.09908 23.65187 24.54629 23.41479 24.78337
## 2021.827      24.03389 23.58668 24.48110 23.34960 24.71818
## 2021.846      24.00000 23.55280 24.44721 23.31571 24.68429
## 2021.865      24.16625 23.71904 24.61346 23.48196 24.85054
## 2021.885      24.24024 23.79303 24.68745 23.55595 24.92453
## 2021.904      24.31694 23.86974 24.76415 23.63265 25.00123
## 2021.923      24.29148 23.84427 24.73869 23.60719 24.97577
## 2021.942      24.35397 23.90676 24.80118 23.66968 25.03826
## 2021.962      24.42848 23.98127 24.87568 23.74419 25.11277
## 2021.981      24.45013 24.00292 24.89734 23.76584 25.13442
## 2022.000      24.48038 24.03318 24.92759 23.79609 25.16467
## 2022.019      24.49092 24.04371 24.93813 23.80663 25.17521

```

```

## 2022.038      24.55072 24.10388 24.99756 23.86699 25.23445
## 2022.058      24.57700 24.13016 25.02385 23.89328 25.26073
## 2022.077      24.63107 24.18423 25.07791 23.94734 25.31480

```

### SBOO Excluding Outliers: Imputed - Excluding External Variables (Forecasting DENSITY)

```

# SBOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly02_train_tb03
# SBOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly02_test_tb03

owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
                    DENSITY)

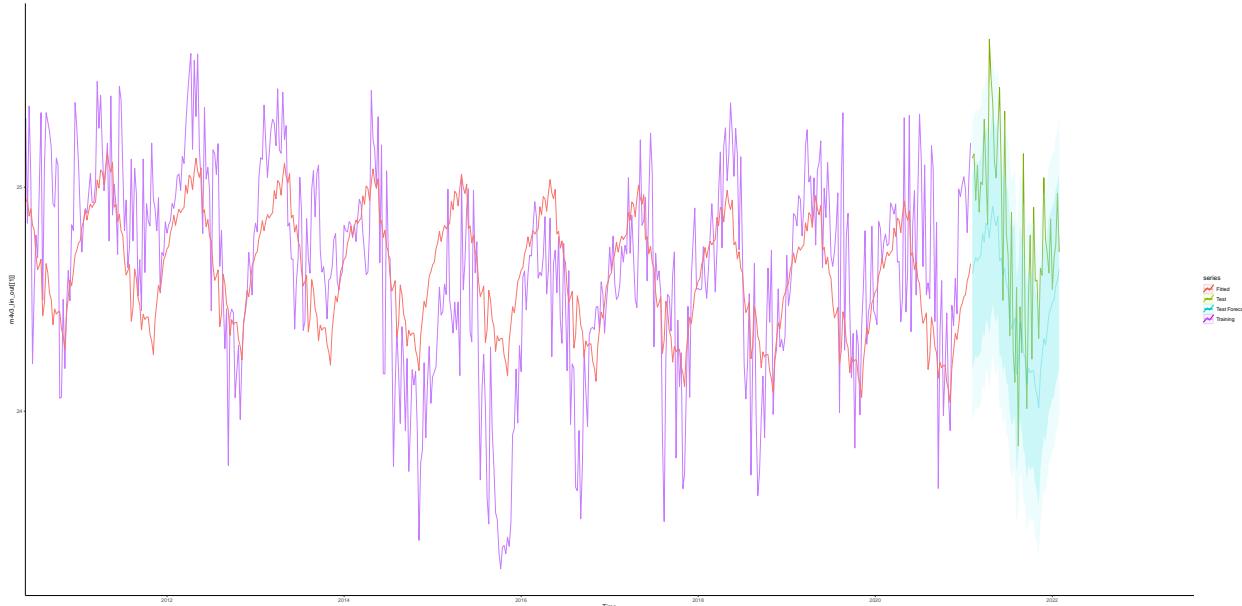
owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        DENSITY,
                        .frequency = "auto",
                        .trend = "auto")

m4v3_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly02_train_tb03,
                            tb_test = owt_df02_gb09_sboo_wkly02_test_tb03,
                            date = "date_sample",
                            param = "DENSITY",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "DENSITY ~ trend + season")

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 1.537781e-17 0.3223322 0.2498774 -0.01720746 1.013680 1.259573
## Test set     3.070166e-01 0.4160535 0.3528652  1.22485103 1.415072 1.778710
##               ACF1
## Training set 0.6443114
## Test set     NA

autoplot(m4v3_lin_out[[1]], series = 'Training') +
  autolayer(m4v3_lin_out[[2]], series = 'Test') +
  autolayer(m4v3_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m4v3_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m4v3_lin_out[[3]])
```

```
##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 25.0356824 -0.0004601  0.0116001  0.0730078  0.0998429  0.1509991
##   season6    season7    season8    season9    season10   season11
##  0.1069505  0.1485823  0.1794448  0.1647678  0.1786420  0.1897574
##   season12   season13   season14   season15   season16   season17
##  0.2885086  0.2523327  0.3345139  0.3241873  0.2703485  0.3521452
##   season18   season19   season20   season21   season22   season23
##  0.4123527  0.3540656  0.3276523  0.3698347  0.1716294  0.1838007
##   season24   season25   season26   season27   season28   season29
##  0.1091518  0.1414890  0.0681124  0.0485362 -0.0632368 -0.1280942
##   season30   season31   season32   season33   season34   season35
## -0.1087901 -0.0809060 -0.3329658 -0.2747655 -0.0988908 -0.1408935
##   season36   season37   season38   season39   season40   season41
## -0.2296922 -0.2567784 -0.3691782 -0.2990309 -0.3212594 -0.3101461
##   season42   season43   season44   season45   season46   season47
## -0.3102373 -0.3851553 -0.4165798 -0.4753008 -0.3170392 -0.2427899
##   season48   season49   season50   season51   season52
## -0.1654119 -0.1909596 -0.1276126 -0.0521993 -0.0309902
##
## Error measures:
##               ME        RMSE        MAE        MPE        MAPE        MASE
## Training set 1.537781e-17 0.3223322 0.2498774 -0.01720746 1.01368 0.7490735
```

```

##          ACF1
## Training set 0.6443114
##
## Forecasts:
##           Point Forecast    Lo 80     Hi 80     Lo 95     Hi 95
## 2021.096      24.61448 24.18115 25.04781 23.95143 25.27754
## 2021.115      24.65566 24.22233 25.08899 23.99260 25.31871
## 2021.135      24.68606 24.25273 25.11939 24.02300 25.34911
## 2021.154      24.67092 24.23759 25.10425 24.00787 25.33397
## 2021.173      24.68433 24.25100 25.11766 24.02128 25.34739
## 2021.192      24.69499 24.26166 25.12832 24.03194 25.35804
## 2021.212      24.79328 24.35995 25.22661 24.13023 25.45634
## 2021.231      24.75665 24.32332 25.18998 24.09359 25.41970
## 2021.250      24.83837 24.40504 25.27170 24.17531 25.50142
## 2021.269      24.82758 24.39425 25.26091 24.16453 25.49063
## 2021.288      24.77328 24.33995 25.20661 24.11023 25.43634
## 2021.308      24.85462 24.42129 25.28795 24.19156 25.51767
## 2021.327      24.91436 24.48104 25.34769 24.25131 25.57742
## 2021.346      24.85562 24.42229 25.28895 24.19256 25.51867
## 2021.365      24.82874 24.39541 25.26207 24.16569 25.49180
## 2021.385      24.87047 24.43714 25.30380 24.20741 25.53352
## 2021.404      24.67180 24.23847 25.10513 24.00875 25.33486
## 2021.423      24.68351 24.25018 25.11684 24.02046 25.34657
## 2021.442      24.60840 24.17507 25.04173 23.94535 25.27146
## 2021.462      24.64028 24.20695 25.07361 23.97723 25.30334
## 2021.481      24.56644 24.13311 24.99977 23.90339 25.22950
## 2021.500      24.54641 24.11308 24.97974 23.88335 25.20946
## 2021.519      24.43417 24.00084 24.86750 23.77112 25.09723
## 2021.538      24.36886 23.93553 24.80219 23.70580 25.03191
## 2021.558      24.38770 23.95437 24.82103 23.72465 25.05076
## 2021.577      24.41513 23.98180 24.84846 23.75207 25.07818
## 2021.596      24.16261 23.72928 24.59594 23.49955 24.82566
## 2021.615      24.22035 23.78702 24.65368 23.55729 24.88340
## 2021.635      24.39576 23.96243 24.82909 23.73271 25.05881
## 2021.654      24.35330 23.91997 24.78663 23.69024 25.01635
## 2021.673      24.26404 23.83071 24.69737 23.60098 24.92709
## 2021.692      24.23649 23.80316 24.66982 23.57344 24.89955
## 2021.712      24.12363 23.69030 24.55696 23.46058 24.78669
## 2021.731      24.19332 23.75999 24.62665 23.53027 24.85637
## 2021.750      24.17063 23.73730 24.60396 23.50758 24.83369
## 2021.769      24.18128 23.74795 24.61461 23.51823 24.84434
## 2021.788      24.18073 23.74740 24.61406 23.51768 24.84379
## 2021.808      24.10536 23.67203 24.53869 23.44230 24.76841
## 2021.827      24.07347 23.64014 24.50680 23.41042 24.73653
## 2021.846      24.01429 23.58096 24.44762 23.35124 24.67734
## 2021.865      24.17209 23.73876 24.60542 23.50904 24.83515
## 2021.885      24.24588 23.81255 24.67921 23.58283 24.90893
## 2021.904      24.32280 23.88947 24.75613 23.65974 24.98585
## 2021.923      24.29679 23.86346 24.73012 23.63374 24.95984
## 2021.942      24.35968 23.92635 24.79301 23.69662 25.02273
## 2021.962      24.43463 24.00130 24.86796 23.77158 25.09769
## 2021.981      24.45538 24.02205 24.88871 23.79233 25.11843
## 2022.000      24.48591 24.05258 24.91924 23.82286 25.14896
## 2022.019      24.49705 24.06372 24.93038 23.83400 25.16010

```

```

## 2022.038      24.55800 24.12502 24.99097 23.89549 25.22051
## 2022.058      24.58437 24.15140 25.01735 23.92186 25.24688
## 2022.077      24.63507 24.20210 25.06804 23.97256 25.29758

```

---

### PLOO All: Imputed - Excluding External Variables (Forecasting PH)

```

# PLOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly03_train_tb03
# PLOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly03_test_tb03

owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                    PH)

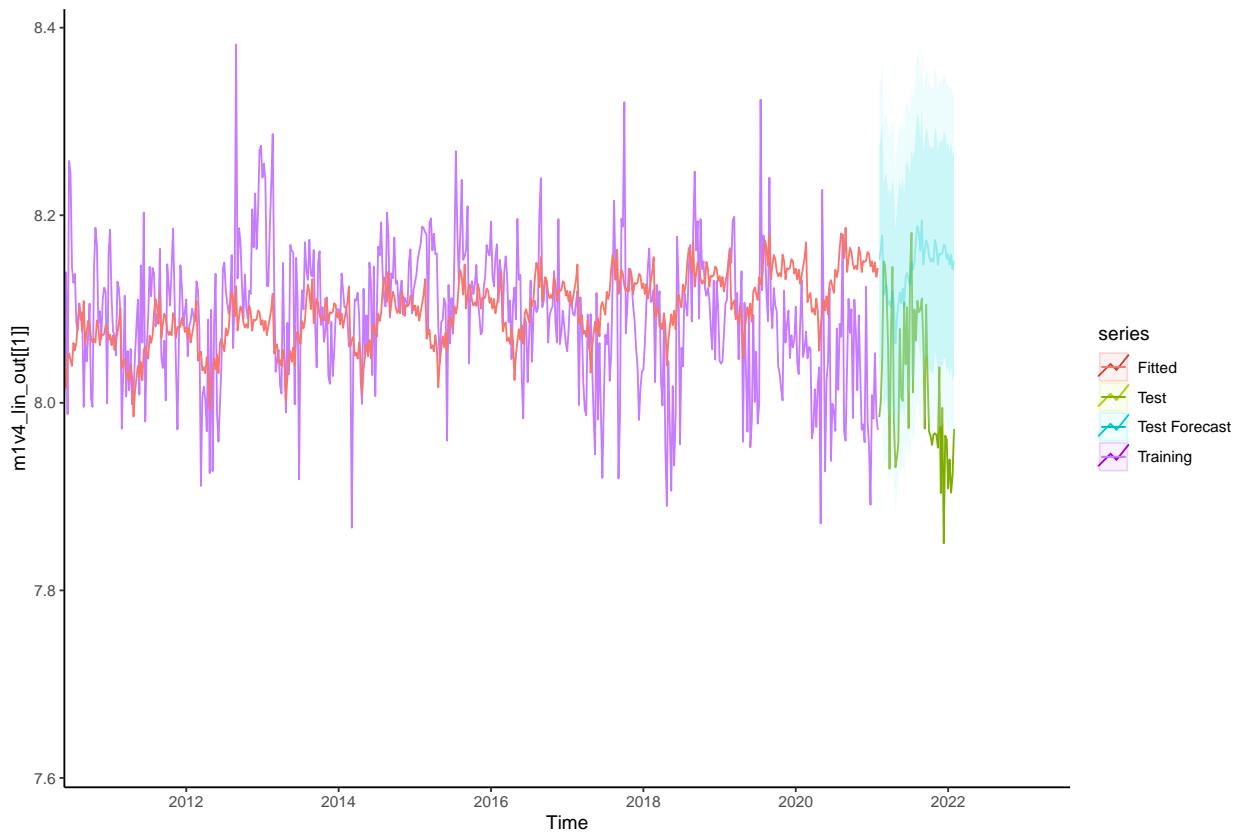
owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        PH,
                        .frequency = "auto",
                        .trend = "auto")

m1v4_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly03_train_tb03,
                            tb_test = owt_df02_gb09_ploo_wkly03_test_tb03,
                            date = "date_sample",
                            param = "PH",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "PH ~ trend + season")

##               ME        RMSE       MAE       MPE       MAPE       MASE
## Training set -9.269220e-18 0.08929282 0.07080095 -0.01237585 0.8807666 1.277369
## Test set      -1.245855e-01 0.15000693 0.12993314 -1.56348438 1.6290748 2.344214
##               ACF1
## Training set 0.6564464
## Test set     NA

autoplot(m1v4_lin_out[[1]], series = 'Training') +
  autolayer(m1v4_lin_out[[2]], series = 'Test') +
  autolayer(m1v4_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m1v4_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m1v4_lin_out[[3]])
```

```
##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 7.9792102  0.0001500 -0.0113925 -0.0012053 -0.0166947 -0.0075052
##   season6    season7    season8    season9    season10   season11
## 0.0011960  0.0106141  0.0269733 -0.0367986 -0.0302831 -0.0273073
##   season12   season13   season14   season15   season16   season17
## -0.0475963 -0.0444153 -0.0510328 -0.0338475 -0.0473597 -0.0897882
##   season18   season19   season20   season21   season22   season23
## -0.0631879 -0.0492182 -0.0359508 -0.0476054 -0.0322878 -0.0521070
##   season24   season25   season26   season27   season28   season29
## -0.0200069 -0.0156886 -0.0228587 -0.0294771 -0.0050681 -0.0130589
##   season30   season31   season32   season33   season34   season35
## -0.0052088  0.0185250  0.0330742  0.0258301  0.0065064  0.0386156
##   season36   season37   season38   season39   season40   season41
## -0.0086332  0.0050999  0.0168375  0.0122134 -0.0006408 -0.0062569
##   season42   season43   season44   season45   season46   season47
```

```

## -0.0029286 -0.0069489 0.0165172 0.0095988 -0.0102944 0.0014298
## season48 season49 season50 season51 season52
## 0.0001438 0.0014341 0.0105906 0.0085482 -0.0049809
##
##
## Error measures:
## ME RMSE MAE MPE MAPE MASE
## Training set -9.26922e-18 0.08929282 0.07080095 -0.01237585 0.8807666 0.8898097
## ACF1
## Training set 0.6564464
##
## Forecasts:
## Point Forecast Lo 80 Hi 80 Lo 95 Hi 95
## 2021.096 8.152664 8.032622 8.272705 7.968984 8.336344
## 2021.115 8.162232 8.042190 8.282273 7.978552 8.345912
## 2021.135 8.178741 8.058699 8.298782 7.995061 8.362421
## 2021.154 8.115119 7.995078 8.235161 7.931439 8.298799
## 2021.173 8.121785 8.001743 8.241826 7.938105 8.305465
## 2021.192 8.124910 8.004869 8.244952 7.941230 8.308590
## 2021.212 8.104772 7.984730 8.224813 7.921092 8.288452
## 2021.231 8.108103 7.988061 8.228144 7.924423 8.291783
## 2021.250 8.101635 7.981594 8.221677 7.917955 8.285315
## 2021.269 8.118970 7.998929 8.239012 7.935290 8.302650
## 2021.288 8.105608 7.985567 8.225650 7.921928 8.289288
## 2021.308 8.063330 7.943288 8.183371 7.879650 8.247010
## 2021.327 8.090080 7.970039 8.210122 7.906400 8.273760
## 2021.346 8.104200 7.984158 8.224242 7.920520 8.287880
## 2021.365 8.117617 7.997576 8.237659 7.933937 8.301297
## 2021.385 8.106113 7.986071 8.226154 7.922433 8.289793
## 2021.404 8.121581 8.001539 8.241622 7.937901 8.305261
## 2021.423 8.101911 7.981870 8.221953 7.918231 8.285591
## 2021.442 8.134162 8.014120 8.254203 7.950482 8.317842
## 2021.462 8.138630 8.018588 8.258671 7.954950 8.322310
## 2021.481 8.131610 8.011568 8.251651 7.947930 8.315290
## 2021.500 8.125141 8.005100 8.245183 7.941461 8.308821
## 2021.519 8.149701 8.029659 8.269742 7.966021 8.333381
## 2021.538 8.141860 8.021818 8.261901 7.958180 8.325540
## 2021.558 8.149860 8.029818 8.269901 7.966180 8.333540
## 2021.577 8.173744 8.053702 8.293785 7.990064 8.357424
## 2021.596 8.188443 8.068402 8.308485 8.004763 8.372123
## 2021.615 8.181349 8.061307 8.301391 7.997669 8.365029
## 2021.635 8.162175 8.042134 8.282217 7.978495 8.345855
## 2021.654 8.194435 8.074393 8.314476 8.010755 8.378115
## 2021.673 8.147336 8.027294 8.267377 7.963656 8.331016
## 2021.692 8.161219 8.041177 8.281261 7.977539 8.344899
## 2021.712 8.173107 8.053065 8.293148 7.989427 8.356787
## 2021.731 8.168633 8.048591 8.288674 7.984953 8.352313
## 2021.750 8.155928 8.035887 8.275970 7.972248 8.339608
## 2021.769 8.150462 8.030421 8.270504 7.966782 8.334142
## 2021.788 8.153941 8.033899 8.273982 7.970261 8.337621
## 2021.808 8.150070 8.030029 8.270112 7.966390 8.333750
## 2021.827 8.173687 8.053645 8.293728 7.990007 8.357367
## 2021.846 8.166918 8.046877 8.286960 7.983238 8.350598
## 2021.865 8.147175 8.027134 8.267217 7.963495 8.330855

```

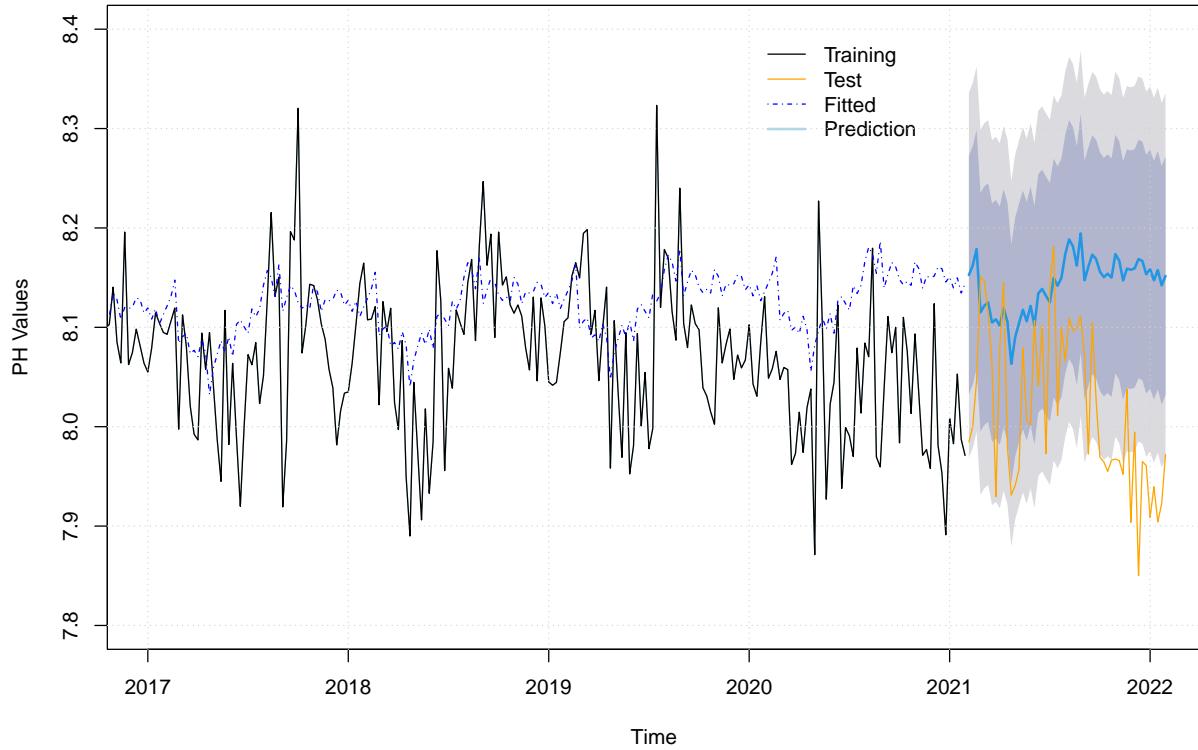
```

## 2021.885      8.159049 8.039008 8.279091 7.975369 8.342729
## 2021.904      8.157913 8.037872 8.277955 7.974233 8.341593
## 2021.923      8.159354 8.039312 8.279395 7.975674 8.343034
## 2021.942      8.168660 8.048619 8.288702 7.984980 8.352340
## 2021.962      8.166768 8.046727 8.286810 7.983088 8.350448
## 2021.981      8.153389 8.033347 8.273430 7.969709 8.337069
## 2022.000      8.158520 8.038478 8.278561 7.974840 8.342200
## 2022.019      8.147277 8.027236 8.267319 7.963597 8.330957
## 2022.038      8.157615 8.037672 8.277557 7.974086 8.341144
## 2022.058      8.142275 8.022333 8.262218 7.958746 8.325804
## 2022.077      8.151615 8.031672 8.271558 7.968086 8.335144

plot(m1v4_lin_out[[3]],
      xlim = c(2017, 2022.05),
      ylim = c(7.8, 8.4),
      xlab = "Time",
      ylab = "PH Values",
      main = "Predicted PH Levels Over Time - PLOO",
      col = "light blue")
lines(m1v4_lin_out[[1]], lty=1, col="black")
lines(m1v4_lin_out[[2]], lty=1, col="orange")
lines(m1v4_lin_out[[3]]$fitted, lty=4, col="blue")
legend(2020, 8.4,
       c("Training", "Test", "Fitted", "Prediction"),
       lty = c(1,1,4,1),
       lwd = c(1,1,1,2),
       col = c("black", "orange", "blue", "light blue"),
       bty = "n")
grid()

```

### Predicted PH Levels Over Time – PLOO



#### PLOO Excluding Outliers: Imputed - Excluding External Variables (Forecasting PH)

```
# PLOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly02_train_tb03
# PLOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly02_test_tb03

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
    PH)

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
    PH,
    .frequency = "auto",
    .trend = "auto")

m2v4_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly02_train_tb03,
  tb_test = owt_df02_gb09_ploo_wkly02_test_tb03,
  date = "date_sample",
  param = "PH",
  ext_pred = c(),
  train_start = c(1999, lubridate::isoweek(ymd(train_start))),
  test_start = c(2021, 6),
  freq = 52,
```

```

            h = 52,
            formula = "PH ~ trend + season")

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -1.104657e-17 0.08640738 0.06927462 -0.01155372 0.8610721 1.276506
## Test set     -1.225481e-01 0.14774555 0.12779428 -1.53798322 1.6023184 2.354833
## ACF1
## Training set 0.6478792
## Test set      NA

autoplot(m2v4_lin_out[[1]], series = 'Training') +
  autolayer(m2v4_lin_out[[2]], series = 'Test') +
  autolayer(m2v4_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m2v4_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m2v4_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
## 7.9815006    0.0001441   -0.0116517    0.0002109   -0.0158001   -0.0065501
## season6      season7      season8      season9      season10     season11
## 0.0040766    0.0117627    0.0276796   -0.0322873   -0.0231654   -0.0189713
## season12     season13     season14     season15     season16     season17

```

```

## -0.0423245 -0.0432401 -0.0487886 -0.0294078 -0.0438132 -0.0900486
## season18 season19 season20 season21 season22 season23
## -0.0600143 -0.0412534 -0.0297337 -0.0466314 -0.0185566 -0.0464367
## season24 season25 season26 season27 season28 season29
## -0.0178877 -0.0149252 -0.0204894 -0.0219769 -0.0037518 -0.0115109
## season30 season31 season32 season33 season34 season35
## -0.0034972 0.0222177 0.0346162 0.0270503 0.0076727 0.0390644
## season36 season37 season38 season39 season40 season41
## -0.0071824 0.0062641 0.0181014 0.0131747 0.0064554 -0.0006943
## season42 season43 season44 season45 season46 season47
## 0.0003004 -0.0057324 0.0171976 0.0105407 -0.0081395 0.0026749
## season48 season49 season50 season51 season52
## 0.0012681 0.0024788 0.0121054 0.0091062 -0.0034408
##
##
## Error measures:
## ME RMSE MAE MPE MAPE
## Training set -1.104657e-17 0.08640738 0.06927462 -0.01155372 0.8610721
## MASE ACF1
## Training set 0.8953634 0.6478792
##
## Forecasts:
## Point Forecast Lo 80 Hi 80 Lo 95 Hi 95
## 2021.096 8.150967 8.034804 8.267129 7.973222 8.328711
## 2021.115 8.158797 8.042635 8.274960 7.981053 8.336542
## 2021.135 8.174858 8.058696 8.291021 7.997114 8.352603
## 2021.154 8.115035 7.998873 8.231198 7.937291 8.292780
## 2021.173 8.124301 8.008139 8.240464 7.946557 8.302046
## 2021.192 8.128639 8.012477 8.244802 7.950895 8.306384
## 2021.212 8.105430 7.989268 8.221593 7.927686 8.283175
## 2021.231 8.104659 7.988496 8.220821 7.926914 8.282403
## 2021.250 8.099254 7.983092 8.215417 7.921510 8.276999
## 2021.269 8.118779 8.002617 8.234942 7.941035 8.296524
## 2021.288 8.104518 7.988355 8.220680 7.926773 8.282262
## 2021.308 8.058426 7.942264 8.174589 7.880682 8.236171
## 2021.327 8.088605 7.972442 8.204767 7.910860 8.266349
## 2021.346 8.107510 7.991347 8.223672 7.929765 8.285254
## 2021.365 8.119174 8.003011 8.235336 7.941429 8.296918
## 2021.385 8.102420 7.986257 8.218582 7.924675 8.280164
## 2021.404 8.130639 8.014476 8.246801 7.952894 8.308383
## 2021.423 8.102903 7.986740 8.219065 7.925158 8.280647
## 2021.442 8.131596 8.015433 8.247758 7.953851 8.309340
## 2021.462 8.134702 8.018540 8.250865 7.956958 8.312447
## 2021.481 8.129282 8.013120 8.245445 7.951538 8.307027
## 2021.500 8.127939 8.011776 8.244101 7.950194 8.305683
## 2021.519 8.146308 8.030146 8.262470 7.968563 8.324052
## 2021.538 8.138693 8.022530 8.254855 7.960948 8.316437
## 2021.558 8.146851 8.030688 8.263013 7.969106 8.324595
## 2021.577 8.172710 8.056547 8.288872 7.994965 8.350454
## 2021.596 8.185252 8.069090 8.301415 8.007508 8.362997
## 2021.615 8.177830 8.061668 8.293993 8.000086 8.355575
## 2021.635 8.158597 8.042434 8.274759 7.980852 8.336341
## 2021.654 8.190133 8.073970 8.306295 8.012388 8.367877
## 2021.673 8.144030 8.027868 8.260192 7.966285 8.321774

```

```

## 2021.692      8.157621 8.041458 8.273783 7.979876 8.335365
## 2021.712      8.169602 8.053439 8.285764 7.991857 8.347346
## 2021.731      8.164819 8.048657 8.280982 7.987075 8.342564
## 2021.750      8.158244 8.042082 8.274406 7.980500 8.335989
## 2021.769      8.151238 8.035076 8.267401 7.973494 8.328983
## 2021.788      8.152377 8.036215 8.268540 7.974633 8.330122
## 2021.808      8.146488 8.030326 8.262651 7.968744 8.324233
## 2021.827      8.169563 8.053400 8.285725 7.991818 8.347307
## 2021.846      8.163050 8.046887 8.279212 7.985305 8.340794
## 2021.865      8.144514 8.028351 8.260676 7.966769 8.322258
## 2021.885      8.155472 8.039310 8.271634 7.977727 8.333216
## 2021.904      8.154209 8.038047 8.270372 7.976465 8.331954
## 2021.923      8.155564 8.039402 8.271726 7.977820 8.333309
## 2021.942      8.165335 8.049172 8.281497 7.987590 8.343079
## 2021.962      8.162480 8.046317 8.278642 7.984735 8.340224
## 2021.981      8.150077 8.033914 8.266239 7.972332 8.327821
## 2022.000      8.153662 8.037499 8.269824 7.975917 8.331406
## 2022.019      8.142154 8.025991 8.258316 7.964409 8.319898
## 2022.038      8.154161 8.038094 8.270227 7.976562 8.331759
## 2022.058      8.138294 8.022227 8.254361 7.960695 8.315892
## 2022.077      8.147688 8.031621 8.263755 7.970089 8.325286

```

### SBOO All: Imputed - Excluding External Variables (Forecasting PH)

```

# SBOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly03_train_tb03
# SBOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly03_test_tb03

owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                    PH)

owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        PH,
                        .frequency = "auto",
                        .trend = "auto")

m3v4_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly03_train_tb03,
                            tb_test = owt_df02_gb09_sboo_wkly03_test_tb03,
                            date = "date_sample",
                            param = "PH",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "PH ~ trend + season")

##               ME        RMSE       MAE       MPE       MAPE
## Training set 7.593386e-17 0.07816866 0.06033009 -0.009313191 0.7453154
## Test set     -1.079938e-01 0.15322399 0.12694409 -1.358164499 1.5867912
##               MASE      ACF1

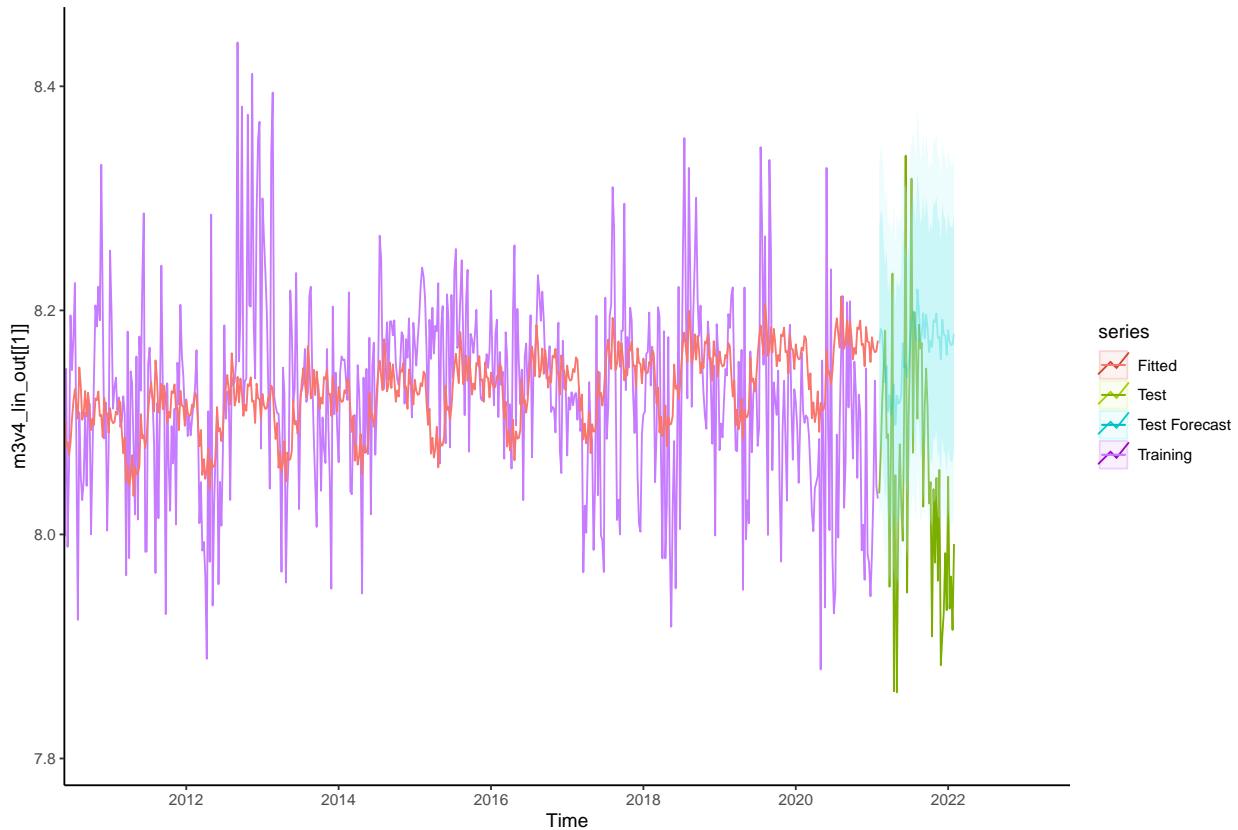
```

```

## Training set 0.9956236 0.4193761
## Test set      2.0949500      NA

autoplot(m3v4_lin_out[[1]], series = 'Training') +
  autolayer(m3v4_lin_out[[2]], series = 'Test') +
  autolayer(m3v4_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m3v4_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m3v4_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
## 8.0368835    0.0001217   -0.0103065   -0.0136633   -0.0129479   -0.0035307
##   season6      season7      season8      season9      season10     season11

```

```

## -0.0063173 0.0066232 0.0039769 -0.0213799 -0.0413630 -0.0270645
## season12 season13 season14 season15 season16 season17
## -0.0672929 -0.0532560 -0.0710262 -0.0631263 -0.0438243 -0.0801844
## season18 season19 season20 season21 season22 season23
## -0.0543537 -0.0611338 -0.0606209 -0.0535703 -0.0078879 -0.0297383
## season24 season25 season26 season27 season28 season29
## -0.0269168 -0.0386381 -0.0276928 -0.0067797 0.0094032 0.0198705
## season30 season31 season32 season33 season34 season35
## 0.0058349 -0.0066782 0.0388753 0.0223285 -0.0080427 -0.0024534
## season36 season37 season38 season39 season40 season41
## 0.0173590 -0.0054138 0.0155995 0.0023678 -0.0180221 -0.0080228
## season42 season43 season44 season45 season46 season47
## -0.0136630 0.0099554 0.0081485 0.0158650 -0.0061413 -0.0052233
## season48 season49 season50 season51 season52
## -0.0253460 0.0096940 -0.0036287 -0.0043141 -0.0220040
##
##
## Error measures:
## ME RMSE MAE MPE MAPE
## Training set 7.593386e-17 0.07816866 0.06033009 -0.009313191 0.7453154
## MASE ACF1
## Training set 0.7376559 0.4193761
##
## Forecasts:
## Point Forecast Lo 80 Hi 80 Lo 95 Hi 95
## 2021.096 8.170310 8.065223 8.275397 8.009513 8.331107
## 2021.115 8.183372 8.078286 8.288459 8.022575 8.344169
## 2021.135 8.180848 8.075761 8.285934 8.020051 8.341645
## 2021.154 8.155613 8.050526 8.260699 7.994815 8.316410
## 2021.173 8.135751 8.030664 8.240838 7.974954 8.296548
## 2021.192 8.150171 8.045085 8.255258 7.989374 8.310968
## 2021.212 8.110065 8.004978 8.215151 7.949268 8.270862
## 2021.231 8.124223 8.019137 8.229310 7.963426 8.285020
## 2021.250 8.106575 8.001488 8.211662 7.945778 8.267372
## 2021.269 8.114596 8.009510 8.219683 7.953799 8.275393
## 2021.288 8.134020 8.028934 8.239107 7.973223 8.294817
## 2021.308 8.097782 7.992695 8.202869 7.936985 8.258579
## 2021.327 8.123734 8.018648 8.228821 7.962937 8.284531
## 2021.346 8.117076 8.011989 8.222163 7.956279 8.277873
## 2021.365 8.117711 8.012624 8.222797 7.956914 8.278508
## 2021.385 8.124883 8.019796 8.229969 7.964086 8.285680
## 2021.404 8.170687 8.065600 8.275774 8.009890 8.331484
## 2021.423 8.148958 8.043872 8.254045 7.988161 8.309755
## 2021.442 8.151902 8.046815 8.256988 7.991104 8.312699
## 2021.462 8.140302 8.035215 8.245389 7.979505 8.301099
## 2021.481 8.151369 8.046282 8.256456 7.990572 8.312166
## 2021.500 8.172404 8.067317 8.277490 8.011607 8.333201
## 2021.519 8.188708 8.083622 8.293795 8.027911 8.349505
## 2021.538 8.199297 8.094211 8.304384 8.038500 8.360094
## 2021.558 8.185384 8.080297 8.290470 8.024587 8.346181
## 2021.577 8.172992 8.067906 8.278079 8.012195 8.333789
## 2021.596 8.218667 8.113581 8.323754 8.057870 8.379464
## 2021.615 8.202242 8.097156 8.307329 8.041445 8.363039
## 2021.635 8.171993 8.066906 8.277080 8.011196 8.332790

```

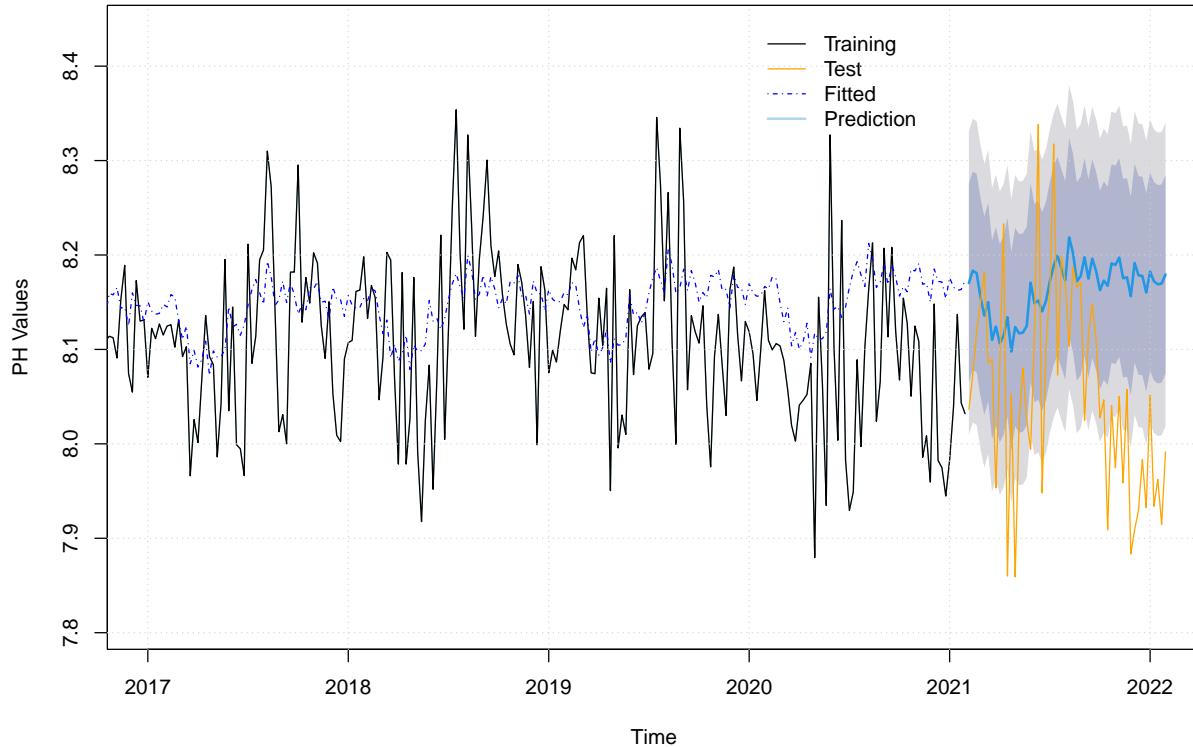
```

## 2021.654      8.177704 8.072617 8.282791 8.016907 8.338501
## 2021.673      8.197638 8.092551 8.302725 8.036841 8.358435
## 2021.692      8.174987 8.069900 8.280074 8.014190 8.335784
## 2021.712      8.196122 8.091035 8.301209 8.035325 8.356919
## 2021.731      8.183012 8.077925 8.288099 8.022215 8.343809
## 2021.750      8.162744 8.057657 8.267831 8.001947 8.323541
## 2021.769      8.172865 8.067778 8.277952 8.012068 8.333662
## 2021.788      8.167346 8.062260 8.272433 8.006549 8.328143
## 2021.808      8.191087 8.086000 8.296173 8.030290 8.351884
## 2021.827      8.189401 8.084315 8.294488 8.028604 8.350198
## 2021.846      8.197240 8.092153 8.302326 8.036443 8.358037
## 2021.865      8.175355 8.070268 8.280442 8.014558 8.336152
## 2021.885      8.176395 8.071308 8.281481 8.015598 8.337192
## 2021.904      8.156394 8.051307 8.261480 7.995597 8.317191
## 2021.923      8.191555 8.086469 8.296642 8.030758 8.352353
## 2021.942      8.178355 8.073268 8.283441 8.017558 8.339152
## 2021.962      8.177791 8.072704 8.282878 8.016994 8.338588
## 2021.981      8.160223 8.055136 8.265309 7.999426 8.321020
## 2022.000      8.182348 8.077262 8.287435 8.021551 8.343145
## 2022.019      8.172164 8.067077 8.277250 8.011367 8.332961
## 2022.038      8.168929 8.063928 8.273929 8.008264 8.329593
## 2022.058      8.169766 8.064765 8.274766 8.009101 8.330431
## 2022.077      8.179305 8.074304 8.284305 8.018640 8.339969

plot(m3v4_lin_out[[3]],
      xlim = c(2017, 2022.05),
      ylim = c(7.8, 8.4),
      xlab = "Time",
      ylab = "PH Values",
      main = "Predicted PH Levels Over Time - SB00",
      col = "light blue")
lines(m3v4_lin_out[[1]], lty=1, col="black")
lines(m3v4_lin_out[[2]], lty=1, col="orange")
lines(m3v4_lin_out[[3]]$fitted, lty=4, col="blue")
legend(2020, 8.45,
       c("Training", "Test", "Fitted", "Prediction"),
       lty = c(1,1,4,1),
       lwd = c(1,1,1,2),
       col = c("black", "orange", "blue", "light blue"),
       bty = "n")
grid()

```

### Predicted PH Levels Over Time – SBOO



#### SBOO Excluding Outliers: Imputed - Excluding External Variables (Forecasting PH)

```
# SBOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly02_train_tb03
# SBOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly02_test_tb03

owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
    PH)

owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
    PH,
    .frequency = "auto",
    .trend = "auto")

m4v4_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly02_train_tb03,
  tb_test = owt_df02_gb09_sboo_wkly02_test_tb03,
  date = "date_sample",
  param = "PH",
  ext_pred = c(),
  train_start = c(1999, lubridate::isoweek(ymd(train_start))),
  test_start = c(2021, 6),
  freq = 52,
```

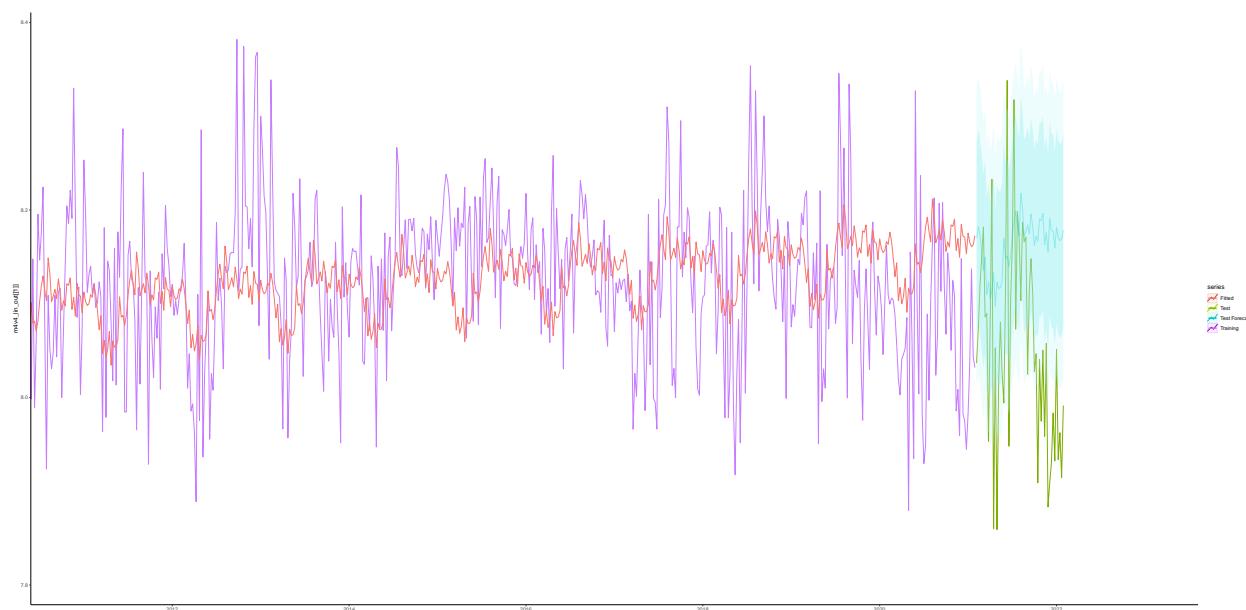
```

          h = 52,
          formula = "PH ~ trend + season")

##               ME        RMSE       MAE       MPE       MAPE
## Training set 5.344694e-17 0.07678678 0.05975517 -0.008998726 0.7384776
## Test set     -1.067714e-01 0.15220261 0.12592061 -1.342966486 1.5740041
##             MASE      ACF1
## Training set 1.002478 0.4212881
## Test set     2.112497      NA

autoplot(m4v4_lin_out[[1]], series = 'Training') +
  autolayer(m4v4_lin_out[[2]], series = 'Test') +
  autolayer(m4v4_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m4v4_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m4v4_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
##   8.0374475    0.0001208   -0.0103021   -0.0147150   -0.0130777   -0.0034082
##   season6      season7      season8      season9      season10     season11
##  -0.0063599    0.0064637   -0.0035562   -0.0212836   -0.0413245   -0.0267645
##   season12     season13     season14     season15     season16     season17

```

```

## -0.0671798 -0.0532200 -0.0709409 -0.0631672 -0.0439279 -0.0801473
## season18 season19 season20 season21 season22 season23
## -0.0544994 -0.0612175 -0.0606101 -0.0535892 -0.0078435 -0.0296446
## season24 season25 season26 season27 season28 season29
## -0.0278384 -0.0385905 -0.0276332 -0.0067601 0.0094043 0.0198998
## season30 season31 season32 season33 season34 season35
## 0.0043485 -0.0067627 0.0387892 0.0223371 -0.0080748 -0.0023578
## season36 season37 season38 season39 season40 season41
## 0.0045422 -0.0053459 0.0156831 0.0024328 -0.0180544 -0.0080202
## season42 season43 season44 season45 season46 season47
## -0.0136544 0.0098567 0.0081359 0.0158884 -0.0177065 -0.0052211
## season48 season49 season50 season51 season52
## -0.0252353 0.0095988 -0.0030570 -0.0042321 -0.0220436
##
##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE
## Training set 5.344694e-17 0.07678678 0.05975517 -0.008998726 0.7384776
##                  MASE      ACF1
## Training set 0.7410219 0.4212881
##
## Forecasts:
##       Point Forecast   Lo 80    Hi 80    Lo 95    Hi 95
## 2021.096     8.169729 8.066500 8.272958 8.011775 8.327684
## 2021.115     8.182674 8.079445 8.285903 8.024719 8.340628
## 2021.135     8.172775 8.069546 8.276003 8.014820 8.330729
## 2021.154     8.155168 8.051939 8.258397 7.997214 8.313122
## 2021.173     8.135248 8.032019 8.238477 7.977293 8.293202
## 2021.192     8.149929 8.046700 8.253157 7.991974 8.307883
## 2021.212     8.109634 8.006405 8.212863 7.951680 8.267588
## 2021.231     8.123715 8.020486 8.226944 7.965760 8.281669
## 2021.250     8.106115 8.002886 8.209343 7.948160 8.264069
## 2021.269     8.114009 8.010780 8.217238 7.956054 8.271963
## 2021.288     8.133369 8.030140 8.236598 7.975415 8.291323
## 2021.308     8.097270 7.994041 8.200499 7.939316 8.255225
## 2021.327     8.123039 8.019810 8.226268 7.965085 8.280993
## 2021.346     8.116442 8.013213 8.219671 7.958487 8.274396
## 2021.365     8.117170 8.013941 8.220399 7.959215 8.275124
## 2021.385     8.124312 8.021083 8.227540 7.966357 8.282266
## 2021.404     8.170178 8.066949 8.273407 8.012224 8.328132
## 2021.423     8.148498 8.045269 8.251727 7.990543 8.306452
## 2021.442     8.150425 8.047196 8.253654 7.992470 8.308379
## 2021.462     8.139793 8.036564 8.243022 7.981839 8.297748
## 2021.481     8.150871 8.047642 8.254100 7.992917 8.308826
## 2021.500     8.171865 8.068636 8.275094 8.013911 8.329820
## 2021.519     8.188150 8.084922 8.291379 8.030196 8.346105
## 2021.538     8.198767 8.095538 8.301996 8.040812 8.356721
## 2021.558     8.183336 8.080107 8.286565 8.025382 8.341291
## 2021.577     8.172346 8.069117 8.275575 8.014391 8.330300
## 2021.596     8.218018 8.114790 8.321247 8.060064 8.375973
## 2021.615     8.201687 8.098458 8.304916 8.043733 8.359641
## 2021.635     8.171396 8.068167 8.274625 8.013442 8.329350
## 2021.654     8.177234 8.074005 8.280463 8.019279 8.335188
## 2021.673     8.184254 8.081026 8.287483 8.026300 8.342209

```

```

## 2021.692      8.174487 8.071258 8.277716 8.016533 8.332442
## 2021.712      8.195637 8.092408 8.298866 8.037682 8.353591
## 2021.731      8.182507 8.079279 8.285736 8.024553 8.340462
## 2021.750      8.162141 8.058912 8.265370 8.004186 8.320095
## 2021.769      8.172296 8.069067 8.275525 8.014342 8.330250
## 2021.788      8.166782 8.063554 8.270011 8.008828 8.324737
## 2021.808      8.190414 8.087185 8.293643 8.032460 8.348369
## 2021.827      8.188814 8.085585 8.292043 8.030860 8.346769
## 2021.846      8.196688 8.093459 8.299917 8.038733 8.354642
## 2021.865      8.163214 8.059985 8.266442 8.005259 8.321168
## 2021.885      8.175820 8.072591 8.279049 8.017865 8.333774
## 2021.904      8.155926 8.052697 8.259155 7.997972 8.313881
## 2021.923      8.190881 8.087652 8.294110 8.032927 8.348835
## 2021.942      8.178346 8.075117 8.281575 8.020392 8.336301
## 2021.962      8.177292 8.074063 8.280521 8.019337 8.335246
## 2021.981      8.159601 8.056372 8.262830 8.001647 8.317555
## 2022.000      8.181765 8.078536 8.284994 8.023811 8.339720
## 2022.019      8.171584 8.068355 8.274813 8.013630 8.329538
## 2022.038      8.167292 8.064148 8.270436 8.009467 8.325116
## 2022.058      8.169050 8.065906 8.272194 8.011225 8.326875
## 2022.077      8.178840 8.075696 8.281984 8.021016 8.336665

```

---

### PLOO All: Imputed - Excluding External Variables (Forecasting SALINITY)

```

# PLOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly03_train_tb03
# PLOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly03_test_tb03

owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                    SALINITY)

owt_df02_gb09_ploo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        SALINITY,
                        .frequency = "auto",
                        .trend = "auto")

m1v5_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly03_train_tb03,
                            tb_test = owt_df02_gb09_ploo_wkly03_test_tb03,
                            date = "date_sample",
                            param = "SALINITY",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "SALINITY ~ trend + season")

##               ME        RMSE       MAE       MPE       MAPE       MASE
## Training set -1.858927e-17 0.1494234 0.11208469 -0.002000979 0.3348794 2.384824

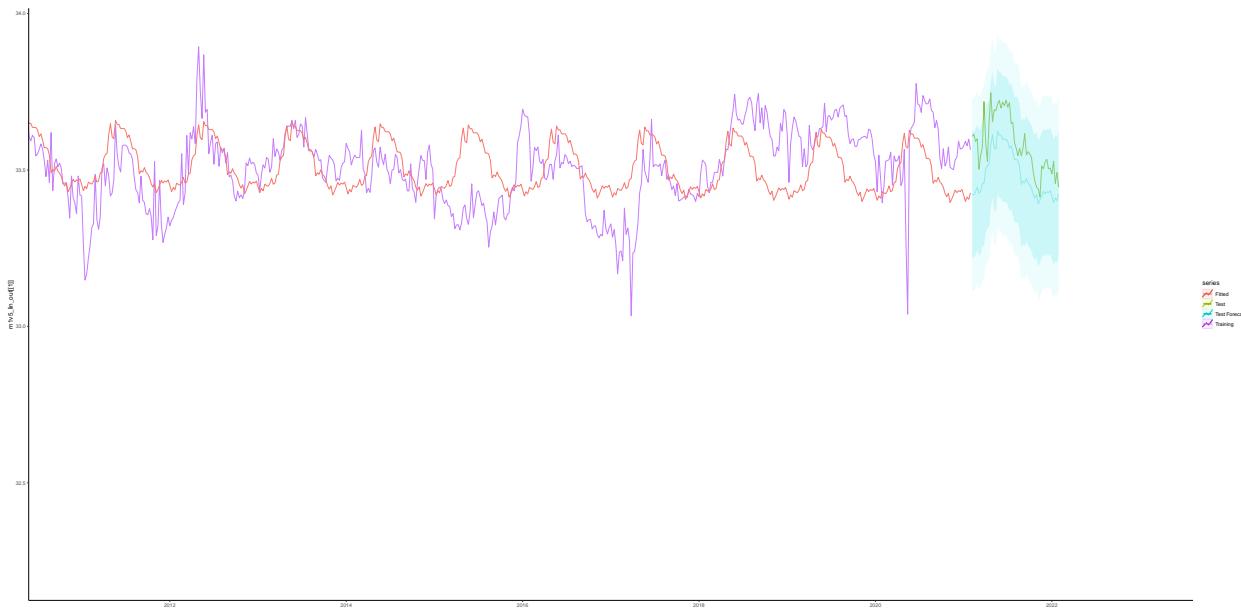
```

```

## Test set      9.563622e-02 0.1072698 0.09563622 0.284563198 0.2845632 2.034850
##          ACF1
## Training set 0.852831
## Test set      NA

autoplot(m1v5_lin_out[[1]], series = 'Training') +
  autolayer(m1v5_lin_out[[2]], series = 'Test') +
  autolayer(m1v5_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m1v5_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                  xlim = c(2011, 2023))

```



```
summary(m1v5_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
##   3.350e+01    -6.594e-05   -2.002e-02   -6.261e-03   -1.336e-02   7.450e-03
##   season6      season7      season8      season9      season10     season11
##   3.597e-03    1.405e-03   1.015e-02   2.636e-02   7.719e-03   1.171e-02
##   season12     season13     season14     season15     season16     season17
##   3.727e-02    3.966e-02   8.288e-02   9.583e-02   9.990e-02   1.622e-01
##   season18     season19     season20     season21     season22     season23
##   1.949e-01    1.530e-01   1.478e-01   2.052e-01   1.929e-01   1.929e-01
##   season24     season25     season26     season27     season28     season29
##   1.803e-01    1.799e-01   1.803e-01   1.726e-01   1.514e-01   1.596e-01

```

```

##    season30      season31      season32      season33      season34      season35
## 1.395e-01 1.156e-01 1.160e-01 1.130e-01 9.126e-02 3.638e-02
##    season36      season37      season38      season39      season40      season41
## 4.601e-02 4.128e-02 5.585e-02 4.119e-02 3.530e-02 2.417e-02
##    season42      season43      season44      season45      season46      season47
## 4.865e-03 -5.698e-03 4.897e-03 -2.422e-02 -1.326e-02 8.850e-04
##    season48      season49      season50      season51      season52
## 1.571e-02 7.648e-03 1.407e-02 1.089e-02 1.741e-02
##
##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -1.858927e-17 0.1494234 0.1120847 -0.002000979 0.3348794 0.9109584
##          ACF1
## Training set 0.852831
##
## Forecasts:
##             Point Forecast     Lo 80     Hi 80     Lo 95     Hi 95
## 2021.096      33.42302 33.22214 33.62390 33.11565 33.73039
## 2021.115      33.42077 33.21989 33.62164 33.11339 33.72814
## 2021.135      33.42944 33.22856 33.63032 33.12207 33.73681
## 2021.154      33.44559 33.24471 33.64647 33.13822 33.75296
## 2021.173      33.42688 33.22600 33.62776 33.11951 33.73425
## 2021.192      33.43081 33.22993 33.63169 33.12344 33.73818
## 2021.212      33.45630 33.25542 33.65718 33.14893 33.76367
## 2021.231      33.45863 33.25775 33.65951 33.15126 33.76600
## 2021.250      33.50178 33.30090 33.70266 33.19441 33.80915
## 2021.269      33.51466 33.31378 33.71554 33.20729 33.82203
## 2021.288      33.51867 33.31779 33.71955 33.21130 33.82604
## 2021.308      33.58090 33.38002 33.78178 33.27353 33.88827
## 2021.327      33.61351 33.41264 33.81439 33.30614 33.92089
## 2021.346      33.57152 33.37064 33.77240 33.26415 33.87889
## 2021.365      33.56633 33.36545 33.76721 33.25896 33.87370
## 2021.385      33.62365 33.42277 33.82453 33.31627 33.93102
## 2021.404      33.61126 33.41038 33.81214 33.30389 33.91863
## 2021.423      33.61125 33.41037 33.81213 33.30388 33.91862
## 2021.442      33.59852 33.39764 33.79940 33.29115 33.90589
## 2021.462      33.59807 33.39719 33.79894 33.29069 33.90544
## 2021.481      33.59845 33.39757 33.79933 33.29108 33.90582
## 2021.500      33.59068 33.38980 33.79156 33.28331 33.89805
## 2021.519      33.56942 33.36854 33.77030 33.26204 33.87679
## 2021.538      33.57752 33.37665 33.77840 33.27015 33.88490
## 2021.558      33.55736 33.35648 33.75823 33.24998 33.86473
## 2021.577      33.53334 33.33246 33.73422 33.22597 33.84071
## 2021.596      33.53376 33.33288 33.73464 33.22639 33.84113
## 2021.615      33.53062 33.32974 33.73150 33.22325 33.83799
## 2021.635      33.50884 33.30796 33.70972 33.20147 33.81621
## 2021.654      33.45389 33.25302 33.65477 33.14652 33.76127
## 2021.673      33.46346 33.26258 33.66434 33.15609 33.77083
## 2021.692      33.45866 33.25779 33.65954 33.15129 33.76604
## 2021.712      33.47316 33.27229 33.67404 33.16579 33.78054
## 2021.731      33.45844 33.25756 33.65932 33.15107 33.76581
## 2021.750      33.45248 33.25160 33.65336 33.14511 33.75985
## 2021.769      33.44129 33.24041 33.64217 33.13392 33.74866

```

```

## 2021.788      33.42192 33.22104 33.62280 33.11455 33.72929
## 2021.808      33.41129 33.21041 33.61217 33.10392 33.71866
## 2021.827      33.42182 33.22094 33.62270 33.11445 33.72919
## 2021.846      33.39264 33.19176 33.59352 33.08527 33.70001
## 2021.865      33.40353 33.20265 33.60441 33.09616 33.71090
## 2021.885      33.41761 33.21673 33.61849 33.11024 33.72498
## 2021.904      33.43236 33.23149 33.63324 33.12499 33.73974
## 2021.923      33.42424 33.22336 33.62512 33.11687 33.73161
## 2021.942      33.43060 33.22972 33.63148 33.12323 33.73797
## 2021.962      33.42735 33.22647 33.62823 33.11998 33.73472
## 2021.981      33.43381 33.23293 33.63468 33.12643 33.74118
## 2022.000      33.41633 33.21545 33.61721 33.10895 33.72370
## 2022.019      33.39624 33.19537 33.59712 33.08887 33.70362
## 2022.038      33.40993 33.20922 33.61065 33.10281 33.71705
## 2022.058      33.40277 33.20206 33.60348 33.09565 33.70989
## 2022.077      33.42351 33.22280 33.62423 33.11639 33.73063

```

### PLOO Excluding Outliers: Imputed - Excluding External Variables (Forecasting SALINITY)

```

# PLOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_ploo_wkly02_train_tb03
# PLOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_ploo_wkly02_test_tb03

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
    SALINITY)

owt_df02_gb09_ploo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
    SALINITY,
    .frequency = "auto",
    .trend = "auto")

m2v5_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_ploo_wkly02_train_tb03,
                            tb_test = owt_df02_gb09_ploo_wkly02_test_tb03,
                            date = "date_sample",
                            param = "SALINITY",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "SALINITY ~ trend + season")

##               ME        RMSE       MAE       MPE       MAPE       MASE
## Training set -6.123497e-18 0.1411693 0.1097105 -0.001780718 0.3276193 2.457331
## Test set      1.001722e-01 0.1115920 0.1001722  0.298067126 0.2980671 2.243689
##               ACF1
## Training set 0.895257
## Test set     NA

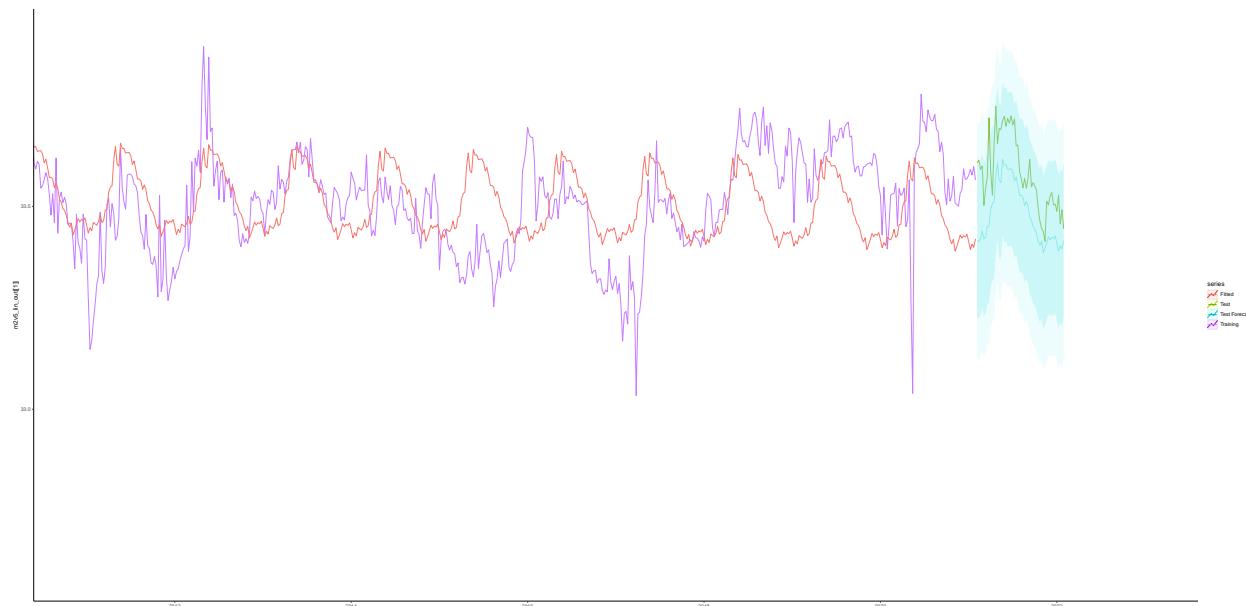
autoplot(m2v5_lin_out[[1]], series = 'Training') +
  autolayer(m2v5_lin_out[[2]], series = 'Test') +

```

```

autolayer(m2v5_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
autolayer(m2v5_lin_out[[3]]$fitted, series = 'Fitted') +
theme_classic() +
coord_cartesian(#ylim = c(-50, 400),
                xlim = c(2011, 2023))

```



```
summary(m2v5_lin_out[[3]])
```

```

##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend      season2      season3      season4      season5
## 3.350e+01 -7.796e-05 -1.979e-02 -6.683e-03 -1.418e-02 6.508e-03
## season6      season7      season8      season9      season10     season11
## 2.798e-03 -2.054e-05 8.974e-03 2.623e-02 6.913e-03 1.128e-02
## season12     season13     season14     season15     season16     season17
## 3.781e-02 3.921e-02 8.166e-02 9.437e-02 9.800e-02 1.613e-01
## season18     season19     season20     season21     season22     season23
## 1.951e-01 1.515e-01 1.466e-01 2.036e-01 1.900e-01 1.907e-01
## season24     season25     season26     season27     season28     season29
## 1.791e-01 1.803e-01 1.811e-01 1.730e-01 1.513e-01 1.601e-01
## season30     season31     season32     season33     season34     season35
## 1.393e-01 1.156e-01 1.160e-01 1.112e-01 9.031e-02 1.015e-01
## season36     season37     season38     season39     season40     season41
## 8.887e-02 6.267e-02 5.520e-02 3.976e-02 3.454e-02 2.305e-02
## season42     season43     season44     season45     season46     season47
## 3.562e-03 -6.290e-03 4.220e-03 -2.456e-02 -1.323e-02 2.904e-04

```

```

##      season48      season49      season50      season51      season52
## 1.502e-02 7.585e-03 1.373e-02 1.081e-02 1.744e-02
##
##
## Error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -6.123497e-18 0.1411693 0.1097105 -0.001780718 0.3276193 0.9324258
##          ACF1
## Training set 0.895257
##
## Forecasts:
##      Point Forecast    Lo 80     Hi 80    Lo 95     Hi 95
## 2021.096   33.41613 33.22635 33.60591 33.12574 33.70652
## 2021.115   33.41323 33.22345 33.60301 33.12284 33.70362
## 2021.135   33.42215 33.23237 33.61193 33.13176 33.71254
## 2021.154   33.43933 33.24954 33.62911 33.14893 33.72972
## 2021.173   33.41993 33.23015 33.60971 33.12954 33.71032
## 2021.192   33.42422 33.23444 33.61400 33.13383 33.71461
## 2021.212   33.45068 33.26090 33.64046 33.16028 33.74107
## 2021.231   33.45199 33.26221 33.64178 33.16160 33.74239
## 2021.250   33.49437 33.30459 33.68415 33.20398 33.78476
## 2021.269   33.50700 33.31721 33.69678 33.21660 33.79739
## 2021.288   33.51055 33.32077 33.70033 33.22016 33.80094
## 2021.308   33.57382 33.38403 33.76360 33.28342 33.86421
## 2021.327   33.60745 33.41767 33.79723 33.31706 33.89784
## 2021.346   33.56377 33.37399 33.75355 33.27338 33.85416
## 2021.365   33.55882 33.36904 33.74860 33.26843 33.84921
## 2021.385   33.61577 33.42598 33.80555 33.32537 33.90616
## 2021.404   33.60206 33.41227 33.79184 33.31166 33.89245
## 2021.423   33.60268 33.41290 33.79246 33.31229 33.89307
## 2021.442   33.59103 33.40125 33.78081 33.30064 33.88142
## 2021.462   33.59210 33.40232 33.78188 33.30171 33.88249
## 2021.481   33.59292 33.40314 33.78270 33.30253 33.88331
## 2021.500   33.58473 33.39495 33.77451 33.29434 33.87512
## 2021.519   33.56291 33.37313 33.75270 33.27252 33.85331
## 2021.538   33.57159 33.38181 33.76138 33.28120 33.86199
## 2021.558   33.55072 33.36094 33.74050 33.26033 33.84111
## 2021.577   33.52700 33.33722 33.71678 33.23661 33.81739
## 2021.596   33.52729 33.33751 33.71707 33.23690 33.81768
## 2021.615   33.52239 33.33260 33.71217 33.23199 33.81278
## 2021.635   33.50146 33.31167 33.69124 33.21106 33.79185
## 2021.654   33.51262 33.32284 33.70240 33.22223 33.80301
## 2021.673   33.49987 33.31008 33.68965 33.20947 33.79026
## 2021.692   33.47358 33.28380 33.66336 33.18319 33.76397
## 2021.712   33.46603 33.27625 33.65582 33.17564 33.75643
## 2021.731   33.45051 33.26073 33.64029 33.16012 33.74091
## 2021.750   33.44522 33.25543 33.63500 33.15482 33.73561
## 2021.769   33.43365 33.24387 33.62343 33.14326 33.72404
## 2021.788   33.41409 33.22430 33.60387 33.12369 33.70448
## 2021.808   33.40416 33.21437 33.59394 33.11376 33.69455
## 2021.827   33.41459 33.22481 33.60437 33.12419 33.70498
## 2021.846   33.38573 33.19595 33.57551 33.09534 33.67612
## 2021.865   33.39698 33.20719 33.58676 33.10658 33.68737
## 2021.885   33.41042 33.22064 33.60021 33.12003 33.70082

```

```

## 2021.904      33.42508 33.23529 33.61486 33.13468 33.71547
## 2021.923      33.41756 33.22778 33.60734 33.12717 33.70796
## 2021.942      33.42363 33.23385 33.61342 33.13324 33.71403
## 2021.962      33.42063 33.23085 33.61041 33.13024 33.71102
## 2021.981      33.42718 33.23740 33.61696 33.13679 33.71757
## 2022.000      33.40967 33.21988 33.59945 33.11927 33.70006
## 2022.019      33.38980 33.20002 33.57958 33.09941 33.68019
## 2022.038      33.40283 33.21320 33.59245 33.11267 33.69298
## 2022.058      33.39525 33.20563 33.58488 33.10510 33.68541
## 2022.077      33.41586 33.22624 33.60549 33.12571 33.70602

```

### SBOO All: Imputed - Excluding External Variables (Forecasting SALINITY)

```

# SBOO All: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly03_train_tb03
# SBOO All: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly03_test_tb03

owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_time_series(date_sample,
                    SALINITY)

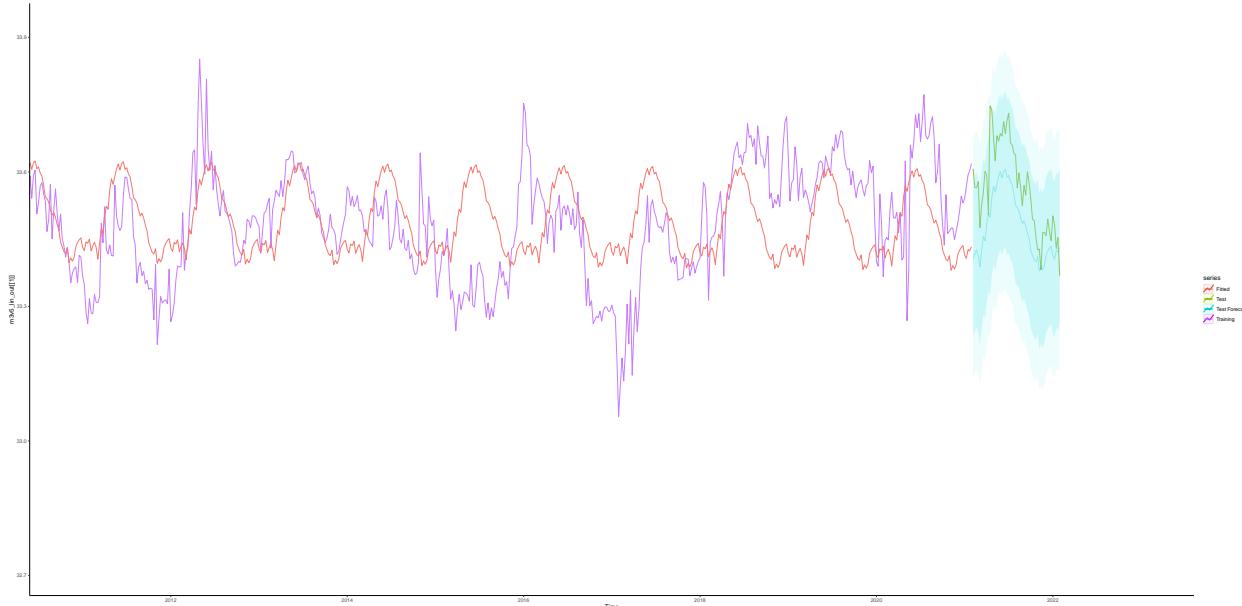
owt_df02_gb09_sboo_wkly03_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        SALINITY,
                        .frequency = "auto",
                        .trend = "auto")

m3v5_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly03_train_tb03,
                            tb_test = owt_df02_gb09_sboo_wkly03_test_tb03,
                            date = "date_sample",
                            param = "SALINITY",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "SALINITY ~ trend + season")

##               ME        RMSE       MAE        MPE       MAPE       MASE
## Training set -6.205923e-18 0.1289931 0.10160558 -0.001487309 0.3036048 2.764791
## Test set      8.702422e-02 0.1024643 0.08977283  0.258952595 0.2671888 2.442810
##               ACF1
## Training set 0.9099218
## Test set     NA

autoplot(m3v5_lin_out[[1]], series = 'Training') +
  autolayer(m3v5_lin_out[[2]], series = 'Test') +
  autolayer(m3v5_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m3v5_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m3v5_lin_out[[3]])
```

```
##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 3.345e+01 -3.326e-05 -7.255e-03 1.245e-02 9.157e-03 1.868e-02
##   season6    season7    season8    season9    season10   season11
## -7.978e-03 3.660e-03 1.141e-02 -4.467e-04 -2.599e-02 9.562e-03
##   season12   season13   season14   season15   season16   season17
## 4.175e-02 3.204e-02 7.053e-02 9.237e-02 8.538e-02 1.287e-01
##   season18   season19   season20   season21   season22   season23
## 1.536e-01 1.412e-01 1.592e-01 1.764e-01 1.867e-01 1.731e-01
##   season24   season25   season26   season27   season28   season29
## 1.875e-01 1.918e-01 1.747e-01 1.784e-01 1.647e-01 1.580e-01
##   season30   season31   season32   season33   season34   season35
## 1.375e-01 1.119e-01 1.076e-01 1.002e-01 8.406e-02 7.094e-02
##   season36   season37   season38   season39   season40   season41
## 7.706e-02 6.638e-02 5.009e-02 3.819e-02 1.112e-02 4.170e-04
##   season42   season43   season44   season45   season46   season47
## -9.674e-03 -1.335e-02 -1.778e-03 -3.414e-02 -2.373e-02 -3.116e-02
##   season48   season49   season50   season51   season52
## -2.158e-02 1.842e-03 1.049e-02 1.712e-02 2.109e-02
##
## Error measures:
##               ME        RMSE        MAE        MPE        MAPE        MASE
## Training set -6.205923e-18 0.1289931 0.1016056 -0.001487309 0.3036048 0.8655685
```

```

##          ACF1
## Training set 0.9099218
##
## Forecasts:
##           Point Forecast    Lo 80     Hi 80     Lo 95     Hi 95
## 2021.096      33.40632 33.23291 33.57974 33.14098 33.67167
## 2021.115      33.41793 33.24452 33.59134 33.15258 33.68327
## 2021.135      33.42565 33.25223 33.59906 33.16030 33.69099
## 2021.154      33.41375 33.24034 33.58717 33.14841 33.67910
## 2021.173      33.38818 33.21477 33.56159 33.12283 33.65353
## 2021.192      33.42370 33.25028 33.59711 33.15835 33.68904
## 2021.212      33.45586 33.28244 33.62927 33.19051 33.72120
## 2021.231      33.44611 33.27270 33.61952 33.18076 33.71145
## 2021.250      33.48456 33.31115 33.65798 33.21922 33.74991
## 2021.269      33.50638 33.33296 33.67979 33.24103 33.77172
## 2021.288      33.49935 33.32594 33.67276 33.23400 33.76469
## 2021.308      33.54267 33.36925 33.71608 33.27732 33.80801
## 2021.327      33.56751 33.39410 33.74092 33.30216 33.83286
## 2021.346      33.55503 33.38162 33.72844 33.28968 33.82037
## 2021.365      33.57301 33.39960 33.74643 33.30767 33.83836
## 2021.385      33.59018 33.41676 33.76359 33.32483 33.85552
## 2021.404      33.60043 33.42702 33.77384 33.33508 33.86577
## 2021.423      33.58688 33.41347 33.76029 33.32153 33.85223
## 2021.442      33.60118 33.42776 33.77459 33.33583 33.86652
## 2021.462      33.60542 33.43201 33.77884 33.34008 33.87077
## 2021.481      33.58835 33.41493 33.76176 33.32300 33.85369
## 2021.500      33.59204 33.41862 33.76545 33.32669 33.85738
## 2021.519      33.57832 33.40490 33.75173 33.31297 33.84366
## 2021.538      33.57157 33.39816 33.74498 33.30623 33.83692
## 2021.558      33.55098 33.37757 33.72439 33.28564 33.81633
## 2021.577      33.52537 33.35196 33.69879 33.26003 33.79072
## 2021.596      33.52099 33.34757 33.69440 33.25564 33.78633
## 2021.615      33.51361 33.34020 33.68702 33.24827 33.77896
## 2021.635      33.49743 33.32401 33.67084 33.23208 33.76277
## 2021.654      33.48427 33.31086 33.65769 33.21893 33.74962
## 2021.673      33.49036 33.31695 33.66378 33.22502 33.75571
## 2021.692      33.47965 33.30623 33.65306 33.21430 33.74499
## 2021.712      33.46333 33.28992 33.63674 33.19798 33.72868
## 2021.731      33.45140 33.27798 33.62481 33.18605 33.71674
## 2021.750      33.42429 33.25088 33.59771 33.15895 33.68964
## 2021.769      33.41355 33.24014 33.58697 33.14821 33.67890
## 2021.788      33.40343 33.23002 33.57684 33.13808 33.66878
## 2021.808      33.39972 33.22631 33.57313 33.13437 33.66506
## 2021.827      33.41126 33.23785 33.58467 33.14591 33.67660
## 2021.846      33.37886 33.20545 33.55227 33.11352 33.64421
## 2021.865      33.38924 33.21582 33.56265 33.12389 33.65458
## 2021.885      33.38178 33.20837 33.55519 33.11643 33.64712
## 2021.904      33.39132 33.21791 33.56474 33.12598 33.65667
## 2021.923      33.41471 33.24130 33.58813 33.14937 33.68006
## 2021.942      33.42333 33.24991 33.59674 33.15798 33.68867
## 2021.962      33.42993 33.25651 33.60334 33.16458 33.69527
## 2021.981      33.43387 33.26045 33.60728 33.16852 33.69921
## 2022.000      33.41274 33.23932 33.58615 33.14739 33.67808
## 2022.019      33.40545 33.23204 33.57886 33.14010 33.67079

```

```

## 2022.038      33.42512 33.25185 33.59839 33.15999 33.69025
## 2022.058      33.42180 33.24852 33.59507 33.15667 33.68692
## 2022.077      33.43128 33.25801 33.60455 33.16615 33.69641

```

### SBOO Excluding Outliers: Imputed - Excluding External Variables (Forecasting SALINITY)

```

# SBOO Excluding Outliers: Imputed - Training partition (01/18/1999-01/04/2021)
#owt_df02_gb09_sboo_wkly02_train_tb03
# SBOO Excluding Outliers: Imputed - Test partition (01/11/2021-01/03/2022)
#owt_df02_gb09_sboo_wkly02_test_tb03

owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_time_series(date_sample,
                    SALINITY)

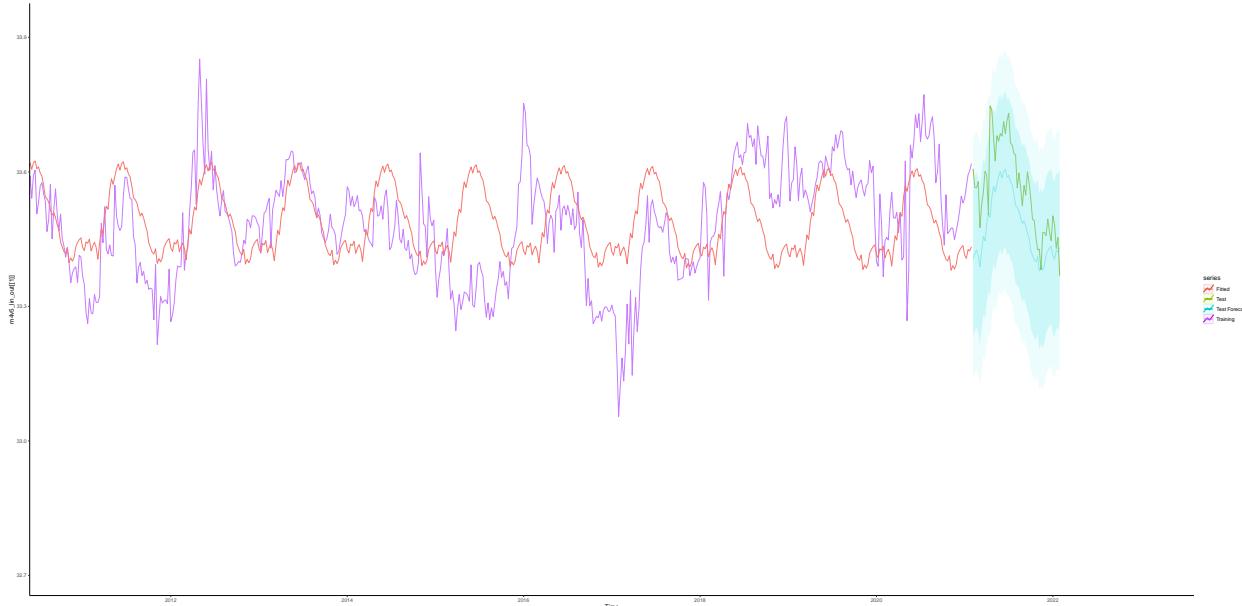
owt_df02_gb09_sboo_wkly02_train_tb03 %>%
  plot_stl_diagnostics(date_sample,
                        SALINITY,
                        .frequency = "auto",
                        .trend = "auto")

m4v5_lin_out <- lr_ts_mod(tb_train = owt_df02_gb09_sboo_wkly02_train_tb03,
                            tb_test = owt_df02_gb09_sboo_wkly02_test_tb03,
                            date = "date_sample",
                            param = "SALINITY",
                            ext_pred = c(),
                            train_start = c(1999, lubridate::isoweek(ymd(train_start))),
                            test_start = c(2021, 6),
                            freq = 52,
                            h = 52,
                            formula = "SALINITY ~ trend + season")

##               ME        RMSE       MAE        MPE       MAPE       MASE
## Training set -6.205923e-18 0.1289931 0.10160558 -0.001487309 0.3036048 2.764791
## Test set      8.702422e-02 0.1024643 0.08977283  0.258952595 0.2671888 2.442810
##               ACF1
## Training set 0.9099218
## Test set     NA

autoplot(m4v5_lin_out[[1]], series = 'Training') +
  autolayer(m4v5_lin_out[[2]], series = 'Test') +
  autolayer(m4v5_lin_out[[3]], series = 'Test Forecast', alpha = .3) +
  autolayer(m4v5_lin_out[[3]]$fitted, series = 'Fitted') +
  theme_classic() +
  coord_cartesian(#ylim = c(-50, 400),
                 xlim = c(2011, 2023))

```



```
summary(m4v5_lin_out[[3]])
```

```
##
## Forecast method: Linear regression model
##
## Model Information:
##
## Call:
## tslm(formula = as.formula(formula), data = train_ts01)
##
## Coefficients:
## (Intercept)      trend    season2    season3    season4    season5
## 3.345e+01 -3.326e-05 -7.255e-03 1.245e-02 9.157e-03 1.868e-02
##   season6    season7    season8    season9    season10   season11
## -7.978e-03 3.660e-03 1.141e-02 -4.467e-04 -2.599e-02 9.562e-03
##   season12   season13   season14   season15   season16   season17
## 4.175e-02 3.204e-02 7.053e-02 9.237e-02 8.538e-02 1.287e-01
##   season18   season19   season20   season21   season22   season23
## 1.536e-01 1.412e-01 1.592e-01 1.764e-01 1.867e-01 1.731e-01
##   season24   season25   season26   season27   season28   season29
## 1.875e-01 1.918e-01 1.747e-01 1.784e-01 1.647e-01 1.580e-01
##   season30   season31   season32   season33   season34   season35
## 1.375e-01 1.119e-01 1.076e-01 1.002e-01 8.406e-02 7.094e-02
##   season36   season37   season38   season39   season40   season41
## 7.706e-02 6.638e-02 5.009e-02 3.819e-02 1.112e-02 4.170e-04
##   season42   season43   season44   season45   season46   season47
## -9.674e-03 -1.335e-02 -1.778e-03 -3.414e-02 -2.373e-02 -3.116e-02
##   season48   season49   season50   season51   season52
## -2.158e-02 1.842e-03 1.049e-02 1.712e-02 2.109e-02
##
## Error measures:
##               ME        RMSE        MAE        MPE        MAPE        MASE
## Training set -6.205923e-18 0.1289931 0.1016056 -0.001487309 0.3036048 0.8655685
```

```

##          ACF1
## Training set 0.9099218
##
## Forecasts:
##           Point Forecast    Lo 80     Hi 80     Lo 95     Hi 95
## 2021.096      33.40632 33.23291 33.57974 33.14098 33.67167
## 2021.115      33.41793 33.24452 33.59134 33.15258 33.68327
## 2021.135      33.42565 33.25223 33.59906 33.16030 33.69099
## 2021.154      33.41375 33.24034 33.58717 33.14841 33.67910
## 2021.173      33.38818 33.21477 33.56159 33.12283 33.65353
## 2021.192      33.42370 33.25028 33.59711 33.15835 33.68904
## 2021.212      33.45586 33.28244 33.62927 33.19051 33.72120
## 2021.231      33.44611 33.27270 33.61952 33.18076 33.71145
## 2021.250      33.48456 33.31115 33.65798 33.21922 33.74991
## 2021.269      33.50638 33.33296 33.67979 33.24103 33.77172
## 2021.288      33.49935 33.32594 33.67276 33.23400 33.76469
## 2021.308      33.54267 33.36925 33.71608 33.27732 33.80801
## 2021.327      33.56751 33.39410 33.74092 33.30216 33.83286
## 2021.346      33.55503 33.38162 33.72844 33.28968 33.82037
## 2021.365      33.57301 33.39960 33.74643 33.30767 33.83836
## 2021.385      33.59018 33.41676 33.76359 33.32483 33.85552
## 2021.404      33.60043 33.42702 33.77384 33.33508 33.86577
## 2021.423      33.58688 33.41347 33.76029 33.32153 33.85223
## 2021.442      33.60118 33.42776 33.77459 33.33583 33.86652
## 2021.462      33.60542 33.43201 33.77884 33.34008 33.87077
## 2021.481      33.58835 33.41493 33.76176 33.32300 33.85369
## 2021.500      33.59204 33.41862 33.76545 33.32669 33.85738
## 2021.519      33.57832 33.40490 33.75173 33.31297 33.84366
## 2021.538      33.57157 33.39816 33.74498 33.30623 33.83692
## 2021.558      33.55098 33.37757 33.72439 33.28564 33.81633
## 2021.577      33.52537 33.35196 33.69879 33.26003 33.79072
## 2021.596      33.52099 33.34757 33.69440 33.25564 33.78633
## 2021.615      33.51361 33.34020 33.68702 33.24827 33.77896
## 2021.635      33.49743 33.32401 33.67084 33.23208 33.76277
## 2021.654      33.48427 33.31086 33.65769 33.21893 33.74962
## 2021.673      33.49036 33.31695 33.66378 33.22502 33.75571
## 2021.692      33.47965 33.30623 33.65306 33.21430 33.74499
## 2021.712      33.46333 33.28992 33.63674 33.19798 33.72868
## 2021.731      33.45140 33.27798 33.62481 33.18605 33.71674
## 2021.750      33.42429 33.25088 33.59771 33.15895 33.68964
## 2021.769      33.41355 33.24014 33.58697 33.14821 33.67890
## 2021.788      33.40343 33.23002 33.57684 33.13808 33.66878
## 2021.808      33.39972 33.22631 33.57313 33.13437 33.66506
## 2021.827      33.41126 33.23785 33.58467 33.14591 33.67660
## 2021.846      33.37886 33.20545 33.55227 33.11352 33.64421
## 2021.865      33.38924 33.21582 33.56265 33.12389 33.65458
## 2021.885      33.38178 33.20837 33.55519 33.11643 33.64712
## 2021.904      33.39132 33.21791 33.56474 33.12598 33.65667
## 2021.923      33.41471 33.24130 33.58813 33.14937 33.68006
## 2021.942      33.42333 33.24991 33.59674 33.15798 33.68867
## 2021.962      33.42993 33.25651 33.60334 33.16458 33.69527
## 2021.981      33.43387 33.26045 33.60728 33.16852 33.69921
## 2022.000      33.41274 33.23932 33.58615 33.14739 33.67808
## 2022.019      33.40545 33.23204 33.57886 33.14010 33.67079

```

```

## 2022.038      33.42512 33.25185 33.59839 33.15999 33.69025
## 2022.058      33.42180 33.24852 33.59507 33.15667 33.68692
## 2022.077      33.43128 33.25801 33.60455 33.16615 33.69641

```

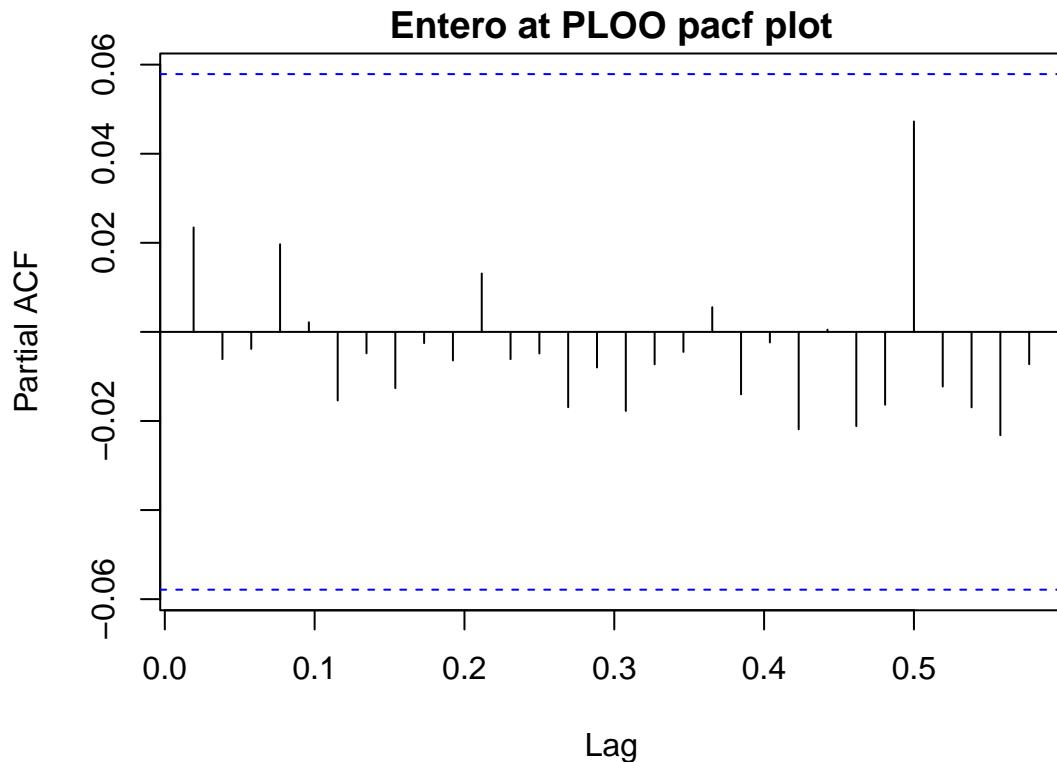
## ARIMA Modeling

```

# PLOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
# owt_df02_gb09_ploo_wkly02_train_tb03 (imputed w/out outliers set)
gb09_ploo_wkly02_train_ts01_ent01 <- ts(owt_df02_gb09_ploo_wkly02_train_tb03$ENTERO,
                                         start = c(1999, 3),
                                         freq = 52)
# PLOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
# owt_df02_gb09_ploo_wkly02_test_tb03$ENTERO

# pacf plot of entero (ploo)
par(mar=c(5, 4, 0, 2)+1.5)
pacf(gb09_ploo_wkly02_train_ts01_ent01)
title("Enter at PLOO pacf plot")

```



## ARIMA of only entero on PLOO data

```

# The plot shows no lines exceeding the boundaries so ar=p=0
# we aren't doing any differences so d=0
# From acf PLOO plot previously done, there are 3 or 4 leaving boundary so q= 3 or 4
# No seasonality (previous PLOO time series graph)

```

```

gb09_ploo_wkly03_train_ts01_ent01 <- ts(owt_df02_gb09_ploo_wkly03_train_tb02$ENTERO,
                                         start = c(1999, 3),
                                         freq = 52)
# calling arima function
arima_entero_ploo_q3 <- arima(gb09_ploo_wkly03_train_ts01_ent01, order= c(0, 0, 3))
summary(arima_entero_ploo_q3)

##
## Call:
## arima(x = gb09_ploo_wkly03_train_ts01_ent01, order = c(0, 0, 3))
##
## Coefficients:
##             ma1      ma2      ma3  intercept
##             0.0214 -0.0054 -0.0052    21.4321
## s.e.   0.0296  0.0290  0.0301     3.0887
##
## sigma^2 estimated as 10510:  log likelihood = -6805.09,  aic = 13620.17
##
## Training set error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.003363843 102.5163 27.91931 -424.0505 436.7107 0.8360876
## ACF1
## Training set 0.0002646514

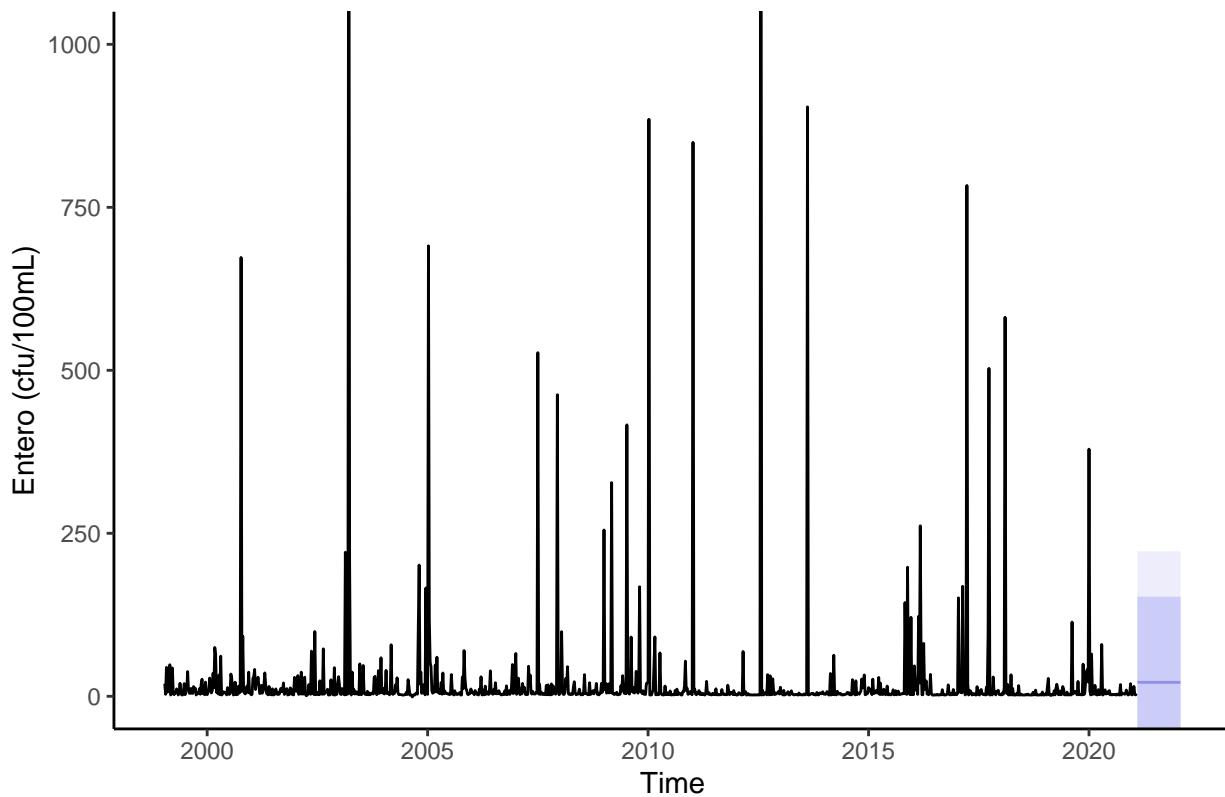
# saving training rmse value
arima_entero_ploo_q3_train_rmse <- 102.5163

# making forecasts and saving them
arima_entero_ploo_q3_forecast <- forecast(arima_entero_ploo_q3, h=52)

#
# getting plot ready
autoplot(gb09_ploo_wkly02_train_ts01_ent01,
         main = "ARIMA(0,0,3) for only Entero at PL00",
         ylab = "Entero (cfu/100mL)") +
  autolayer(arima_entero_ploo_q3_forecast, alpha=.3) +
  coord_cartesian(xlim=c(2015, 2025)) +
  coord_cartesian(ylim=c(0, 1000)) +
  theme_classic()

```

### ARIMA(0,0,3) for only Enteroto at PLOO



```
# calling arima function
arima_entero_ploo_q4 <- arima(gb09_ploo_wkly03_train_ts01_ent01, order= c(0, 0, 4))

summary(arima_entero_ploo_q4)

##
## Call:
## arima(x = gb09_ploo_wkly03_train_ts01_ent01, order = c(0, 0, 4))
##
## Coefficients:
##             ma1      ma2      ma3      ma4  intercept
##             0.0211 -0.0048 -0.0044  0.0214   21.4330
## s.e.    0.0296  0.0296  0.0301  0.0308    3.1552
##
## sigma^2 estimated as 10505:  log likelihood = -6804.84,  aic = 13621.69
##
## Training set error measures:
##              ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.005557505 102.4938 27.90147 -422.6641 435.3383 0.8355533
##                  ACF1
## Training set 0.0004429775

# saving training rmse value
arima_entero_ploo_q4_train_rmse <- 102.4938

# making forecasts and saving them
```

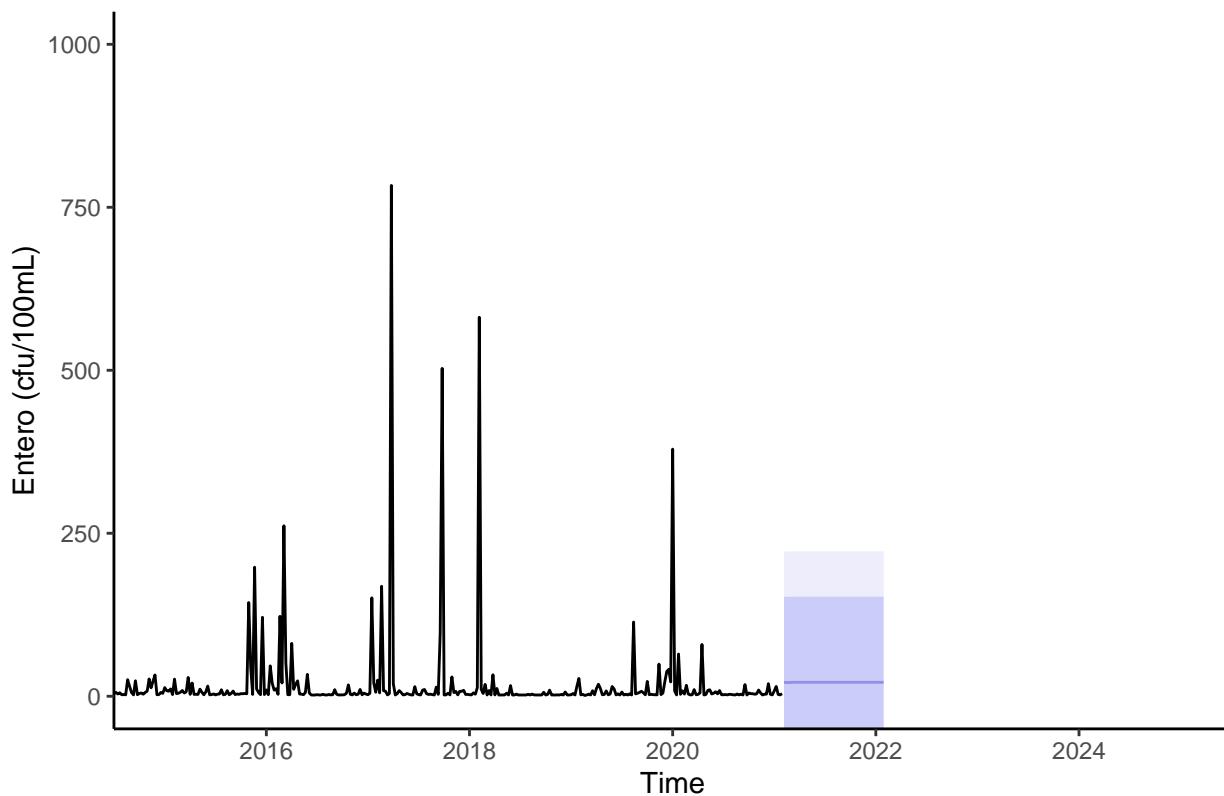
```

arima_entero_ploo_q4_forecast <- forecast(arima_entero_ploo_q4, h=52)

# getting plot ready
autoplot(gb09_ploo_wkly02_train_ts01_ent01,
         main = "ARIMA(0,0,4) for only Entero at PLOO",
         ylab = "Entero (cfu/100mL)") +
  autolayer(arima_entero_ploo_q4_forecast, alpha=.3) +
  coord_cartesian(xlim=c(2015, 2025),
                  ylim=c(0, 1000)) +
  theme_classic()

```

ARIMA(0,0,4) for only Entero at PLOO



```

print(paste("ARIMA(0,0,3) RMSE of ", arima_entero_ploo_q3_train_rmse))

## [1] "ARIMA(0,0,3) RMSE of 102.5163"

print(paste("ARIMA(0,0,4) RMSE of ", arima_entero_ploo_q4_train_rmse))

## [1] "ARIMA(0,0,4) RMSE of 102.4938"

# the RMSE values are very close (they both round to 102.5) so going with simpler one
# (q=3)

# looking at performance of the better (lower RMSE train) or ARIMA(0,0,3)
arima_entero_ploo_acc <- accuracy(arima_entero_ploo_q3_forecast,
                                    owt_df02_gb09_ploo_wkly02_test_tb03$ENTERO)

```

```
arima_entero_ploo_acc
```

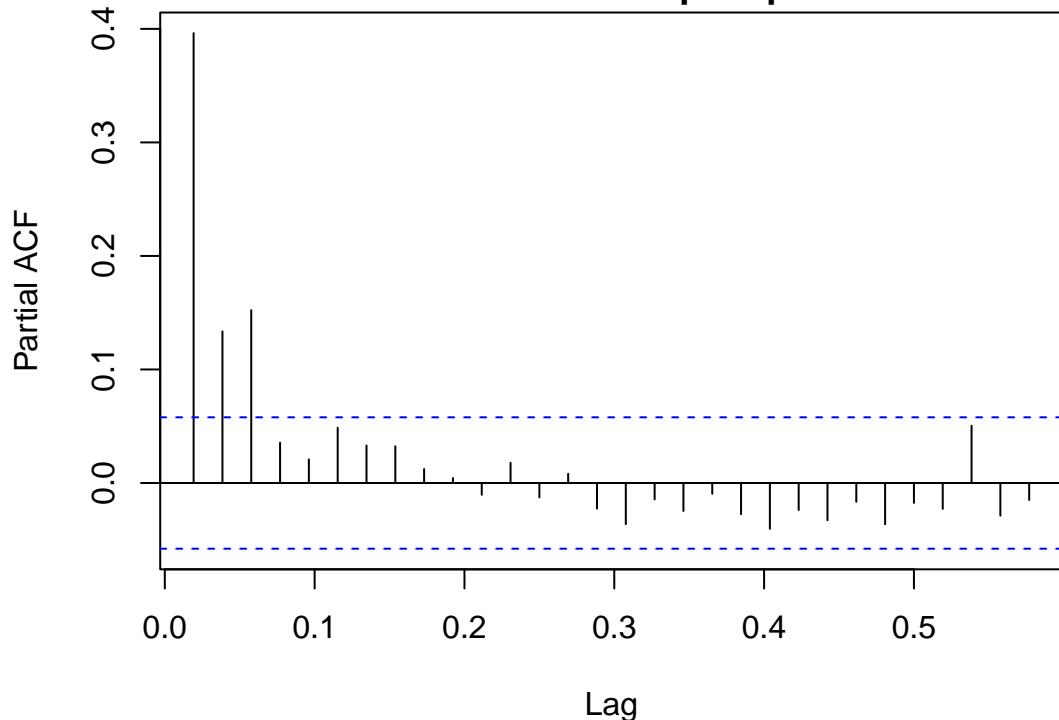
```
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.003363843 102.51625 27.91931 -424.0505 436.7107 0.8360876
## Test set     -14.377836809 19.72948 18.07501 -569.9495 576.5190 0.5412846
##                   ACF1
## Training set 0.0002646514
## Test set      NA
```

### ARIMA of only entero on SBOO data

```
# SBOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
# owt_df02_gb09_sboo_wkly02_train_tb03
gb09_sboo_wkly02_train_ts01_ent01 <- ts(owt_df02_gb09_sboo_wkly02_train_tb03$ENTERO,
                                         start = c(1999, 3),
                                         freq = 52)
# SBOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
# owt_df02_gb09_sboo_wkly02_test_tb03

# pacf plot of entero (ploo)
par(mar=c(5, 4, 0, 2)+1.5)
pacf(gb09_sboo_wkly02_train_ts01_ent01)
title("Enter at SBOO pacf plot")
```

Enter at SBOO pacf plot



```

# based on pacf plot with 1 set out of bounds, p=1
# no differencing done so d=0
# based on the acf plot with 2 or 3 sets out of bound, q=2 or 3
# seasonality in time series plot so need second set
# P= seasonal AR= 0 since only out of bounds at beginning
# D=0 (still no differencing)
# Q= Seasonal MA (looking at year points on acf): repeated spikes corresponding to year
# ahead
# therefore Q=1

# calling arima model for sboo
arima_entero_sboo_q2 <- arima(gb09_sboo_wkly02_train_ts01_ent01,
                               order = c(1, 0, 2),
                               seasonal = c(0, 0, 1))
summary(arima_entero_sboo_q2)

##
## Call:
## arima(x = gb09_sboo_wkly02_train_ts01_ent01, order = c(1, 0, 2), seasonal = c(0,
##       0, 1))
##
## Coefficients:
##             ar1      ma1      ma2      sma1  intercept
##             0.8706 -0.5585 -0.0937  0.0577   141.4872
## s.e.    0.0344  0.0460  0.0365  0.0311   25.3017
##
## sigma^2 estimated as 92009:  log likelihood = -8182.65,  aic = 16377.31
##
## Training set error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set 0.05817302 303.3306 160.5064 -1082.045 1104.841 0.993147
## ACF1
## Training set -0.002314864

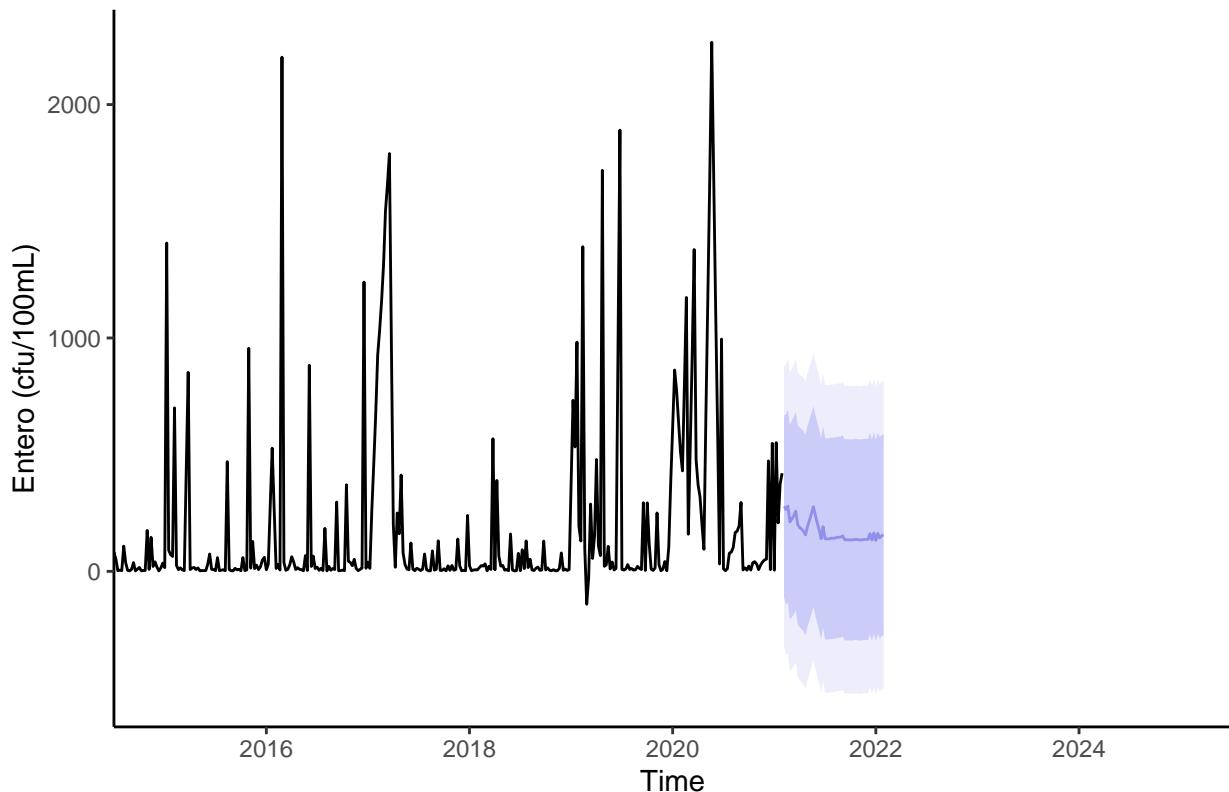
# saving training rmse value
arima_entero_sboo_q2_train_rmse <- sqrt(mean(arima_entero_sboo_q2$residuals^2))

# making forecasts and saving them
arima_entero_sboo_q2_forecast <- forecast(arima_entero_sboo_q2, h=52)

# getting plot ready
autoplot(gb09_sboo_wkly02_train_ts01_ent01,
          main = "ARIMA(1,0,2)(0,0,1) for only Enteroto at SBOO",
          ylab = "Enteroto (cfu/100mL)") +
  autolayer(arima_entero_sboo_q2_forecast, alpha=.3) +
  coord_cartesian(xlim=c(2015, 2025)) +
  theme_classic()

```

### ARIMA(1,0,2)(0,0,1) for only Enteroto at SBOO



```
# calling arima model for sboo with q=3
arima_entero_sboo_q3 <- arima(gb09_sboo_wkly02_train_ts01_ent01,
                               order = c(1, 0, 3),
                               seasonal = c(0, 0, 1))
summary(arima_entero_sboo_q3)

##
## Call:
## arima(x = gb09_sboo_wkly02_train_ts01_ent01, order = c(1, 0, 3), seasonal = c(0,
##       0, 1))
##
## Coefficients:
##             ar1      ma1      ma2      ma3     sma1  intercept
##             0.8487 -0.5364 -0.1022  0.0339  0.0539   141.7728
## s.e.    0.0482  0.0574  0.0387  0.0330  0.0315    24.5176
##
## sigma^2 estimated as 91923:  log likelihood = -8182.11,  aic = 16378.22
##
## Training set error measures:
##                  ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.0849465 303.1888 160.6197 -1082.38 1105.38 0.993848
##                  ACF1
## Training set -0.001032968

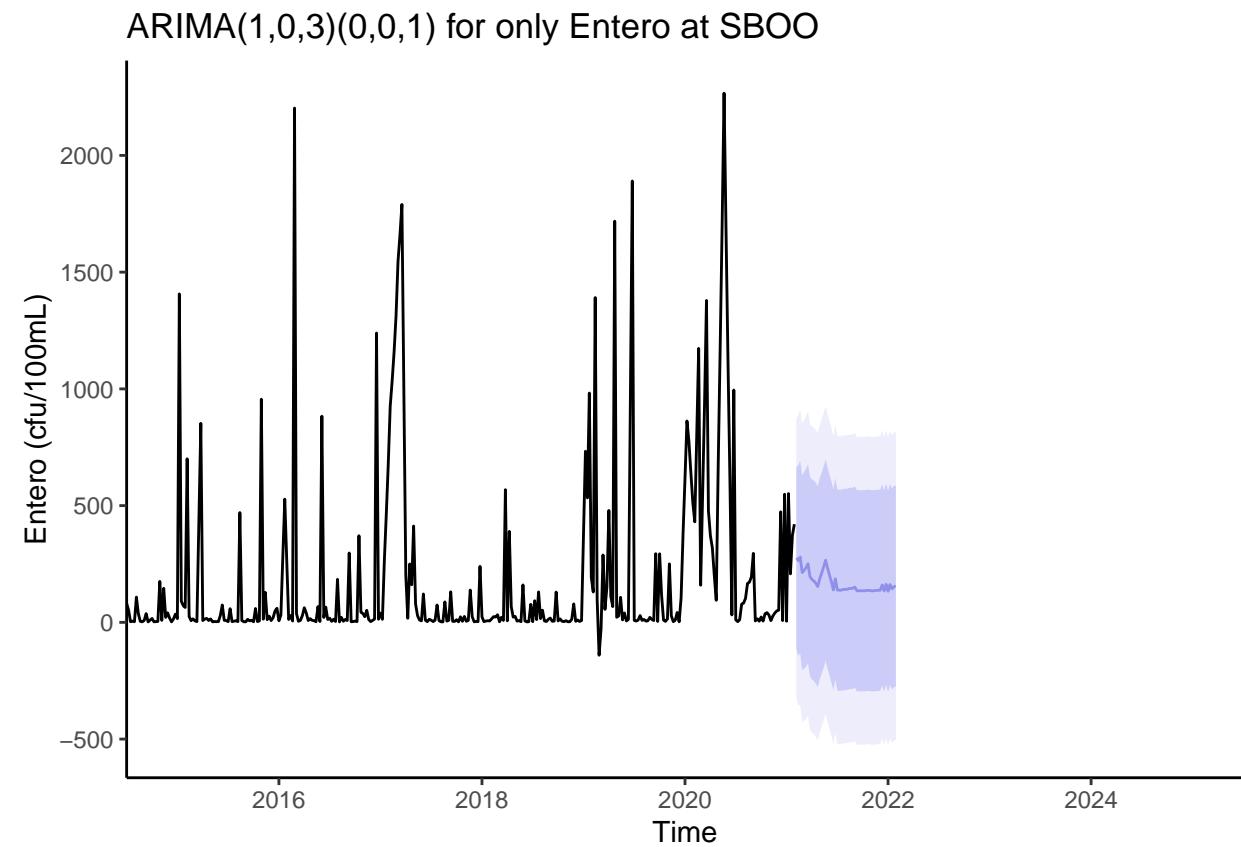
# saving training rmse value
arima_entero_sboo_q3_train_rmse <- sqrt(mean(arima_entero_sboo_q3$residuals^2))
```

```

# making forecasts and saving them
arima_entero_sboo_q3_forecast <- forecast(arima_entero_sboo_q3, h=52)

# getting plot ready
autoplot(gb09_sboo_wkly02_train_ts01_ent01,
         main = "ARIMA(1,0,3)(0,0,1) for only Entero at SBOO",
         ylab = "Entero (cfu/100mL)") +
  autolayer(arima_entero_sboo_q3_forecast, alpha=.3) +
  coord_cartesian(xlim=c(2015, 2025)) +
  theme_classic()

```



```

print(paste("ARIMA(1,0,2)(0,0,1) RMSE of ", arima_entero_sboo_q2_train_rmse))

## [1] "ARIMA(1,0,2)(0,0,1) RMSE of 303.330637745971"

print(paste("ARIMA(1,0,3)(0,0,1) RMSE of ", arima_entero_sboo_q3_train_rmse))

## [1] "ARIMA(1,0,3)(0,0,1) RMSE of 303.188753331435"

# q=2 RMSE of 303.3 vs. q=3 RMSE of 303.2; going with q=3 since lower.

# looking at performance of the better (lower RMSE train) or ARIMA(1,0,3)(0,0,1).
arima_entero_sboo_acc <- accuracy(arima_entero_sboo_q3_forecast,
                                    owt_df02_gb09_sboo_wkly02_test_tb03$ENTERO)

```

```
arima_entero_sboo_acc
```

```
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.0849465 303.1888 160.6197 -1082.3797 1105.3801 0.993848
## Test set     142.0636657 465.5062 293.9374 -838.8908 884.7925 1.818763
##                   ACF1
## Training set -0.001032968
## Test set       NA
```

### ARIMA Regression Models:

#### ARIMA Regression 1-PLOO: Using all but SUSO and OG from PLOO

Use: chlorophyll, fecal, ph, salinity, temp, density, DO, XMS) to get: Entero

```
# set up ARIMA regression
# PLOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)

# training set: all predictors (minus the OG and SUSO) from PLOO
ploo_arima_train <- owt_df02_gb09_ploo_wkly02_train_tb03 %>% select(-date_sample)
# test set: all predictors (minus the OG and SUSO) from PLOO
ploo_arima_test <- owt_df02_gb09_ploo_wkly02_test_tb03 %>% select(-date_sample)

# predictors as matrix
# predictors as matrix (1-9 columns)
ploo_arima_predictors_train_df <- ploo_arima_train %>% select(-ENTERO)
ploo_arima_predictors_train <- as.matrix(ploo_arima_predictors_train_df)

ploo_arima_predictors_test_df <- ploo_arima_test %>% select(-ENTERO)
ploo_arima_predictors_test <- as.matrix(ploo_arima_predictors_test_df)

# outcome
ploo_arima_train_outcome <- ploo_arima_train$ENTERO
ploo_arima_test_outcome <- ploo_arima_test$ENTERO

# using the same model set up PLOO-entero only: ARIMA(0,0,3)
ploo_arimaReg <- Arima(ploo_arima_train_outcome, order = c(0,0,3), xreg =
  ploo_arima_predictors_train)

summary(ploo_arimaReg)

## Series: ploo_arima_train_outcome
## Regression with ARIMA(0,0,3) errors
##
## Coefficients:
##             ma1      ma2      ma3  intercept CHLOROPHYLL    DENSITY      DO      FECAL
##             0.0103   -0.0133   -0.0019    353.0589    -2.3532   37.9092   3.6846   0.4184
## s.e.      0.0297    0.0295    0.0297    750.2709     1.1970   17.3877   4.6965   0.0229
##             PH  SALINITY    TEMP      XMS
##             72.7709  -57.9220   7.4265   -0.7637
## s.e.      41.9715   23.0405   3.6873    0.5800
##             sigma^2 = 8011: log likelihood = -6776.44
## AIC=13578.88  AICc=13579.2  BIC=13644.46
##
```

```

## Training set error measures:
##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -4.273099e-06 89.03495 25.55855 -191.1968 295.9924 0.7858751
##               ACF1
## Training set -1.932063e-06

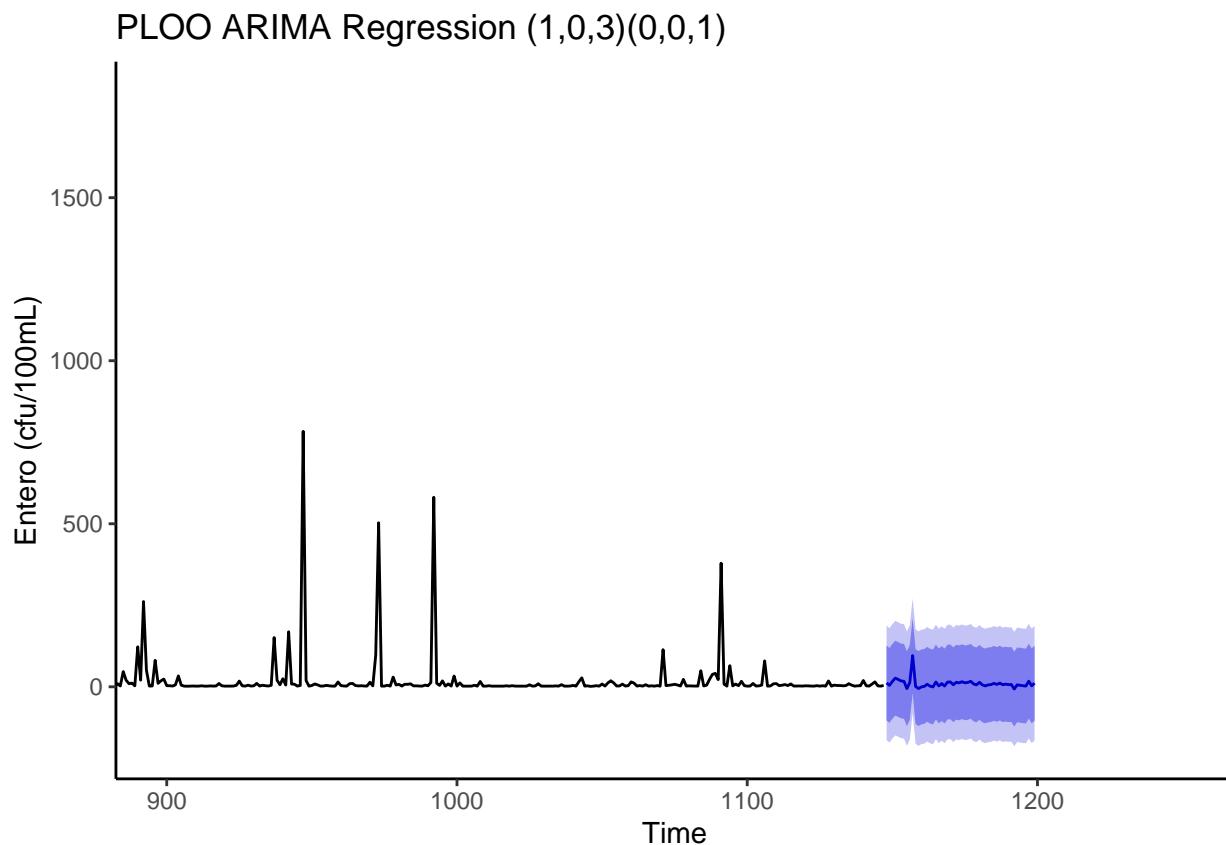
ploo_arimaReg_train_rmse <- sqrt(mean(ploo_arimaReg$residuals^2))
print(paste("PLOO ARIMA Regression RMSE: ", ploo_arimaReg_train_rmse))

## [1] "PLOO ARIMA Regression RMSE: 89.0349452478337"

# saving forecast using test set
ploo_arimaReg_forecast <- forecast(ploo_arimaReg, xreg= ploo_arima_predictors_test, h=52)

# plotting the forecasts
autoplot(ploo_arimaReg_forecast,
         main = "PLOO ARIMA Regression (1,0,3)(0,0,1)",
         ylab = "Enterobacter (cfu/100mL)" +
         coord_cartesian(xlim = c(900, 1250))+
         theme_classic()

```



```

ploo_arimaReg_coefs <- as.data.frame(round(ploo_arimaReg$coef, 3))
colnames(ploo_arimaReg_coefs)[colnames(ploo_arimaReg_coefs) == "round(ploo_arimaReg$coef,
← 3)"] <- "coef_value"
ploo_arimaReg_coefs

##           coef_value

```

```

## ma1          0.010
## ma2         -0.013
## ma3        -0.002
## intercept   353.059
## CHLOROPHYLL -2.353
## DENSITY     37.909
## DO           3.685
## FECAL        0.418
## PH           72.771
## SALINITY    -57.922
## TEMP         7.427
## XMS         -0.764

# the three strongest absolute coeffecients (most important) at PLOO are:
# pH (.73), density (.38), temp (.7.43)
# the next are DO (.69), chlorophyll (2.35), XMS (.764), and fecal (.418)

# looking at performance of PLOO ARima Regression.
arimaReg_entero_ploo_acc <- accuracy(ploo_arimaReg_forecast,
                                         owt_df02_gb09_ploo_wkly02_test_tb03$ENTERO)

arimaReg_entero_ploo_acc

```

```

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -4.273099e-06 89.03495 25.55855 -191.1968 295.9924 0.7858751
## Test set      -2.978892e+00 19.60083 11.46303 -198.9662 250.0864 0.3524655
##                      ACF1
## Training set -1.932063e-06
## Test set       NA

```

### ARIMA Regression 1-SBOO: Using all but SUSO and OG from SBOO

Use: chlorophyll, fecal, ph, salinity, temp, density, DO, XMS) to get: Entero

```

# set up ARIMA regression for SBOO

# training set: all predictors (minus the OG and SUSO) from SBOO
sboo_arima_train <- owt_df02_gb09_sboo_wkly02_train_tb03 %>% select(-date_sample)
# test set: all predictors (minus the OG and SUSO) from SBOO
sboo_arima_test <- owt_df02_gb09_sboo_wkly02_test_tb03 %>% select(-date_sample)

# predictors as matrix
sboo_arima_predictors_train_df <- sboo_arima_train %>% select(-ENTERO)
sboo_arima_predictors_train <- as.matrix(sboo_arima_predictors_train_df)

sboo_arima_predictors_test_df <- sboo_arima_test %>% select(-ENTERO)
sboo_arima_predictors_test <- as.matrix(sboo_arima_predictors_test_df)
# outcome
sboo_arima_train_outcome <- sboo_arima_train$ENTERO
sboo_arima_test_outcome <- sboo_arima_test$ENTERO

# using the same model set up SBOO-entero only: ARIMA(1,0,3)(0,0,1)
sboo_arimaReg <- Arima(sboo_arima_train_outcome, order = c(1,0,3), seasonal = c(0,0,1),
                       xreg = sboo_arima_predictors_train)

```

```

summary(sboo_arimaReg)

## Series: sboo_arima_train_outcome
## Regression with ARIMA(1,0,3) errors
##
## Coefficients:
##             ar1      ma1      ma2      ma3  intercept CHLOROPHYLL    DENSITY
##             0.4531 -0.1253 -0.0761  0.0961   10328.437     -4.5984 -68.1285
## s.e.    0.1607  0.1603  0.0598  0.0339   2879.752      3.4067  68.4621
##             D0    FECAL          PH  SALINITY      TEMP       XMS
##             22.1975  0.3890 -223.7577 -181.5957  -16.9649  -7.7588
## s.e.    14.2382  0.0175  135.1713   93.5847   14.4394   1.2690
##
## sigma^2 = 60253: log likelihood = -7933.17
## AIC=15894.35  AICc=15894.72  BIC=15964.98
##
## Training set error measures:
##             ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.02501764 244.069 121.7442 -362.0654 647.8616 0.7533024
##             ACF1
## Training set 0.001202772

sboo_arimaReg_train_rmse <- sqrt(mean(sboo_arimaReg$residuals^2))
print(paste("SBOO ARIMA Regression RMSE: ", sboo_arimaReg_train_rmse))

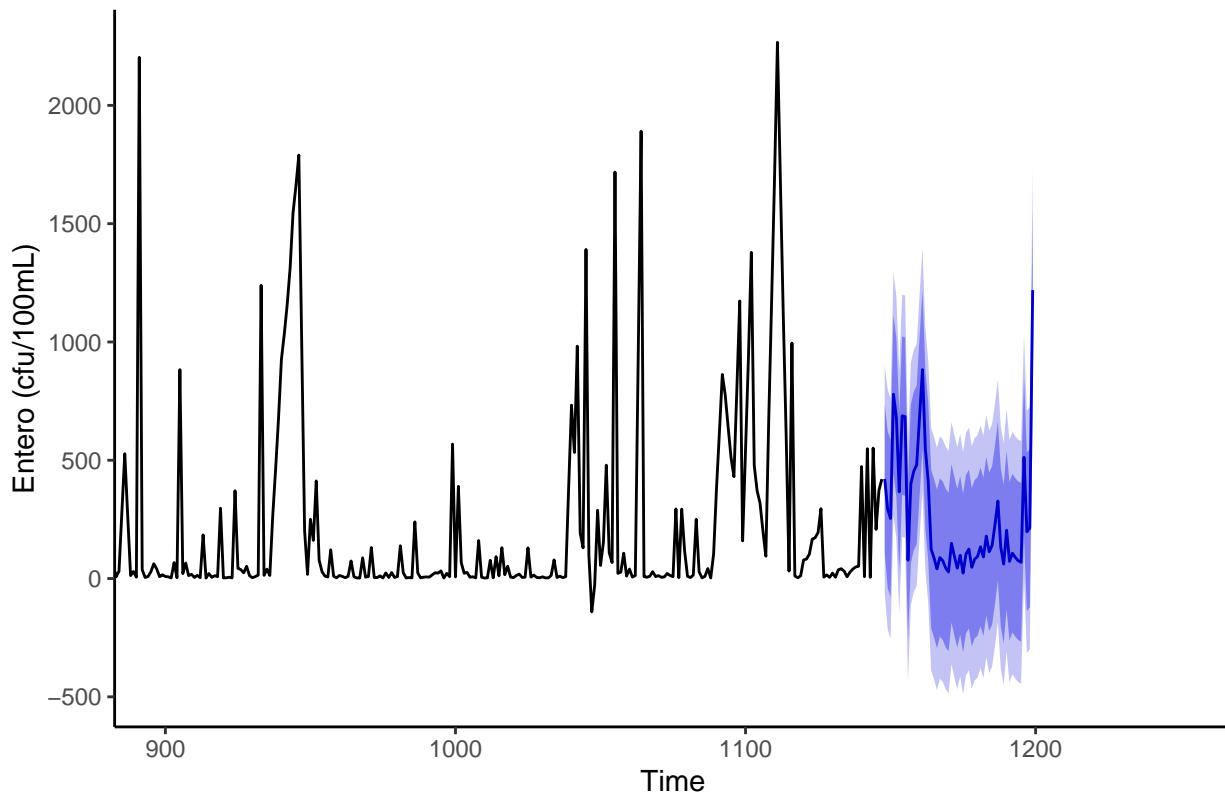
## [1] "SBOO ARIMA Regression RMSE: 244.068957667935"

# saving forecast using test set
sboo_arimaReg_forecast <- forecast(sboo_arimaReg, xreg= sboo_arima_predictors_test)

# plotting the forecasts
autoplot(sboo_arimaReg_forecast,
         main = "SBOO ARIMA Regression (1,0,3)(0,0,1)",
         ylab = "Enterobacteriaceae (cfu/100mL)" +
coord_cartesian(xlim = c(900, 1250))+theme_classic()

```

## SBOO ARIMA Regression (1,0,3)(0,0,1)



```
sboo_arimaReg_coefs <- as.data.frame(round(sboo_arimaReg$coef, 3))
colnames(sboo_arimaReg_coefs)[colnames(sboo_arimaReg_coefs) == "round(sboo_arimaReg$coef,
  ↪ 3)"] <- "coef_value"
sboo_arimaReg_coefs

##           coef_value
## ar1          0.453
## ma1         -0.125
## ma2         -0.076
## ma3          0.096
## intercept   10328.437
## CHLOROPHYLL -4.598
## DENSITY     -68.129
## DO           22.198
## FECAL        0.389
## PH          -223.758
## SALINITY    -181.596
## TEMP         -16.965
## XMS          -7.759

# three strongest absolute coefficients (most important) at SBOO are:
# pH (224), salinity (182), density (68),
# then it drops to DO (22), temp (17), xms (7.76), chlorophyll (4.60), fecal (.389)

# looking at performance of the ARIMA Regression at SBOO.
arimaReg_entero_sboo_acc <- accuracy(sboo_arimaReg_forecast,
```

```

        owt_df02_gb09_sboo_wkly02_test_tb03$ENTERO)

arimaReg_entero_sboo_acc

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.02501764 244.069 121.7442 -362.0654 647.8616 0.7533024
## Test set      50.51999458 230.856 150.8782 -421.8009 445.9124 0.9335716
##               ACF1
## Training set 0.001202772
## Test set      NA

```

### ARIMA models of the top coefficients of the regression models

#### ARIMA at PLOO

```

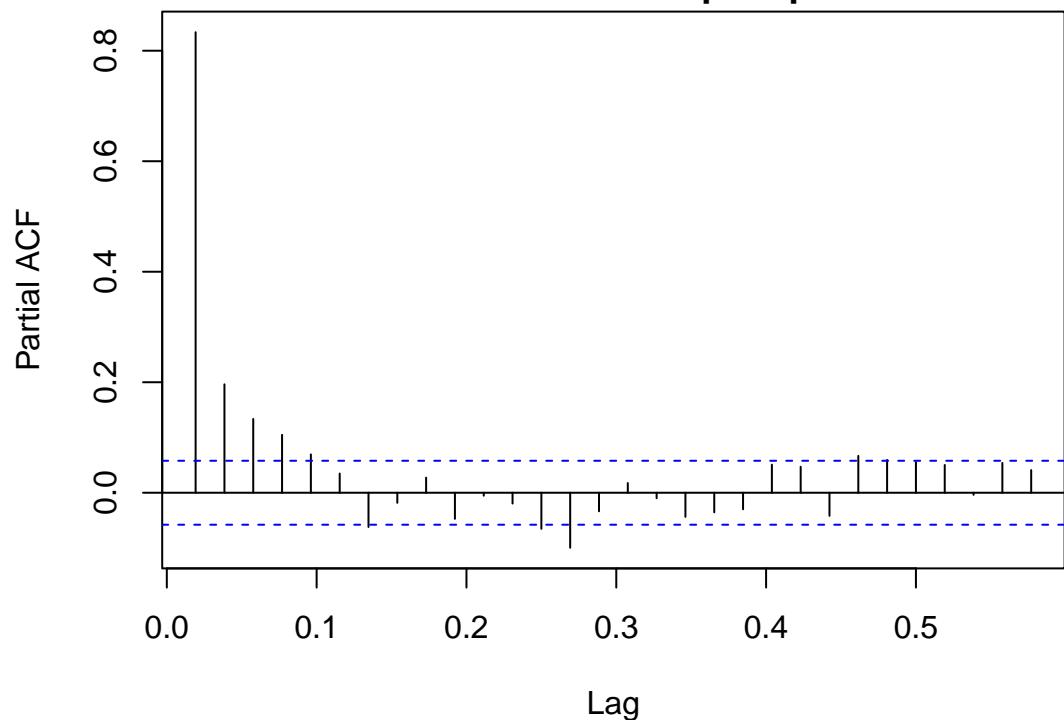
# PLOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
# owt_df02_gb09_ploo_wkly02_train_tb03 (imputed w/out outliers set)

# DENSITY
ploo_arima_train_density <- ts(owt_df02_gb09_ploo_wkly02_train_tb03$DENSITY,
                                start = c(1999, 3),
                                freq = 52)
# PLOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
ploo_arima_test_density <- owt_df02_gb09_ploo_wkly02_test_tb03$DENSITY

# pacf plot of density (ploo)
par(mar=c(5, 4, 0, 2)+1.5)
pacf(ploo_arima_train_density)
title("DENSITY at PLOO pacf plot")

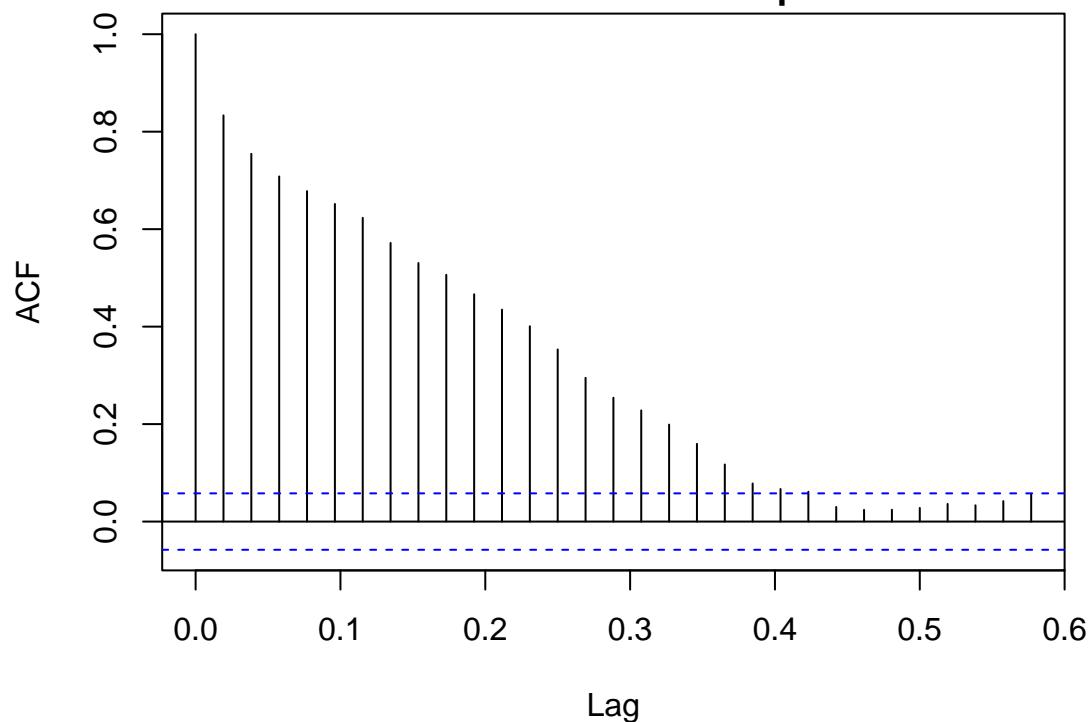
```

DENSITY at PLOO pacf plot



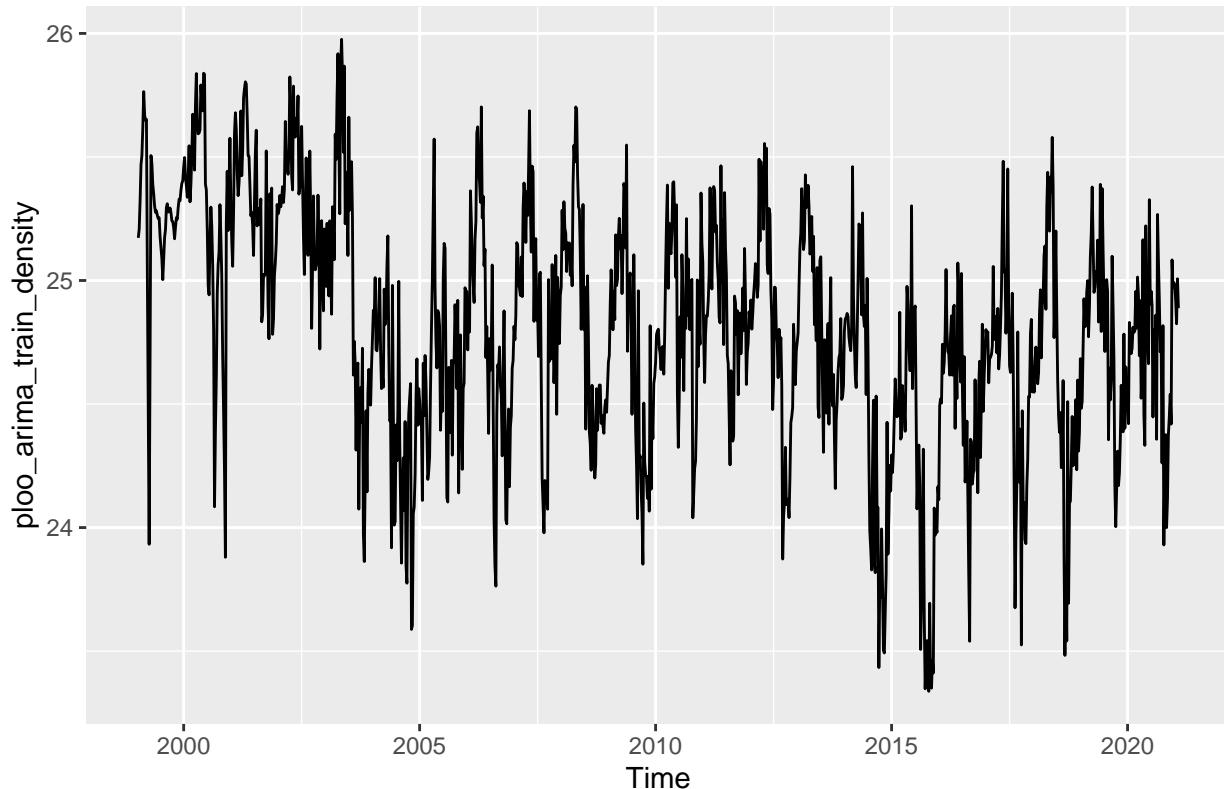
```
# p=2  
  
# acf plot of density (ploo)  
acf(ploo_arima_train_density)  
title("DENSITY at PLOO acf plot")
```

**DENSITY at PLOO acf plot**



```
# q value at least 1  
  
# ts plot of density (ploo)  
autoplot(ploo_arima_train_density,  
         main = "DENSITY at PLOO ts plot")
```

## DENSITY at PLOO ts plot



```

# definite seasonality so 2nd part needed
# d and D = 0
# P= 1 (pacf plot out of bounds at more than beginning, barely)
# Q (acf): Q= 0 since acf had no repeating patterns of out of bounds

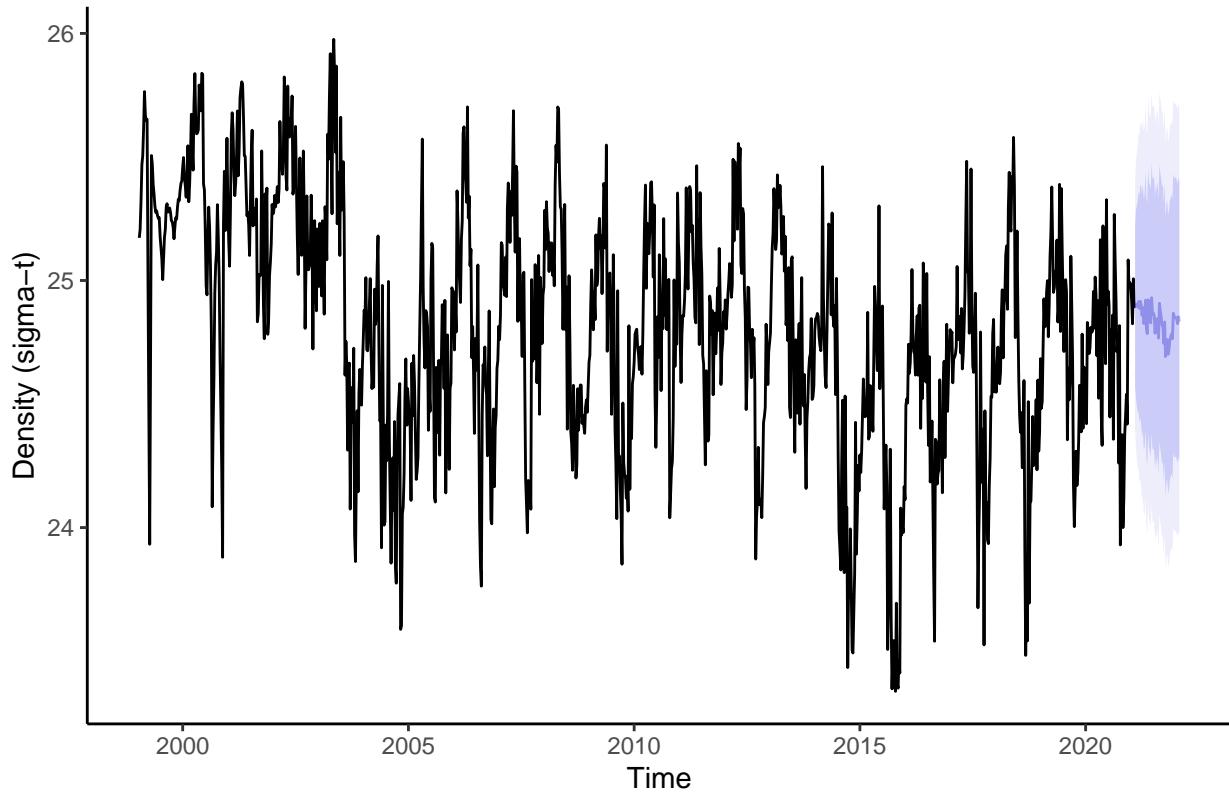
ploo_arima_density <- arima(ploo_arima_train_density,
                             order=c(2, 0, 1), seasonal = c(1, 0, 0))

# saving forecast using test set
ploo_arima_density_forecast <- forecast(ploo_arima_density, h=52)

# plotting the forecasts
autoplot(ploo_arima_train_density,
         main = "PLOO ARIMA Density",
         ylab = "Density (sigma-t)") +
  autolayer(ploo_arima_density_forecast, alpha=.3) +
  theme_classic()

```

## PLOO ARIMA Density



```
# looking at performance of the ARIMA Regression at SBOO.
ploo_arima_density_acc <- accuracy(ploo_arima_density_forecast, ploo_arima_test_density)

ploo_arima_density_acc

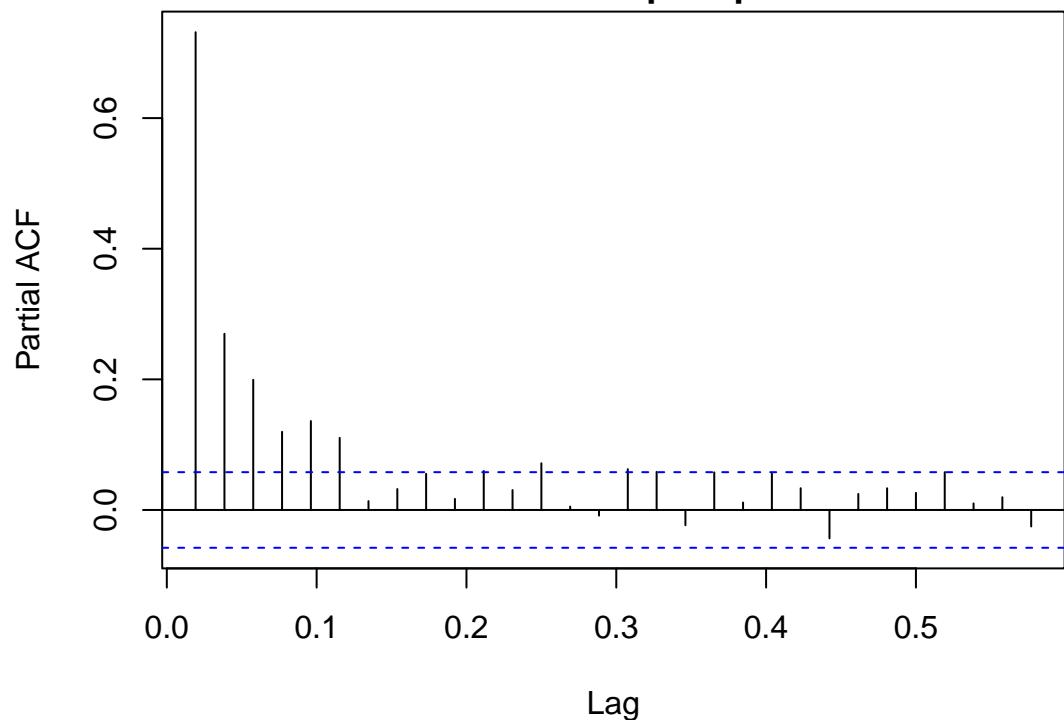
##                               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.001313540 0.2542205 0.1927933 -0.01617478 0.7797282 0.9308101
## Test set       0.002642859 0.2953983 0.2388208 -0.00427795 0.9603224 1.1530320
##                               ACF1
## Training set 0.006691562
## Test set      NA

# PLOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
# owt_df02_gb09_ploo_wkly02_train_tb03 (imputed w/out outliers set)

# PH
ploo_arima_train_ph <- ts(owt_df02_gb09_ploo_wkly02_train_tb03$PH,
                           start = c(1999, 3),
                           freq = 52)
# PLOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
ploo_arima_test_ph <- owt_df02_gb09_ploo_wkly02_test_tb03$PH

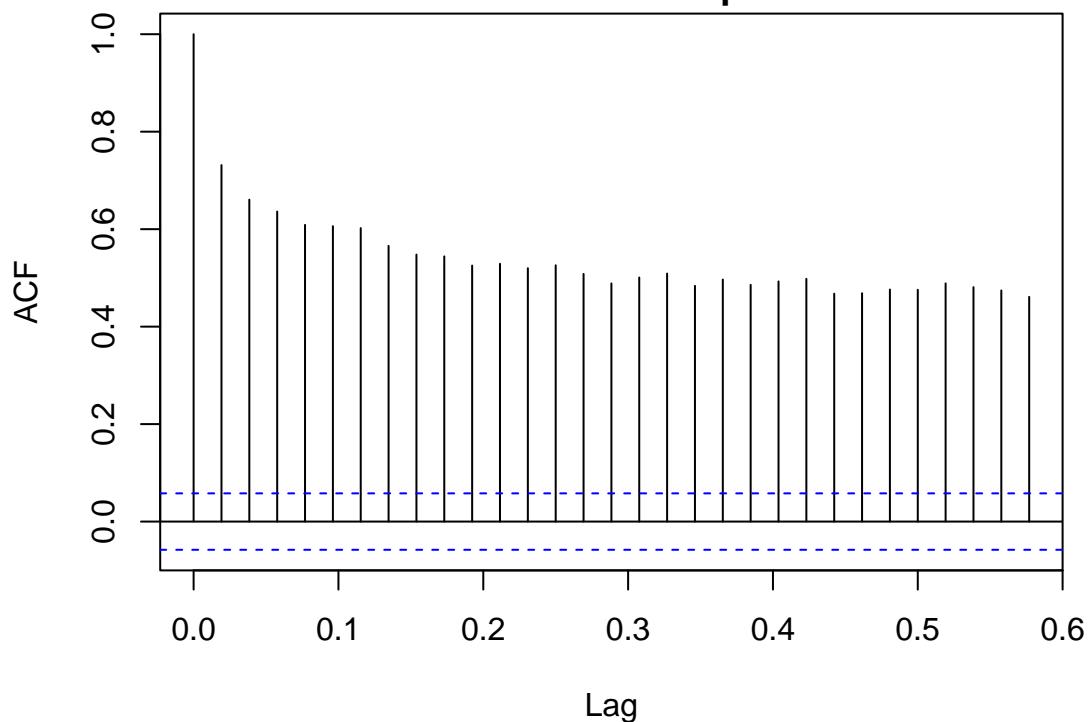
# pacf plot of ph (ploo)
par(mar=c(5, 4, 0, 2)+1.5)
pacf(ploo_arima_train_ph)
title("PH at PL00 pacf plot")
```

PH at PLOO pacf plot



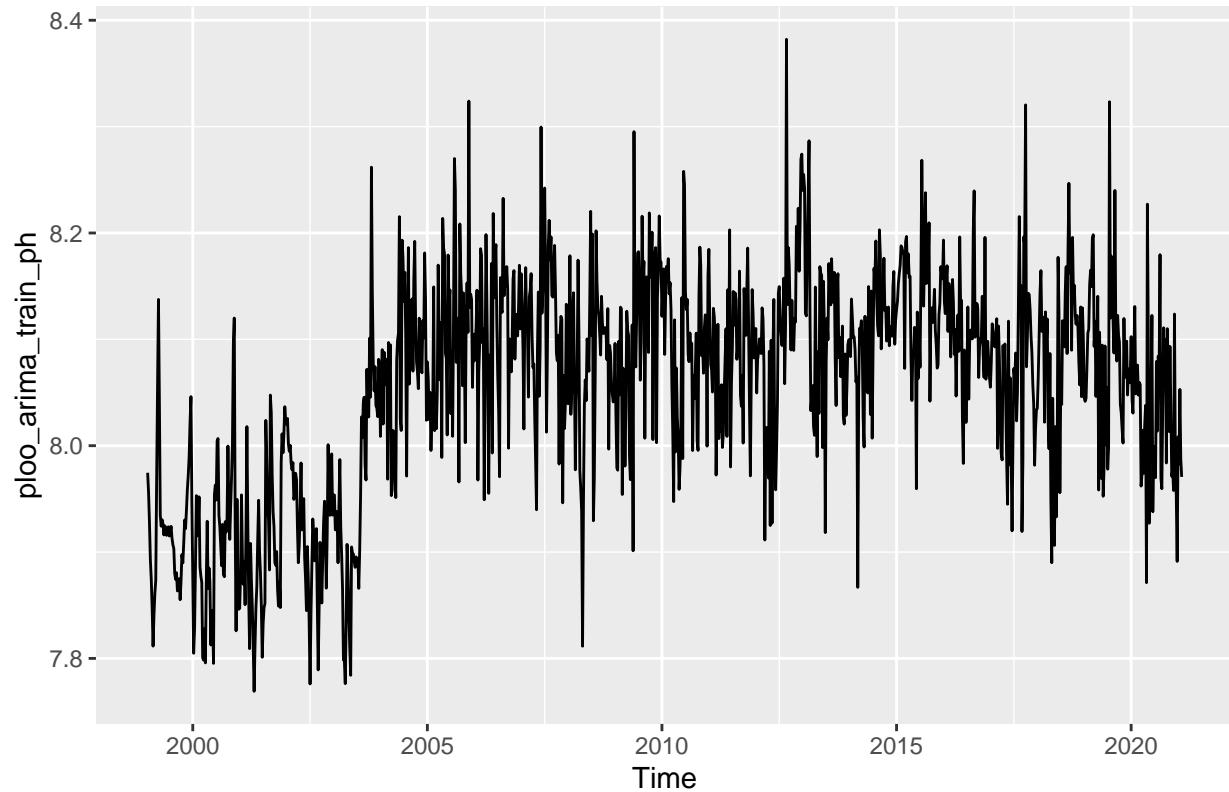
```
# p= 1  
  
# acf plot of density (ploo)  
acf(ploo_arima_train_ph)  
title("PH at PLOO acf plot")
```

**PH at PLOO acf plot**



```
# q (acf plot) all out of bounds so 1  
  
# ts plot of density (ploo)  
autoplot(ploo_arima_train_ph,  
         main = "PH at PLOO ts plot")
```

PH at PLOO ts plot



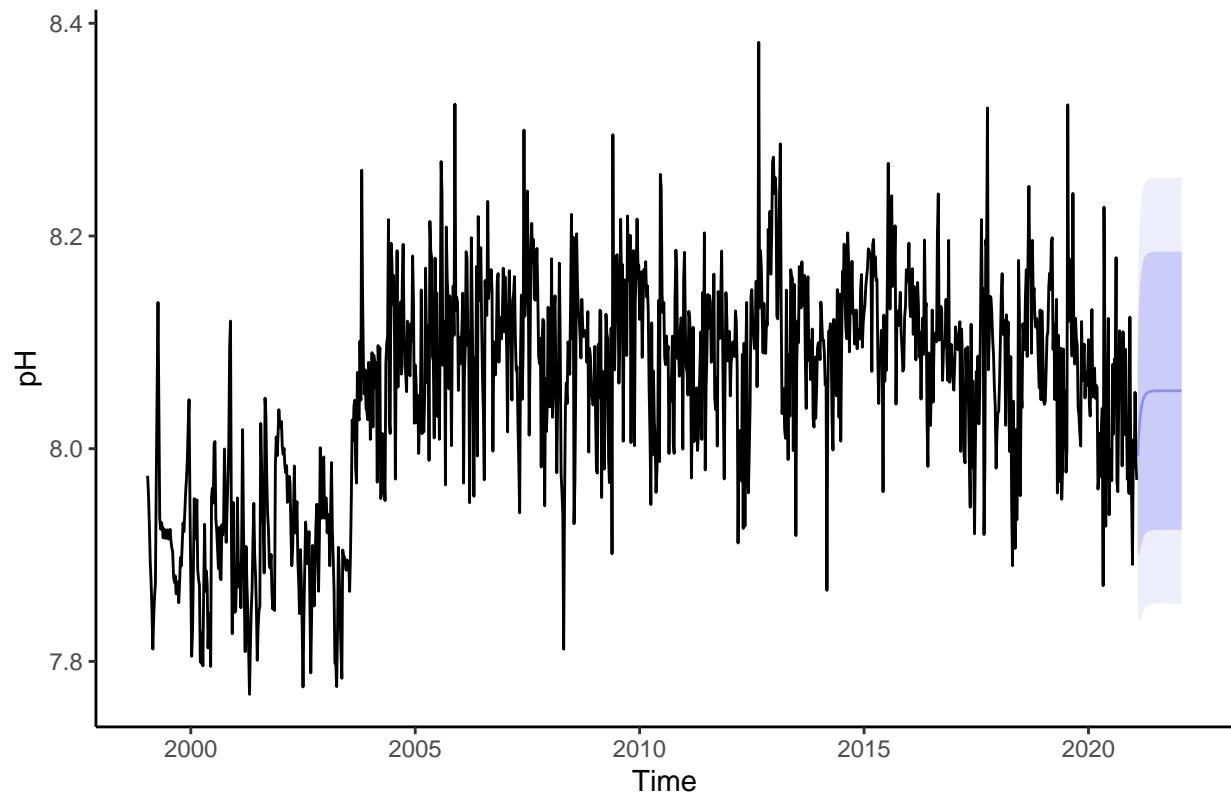
```
# hard to tell on seasonality maybe none

ploo_arima_ph <- arima(ploo_arima_train_ph,
                        order=c(1, 0, 0))

# saving forecast using test set
ploo_arima_ph_forecast <- forecast(ploo_arima_ph, h=52)

# plotting the forecasts
autoplot(ploo_arima_train_ph,
         main = "PLOO ARIMA PH",
         ylab = "pH") +
  autolayer(ploo_arima_ph_forecast, alpha=.3) +
  theme_classic()
```

## PLOO ARIMA PH



```
# looking at performance of the ARIMA Regression at SBOO.
ploo_arima_ph_acc <- accuracy(ploo_arima_ph_forecast, ploo_arima_test_ph)

ploo_arima_ph_acc

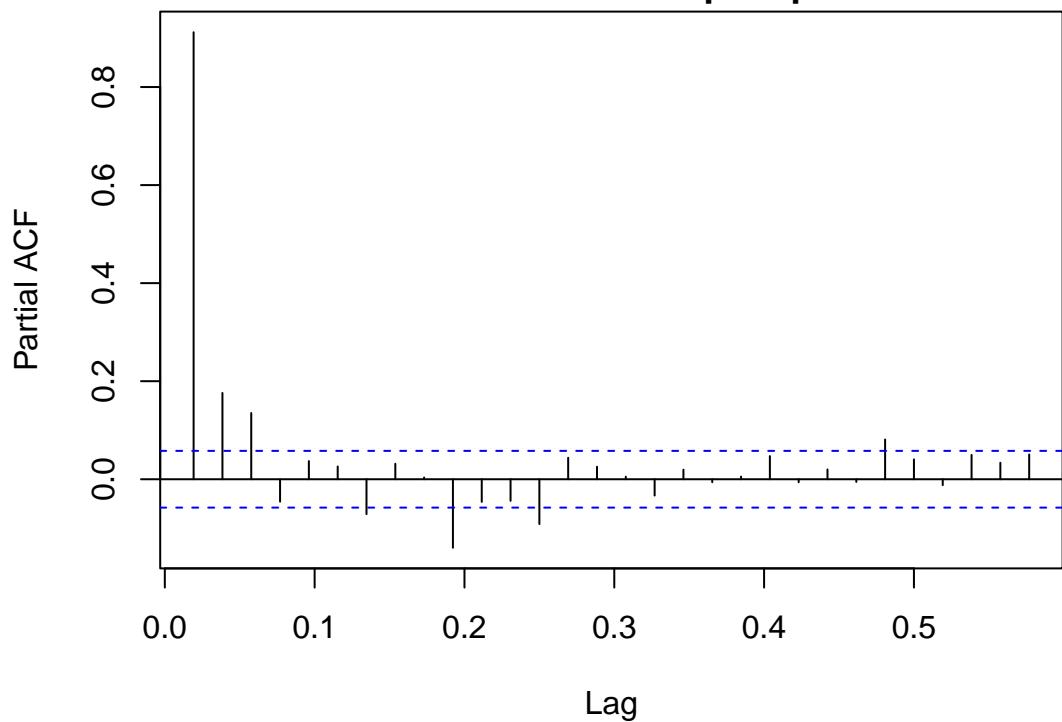
##                               ME      RMSE      MAE      MPE      MAPE
## Training set  3.604196e-05 0.0695939 0.05312883 -0.007032612 0.6595602
## Test set      -3.153926e-02 0.0864575 0.07483995 -0.403072769 0.9360303
##                         MASE      ACF1
## Training set 0.9789913 -0.1976876
## Test set      1.3790567       NA

# PLOO Excluding Outliers - Training partition (01/18/1999-01/04/2021)
# owt_df02_gb09_ploo_wkly02_train_tb03 (imputed w/out outliers set)

# SALINITY
ploo_arima_train_sal <- ts(owt_df02_gb09_ploo_wkly02_train_tb03$SALINITY,
                           start = c(1999, 3),
                           freq = 52)
# PLOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
ploo_arima_test_sal <- owt_df02_gb09_ploo_wkly02_test_tb03$SALINITY

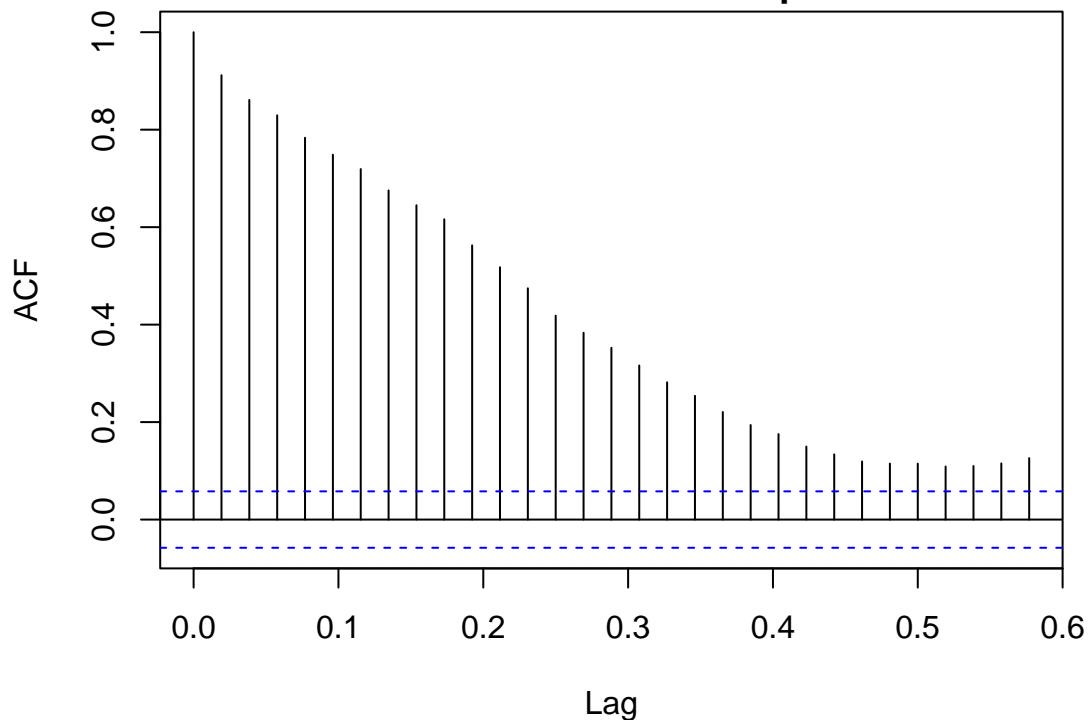
# pacf plot
par(mar=c(5, 4, 0, 2)+1.5)
pacf(ploo_arima_train_sal)
title("SALINITY at PLOO pacf plot")
```

**SALINITY at PLOO pacf plot**



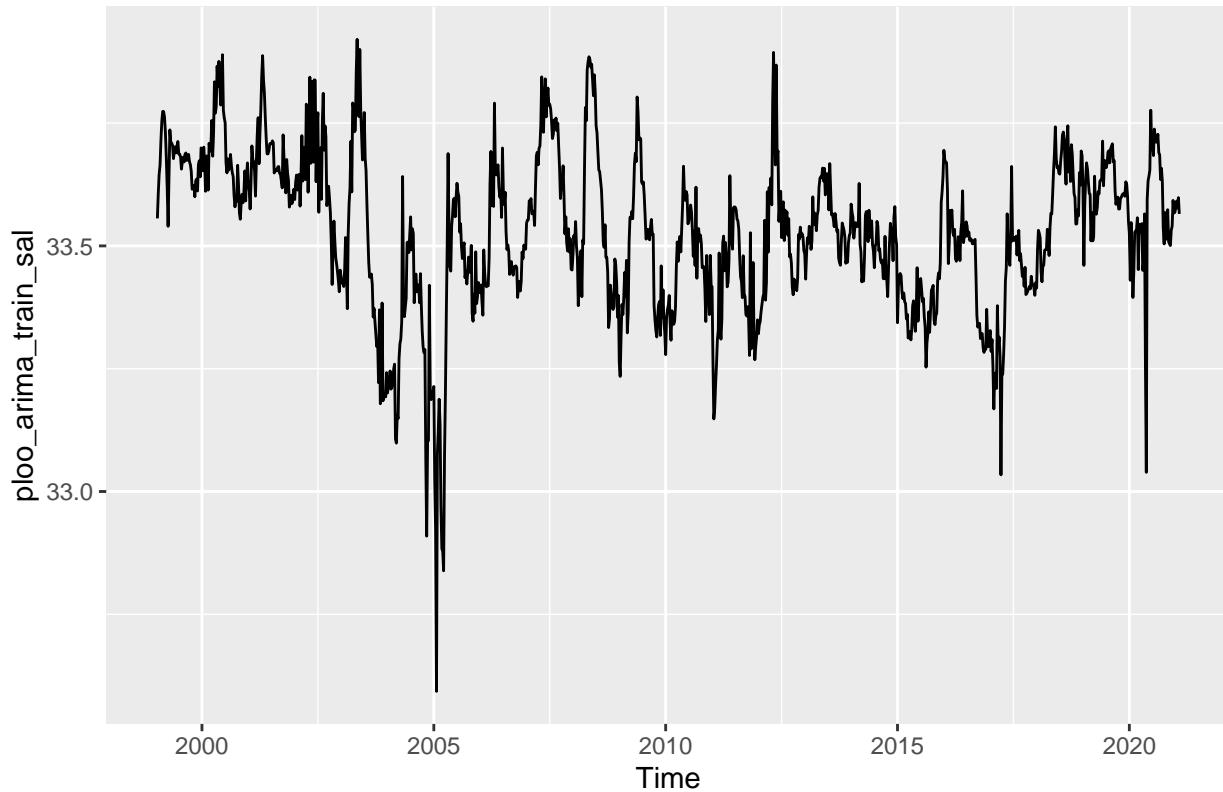
```
# p= 2  
  
# acf plot  
acf(ploo_arima_train_sal)  
title("SALINITY at PLOO acf plot")
```

**SALINITY at PLOO acf plot**



```
# q (acf plot) all out of bounds so 1  
  
# ts plot  
autoplot(ploo_arima_train_sal,  
         main = "SALINITY at PLOO ts plot")
```

## SALINITY at PLOO ts plot



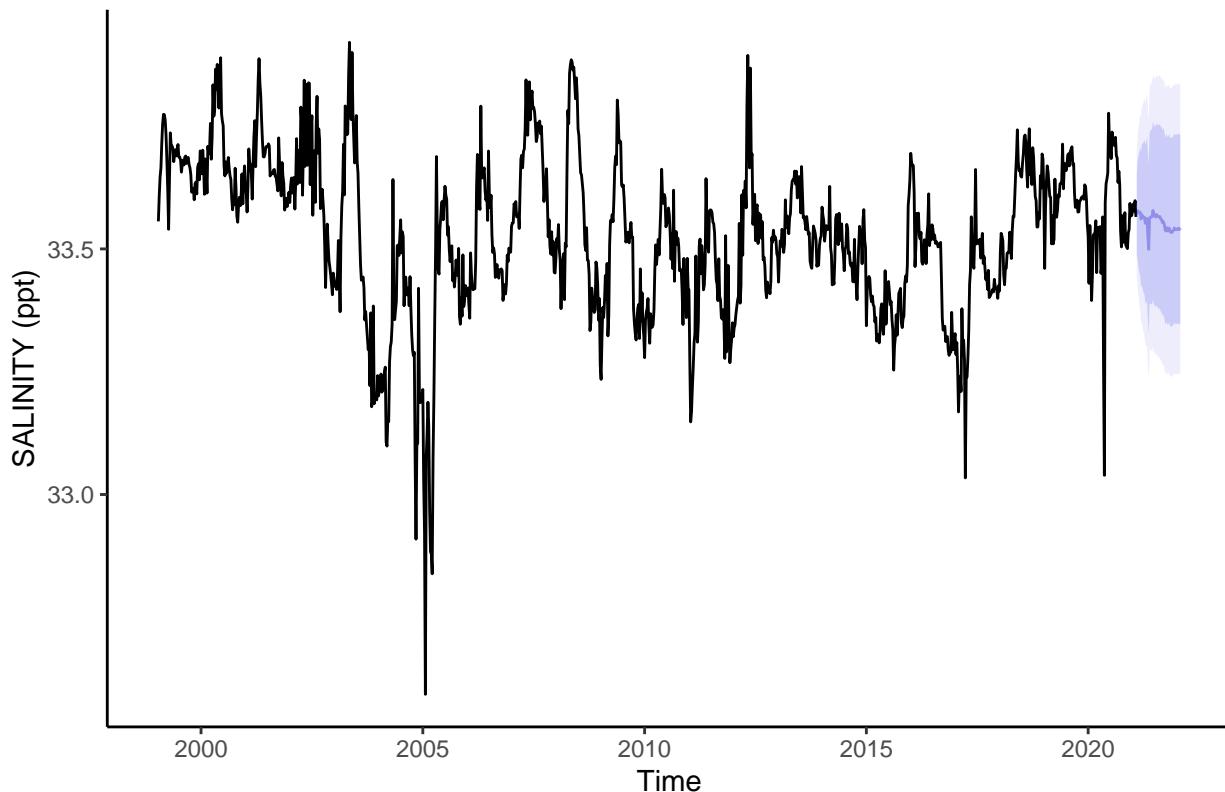
```
# seasonality, need P, D, Q
# P (pacf plot repeat out of bounds): 1
# D, like d, is 0
# Q (acf plot patterns), no pattern so 0

ploo_arima_sal <- arima(ploo_arima_train_sal,
                         order=c(2, 0, 1), seasonal = c(1,0,0))

# saving forecast using test set
ploo_arima_sal_forecast <- forecast(ploo_arima_sal, h=52)

# plotting the forecasts
autoplot(ploo_arima_train_sal,
         main = "PLOO ARIMA SALINITY",
         ylab = "SALINITY (ppt)") +
  autolayer(ploo_arima_sal_forecast, alpha=.3) +
  theme_classic()
```

## PLOO ARIMA SALINITY



```
# looking at performance of the ARIMA .
ploo_arima_sal_acc <- accuracy(ploo_arima_sal_forecast, ploo_arima_test_sal)

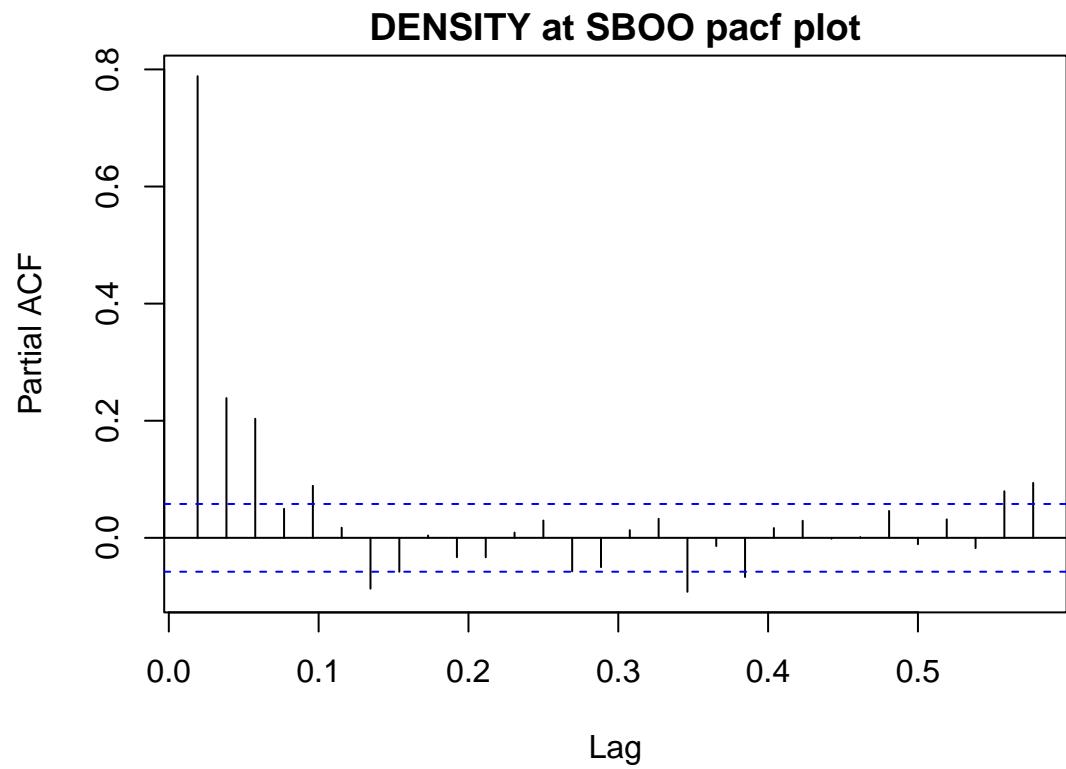
ploo_arima_sal_acc
```

```
##               ME      RMSE      MAE      MPE      MAPE
## Training set -2.878516e-05 0.06417251 0.04354409 -0.000461302 0.1299821
## Test set      2.807745e-02 0.08837713 0.06777939  0.082954959 0.2015667
##             MASE      ACF1
## Training set 0.9753143 0.005495697
## Test set      1.5181441          NA
```

## ARIMA at SBOO

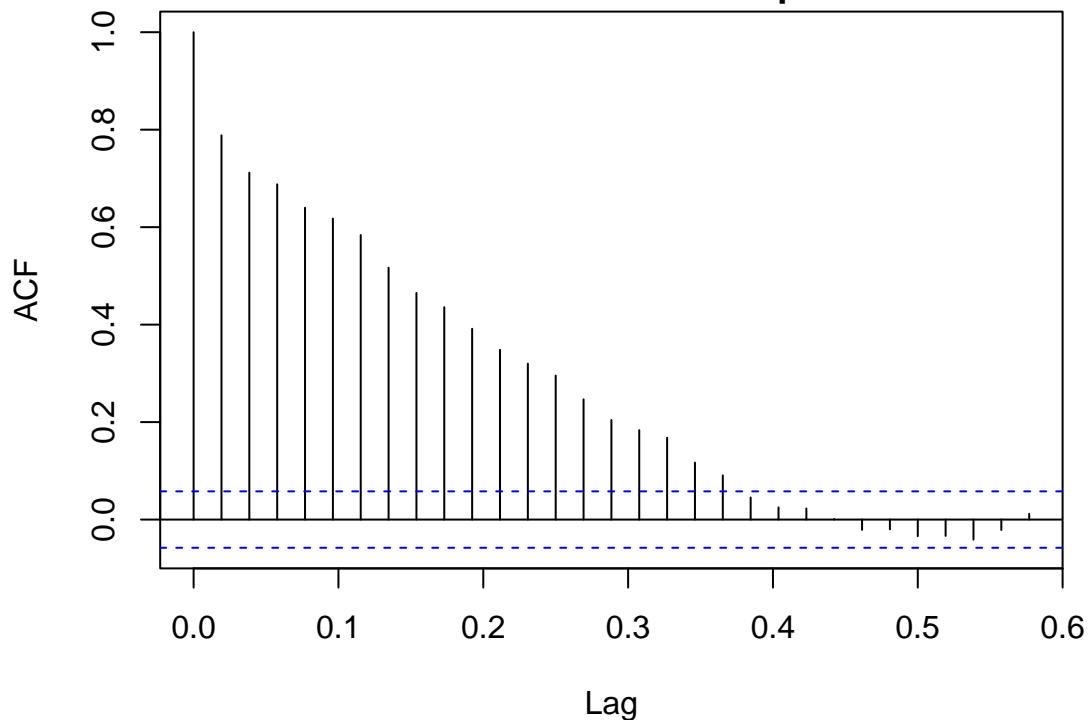
```
# DENSITY
sboo_arima_train_density <- ts(owt_df02_gb09_sboo_wkly02_train_tb03$DENSITY,
                                start = c(1999, 3),
                                freq = 52)
# SBOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
sboo_arima_test_density <- owt_df02_gb09_sboo_wkly02_test_tb03$DENSITY

# pacf plot
par(mar=c(5, 4, 0, 2)+1.5)
pacf(sboo_arima_train_density)
title("DENSITY at SBOO pacf plot")
```



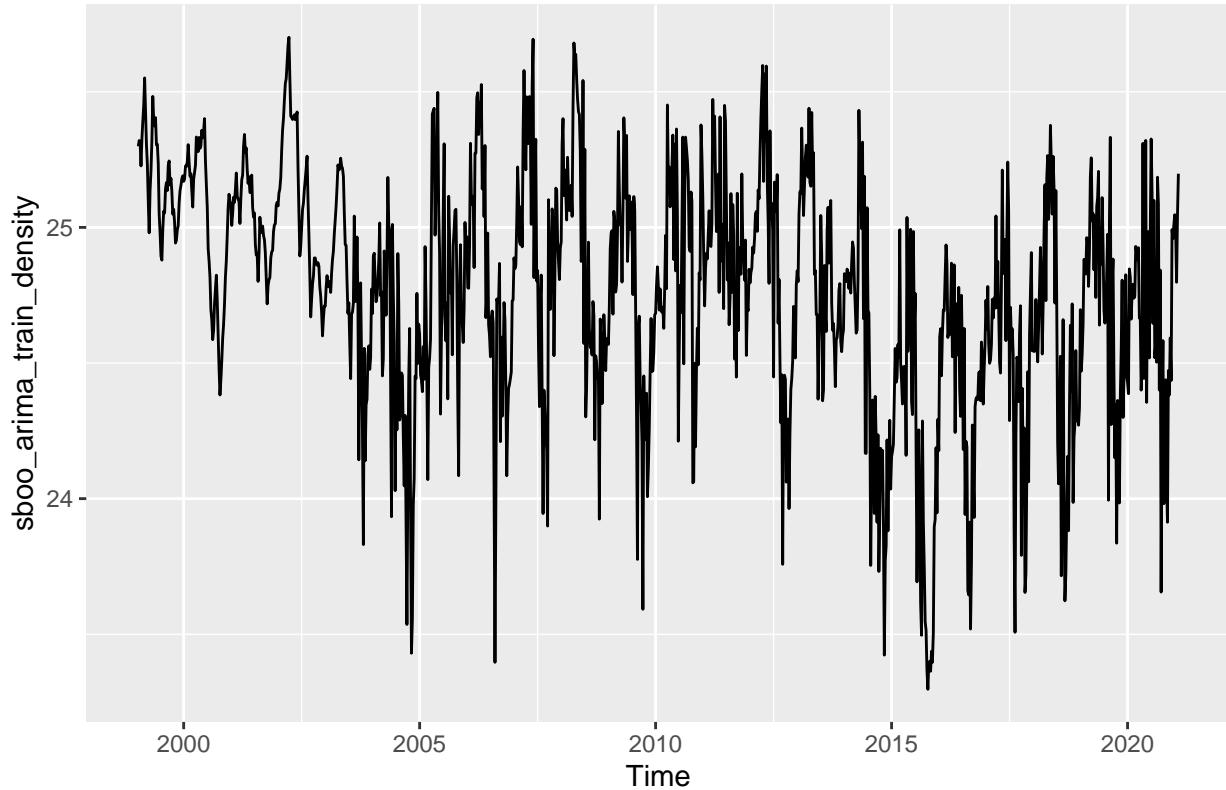
```
# p=2?  
  
# acf plot  
acf(sboo_arima_train_density)  
title("DENSITY at SBOO acf plot")
```

**DENSITY at SBOO acf plot**



```
# q value 1  
  
# ts plot  
autoplot(sboo_arima_train_density,  
         main = "DENSITY at SBOO ts plot")
```

## DENSITY at SBOO ts plot



```

# definite seasonality so 2nd part needed
# d and D = 0
# P= 1 (pacf plot out of bounds not only beginning)
# Q (acf): Q= 0

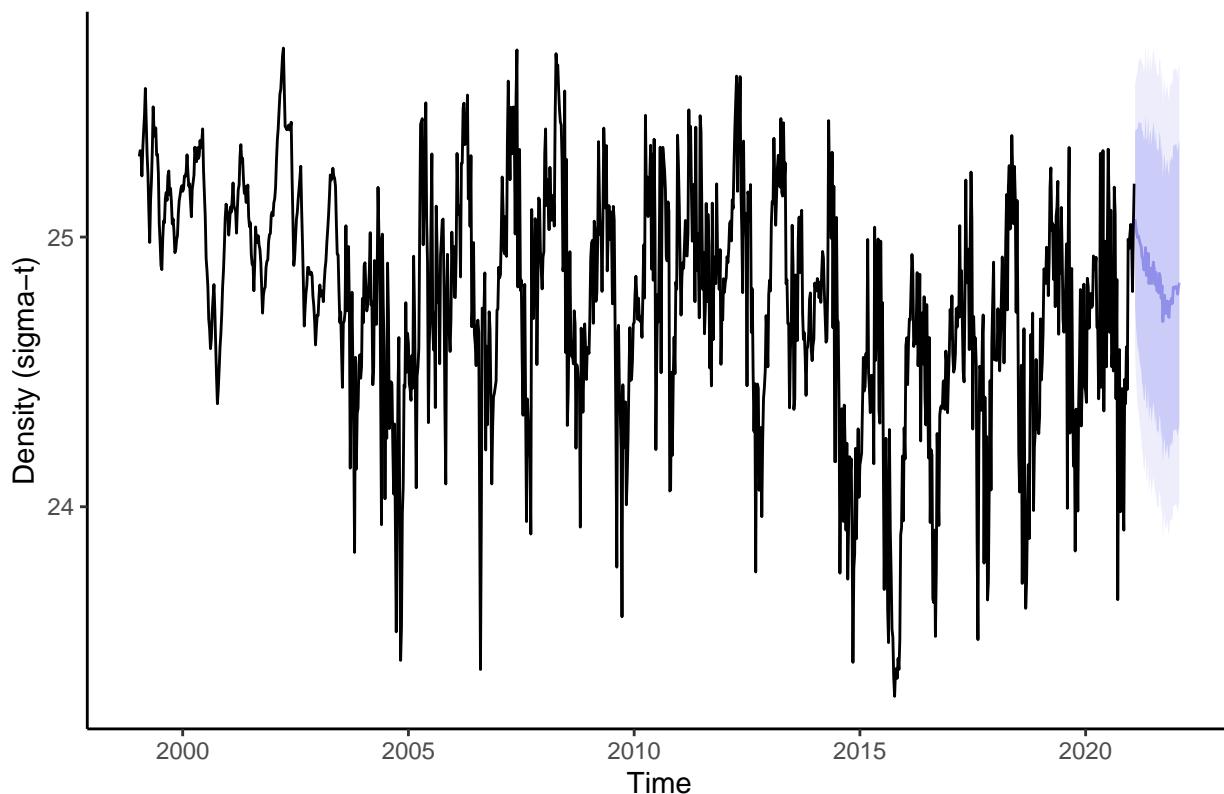
sboo_arima_density <- arima(sboo_arima_train_density,
                             order=c(2, 0, 1), seasonal = c(1, 0, 0))

# saving forecast using test set
sboo_arima_density_forecast <- forecast(sboo_arima_density, h=52)

# plotting the forecasts
autoplot(sboo_arima_train_density,
         main = "SBOO ARIMA Density",
         ylab = "Density (sigma-t)") +
  autolayer(sboo_arima_density_forecast, alpha=.3) +
  theme_classic()

```

## SBOO ARIMA Density



```
# looking at performance of the ARIMA
sboo_arima_density_acc <- accuracy(sboo_arima_density_forecast, sboo_arima_test_density)

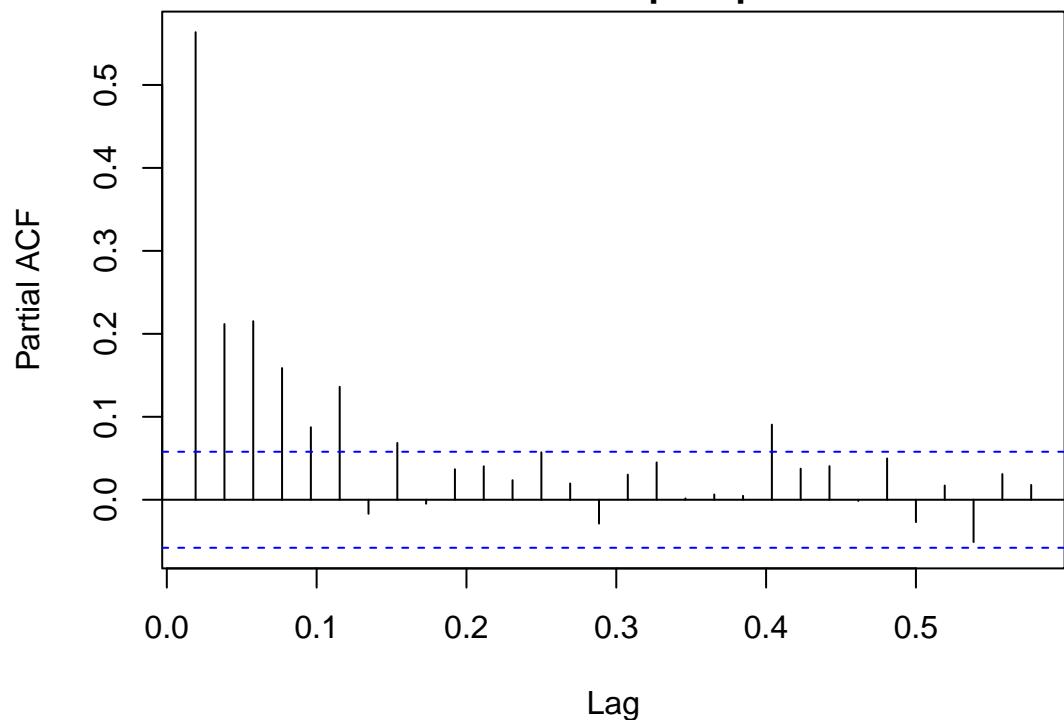
sboo_arima_density_acc

##               ME      RMSE      MAE      MPE      MAPE      MASE
## Training set -0.001087979 0.2519350 0.1829165 -0.01502515 0.7422643 0.9220391
## Test set      -0.054286261 0.3555327 0.2765508 -0.24064085 1.1193129 1.3940275
##                  ACF1
## Training set 0.004775348
## Test set      NA

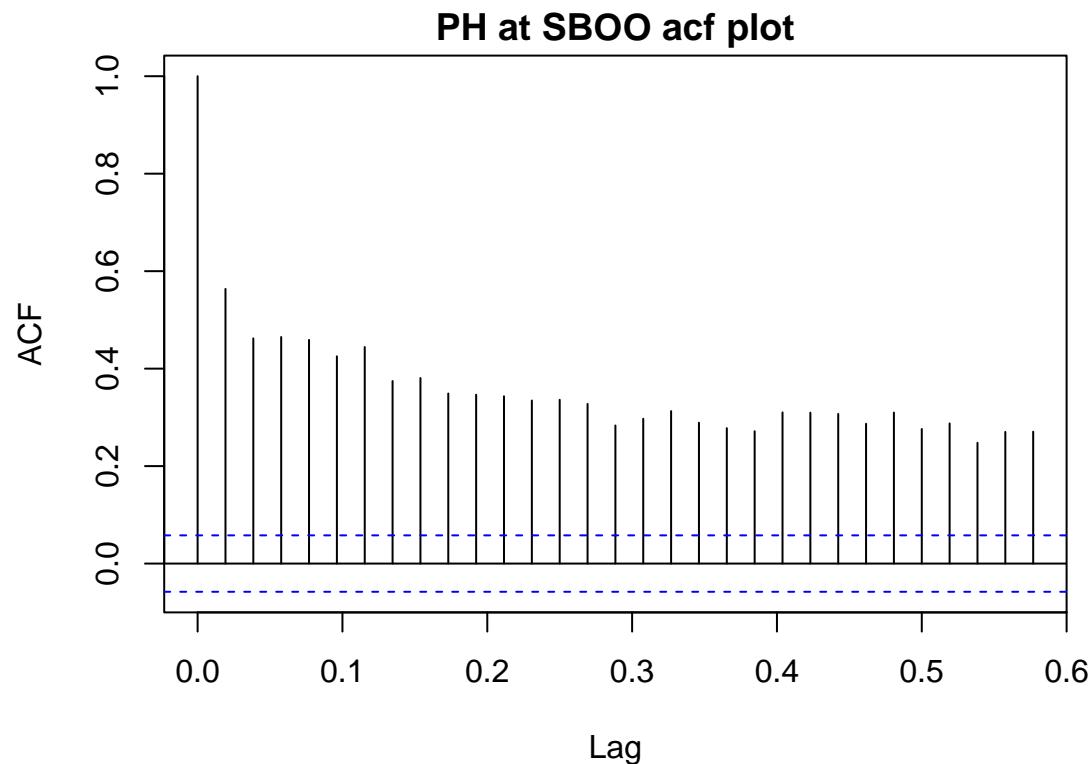
# PH
sboo_arima_train_ph <- ts(owt_df02_gb09_sboo_wkly02_train_tb03$PH,
                           start = c(1999, 3),
                           freq = 52)
# SBOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
sboo_arima_test_ph <- owt_df02_gb09_sboo_wkly02_test_tb03$PH

# pacf plot
par(mar=c(5, 4, 0, 2)+1.5)
pacf(sboo_arima_train_ph)
title("PH at SBOO pacf plot")
```

PH at SBOO pacf plot

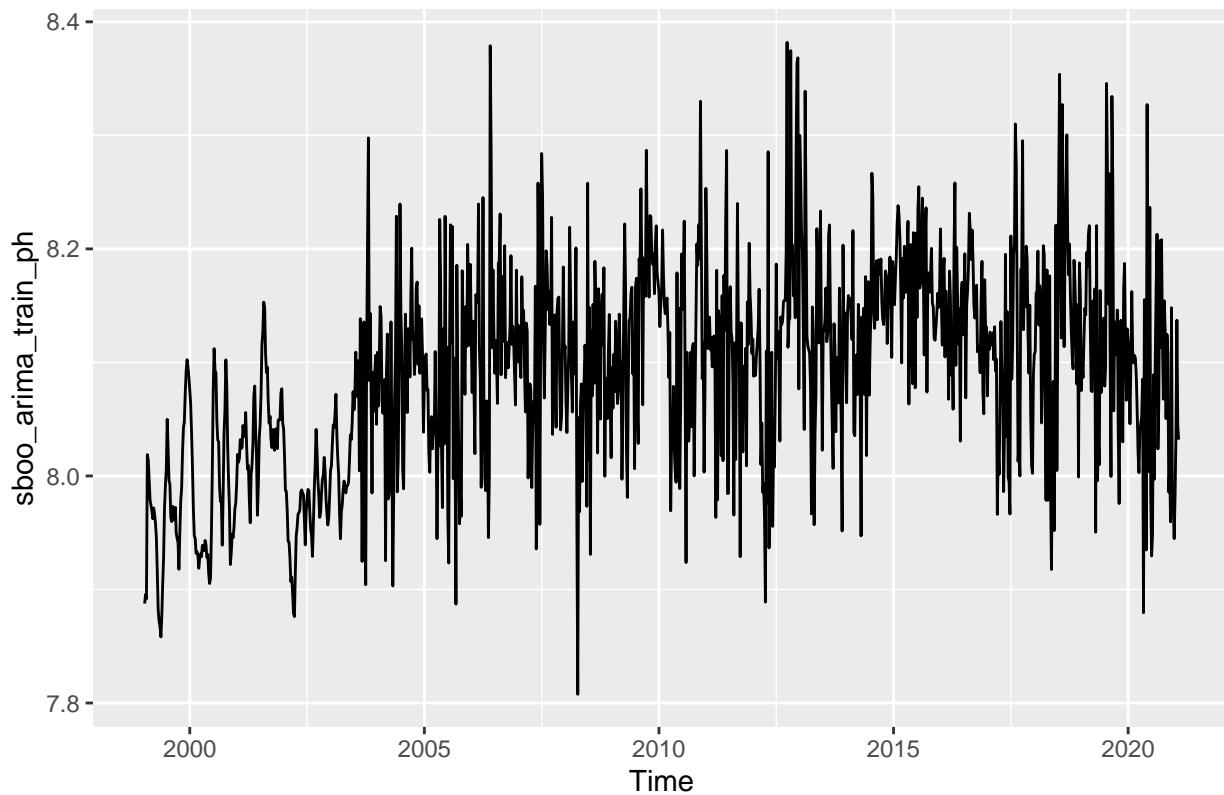


```
# p=2  
  
# acf plot  
acf(sboo_arima_train_ph)  
title("PH at SBOO acf plot")
```



```
# q 1  
  
# ts plot  
autoplot(sboo_arima_train_ph,  
         main = "PH at SBOO ts plot")
```

PH at SBOO ts plot



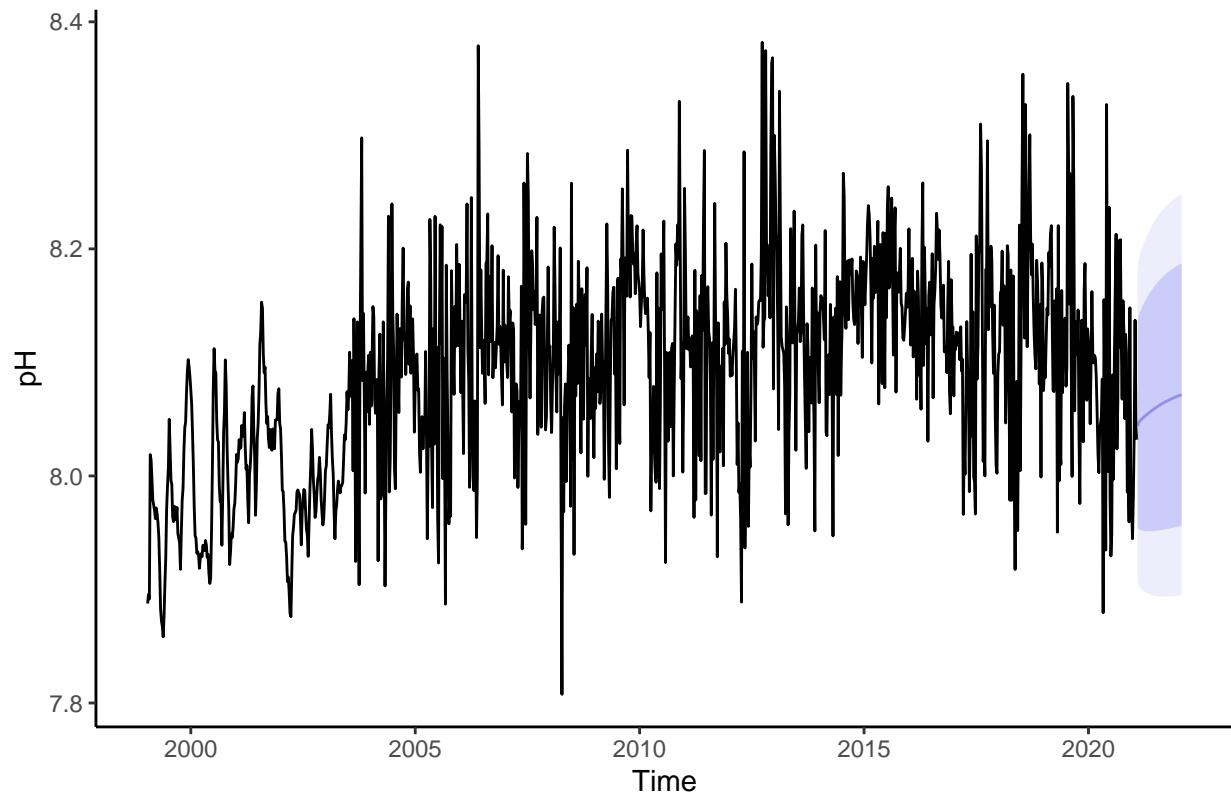
```
# hard to tell on seasonality maybe none
# d and D = 0

sboo_arima_ph <- arima(sboo_arima_train_ph,
                        order=c(2, 0, 1))

# saving forecast using test set
sboo_arima_ph_forecast <- forecast(sboo_arima_ph, h=52)

# plotting the forecasts
autoplot(sboo_arima_train_ph,
         main = "SBOO ARIMA pH",
         ylab = "pH") +
  autolayer(sboo_arima_ph_forecast, alpha=.3) +
  theme_classic()
```

## SBOO ARIMA pH



```
# looking at performance of the ARIMA
sboo_arima_ph_acc <- accuracy(sboo_arima_ph_forecast, sboo_arima_test_ph)

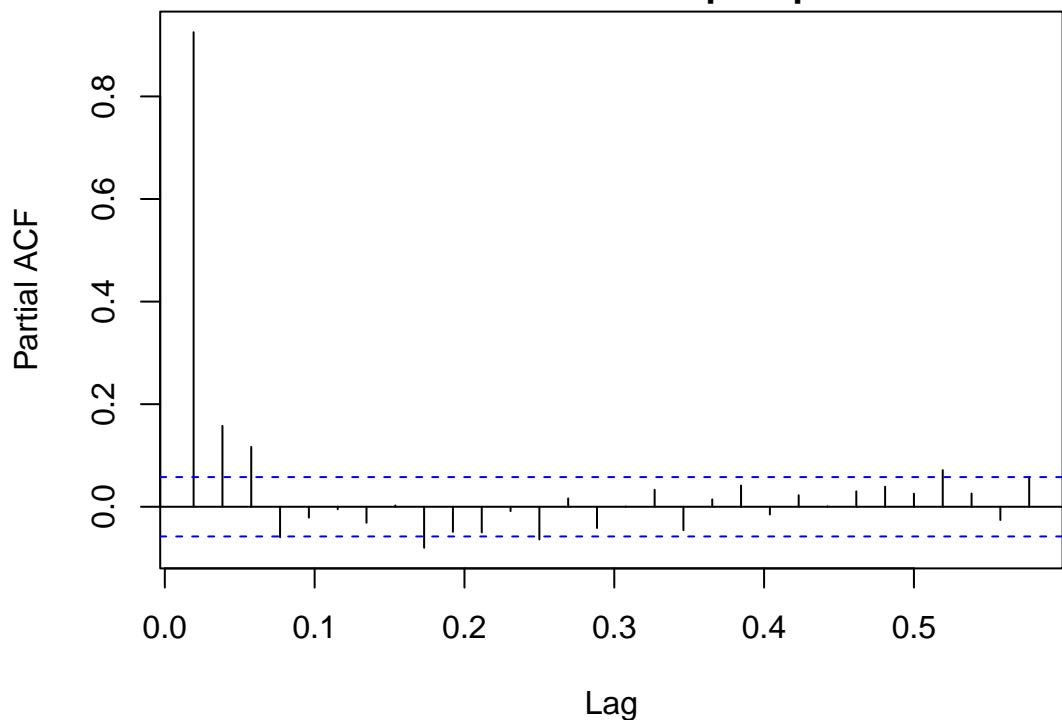
sboo_arima_ph_acc

##               ME        RMSE        MAE        MPE        MAPE
## Training set 0.000807955 0.06957934 0.05169269 0.002683095 0.6382645
## Test set     -0.005279801 0.11030998 0.08935559 -0.083728450 1.1090916
##             MASE        ACF1
## Training set 0.8672183 0.001676008
## Test set     1.4990670          NA

# SALINITY
sboo_arima_train_sal <- ts(owt_df02_gb09_sboo_wkly02_train_tb03$SALINITY,
                           start = c(1999, 3),
                           freq = 52)
# SBOO Excluding Outliers - Test partition (01/11/2021-01/03/2022)
sboo_arima_test_sal <- owt_df02_gb09_sboo_wkly02_test_tb03$SALINITY

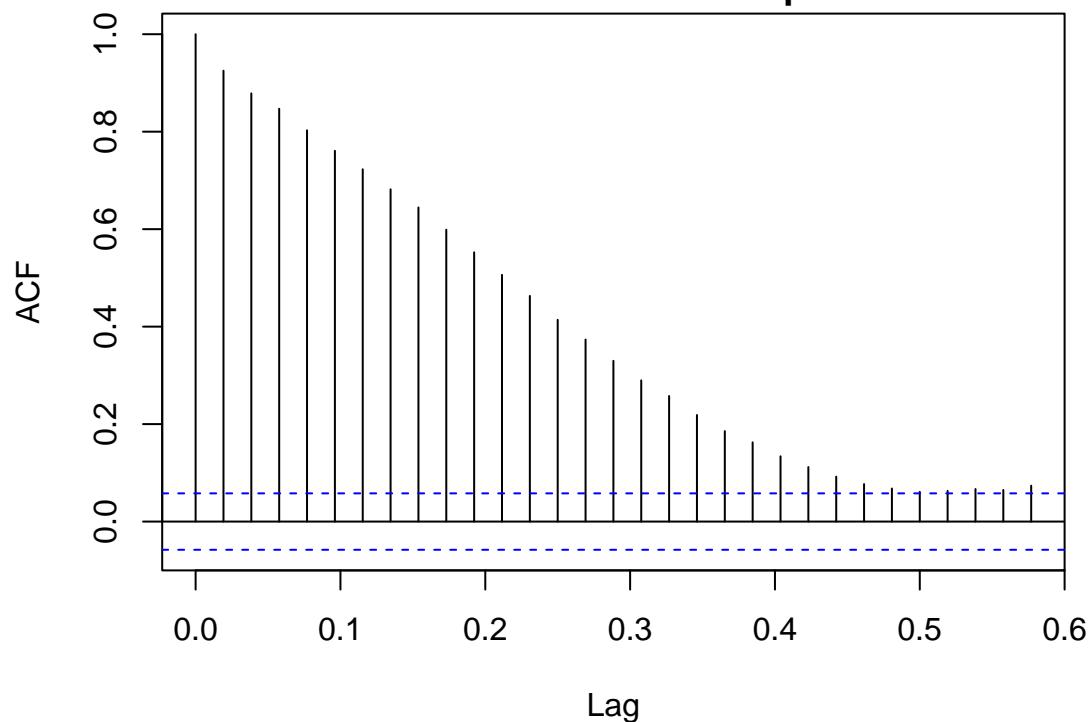
# pacf plot
par(mar=c(5, 4, 0, 2)+1.5)
pacf(sboo_arima_train_sal)
title("SALINITY at SBOO pacf plot")
```

**SALINITY at SBOO pacf plot**



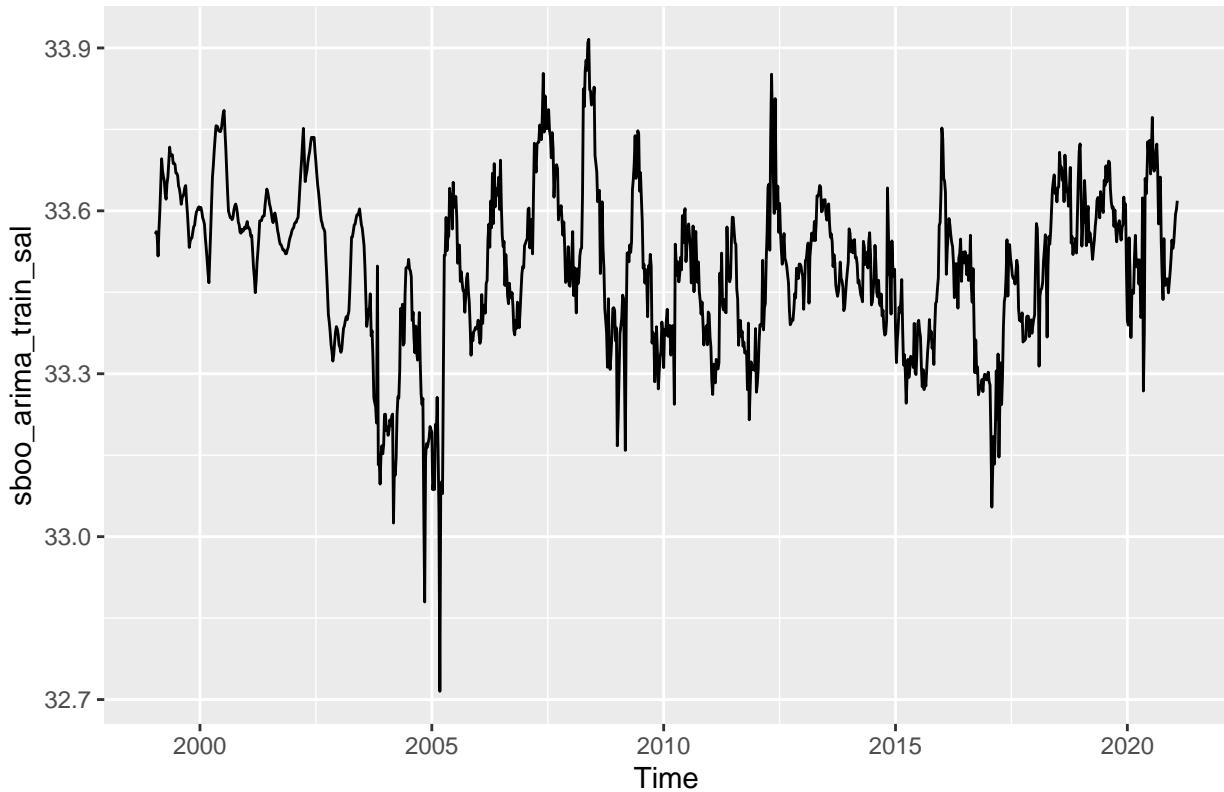
```
# p=1  
  
# acf plot  
acf(sboo_arima_train_sal)  
title("SALINITY at SBOO acf plot")
```

**SALINITY at SBOO acf plot**



```
# q 1  
  
# ts plot  
autoplot(sboo_arima_train_sal,  
         main = "SALINITY at SBOO ts plot")
```

## SALINITY at SBOO ts plot



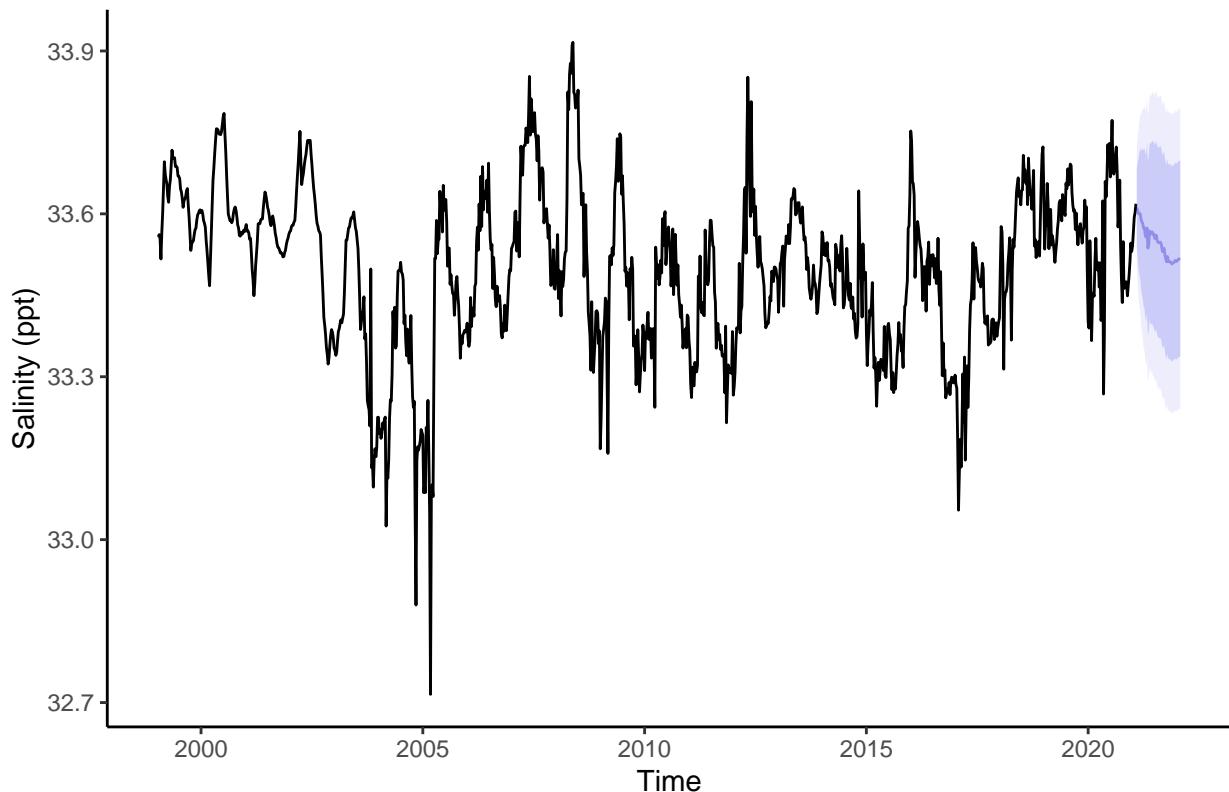
```
# seasonal plot
# P (pacf plot) = 1
# d and D = 0
# Q (acf plot) = 0

sboo_arima_sal <- arima(sboo_arima_train_sal,
                         order=c(1, 0, 1), seasonal = c(1,0,0))

# saving forecast using test set
sboo_arima_sal_forecast <- forecast(sboo_arima_sal, h=52)

# plotting the forecasts
autoplot(sboo_arima_train_sal,
         main = "SBOO ARIMA SALINITY",
         ylab = "Salinity (ppt)") +
  autolayer(sboo_arima_sal_forecast, alpha=.3) +
  theme_classic()
```

## SBOO ARIMA SALINITY



```
# looking at performance of the ARIMA
sboo_arima_sal_acc <- accuracy(sboo_arima_sal_forecast, sboo_arima_test_sal)

sboo_arima_sal_acc

##                               ME      RMSE      MAE      MPE      MAPE
## Training set 2.058847e-05 0.05498850 0.03628011 -0.0002137381 0.1084051
## Test set      1.760262e-02 0.08751071 0.07237851  0.0517296153 0.2154528
##                               MASE      ACF1
## Training set 0.9872188 0.01400696
## Test set      1.9694928      NA

z <- get("ENTER0", owt_df02_gb09_ploo_wkly03_train_tb03)
ts_owt_df02_gb09_sboo_wkly02_train_tb03 <- ts(z, start = c(1999, 1), freq = 52)

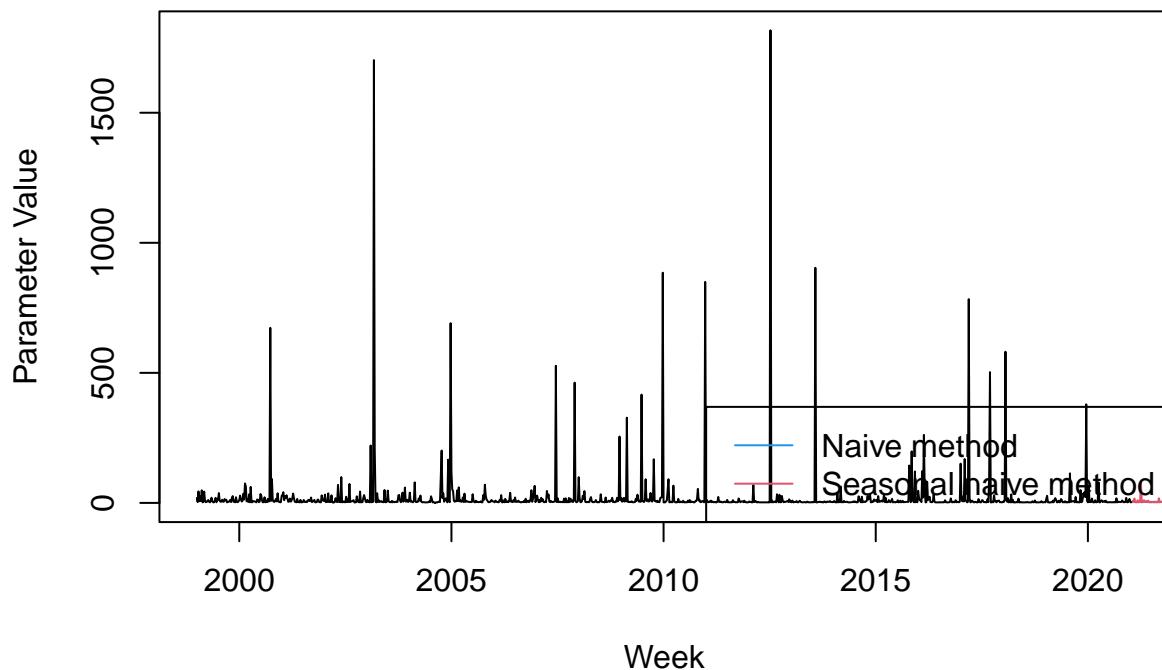
naive.rose <- naive(ts_owt_df02_gb09_sboo_wkly02_train_tb03, h=104)
plot(ts_owt_df02_gb09_sboo_wkly02_train_tb03, main="Forecast for weekly PL00 dataset",
     xlab="Week", ylab="Parameter Value")

snaive.rose <- snaive(ts_owt_df02_gb09_sboo_wkly02_train_tb03, h=104)
plot(ts_owt_df02_gb09_sboo_wkly02_train_tb03, main="Forecast for weekly PL00 dataset",
     xlab="Week", ylab="Parameter Value")

lines(naive.rose$mean, col=4)
lines(snaive.rose$mean, col=2)
```

```
legend("bottomright", lty=1, col=c(4,2),
      legend=c("Naive method", "Seasonal naive method"))
```

## Forecast for weekly PLOO dataset



```
print(accuracy(snaive.rose))
```

```
##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set -0.2189141 143.2925 32.63567 -461.2263 511.0516    1 0.02976892
```

### # DENSITY

```
z_den <- get("DENSITY", owt_df02_gb09_ploo_wkly03_train_tb03)
ts_owt_df02_gb09_sboo_wkly02_train_tb03 <- ts(z_den, start = c(1999, 1), freq = 52)
snaive.den <- snaive(ts_owt_df02_gb09_sboo_wkly02_train_tb03, h=104)
print("DENSITY:")
```

```
## [1] "DENSITY:"
```

```
print(accuracy(snaive.den))
```

```
##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set -0.02520021 0.4384758 0.3346855 -0.1167214 1.35569    1 0.6311523
```

### # PH

```
z_ph <- get("PH", owt_df02_gb09_ploo_wkly03_train_tb03)
ts_owt_df02_gb09_sboo_wkly02_train_tb03 <- ts(z_ph, start = c(1999, 1), freq = 52)
snaive.ph <- snaive(ts_owt_df02_gb09_sboo_wkly02_train_tb03, h=104)
print("PH:")
```

```

## [1] "PH:"

print(accuracy(snaive.ph))

##               ME      RMSE      MAE      MPE      MAPE MASE
## Training set 0.005067217 0.1020739 0.07956865 0.0554673 0.9879985    1
##               ACF1
## Training set 0.4673687

# SALINITY
z_sal <- get("SALINITY", owt_df02_gb09_ploo_wkly03_train_tb03)
ts_owt_df02_gb09_sboo_wkly02_train_tb03 <- ts(z_sal, start = c(1999, 1), freq = 52)
snaive.sal <- snaive(ts_owt_df02_gb09_sboo_wkly02_train_tb03, h=104)
print("SALINITY:")

## [1] "SALINITY:"

print(accuracy(snaive.sal))

##               ME      RMSE      MAE      MPE      MAPE MASE
## Training set -0.004825046 0.1763696 0.1230404 -0.01577362 0.3677022    1
##               ACF1
## Training set 0.7814462

z <- get("ENTERO", owt_df02_gb09_ploo_wkly03_test_tb03)
ts_owt_df02_gb09_ploo_wkly03_test_tb03 <- ts(z, start = c(2021, 1), freq = 52)

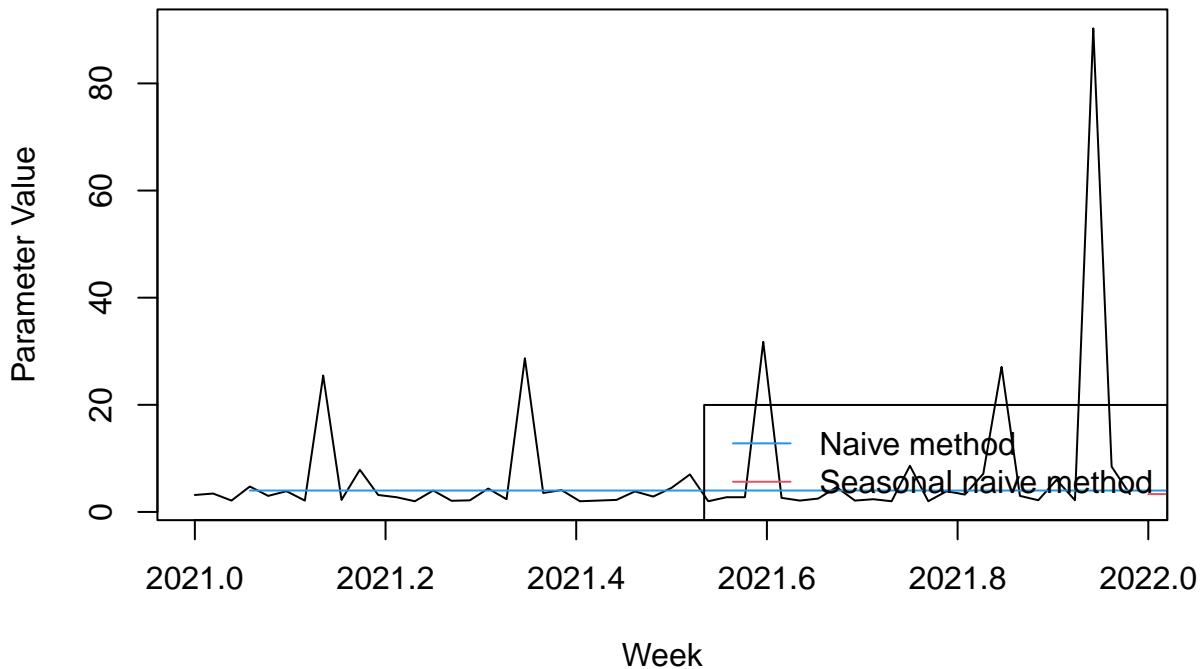
snaive.rose <- naive(ts_owt_df02_gb09_ploo_wkly03_test_tb03, h=104)
plot(ts_owt_df02_gb09_ploo_wkly03_test_tb03, main="Forecast for weekly PL00 dataset",
  ~ xlab="Week", ylab="Parameter Value")

lines(naive.rose$mean, col=4)
lines(snaive.rose$mean, col=2)

legend("bottomright", lty=1, col=c(4,2),
       legend=c("Naive method", "Seasonal naive method"))

```

## Forecast for weekly PLOO dataset



```

print(accuracy(snaive.rose))

##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set 0.003267974 19.72166 8.882983 -103.4933 150.049  NaN -0.500478

# DENSITY
z_den <- get("DENSITY", owt_df02_gb09_ploo_wkly03_test_tb03)
ts_owt_df02_gb09_ploo_wkly03_test_tb03 <- ts(z_den, start = c(2021, 1), freq = 52)
snaive.den <- naive(ts_owt_df02_gb09_ploo_wkly03_test_tb03, h=104)
print("DENSITY:")

## [1] "DENSITY:"

print(accuracy(snaive.den))

##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set -0.007789891 0.3026302 0.2493652 -0.03865236 1.004043  NaN
##               ACF1
## Training set -0.4839433

# PH
z_ph <- get("PH", owt_df02_gb09_ploo_wkly03_test_tb03)
ts_owt_df02_gb09_ploo_wkly03_test_tb03 <- ts(z_ph, start = c(2021, 1), freq = 52)
snaive.ph <- naive(ts_owt_df02_gb09_ploo_wkly03_test_tb03, h=104)
print("PH:")

## [1] "PH:"

```

```

print(accuracy(snaive.ph))

##               ME        RMSE       MAE        MPE       MAPE MASE
## Training set -0.0002490054 0.08047558 0.06232518 -0.00815208 0.7769789  NaN
##                  ACF1
## Training set -0.4204429

# SALINITY
z_sal <- get("SALINITY", owt_df02_gb09_ploo_wkly03_test_tb03)
ts_owt_df02_gb09_ploo_wkly03_test_tb03 <- ts(z_sal, start = c(2021, 1), freq = 52)
snaive.sal <- naive(ts_owt_df02_gb09_ploo_wkly03_test_tb03, h=104)
print("SALINITY:")

## [1] "SALINITY:"

print(accuracy(snaive.sal))

##               ME        RMSE       MAE        MPE       MAPE MASE
## Training set -0.003188264 0.05168319 0.03787635 -0.009628083 0.1127649  NaN
##                  ACF1
## Training set -0.2564732

z <- get("ENTERO", owt_df02_gb09_sboo_wkly03_train_tb03)
ts_owt_df02_gb09_sboo_wkly03_train_tb03 <- ts(z, start = c(1999, 1), freq = 52)

naive.rose <- naive(ts_owt_df02_gb09_sboo_wkly03_train_tb03, h=104)
plot(ts_owt_df02_gb09_sboo_wkly03_train_tb03, main="Forecast for weekly PL00 dataset",
  ~ xlab="Week", ylab="Parameter Value")

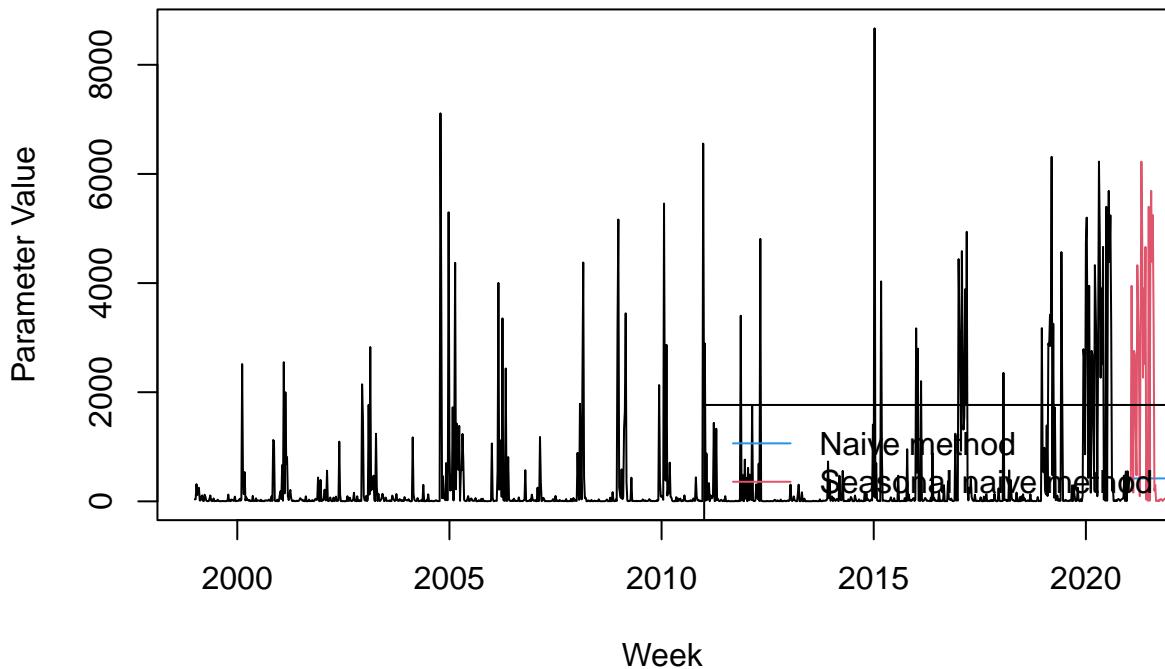
snaive.rose <- snaive(ts_owt_df02_gb09_sboo_wkly03_train_tb03, h=104)
plot(ts_owt_df02_gb09_sboo_wkly03_train_tb03, main="Forecast for weekly PL00 dataset",
  ~ xlab="Week", ylab="Parameter Value")

lines(naive.rose$mean, col=4)
lines(snaive.rose$mean, col=2)

legend("bottomright", lty=1, col=c(4,2),
      legend=c("Naive method", "Seasonal naive method"))

```

## Forecast for weekly PLOO dataset



```

print(accuracy(snaive.rose))

##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set 74.85486 1257.591 489.9936 -1843.094 1913.031    1 0.2416428

# DENSITY
z_den <- get("DENSITY", owt_df02_gb09_sboo_wkly03_train_tb03)
ts_owt_df02_gb09_sboo_wkly03_train_tb03 <- ts(z_den, start = c(1999, 1), freq = 52)
snaive.den <- snaive(ts_owt_df02_gb09_sboo_wkly03_train_tb03, h=104)
print("DENSITY:")

## [1] "DENSITY:"
print(accuracy(snaive.den))

##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set -0.02267708 0.4369493 0.3392177 -0.1072116 1.377332    1 0.5948643

# PH
z_ph <- get("PH", owt_df02_gb09_sboo_wkly03_train_tb03)
ts_owt_df02_gb09_sboo_wkly03_train_tb03 <- ts(z_ph, start = c(1999, 1), freq = 52)
snaive.ph <- snaive(ts_owt_df02_gb09_sboo_wkly03_train_tb03, h=104)
print("PH:")

## [1] "PH:"
print(accuracy(snaive.ph))

```

```

##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set 0.004397847 0.1056579 0.08178623 0.04620683 1.009717    1 0.353987

# SALINITY
z_sal <- get("SALINITY", owt_df02_gb09_sboo_wkly03_train_tb03)
ts_owt_df02_gb09_sboo_wkly03_train_tb03 <- ts(z_sal, start = c(1999, 1), freq = 52)
snaive.sal <- snaive(ts_owt_df02_gb09_sboo_wkly03_train_tb03, h=104)
print("SALINITY:")

## [1] "SALINITY:"
print(accuracy(snaive.sal))

##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set -0.003068609 0.1492933 0.117386 -0.01015136 0.3507278    1
##               ACF1
## Training set 0.8635462

z <- get("ENTERO", owt_df02_gb09_sboo_wkly03_test_tb03)
ts_owt_df02_gb09_sboo_wkly03_test_tb03 <- ts(z, start = c(2021, 1), freq = 52)

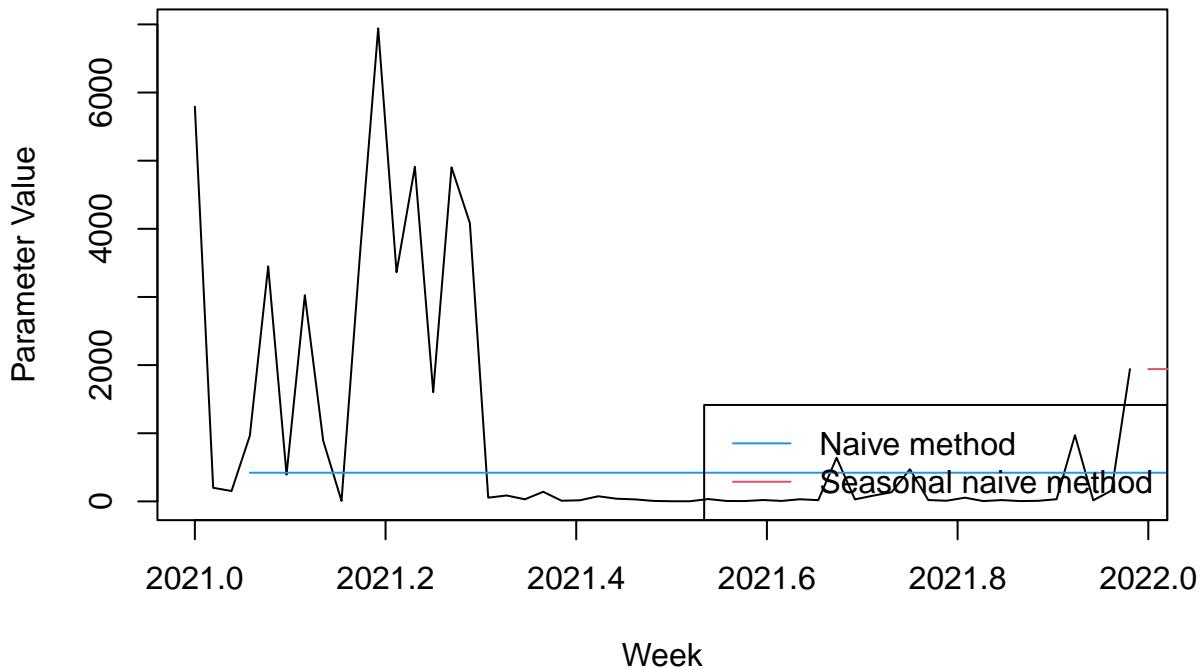
snaive.rose <- naive(ts_owt_df02_gb09_sboo_wkly03_test_tb03, h=104)
plot(ts_owt_df02_gb09_sboo_wkly03_test_tb03, main="Forecast for weekly PL00 dataset",
  ~ xlab="Week", ylab="Parameter Value")

lines(naive.rose$mean, col=4)
lines(snaive.rose$mean, col=2)

legend("bottomright", lty=1, col=c(4,2),
       legend=c("Naive method", "Seasonal naive method"))

```

## Forecast for weekly PLOO dataset



```

print(accuracy(snaive.rose))

##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set -75.5289 1679.732 938.639 -757.3371 828.1079  NaN -0.2973567

# DENSITY
z_den <- get("DENSITY", owt_df02_gb09_sboo_wkly03_test_tb03)
ts_owt_df02_gb09_sboo_wkly03_test_tb03 <- ts(z_den, start = c(2021, 1), freq = 52)
snaive.den <- naive(ts_owt_df02_gb09_sboo_wkly03_test_tb03, h=104)
print("DENSITY:")

## [1] "DENSITY:"
print(accuracy(snaive.den))

##               ME      RMSE      MAE      MPE      MAPE MASE      ACF1
## Training set -0.008203548 0.3977213 0.3230145 -0.0458566 1.304932  NaN
##               ACF1
## Training set -0.5195655

# PH
z_ph <- get("PH", owt_df02_gb09_sboo_wkly03_test_tb03)
ts_owt_df02_gb09_sboo_wkly03_test_tb03 <- ts(z_ph, start = c(2021, 1), freq = 52)
snaive.ph <- naive(ts_owt_df02_gb09_sboo_wkly03_test_tb03, h=104)
print("PH:")

## [1] "PH:"

```

```

print(accuracy(snaive.ph))

##               ME      RMSE      MAE      MPE      MAPE MASE
## Training set -0.0008870215 0.1294695 0.1006093 -0.02398872 1.251453  NaN
##                      ACF1
## Training set -0.5671807

# SALINITY
z_sal <- get("SALINITY", owt_df02_gb09_sboo_wkly03_test_tb03)
ts_owt_df02_gb09_sboo_wkly03_test_tb03 <- ts(z_sal, start = c(2021, 1), freq = 52)
snaive.sal <- naive(ts_owt_df02_gb09_sboo_wkly03_test_tb03, h=104)
print("SALINITY:")

## [1] "SALINITY:"

print(accuracy(snaive.sal))

##               ME      RMSE      MAE      MPE      MAPE MASE
## Training set -0.00467507 0.05398767 0.03857742 -0.01408978 0.1149218  NaN
##                      ACF1
## Training set -0.2877513

```