Community vs SGD Regression

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Install necessary libraries

```
if("tidyverse" %in% rownames(installed.packages()) == FALSE){install.packages("tidyvers
e")}
if("here" %in% rownames(installed.packages()) == FALSE){install.packages("here")}
if("ggrepel" %in% rownames(installed.packages()) == FALSE){install.packages("ggrepel")}
if("PNWColors" %in% rownames(installed.packages()) == FALSE){install.packages("PNWColor
s")}
if("vegan" %in% rownames(installed.packages()) == FALSE){install.packages("vegan")}
if("pairwiseAdonis" %in% rownames(installed.packages()) == FALSE){ devtools::install_git
hub("pmartinezarbizu/pairwiseAdonis/pairwiseAdonis")}
if("patchwork" %in% rownames(installed.packages()) == FALSE){install.packages("patchwor
k")}
if("ggmap" %in% rownames(installed.packages()) == FALSE){install.packages("ggmap")}
```

Load Libraries

```
library(tidyverse)
```

```
## ── Attaching packages ─────────────────────────────────────── tidyverse 1.3.2 ──
## ✓ ggplot2 3.3.6      ✓ purrr   0.3.5
## ✓ tibble  3.1.8      ✓ dplyr   1.0.10
## ✓ tidyr   1.2.1      ✓ stringr 1.4.1
## ✓ readr   2.1.3      ✓ forcats 0.5.2
## ── Conflicts ────────────────────────────────────────── tidyverse_conflicts() ──
## ✖ dplyr::filter() masks stats::filter()
## ✖ dplyr::lag()    masks stats::lag()
```

```
library(here)
```

```
## here() starts at C:/Users/Danielle Barnas/Documents/Repositories/Community_Functional
_Diversity
```

```
library(ggrepel)
library(PNWColors)
library(vegan)
```

```
## Loading required package: permute
## Loading required package: lattice
## This is vegan 2.6-2
```

```
library(pairwiseAdonis)
```

```
## Loading required package: cluster
```

```
library(patchwork)
library(ggmap)
```

```
## Google's Terms of Service: https://cloud.google.com/maps-platform/terms/.
## Please cite ggmap if you use it! See citation("ggmap") for details.
```

```
library(wakefield)
```

```
##
## Attaching package: 'wakefield'
##
## The following object is masked from 'package:patchwork':
##
##     area
##
## The following object is masked from 'package:dplyr':
##
##     id
```

Read in data

```
meta <- read_csv(here("Data", "Full_Metadata.csv"))

#comp <- read_csv(here("Data","Surveys","Species_Composition_2022.csv"))
taxa <- read_csv(here("Data","Surveys","Distinct_Taxa.csv"))
chem <- read_csv(here("Data","Biogeochem", "Nutrients_Processed_All.csv"))
turb <- read_csv(here("Data","Biogeochem", "July2022", "Turb_NC.csv"))
# richness, % richness of community pool, and % volume of community pool
Fric <- read_csv(here("Data", "Sp_FE_Vol.csv"))


# create color palette for plotting
mypalette <- pnw_palette(name="Bay")
midpalette <- pnw_palette(name = "Bay", n = 30)
largepalette <- pnw_palette(name = "Bay", n = 100)
```

Process and Join data

```
# reduce metadata
meta <- meta %>%
  drop_na(lat) %>%  # removes Maya's project sites (not being used for my study)
  left_join(turb)
```

```
## Joining, by = c("Location", "CowTagID", "del15N", "C_N", "N_percent")
```

```
# join dfs
Full_data <- Fric %>%
  left_join(meta) %>%
  mutate(meanRugosity = if_else(CowTagID == "VSEEP", 0.97, meanRugosity)) %>%   # i'm a
ninny and still haven't added the seep rugosity yet *sigh*
  left_join(chem) %>%
  select(-Location)
```

```
## Joining, by = "CowTagID"
## Joining, by = c("CowTagID", "Location", "lat", "lon")
```

```
myturb <- turb %>%
  pivot_longer(cols = del15N:N_percent, names_to = "Parameters", values_to = "Values") %
>%
  right_join(Fric) %>%
  select(-Location) %>%
  relocate(Parameters, .after = Vol8D) %>%
  relocate(Values, .after = Parameters) %>%
  mutate(Season = "June2022")
```

```
## Joining, by = "CowTagID"
```

Visualize linear and nonlinear regressions: Richness and Volume

```
# Plotting function
# create ggplot function
plotfun <- function(mydata = Full_data, x, y, myfacet, myformula) {

  x<-enquo(x)
  y<-enquo(y)

  plot <- ggplot(data = mydata,
                 aes(y = !!y,
                     x = !!x,
                     color = Season)) +
  geom_point() +
  geom_smooth(method = "lm", formula = myformula) +
  facet_wrap(enquo(myfacet), scales = "free") +
  labs(y = paste(as_label(y)),
       x = paste(as_label(x))) +
  theme_bw()+
  theme(legend.direction = "horizontal",
        legend.position = "top")

  return(plot)
}

# pvalue Functions: LM and Polynomial
pvalLM <- function(mydata = Full_data, myparam, myseason){

  Param_data <- mydata %>%
    select(CowTagID, NbSp:Vol8D, Season, Parameters, {{myparam}}) %>%
    pivot_wider(names_from = Parameters, values_from = {{myparam}})

  ParamType <- as.character(myparam)

  p_df <- tibble(Parameter = as.character(),
                 ParamType = as.character(),
                 Dependent = as.character(),
                 Season = as.character(),
                 pvalue = as.numeric(),
                 r_squared = as.numeric(),
                 adj_r_squared = as.numeric())

  for(i in 2:6){ # 2:6 are our dependent variables NbSp, NbFEs, Vol8D

    for(j in 8:ncol(Param_data)){

      Param_data <- Param_data %>%
        filter(Season == myseason)
      Season <- myseason

      Parameter <- colnames(Param_data)[j]
      Dependent <- colnames(Param_data)[i] # select dependent parameter
```

```
      if(is.na(Param_data[1,j])){ # some variables have no data in the wet season, so sk
ip these variables
        p_df <- p_df
      } else {

      mod <- lm(paste(Dependent, "~", Parameter), data = Param_data)
      pvalue <- summary(mod)[4]$coefficients[8]
      r_squared <- summary(mod)[8]$r.squared
      adj_r_squared <- summary(mod)[9]$adj.r.squared

      temp <- as_tibble(cbind(Parameter, ParamType, Dependent, Season,
                          pvalue, r_squared, adj_r_squared)) %>%
              mutate(pvalue = as.numeric(pvalue),
                     r_squared = as.numeric(r_squared),
                     adj_r_squared = as.numeric(adj_r_squared))

      p_df <- p_df %>%
              rbind(temp)
      }
    }
  }
return(p_df)
}


pvalpoly <- function(mydata = Full_data, myparam, myseason){

  Param_data <- mydata %>%
    select(CowTagID, NbSp:Vol8D, Season, Parameters, {{myparam}}) %>%
    pivot_wider(names_from = Parameters, values_from = {{myparam}})

  ParamType <- as.character(myparam)

  p_df <- tibble(Parameter = as.character(),
                 ParamType = as.character(),
                 Dependent = as.character(),
                 Season = as.character(),
                 pvalue1 = as.numeric(),
                 pvalue2 = as.numeric(),
                 r_squared = as.numeric(),
                 adj_r_squared = as.numeric())

  for(i in 2:6){ # 2:6 are our dependent variables NbSp, NbFEs, Vol8D

    for(j in 8:ncol(Param_data)){

      Param_data <- Param_data %>%
        filter(Season == myseason)
      Season <- myseason

      Parameter <- colnames(Param_data)[j]
```

```
      Dependent <- colnames(Param_data)[i] # select dependent parameter

      if(is.na(Param_data[1,j])){ # some variables have no data in the wet season, so sk
ip these variables
        p_df <- p_df
      } else {
        mod <- lm(paste(Dependent, "~ poly(", Parameter, ",2)"), data = Param_data)
        pvalue1 <- summary(mod)[4]$coefficients[11]
        pvalue2 <- summary(mod)[4]$coefficients[12]
        r_squared <- summary(mod)[8]$r.squared
        adj_r_squared <- summary(mod)[9]$adj.r.squared

        temp <- as_tibble(cbind(Parameter, ParamType, Dependent, Season,
                          pvalue1, pvalue2, r_squared, adj_r_squared)) %>%
              mutate(pvalue1 = as.numeric(pvalue1),
                     pvalue2 = as.numeric(pvalue2),
                     r_squared = as.numeric(r_squared),
                     adj_r_squared = as.numeric(adj_r_squared))

        p_df <- p_df %>%
          rbind(temp)
      }
    }
  }
  return(p_df)
}

# pvalue plots
pvalplot <- function(mydata, season = "Dry"){

  mydata <- mydata %>%
    pivot_longer(cols = c(pvalue1, pvalue2), names_to = "p1_p2", values_to = "pvalue")
  # pvalue1 is the same in Linear and Poly2

  season <- enquo(season)

  plot1 <- mydata %>%
    filter(Dependent == "NbFEs" | Dependent == "NbSp" | Dependent == "Vol8D") %>%
    filter(Season == {{season}}) %>%
    ggplot(aes(x = Parameter, y  = pvalue)) +
    geom_col(aes(fill = p1_p2),
             position = "dodge") +
    theme_bw() +
    geom_hline(yintercept = 0.05, color = "black", size = 1) +
    theme(axis.text.x = element_text(angle = 90),
          legend.position = "top") +
    facet_wrap(~Dependent, scales = "free")

  return(plot1)
}
```

```
# site characteristic regression plots
paramPlot <- function(mydata = Full_data, ParamType, PTname, myformula = "y~x"){

  # isolate the desired paramtype (ex. Max, Min, Mean)
  data <- mydata %>%
    select(-c(NbSp:Vol8D,lat, lon))

  myparamdata <- data %>%
    select(CowTagID, Season, Parameters, Maximum)# {{ParamType}})

  data <- data[,1:13]
  data <- full_join(data, myparamdata)

  data <- data %>%
    pivot_wider(names_from = Parameters, values_from = Maximum) %>% # {{ParamType}}) %>%
    relocate(Season, .after = CowTagID)

  p <- list() # empty list for saving plots

  for(i in 3:ncol(data)){
  # isolate dependent variable
  myDep <- data %>%
    select(CowTagID, Season) %>%  # will join back after pivoting remaining variables
    cbind(data[,i]) %>%
    drop_na()

  newdata <- data %>%
    select(-c(colnames(data[,i]))) %>% # remove dependent var to not pivot on itself
    pivot_longer(cols = 3:ncol(.), names_to = "Parameters", values_to = "Values") %>%
    right_join(myDep)  # bring back dependent var

  yplot <- as.name(colnames(newdata[,5]))

  p[[i]] <- newdata %>%
    ggplot(aes(x = Values, y = !!yplot, color = Season)) +
    geom_point() +
    geom_smooth(method = "lm", formula = myformula) +
    theme_bw() +
    theme(legend.position = "top",
          legend.direction = "horizontal") +
    facet_wrap(~Parameters, scales = "free")
  }

  # Save all plots in a single pdf
  pdf(here("Output","Biogeochem_Regression",paste0("V_site_regressions_", PTname ,".pd
f")), onefile = TRUE)
  for (i in 1:length(p)) {
    tplot <- p[[i]]
    print(tplot)
  }
  dev.off()
```

```
return(p)
}
```

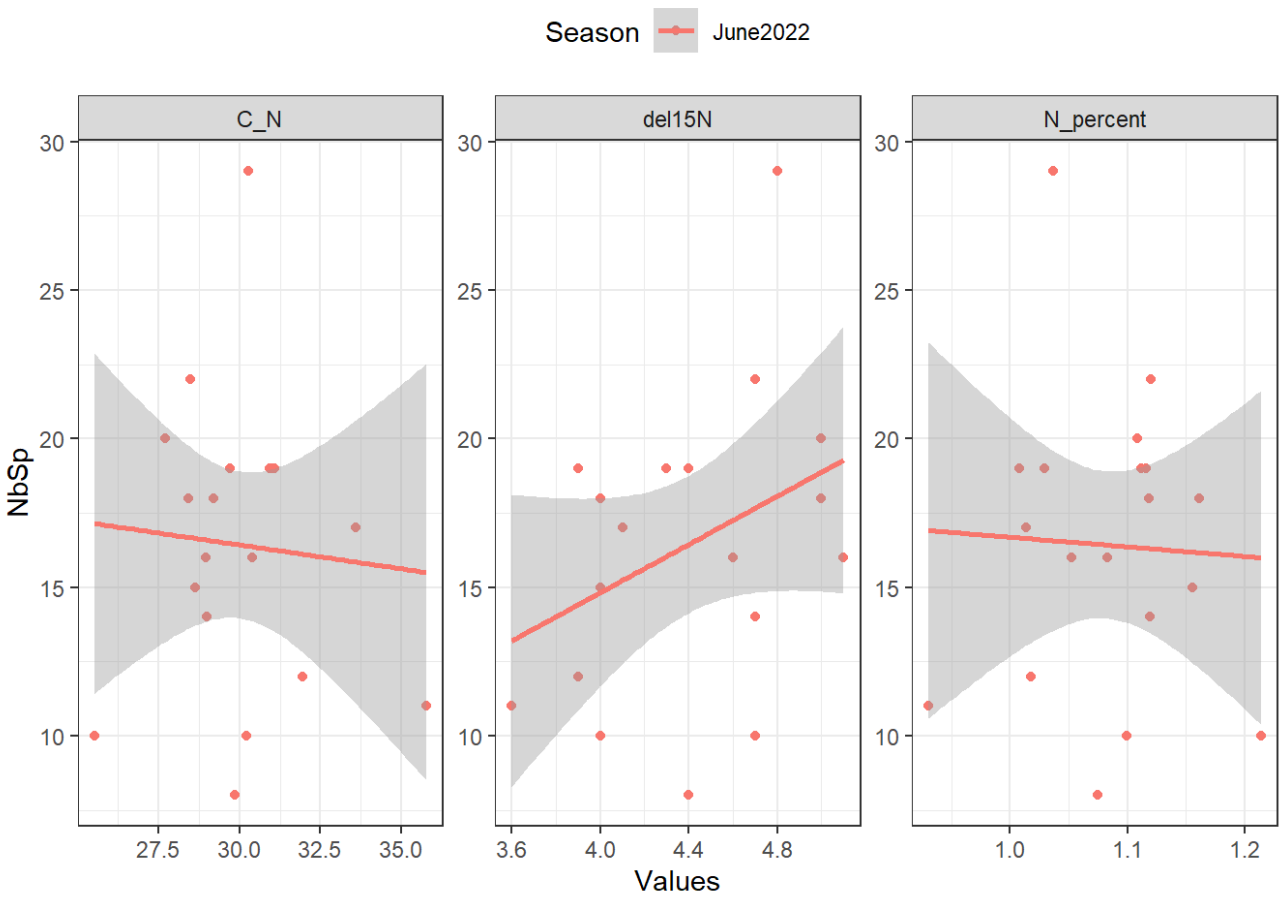
NOT INCLUDING VSEEP

Remove VSEEP from Full_data

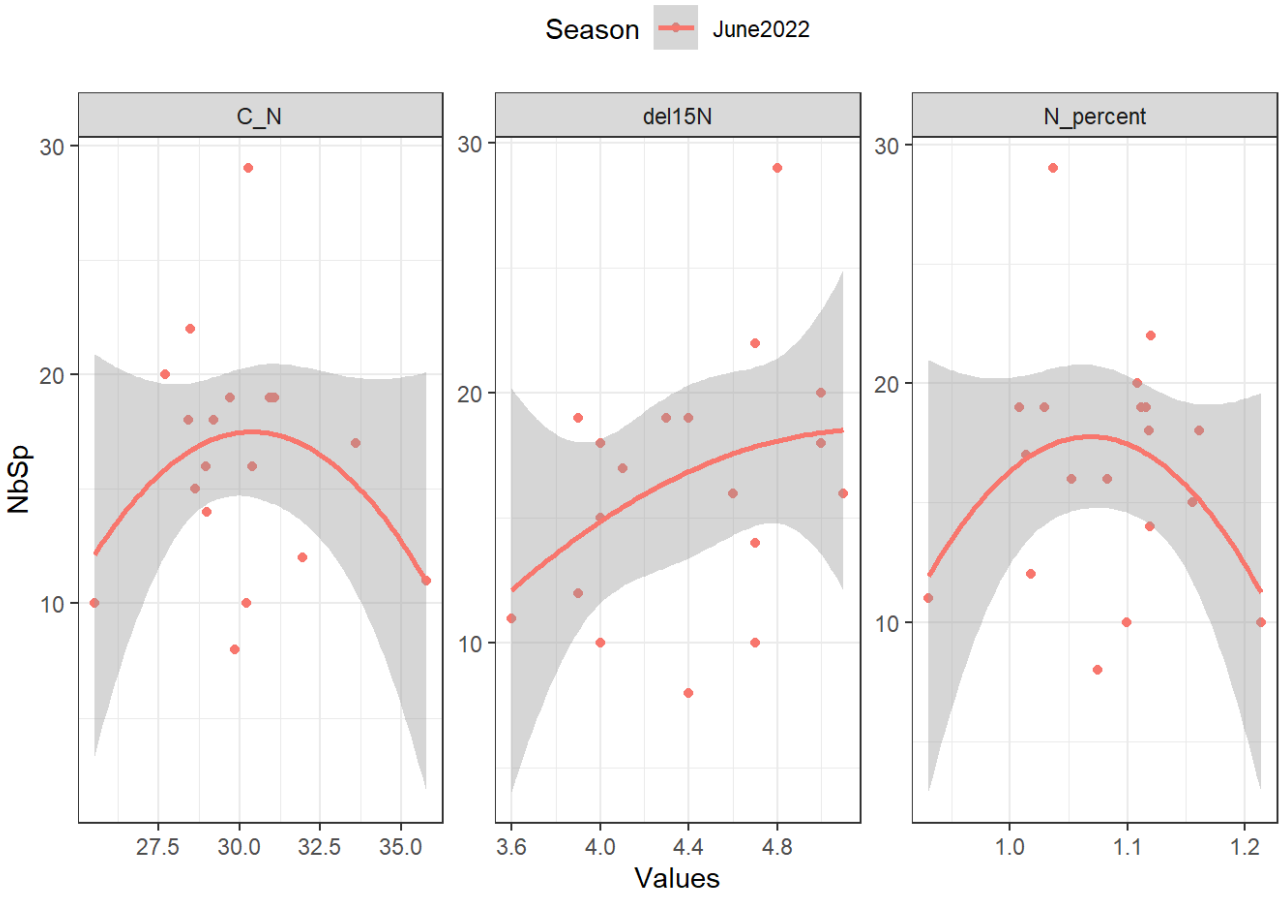
```
Full_data <- Full_data %>%
  filter(CowTagID!= "VSEEP")
myturb <- myturb %>%
  filter(CowTagID != "VSEEP")
```

TURBINARIA NUTRIENT LOADING

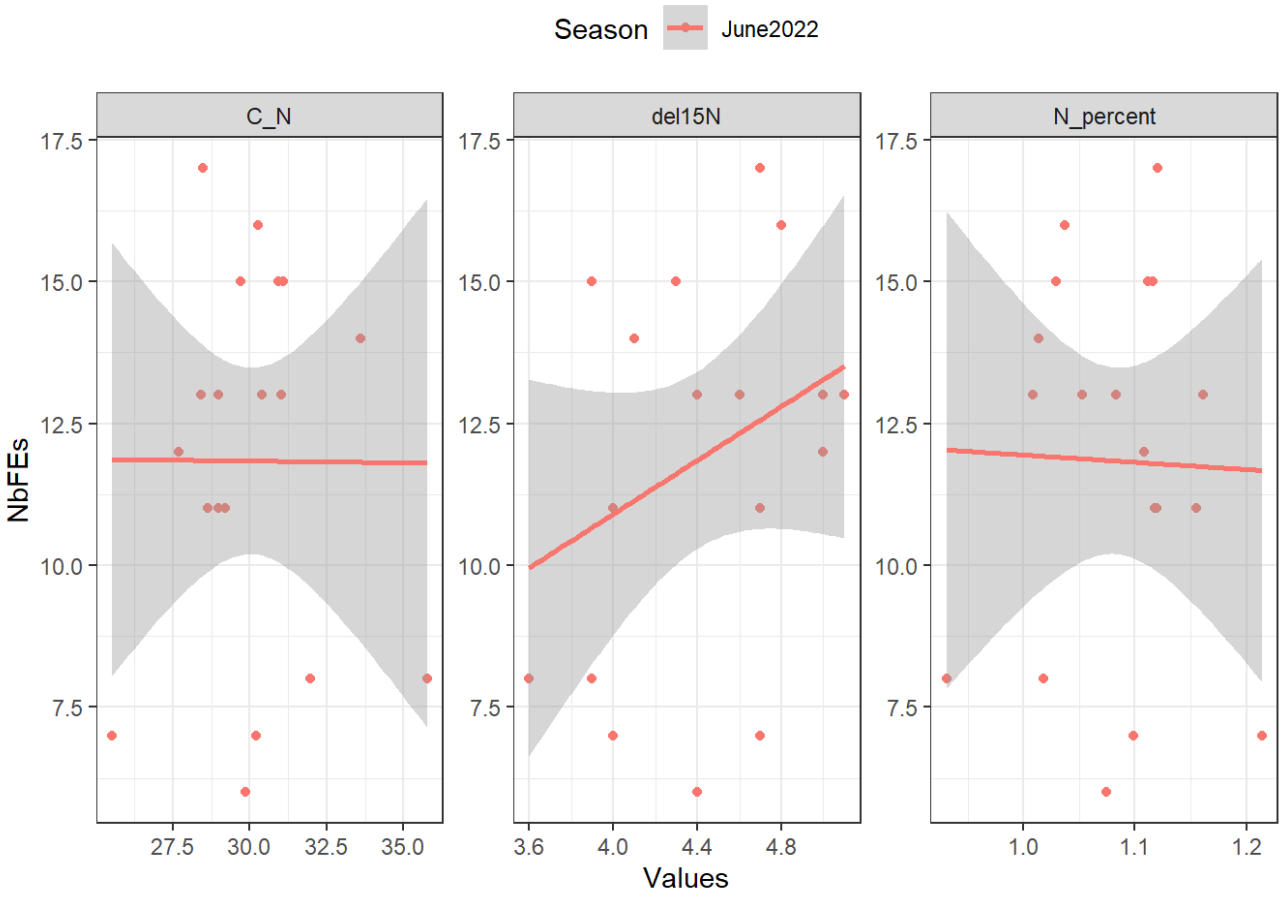
```
plotfun(y = NbSp, x = Values, myfacet = Parameters, myformula = "y~x", mydata = myturb)
```



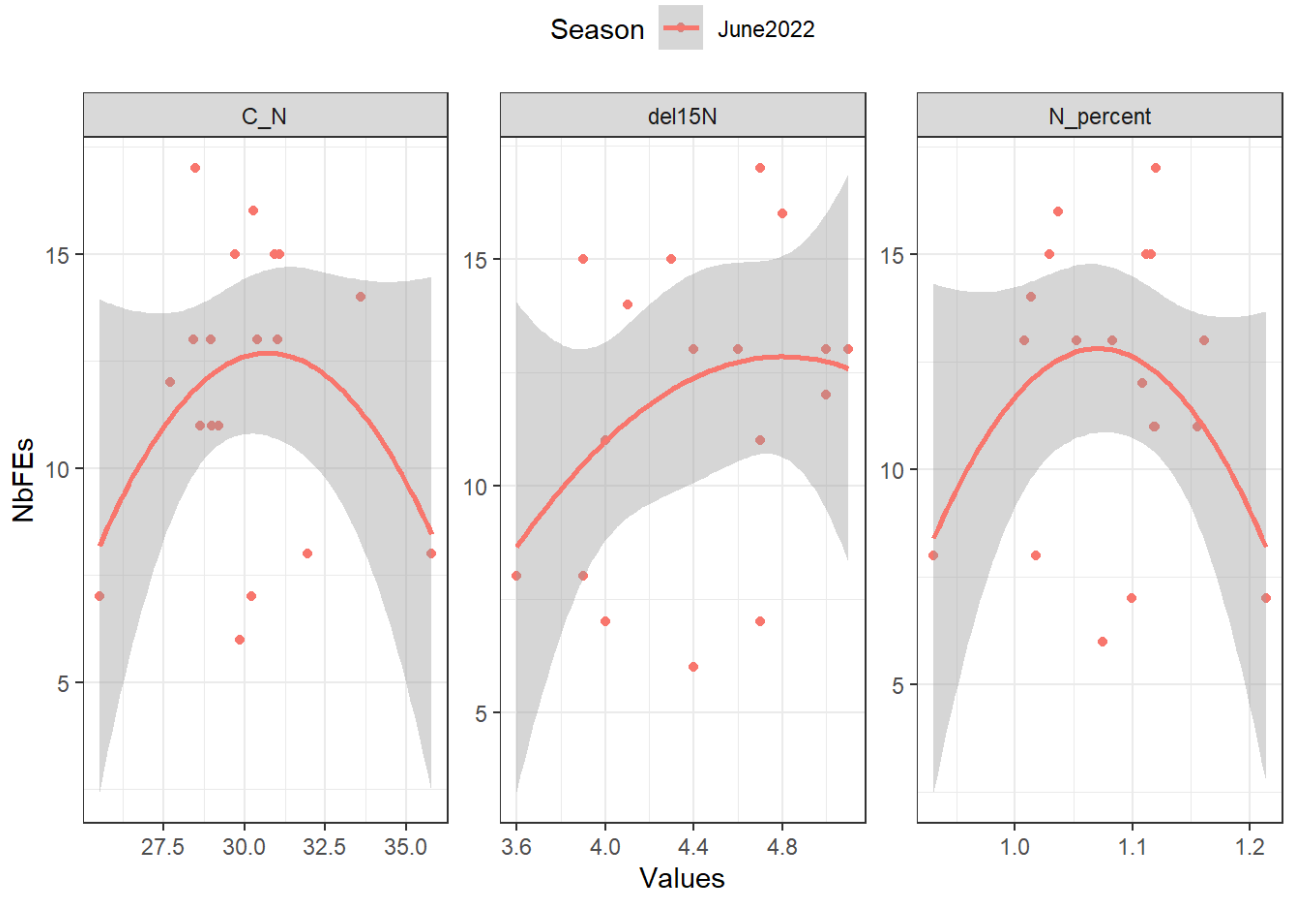

```
plotfun(y = NbSp, x = Values, myfacet = Parameters, myformula = "y~poly(x,2)", mydata =
myturb)
```



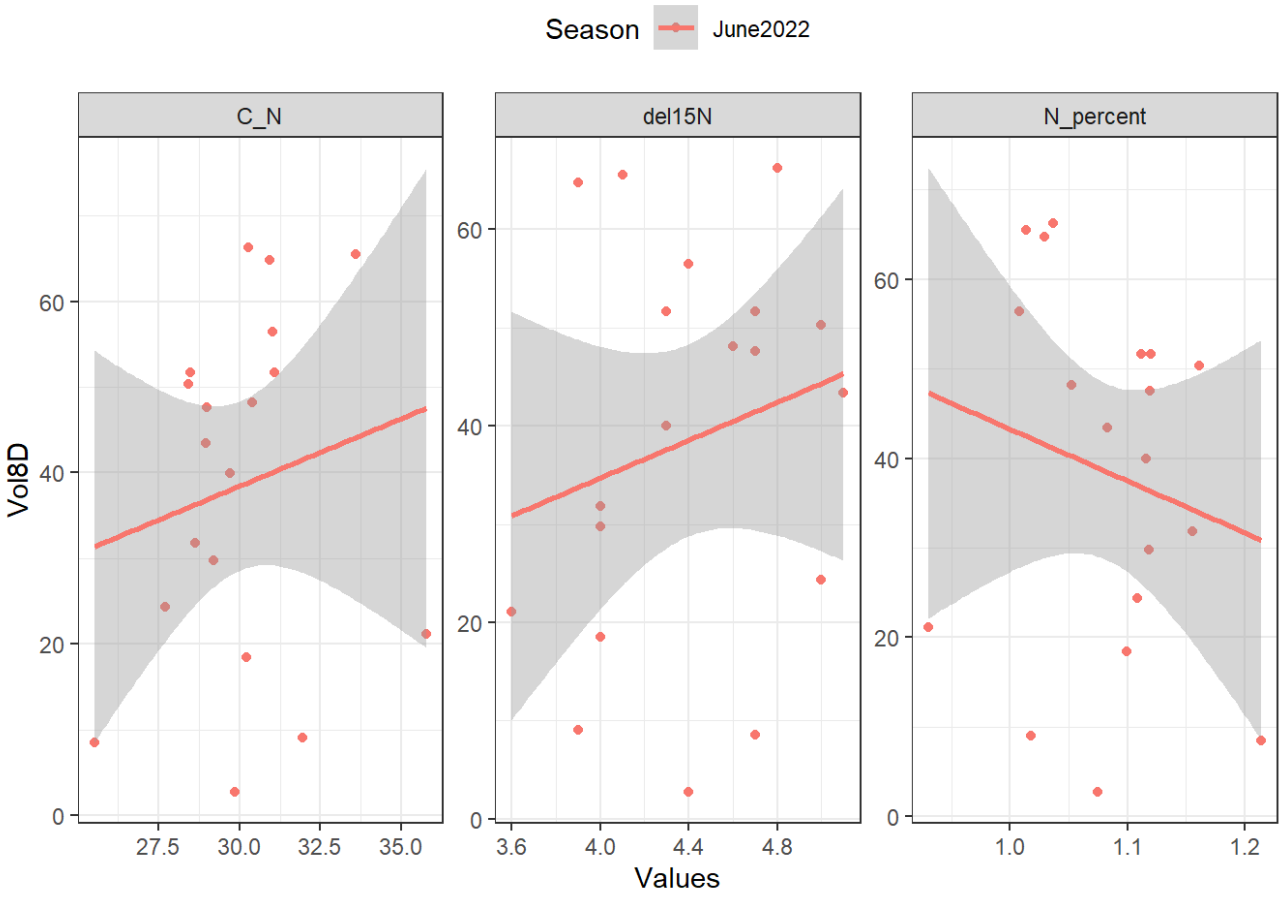

```
plotfun(y = NbFEs, x = Values, myfacet = Parameters, myformula = "y~x", mydata = myturb)
```



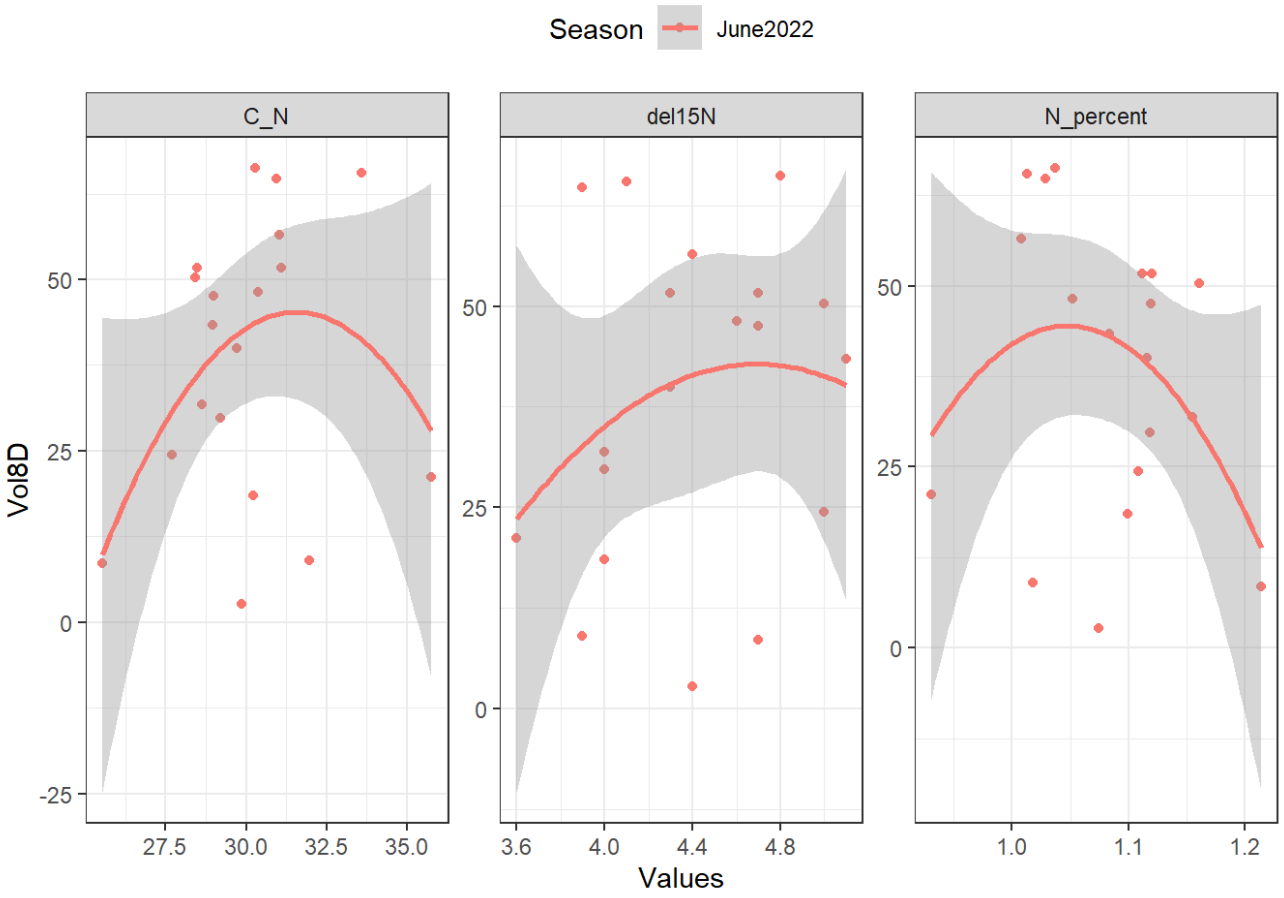

```
plotfun(y = NbFEs, x = Values, myfacet = Parameters, myformula = "y~poly(x,2)", mydata = myturb)
```




```
plotfun(y = Vol8D, x = Values, myfacet = Parameters, myformula = "y~x", mydata = myturb)
```



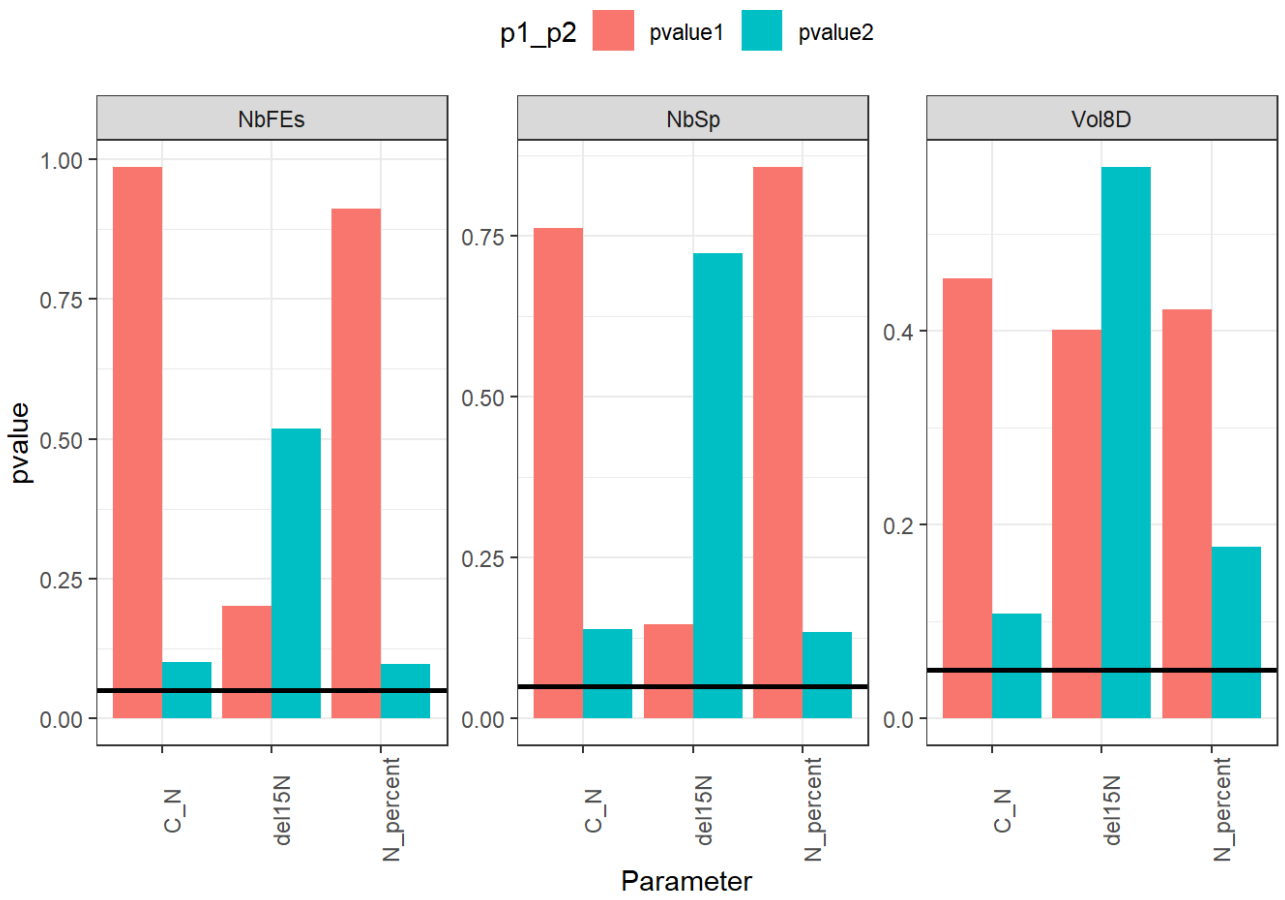

```
plotfun(y = Vol8D, x = Values, myfacet = Parameters, myformula = "y~poly(x,2)", mydata = myturb)
```




```
# get pvalues
pTO<-pvalpoly(mydata = myturb, myparam = "Values", myseason = "June2022")
pTO
```

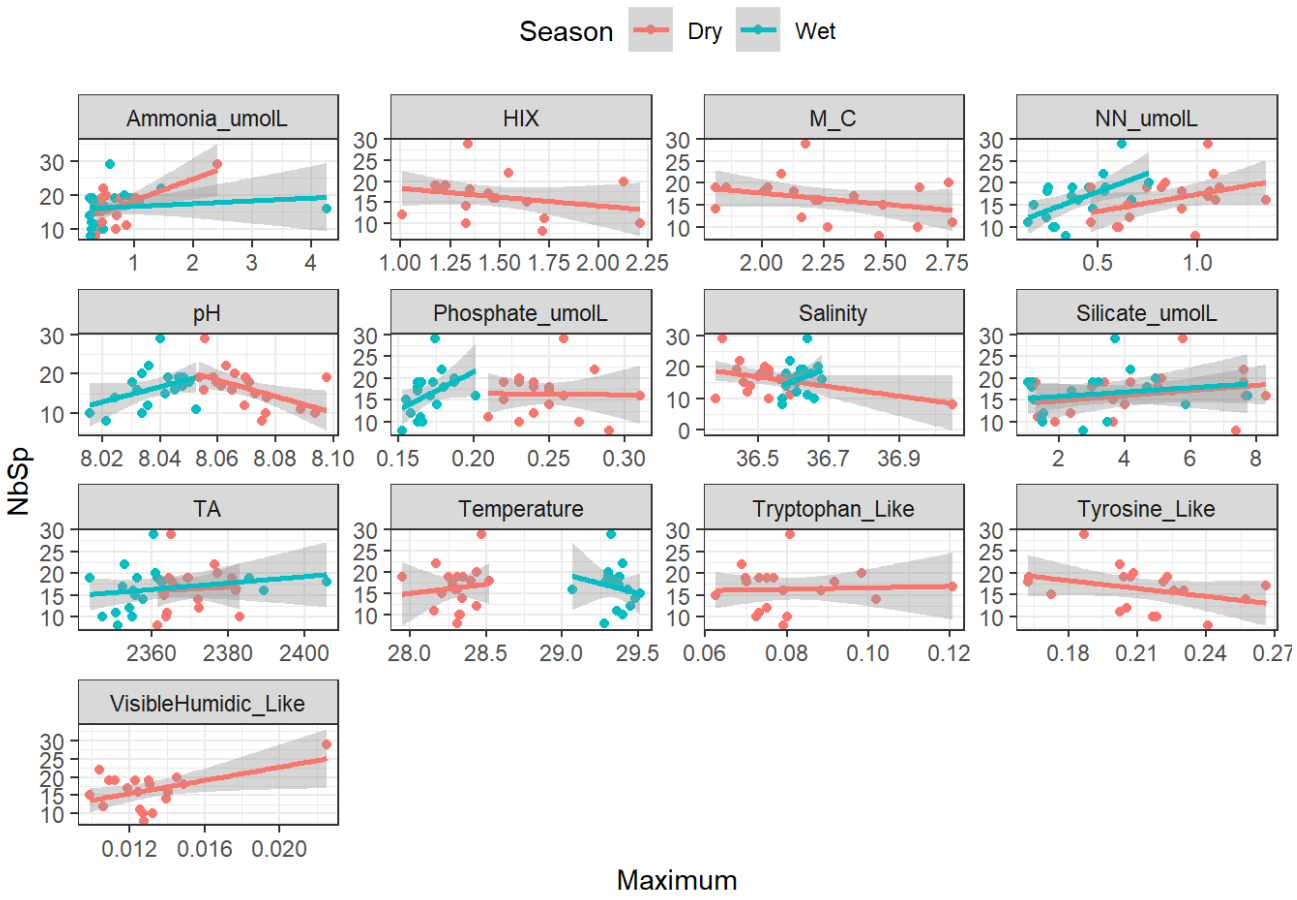
```
## # A tibble: 15 × 8
##    Parameter ParamType Dependent Season   pvalue1 pvalue2 r_squared adj_r_squa…¹
##    <chr>     <chr>     <chr>     <chr>      <dbl>   <dbl>     <dbl>        <dbl>
##  1 del15N    Values    NbSp      June2022   0.146  0.722     0.133        0.0252
##  2 C_N       Values    NbSp      June2022   0.762  0.138     0.137        0.0286
##  3 N_percent Values    NbSp      June2022   0.856  0.134     0.137        0.0286
##  4 del15N    Values    NbSpP     June2022   0.146  0.722     0.133        0.0252
##  5 C_N       Values    NbSpP     June2022   0.762  0.138     0.137        0.0286
##  6 N_percent Values    NbSpP     June2022   0.856  0.134     0.137        0.0286
##  7 del15N    Values    NbFEs     June2022   0.201  0.518     0.122        0.0118
##  8 C_N       Values    NbFEs     June2022   0.986  0.100     0.160        0.0549
##  9 N_percent Values    NbFEs     June2022   0.912  0.0968    0.163        0.0588
## 10 del15N    Values    NbFEsP    June2022   0.201  0.518     0.122        0.0118
## 11 C_N       Values    NbFEsP    June2022   0.986  0.100     0.160        0.0549
## 12 N_percent Values    NbFEsP    June2022   0.912  0.0968    0.163        0.0588
## 13 del15N    Values    Vol8D     June2022   0.401  0.569     0.0633      -0.0538
## 14 C_N       Values    Vol8D     June2022   0.454  0.108     0.179        0.0761
## 15 N_percent Values    Vol8D     June2022   0.422  0.177     0.143        0.0362
## # … with abbreviated variable name ¹adj_r_squared
```

```
pvalplot(mydata = pTO, season = "June2022")
```

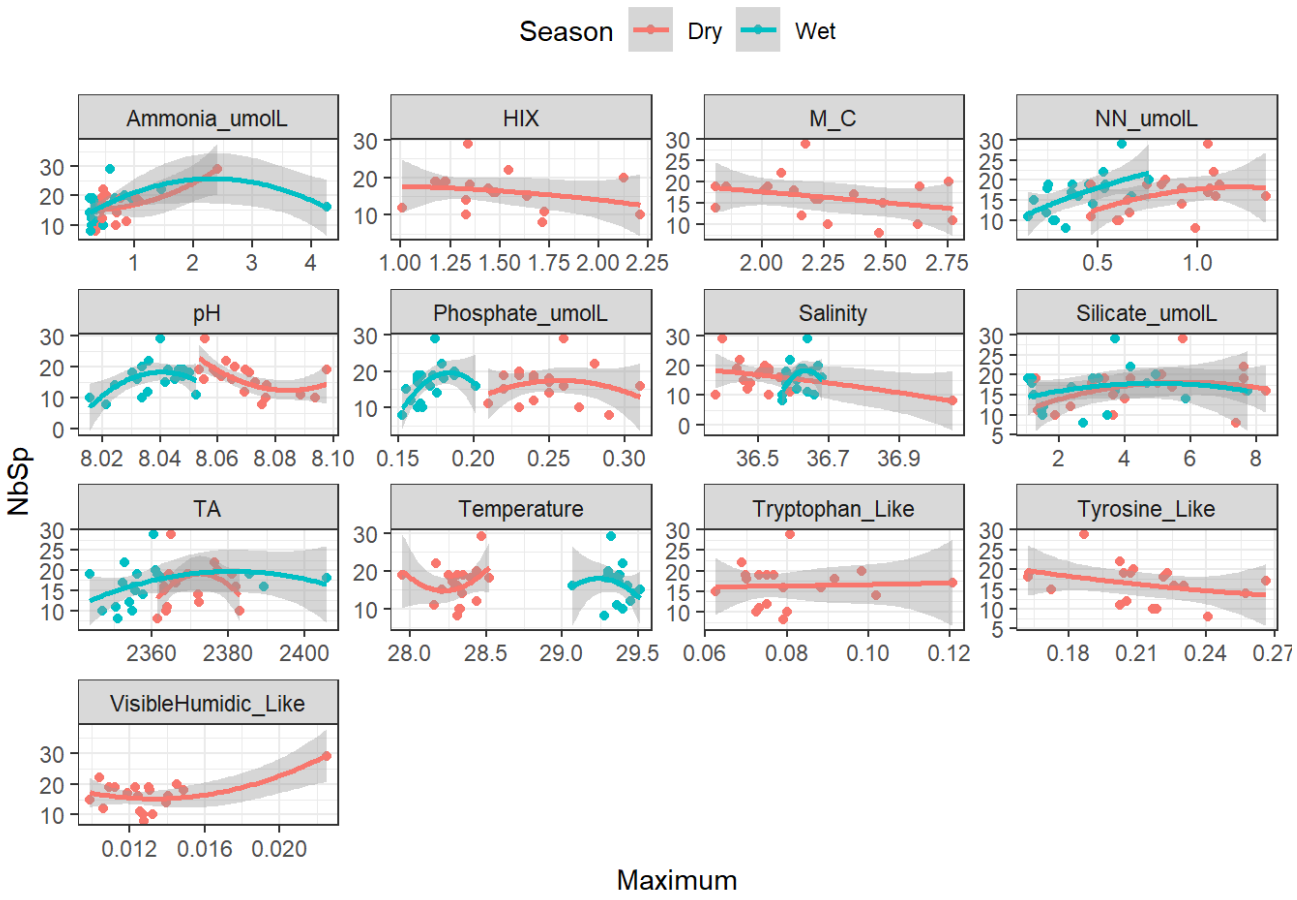


MAXIMUM VALUES

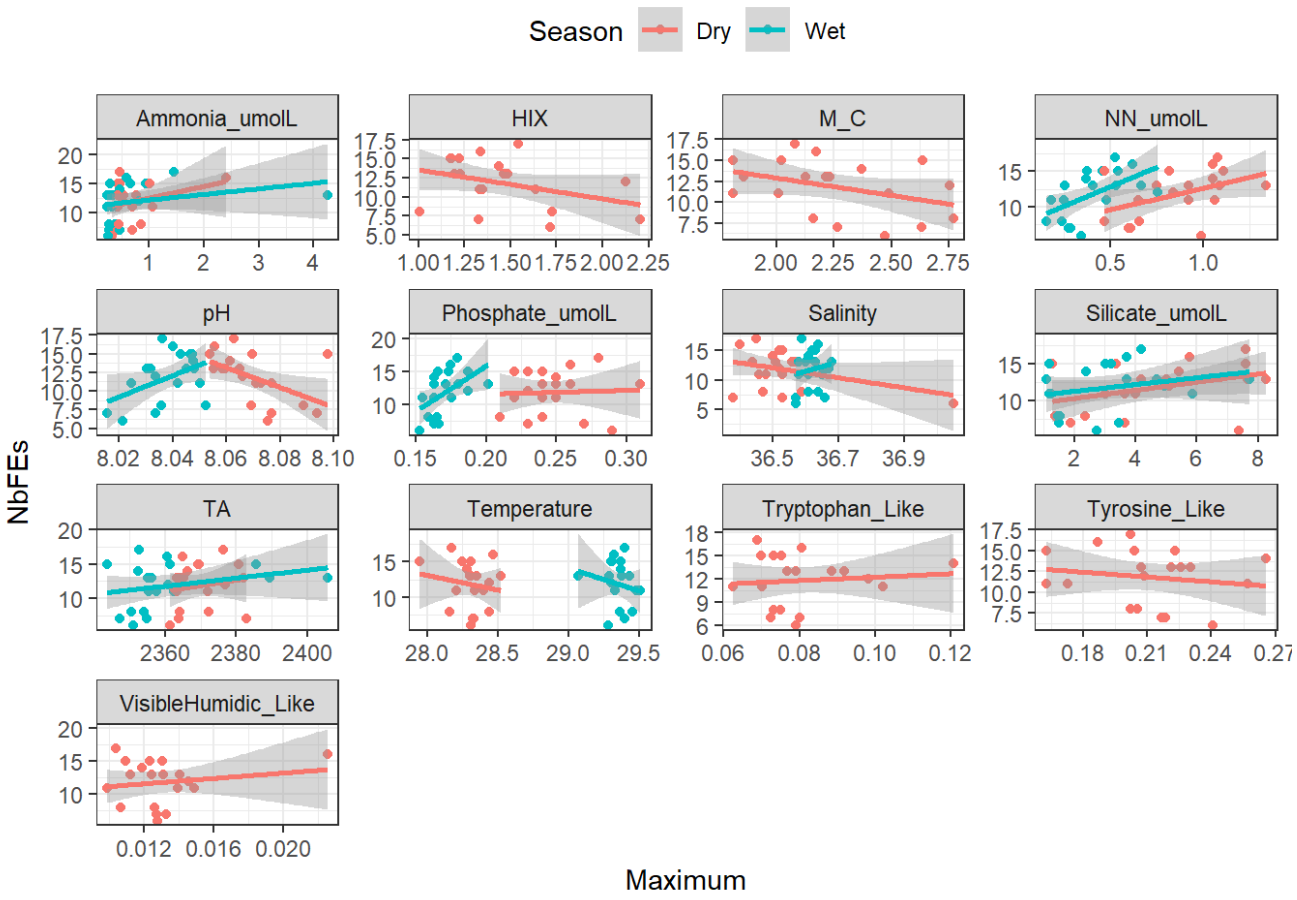
```
plotfun(y = NbSp, x = Maximum, myfacet = Parameters, myformula = "y~x")
```



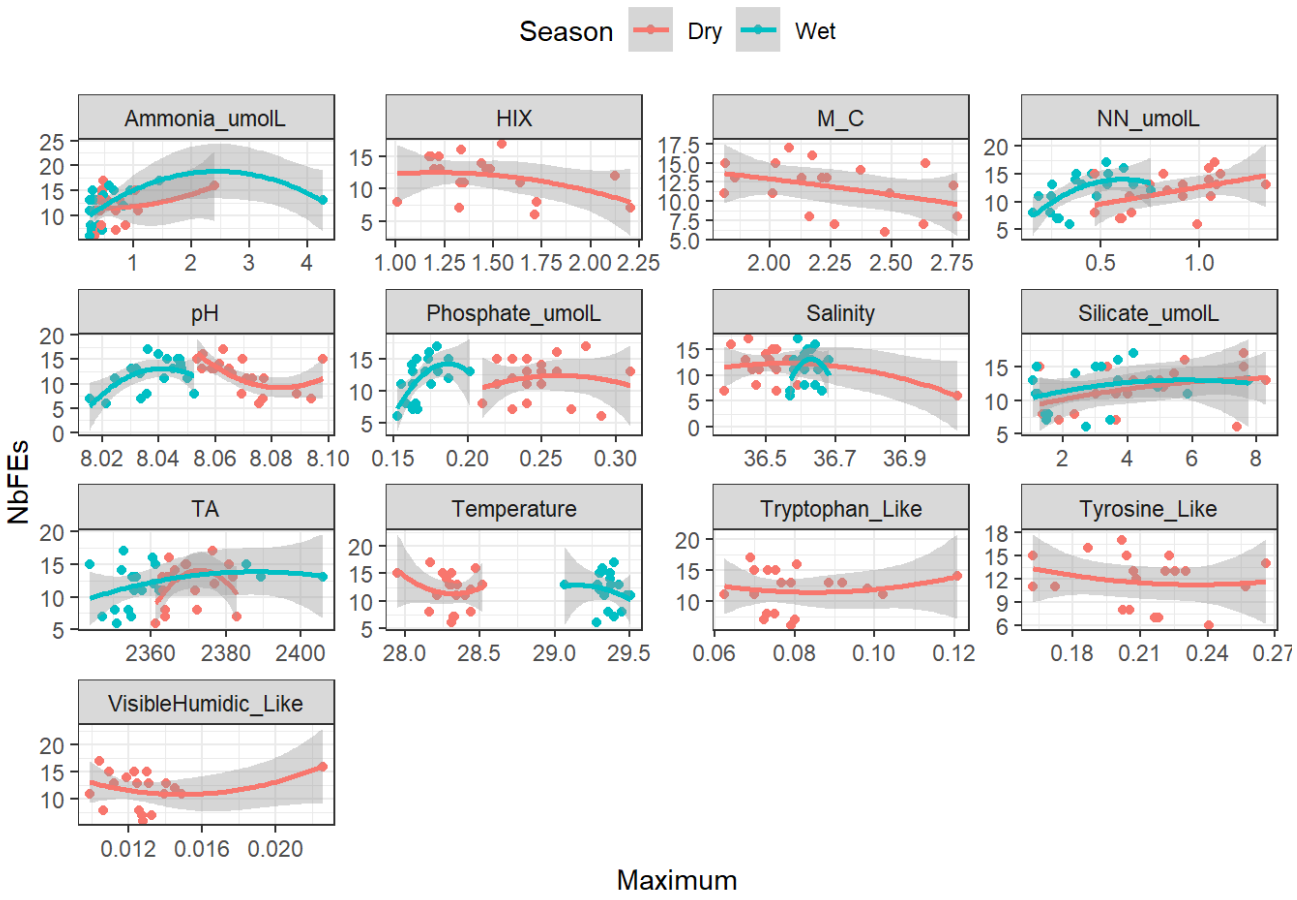

```
plotfun(y = NbSp, x = Maximum, myfacet = Parameters, myformula = "y~poly(x,2)")
```



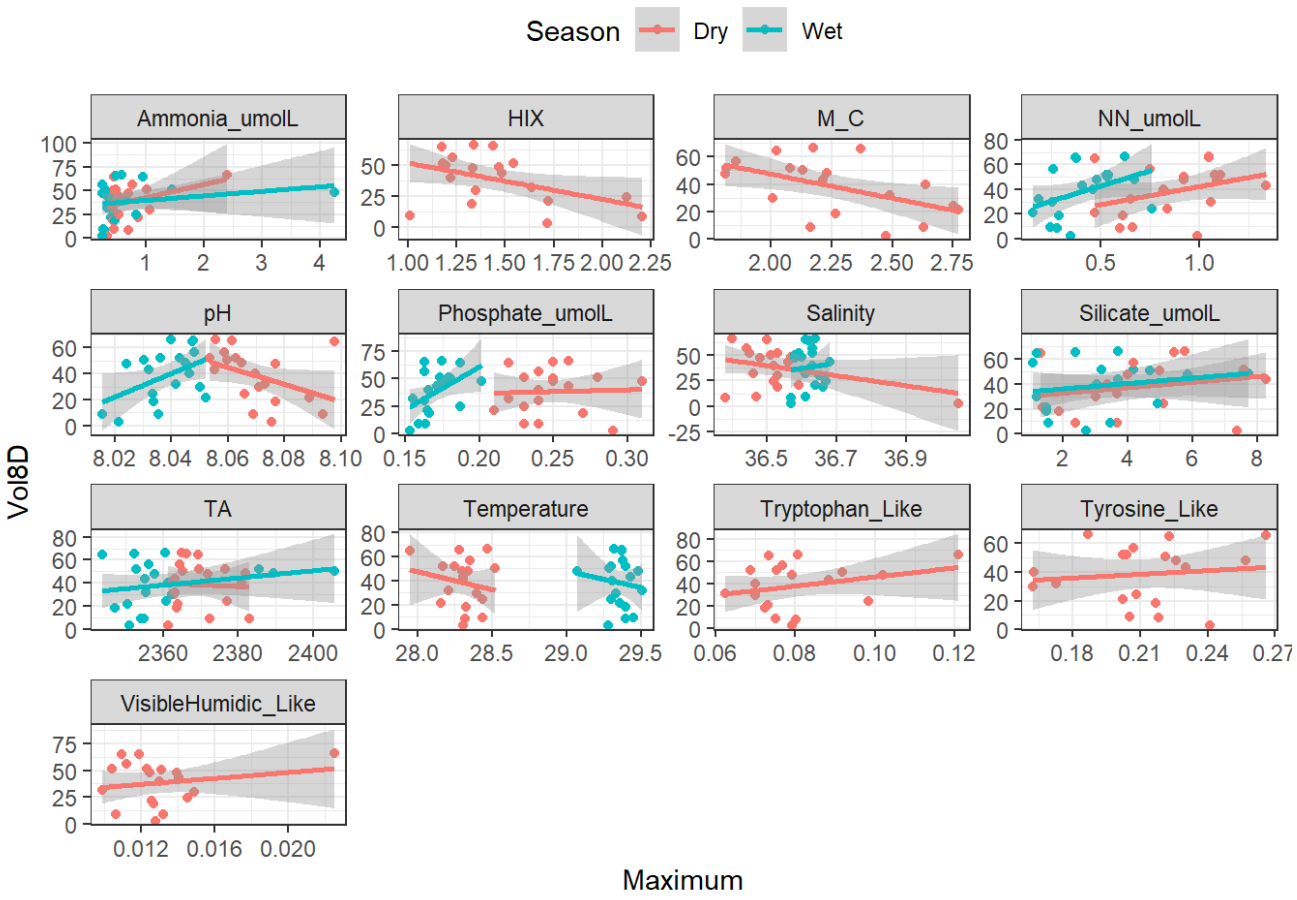

```
plotfun(y = NbFEs, x = Maximum, myfacet = Parameters, myformula = "y~x")
```



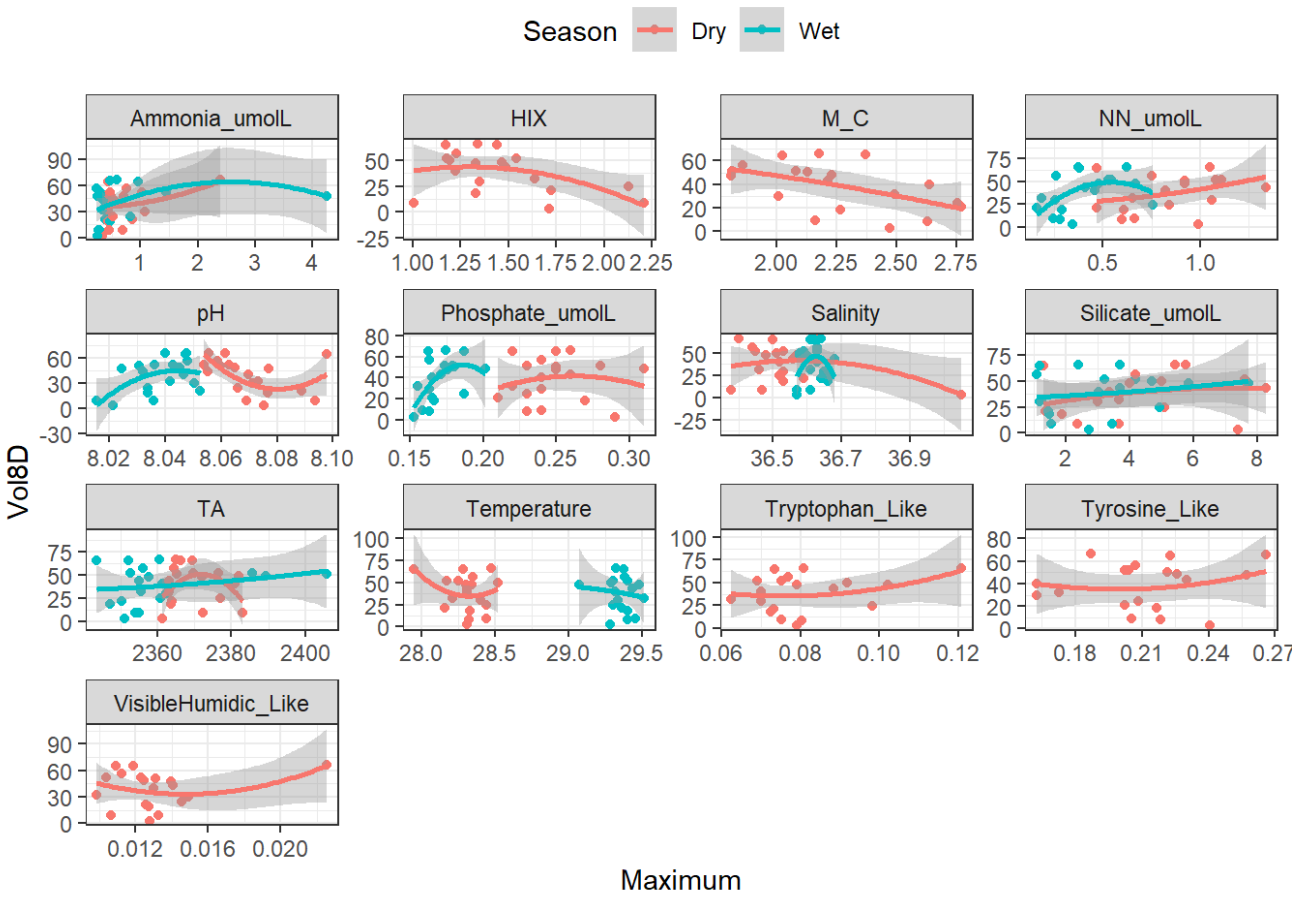

```
plotfun(y = NbFEs, x = Maximum, myfacet = Parameters, myformula = "y~poly(x,2)")
```




```
plotfun(y = Vol8D, x = Maximum, myfacet = Parameters, myformula = "y~x")
```




```
plotfun(y = Vol8D, x = Maximum, myfacet = Parameters, myformula = "y~poly(x,2)")
```



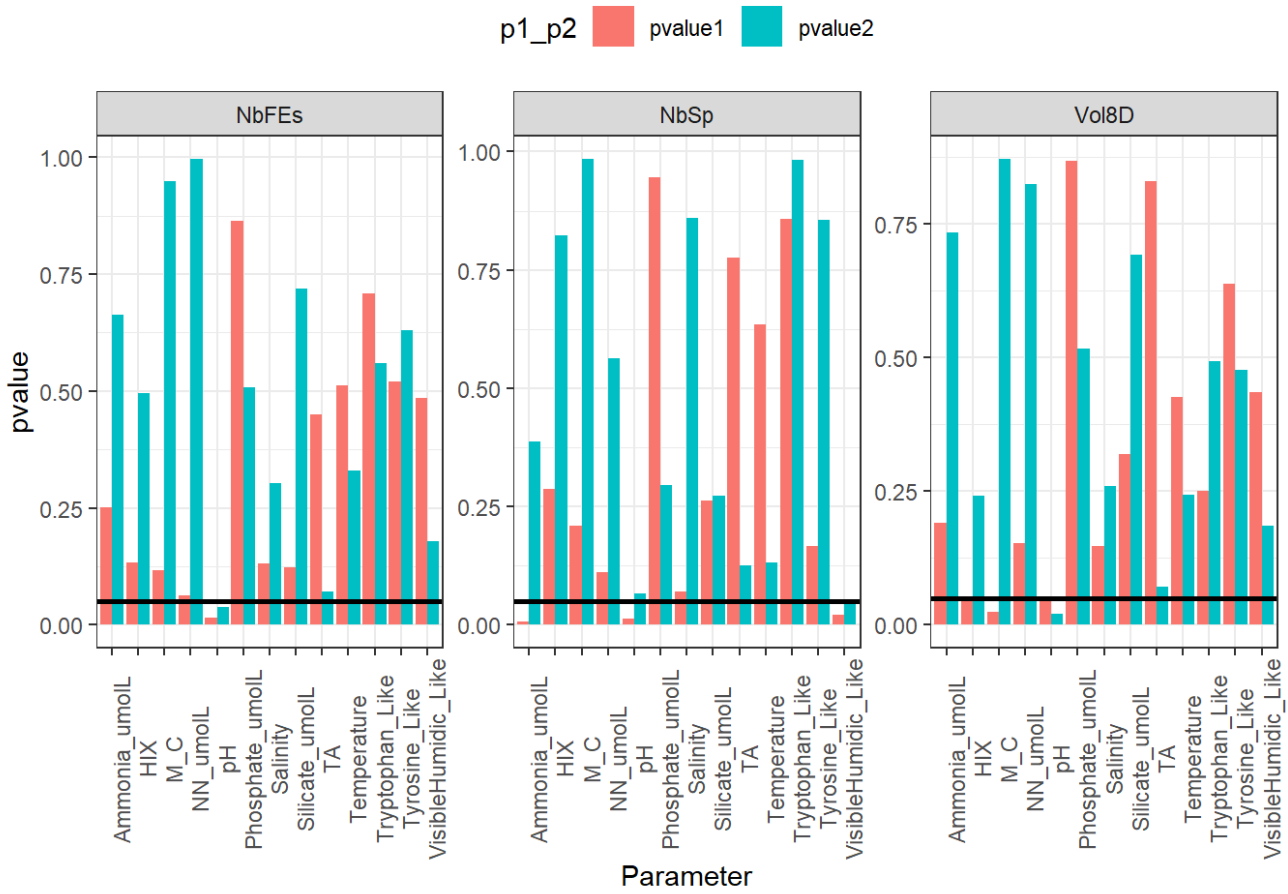

```
# get pvalues
Max3<-pvalpoly(myparam = "Maximum", myseason = "Dry")
Max4<-pvalpoly(myparam = "Maximum", myseason = "Wet")


Max <- full_join(Max3, Max4)
```

```
## Joining, by = c("Parameter", "ParamType", "Dependent", "Season", "pvalue1",
## "pvalue2", "r_squared", "adj_r_squared")
```

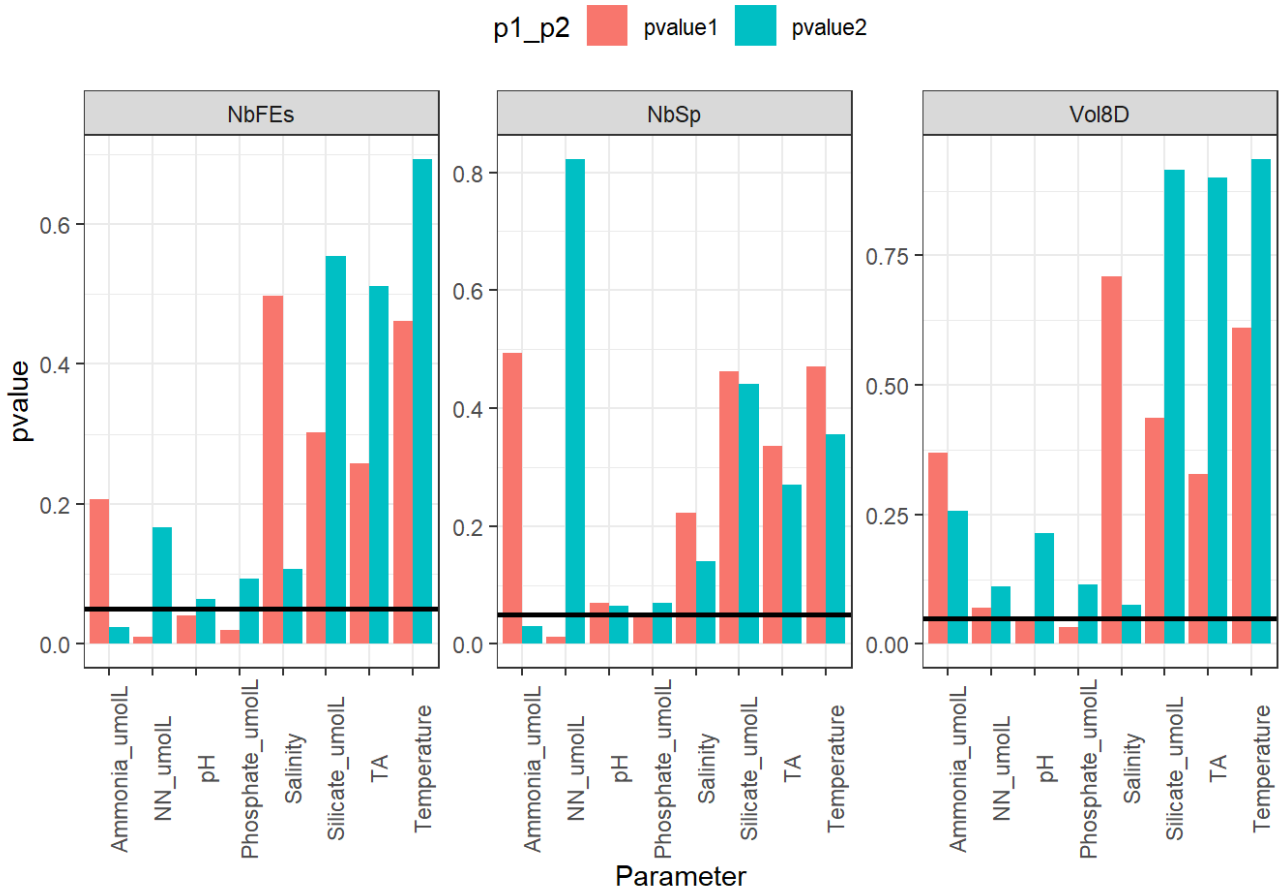
```
Max
```

```
## # A tibble: 105 × 8
##    Parameter       ParamType Dependent Season pvalue1 pvalue2 r_squared adj_r_…¹
##    <chr>           <chr>     <chr>     <chr>    <dbl>   <dbl>     <dbl>    <dbl>
##  1 Salinity        Maximum   NbSp      Dry     0.0708   0.859     0.191    0.0900
##  2 Temperature     Maximum   NbSp      Dry     0.635    0.131     0.148    0.0410
##  3 TA              Maximum   NbSp      Dry     0.776    0.125     0.145    0.0378
##  4 pH              Maximum   NbSp      Dry     0.0123   0.0669    0.425    0.353
##  5 Phosphate_umolL Maximum   NbSp      Dry     0.947    0.295     0.0686  -0.0478
##  6 Silicate_umolL  Maximum   NbSp      Dry     0.263    0.272     0.142    0.0343
##  7 NN_umolL        Maximum   NbSp      Dry     0.112    0.564     0.166    0.0615
##  8 Ammonia_umolL   Maximum   NbSp      Dry     0.00776  0.387     0.386    0.309
##  9 M_C             Maximum   NbSp      Dry     0.209    0.984     0.0966  -0.0163
## 10 HIX             Maximum   NbSp      Dry     0.288    0.822     0.0730  -0.0428
## # … with 95 more rows, and abbreviated variable name ¹adj_r_squared
```

```
pvalplot(mydata = Max, season = "Dry")
```




```
pvalplot(mydata = Max, season = "Wet")
```




```
p1 <- paramPlot(mydata = Full_data, ParamType = Maximum, PTname = "Maximum")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
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## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

```
## NULL
## NULL
```

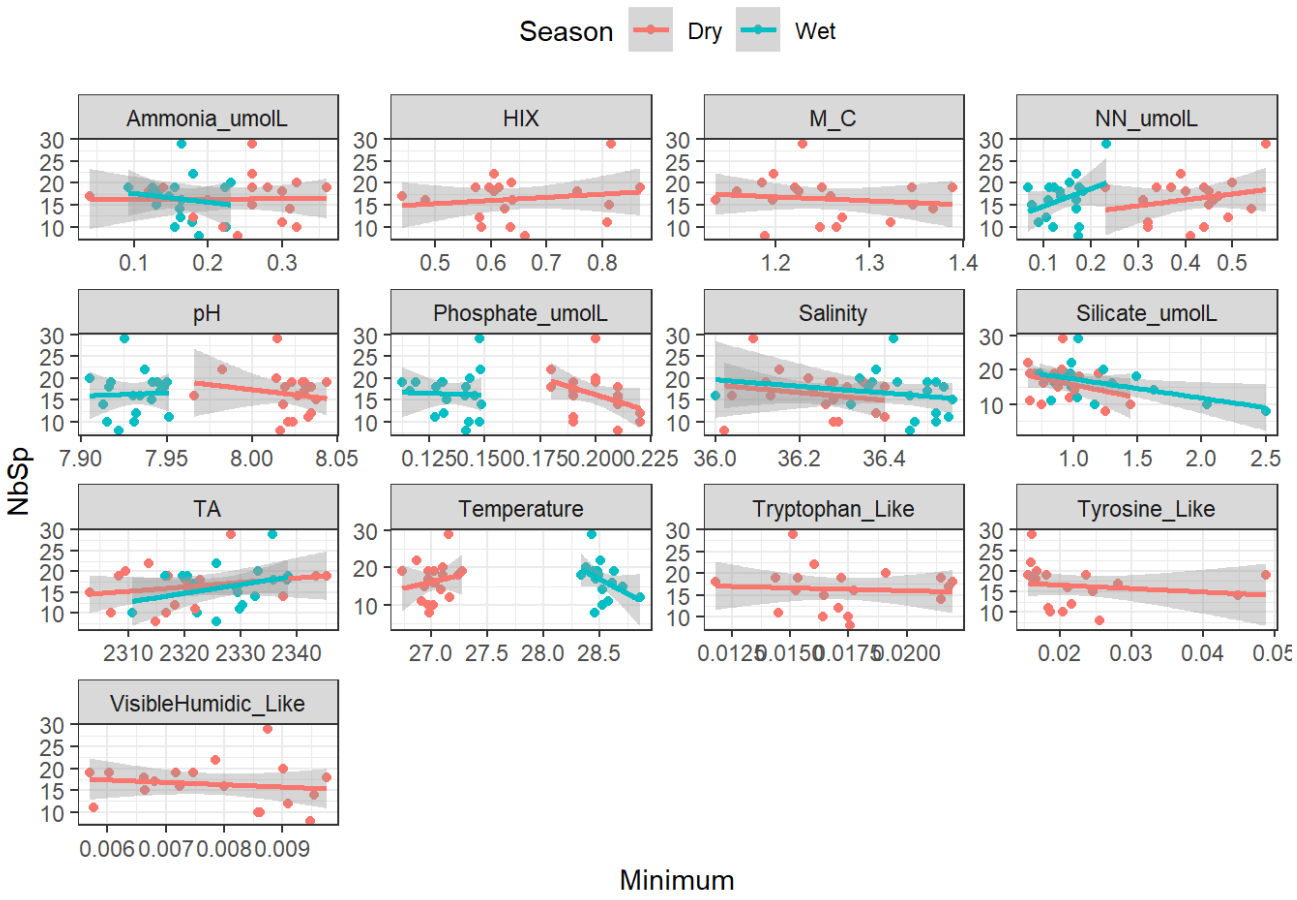
```
p1b <- paramPlot(mydata = Full_data, ParamType = Maximum, PTname = "Maximum_poly", myfor
mula = "y~poly(x,2)")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

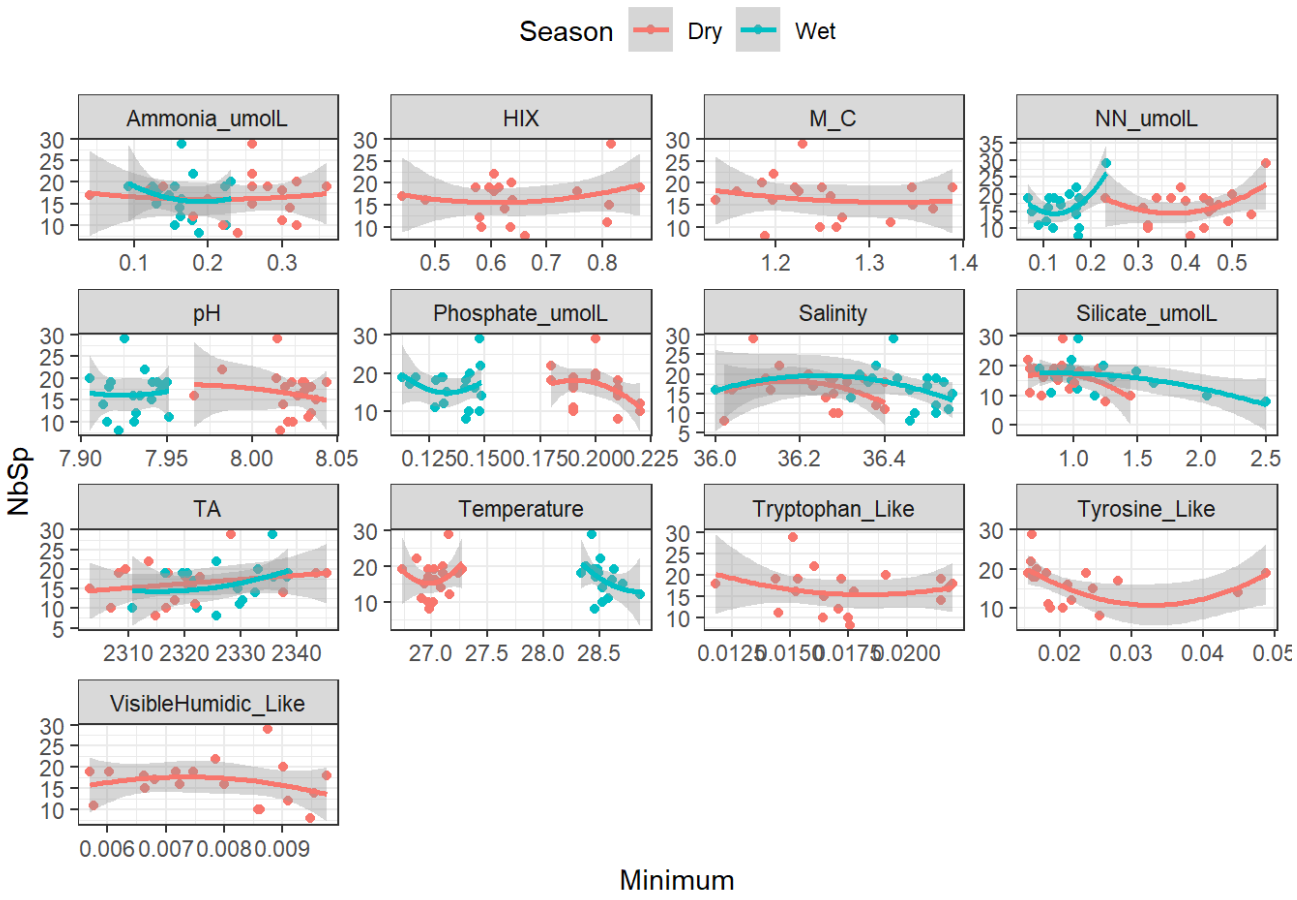
```
## NULL
## NULL
```

MINIMUM VALUES

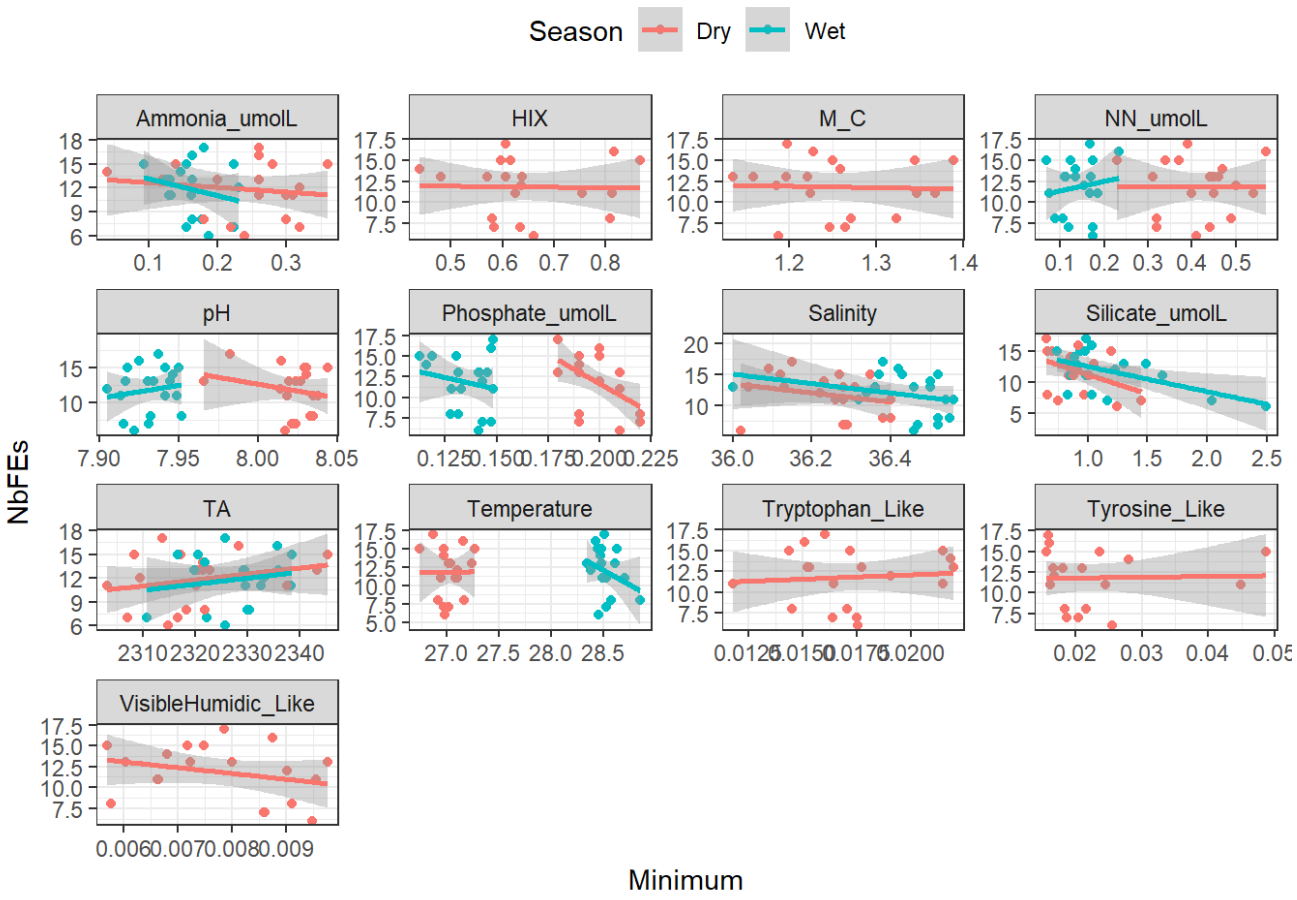
```
plotfun(y = NbSp, x = Minimum, myfacet = Parameters, myformula = "y~x")
```



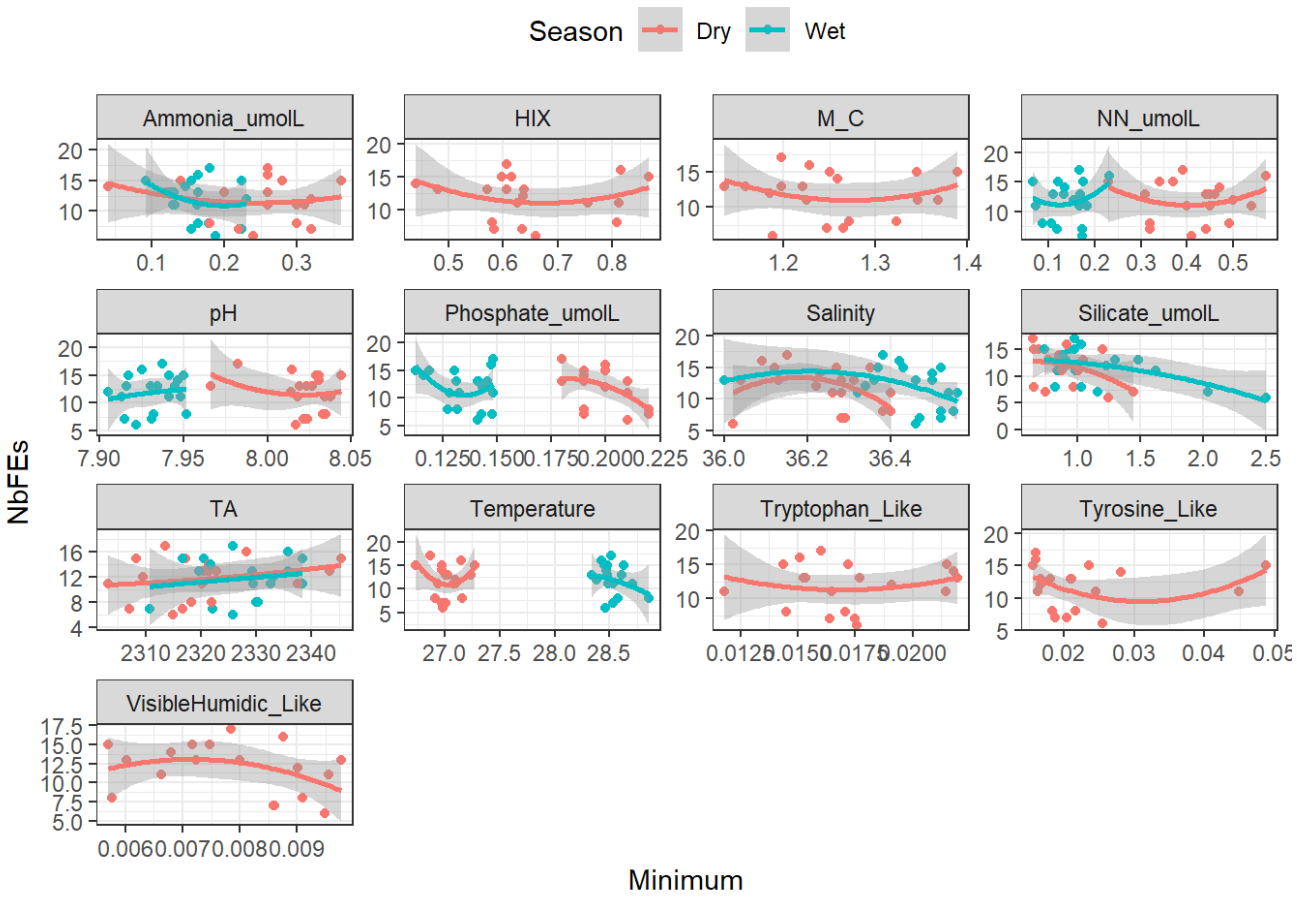

```
plotfun(y = NbSp, x = Minimum, myfacet = Parameters, myformula = "y~poly(x,2)")
```



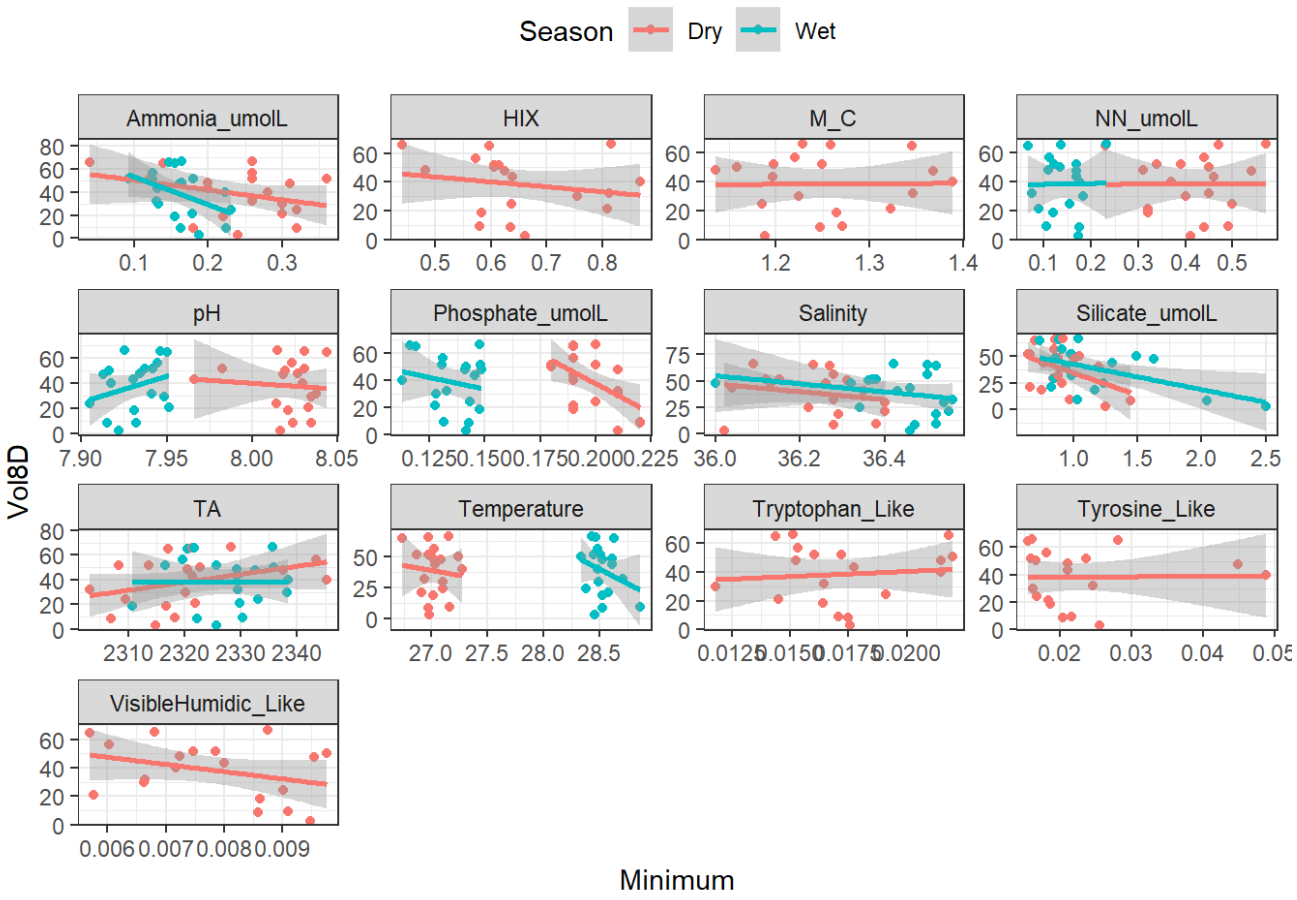

```
plotfun(y = NbFEs, x = Minimum, myfacet = Parameters, myformula = "y~x")
```



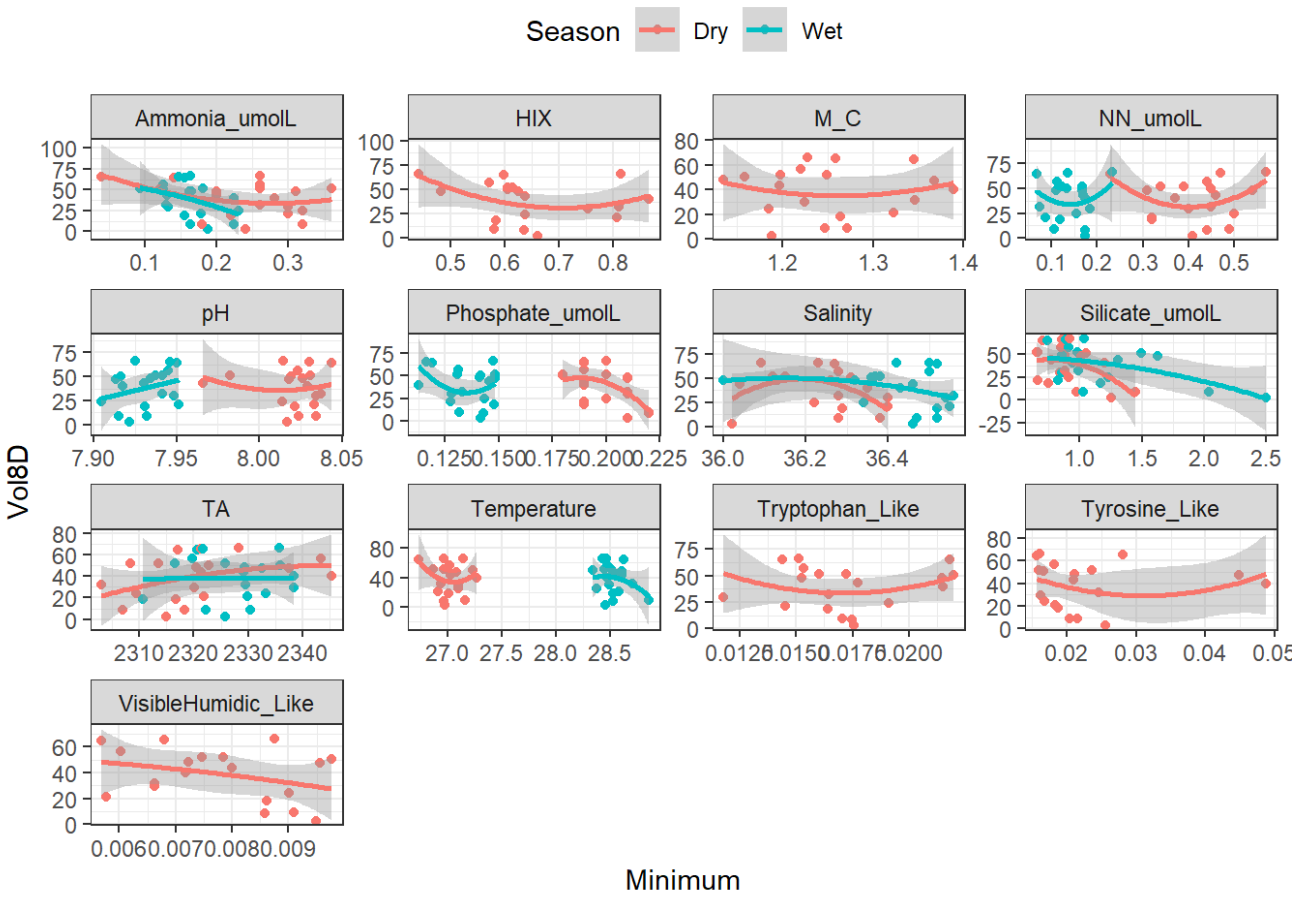

```
plotfun(y = NbFEs, x = Minimum, myfacet = Parameters, myformula = "y~poly(x,2)")
```




```
plotfun(y = Vol8D, x = Minimum, myfacet = Parameters, myformula = "y~x")
```




```
plotfun(y = Vol8D, x = Minimum, myfacet = Parameters, myformula = "y~poly(x,2)")
```



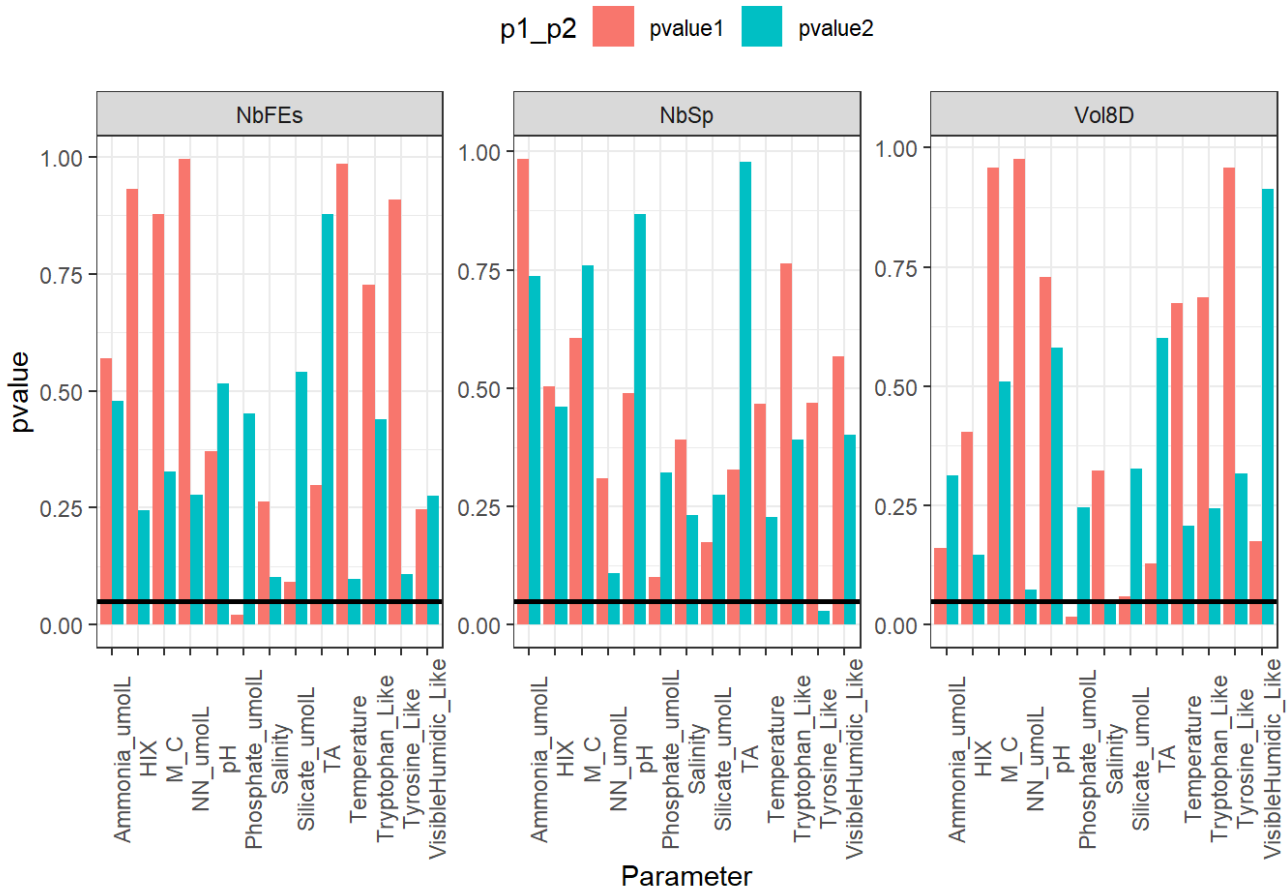

```
# get pvalues
Min3<-pvalpoly(myparam = "Minimum", myseason = "Dry")
Min4<-pvalpoly(myparam = "Minimum", myseason = "Wet")

Min <- full_join(Min3, Min4)
```

```
## Joining, by = c("Parameter", "ParamType", "Dependent", "Season", "pvalue1",
## "pvalue2", "r_squared", "adj_r_squared")
```

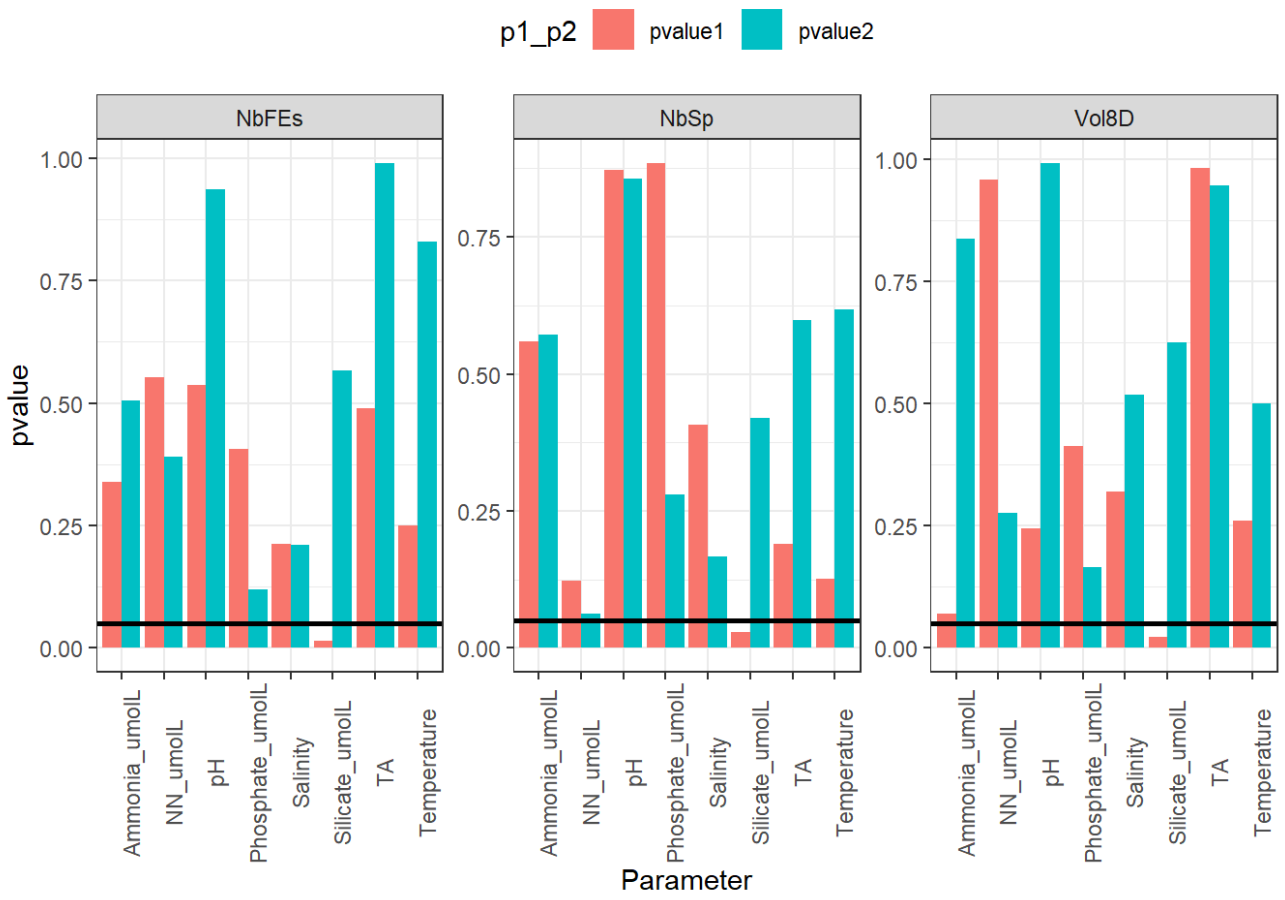
```
Min
```

```
## # A tibble: 105 × 8
##    Parameter       ParamType Dependent Season pvalue1 pvalue2 r_squared adj_r_…¹
##    <chr>           <chr>     <chr>     <chr>    <dbl>   <dbl>     <dbl>    <dbl>
##  1 Salinity        Minimum   NbSp      Dry      0.392   0.232   0.127    0.0176
##  2 Temperature     Minimum   NbSp      Dry      0.467   0.228   0.117    0.00693
##  3 TA              Minimum   NbSp      Dry      0.328   0.978   0.0598  -0.0577
##  4 pH              Minimum   NbSp      Dry      0.490   0.867   0.0320  -0.0890
##  5 Phosphate_umolL Minimum   NbSp      Dry      0.101   0.322   0.203    0.103
##  6 Silicate_umolL  Minimum   NbSp      Dry      0.174   0.275   0.171    0.0674
##  7 NN_umolL        Minimum   NbSp      Dry      0.310   0.110   0.198    0.0982
##  8 Ammonia_umolL   Minimum   NbSp      Dry      0.984   0.736   0.00730 -0.117
##  9 M_C             Minimum   NbSp      Dry      0.606   0.759   0.0229  -0.0993
## 10 HIX             Minimum   NbSp      Dry      0.504   0.460   0.0611  -0.0563
## # … with 95 more rows, and abbreviated variable name ¹adj_r_squared
```

```
pvalplot(mydata = Min, season = "Dry")
```




```
pvalplot(mydata = Min, season = "Wet")
```




```
p2 <- paramPlot(mydata = Full_data, ParamType = Minimum, PTname = "Minimum")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

```
## NULL
## NULL
```

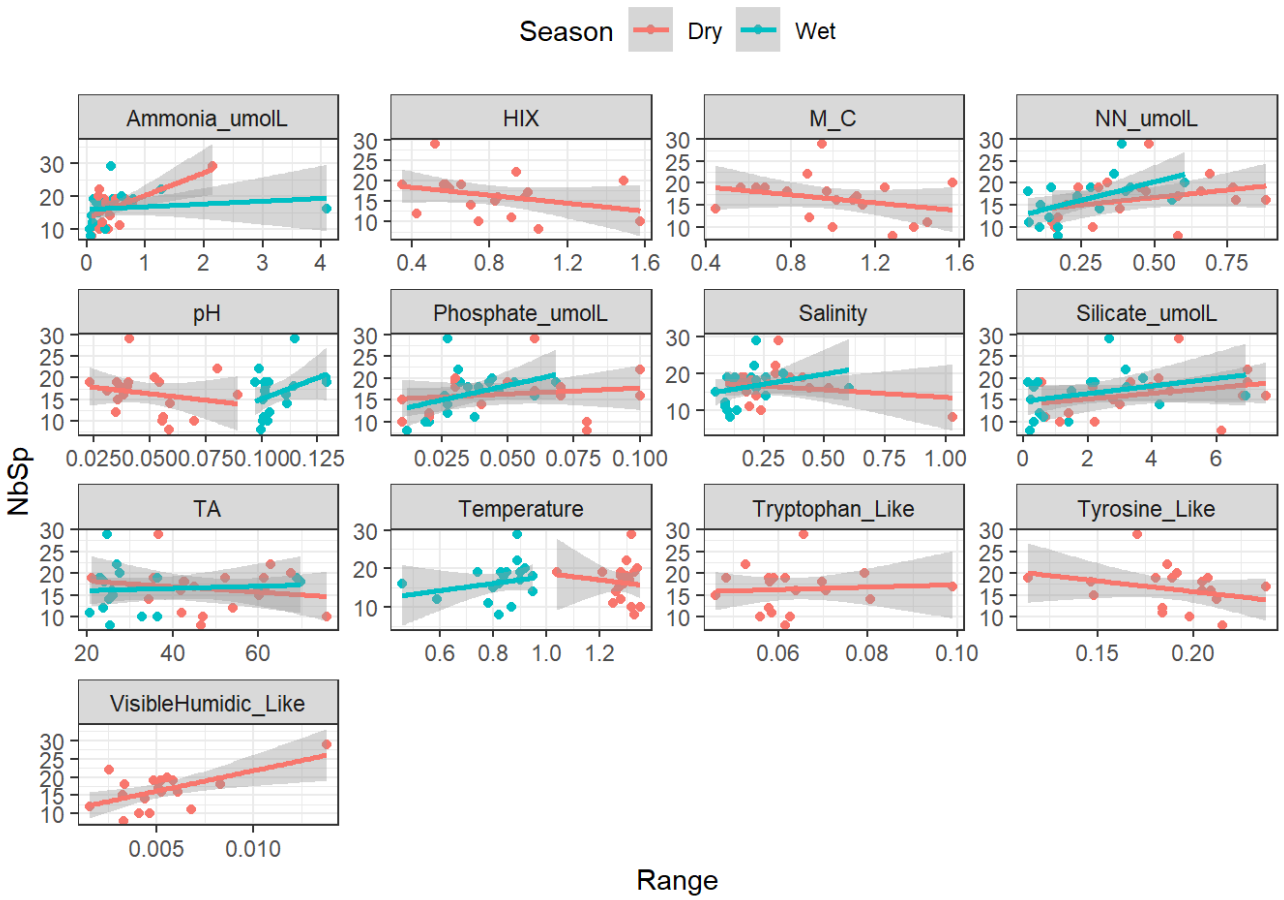
```
p2b <- paramPlot(mydata = Full_data, ParamType = Minimum, PTname = "Minimum_poly", myfor
mula = "y~poly(x,2)")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

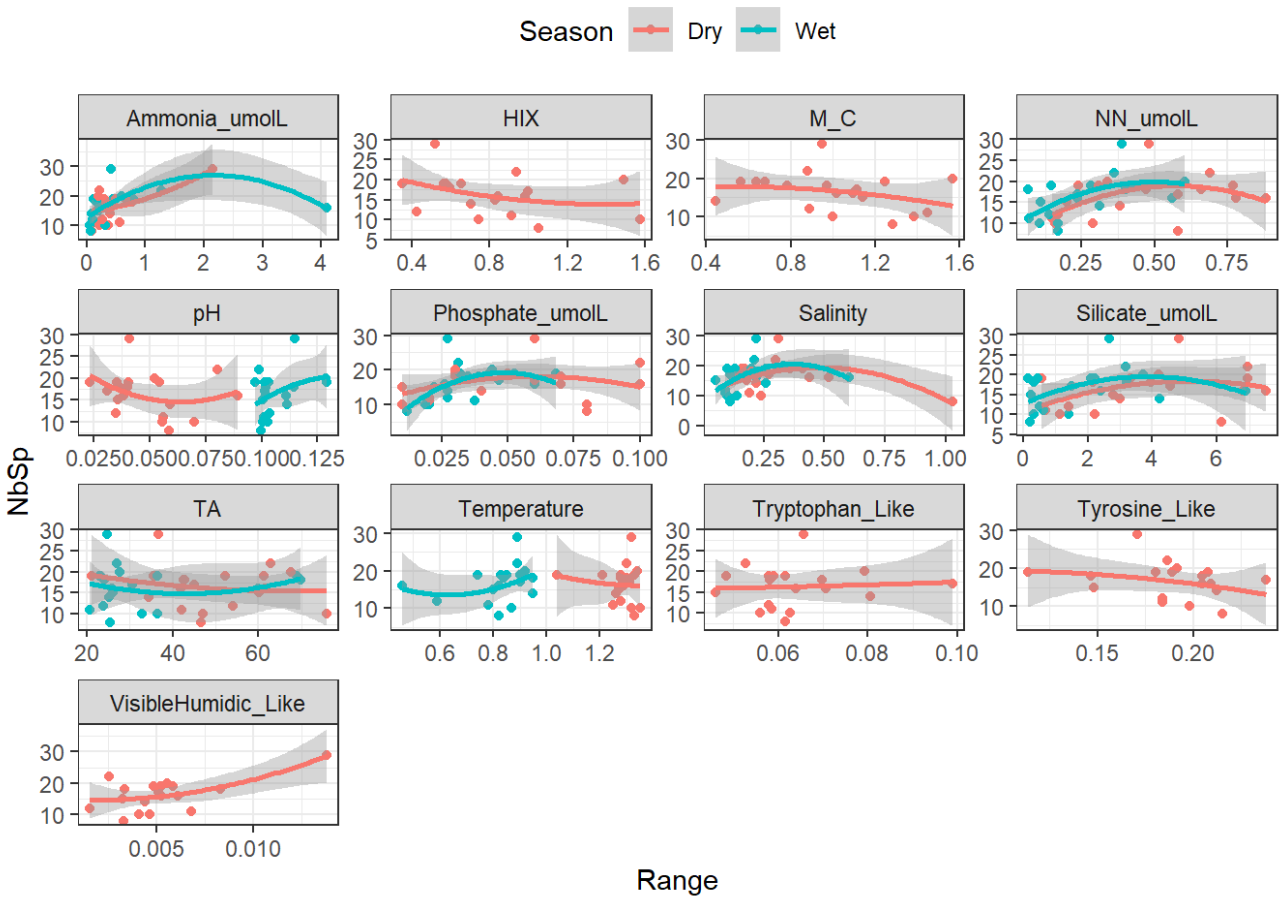
```
## NULL
## NULL
```

RANGE VALUES

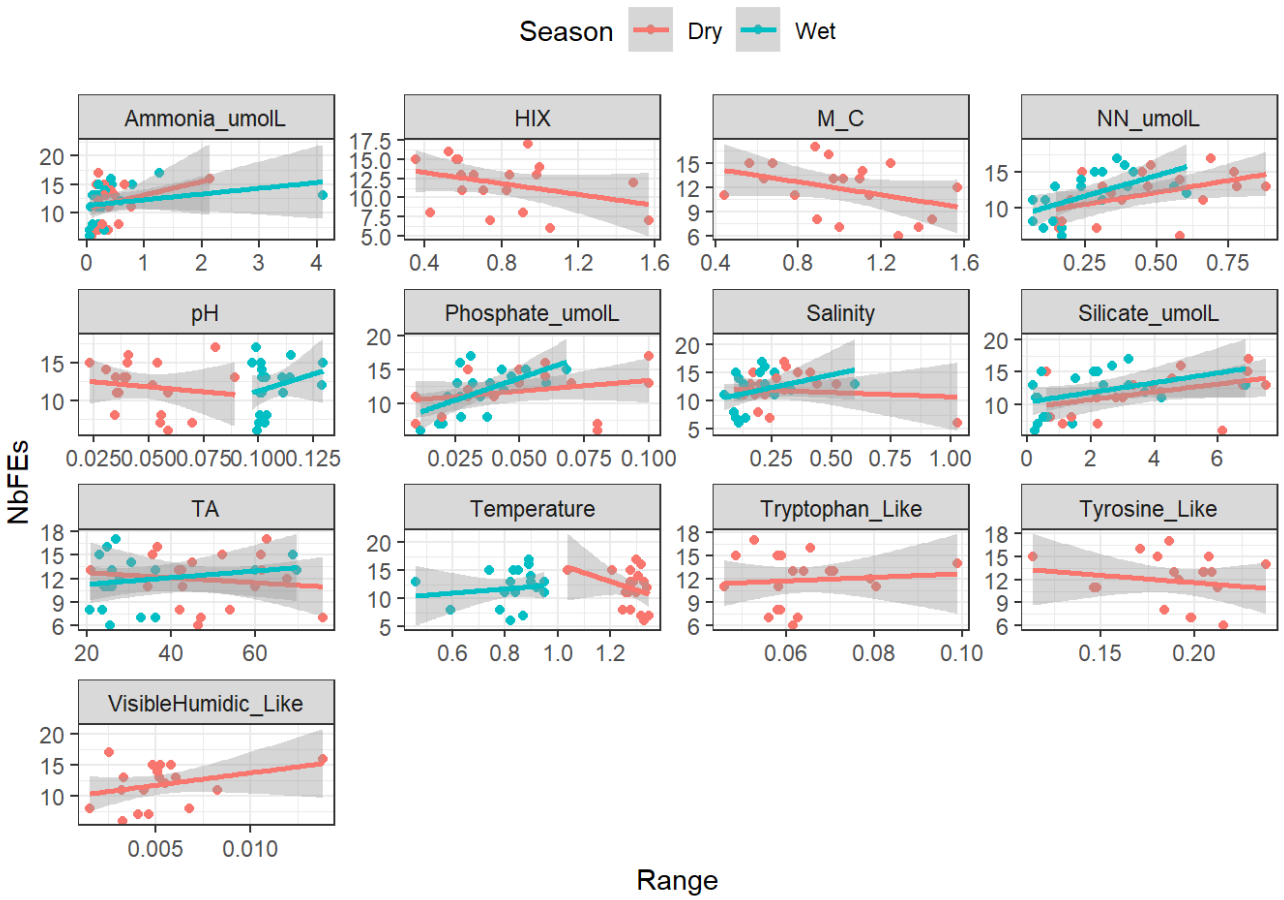
```
plotfun(y = NbSp, x = Range, myfacet = Parameters, myformula = "y~x")
```



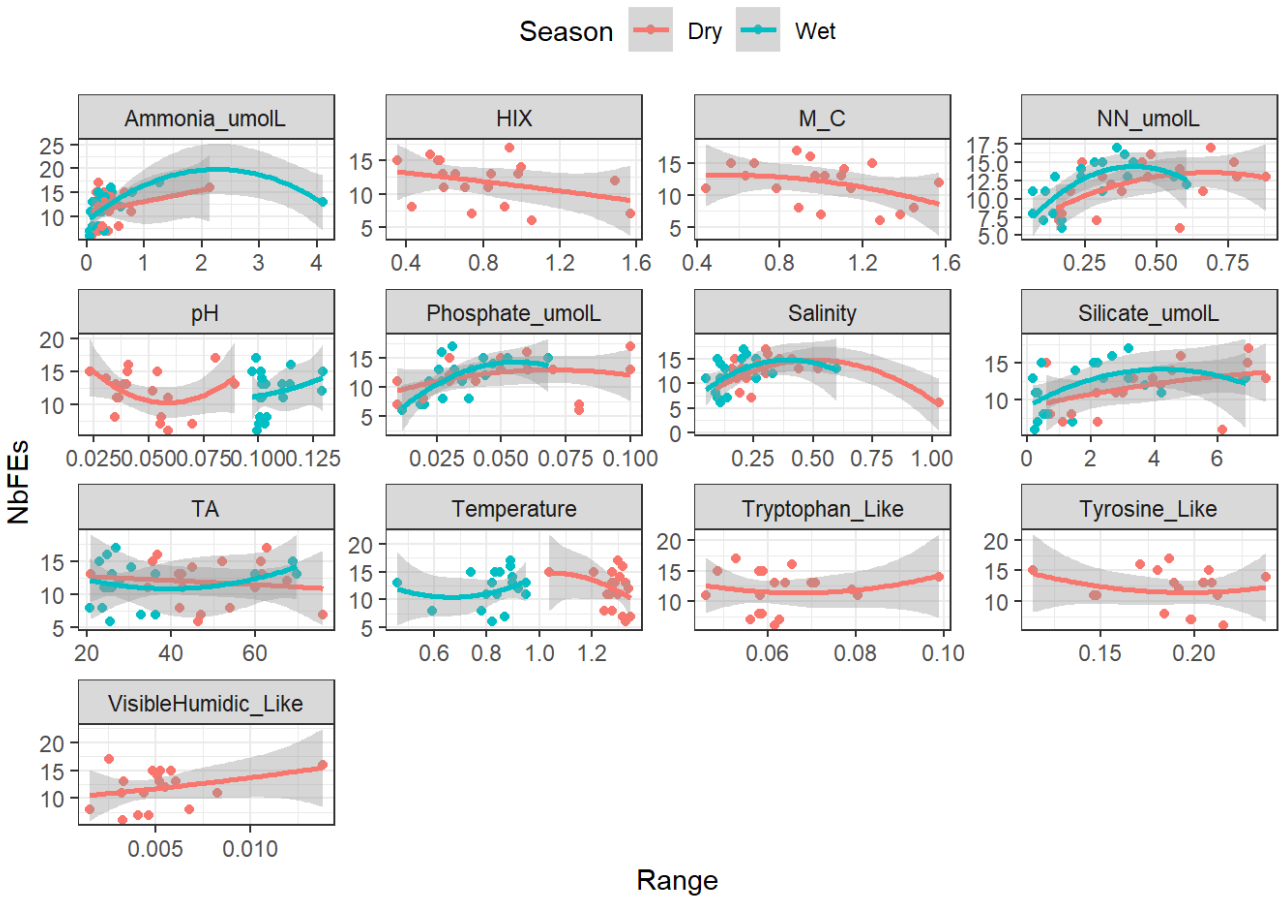

```
plotfun(y = NbSp, x = Range, myfacet = Parameters, myformula = "y~poly(x,2)")
```



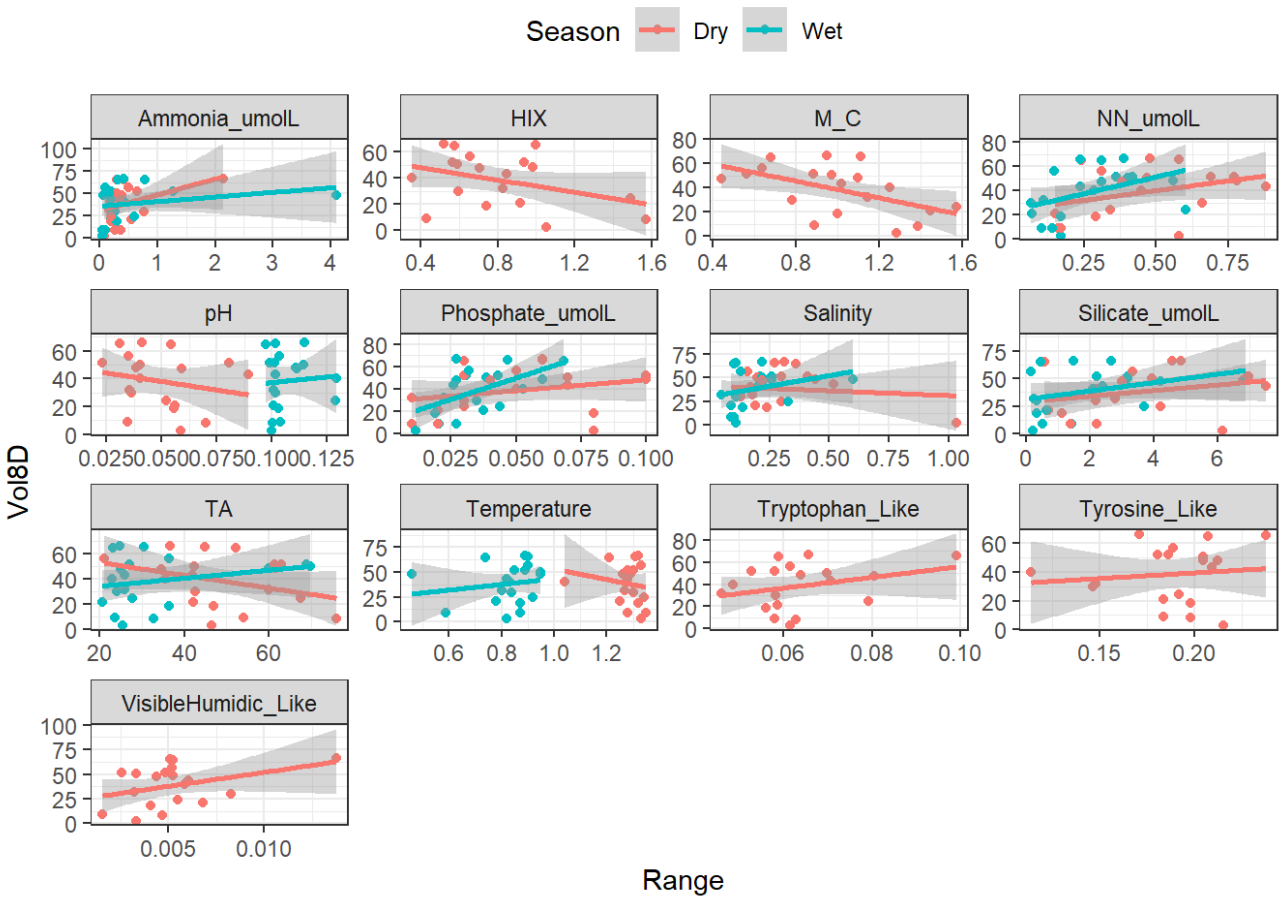

```
plotfun(y = NbFEs, x = Range, myfacet = Parameters, myformula = "y~x")
```



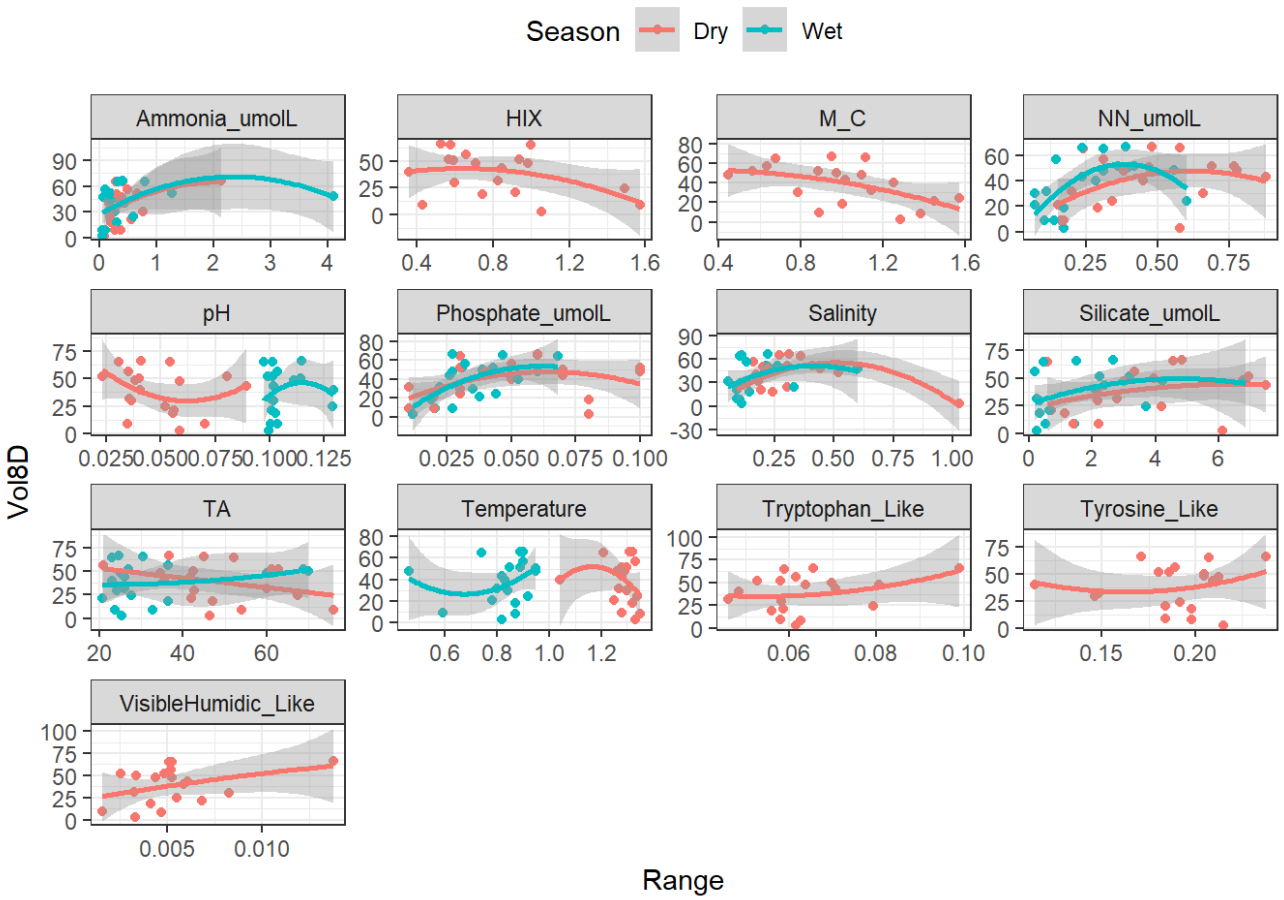

```
plotfun(y = NbFEs, x = Range, myfacet = Parameters, myformula = "y~poly(x,2)")
```




```
plotfun(y = Vol8D, x = Range, myfacet = Parameters, myformula = "y~x")
```




```
plotfun(y = Vol8D, x = Range, myfacet = Parameters, myformula = "y~poly(x,2)")
```



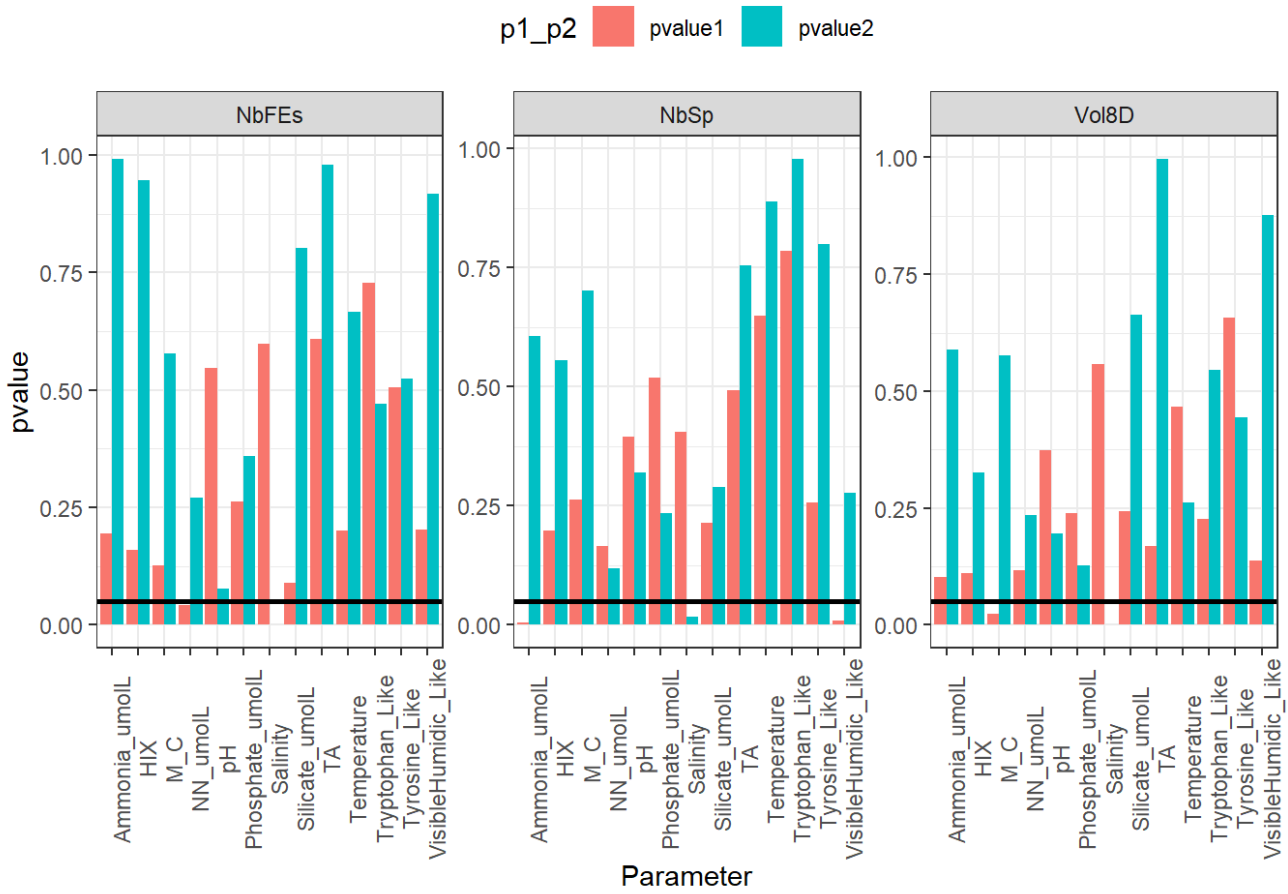

```
# get pvalues
Ran3<-pvalpoly(myparam = "Range", myseason = "Dry")
Ran4<-pvalpoly(myparam = "Range", myseason = "Wet")

Ran <- full_join(Ran3, Ran4)
```

```
## Joining, by = c("Parameter", "ParamType", "Dependent", "Season", "pvalue1",
## "pvalue2", "r_squared", "adj_r_squared")
```

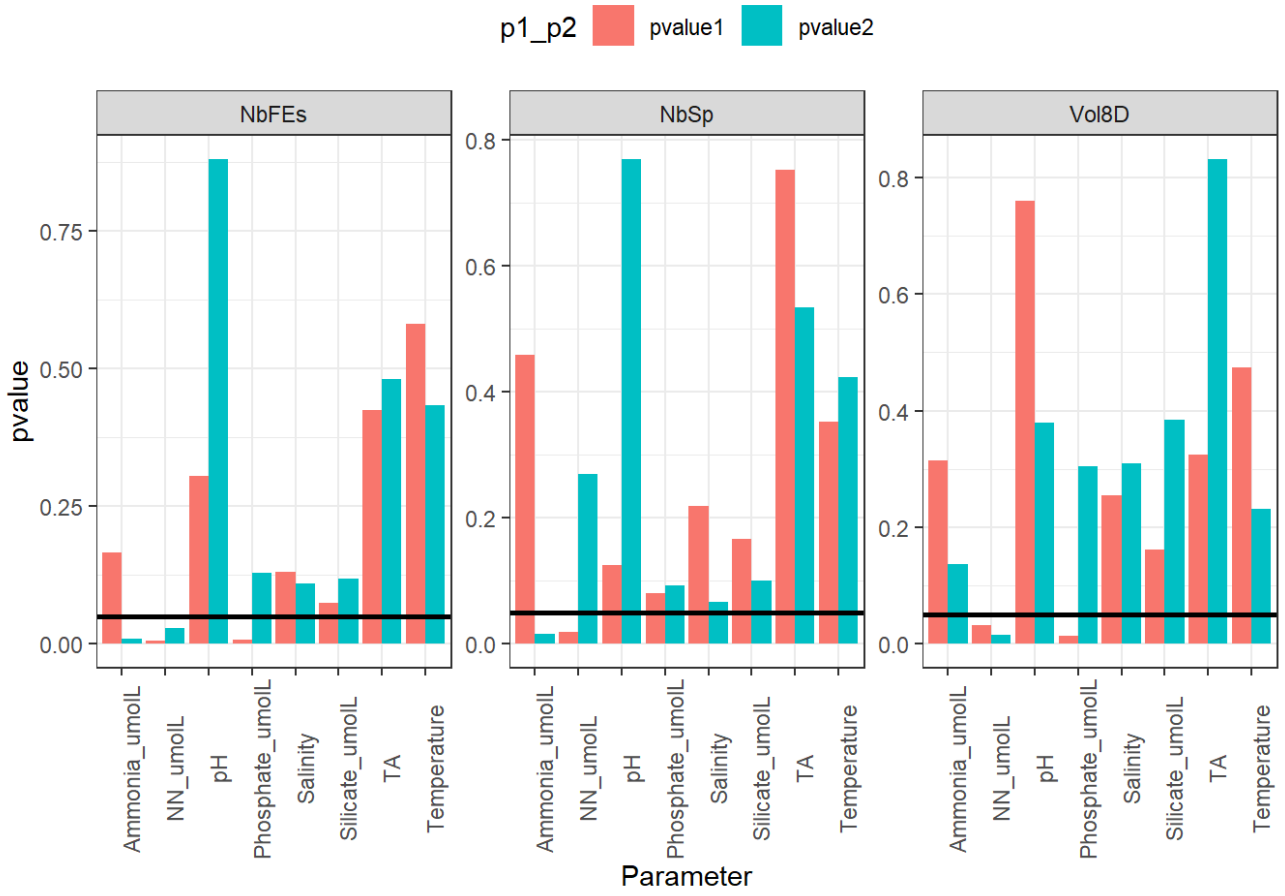
```
Ran
```

```
## # A tibble: 105 × 8
##    Parameter       ParamType Dependent Season pvalue1 pvalue2 r_squared adj_r_…¹
##    <chr>           <chr>     <chr>     <chr>    <dbl>   <dbl>     <dbl>    <dbl>
##  1 Salinity        Range     NbSp      Dry    0.406    0.0161    0.332   0.249
##  2 Temperature     Range     NbSp      Dry    0.648    0.888     0.0146 -0.109
##  3 TA              Range     NbSp      Dry    0.493    0.755     0.0357 -0.0848
##  4 pH              Range     NbSp      Dry    0.396    0.320     0.102  -0.0103
##  5 Phosphate_umolL Range     NbSp      Dry    0.520    0.234     0.109  -0.00223
##  6 Silicate_umolL  Range     NbSp      Dry    0.214    0.289     0.152   0.0462
##  7 NN_umolL        Range     NbSp      Dry    0.166    0.119     0.231   0.135
##  8 Ammonia_umolL   Range     NbSp      Dry    0.00567  0.607     0.395   0.320
##  9 M_C             Range     NbSp      Dry    0.262    0.702     0.0859 -0.0283
## 10 HIX             Range     NbSp      Dry    0.197    0.556     0.120   0.00966
## # … with 95 more rows, and abbreviated variable name ¹adj_r_squared
```

```
pvalplot(mydata = Ran, season = "Dry")
```




```
pvalplot(mydata = Ran, season = "Wet")
```




```
p3 <- paramPlot(mydata = Full_data, ParamType = Range, PTname = "Range")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

```
## NULL
## NULL
```

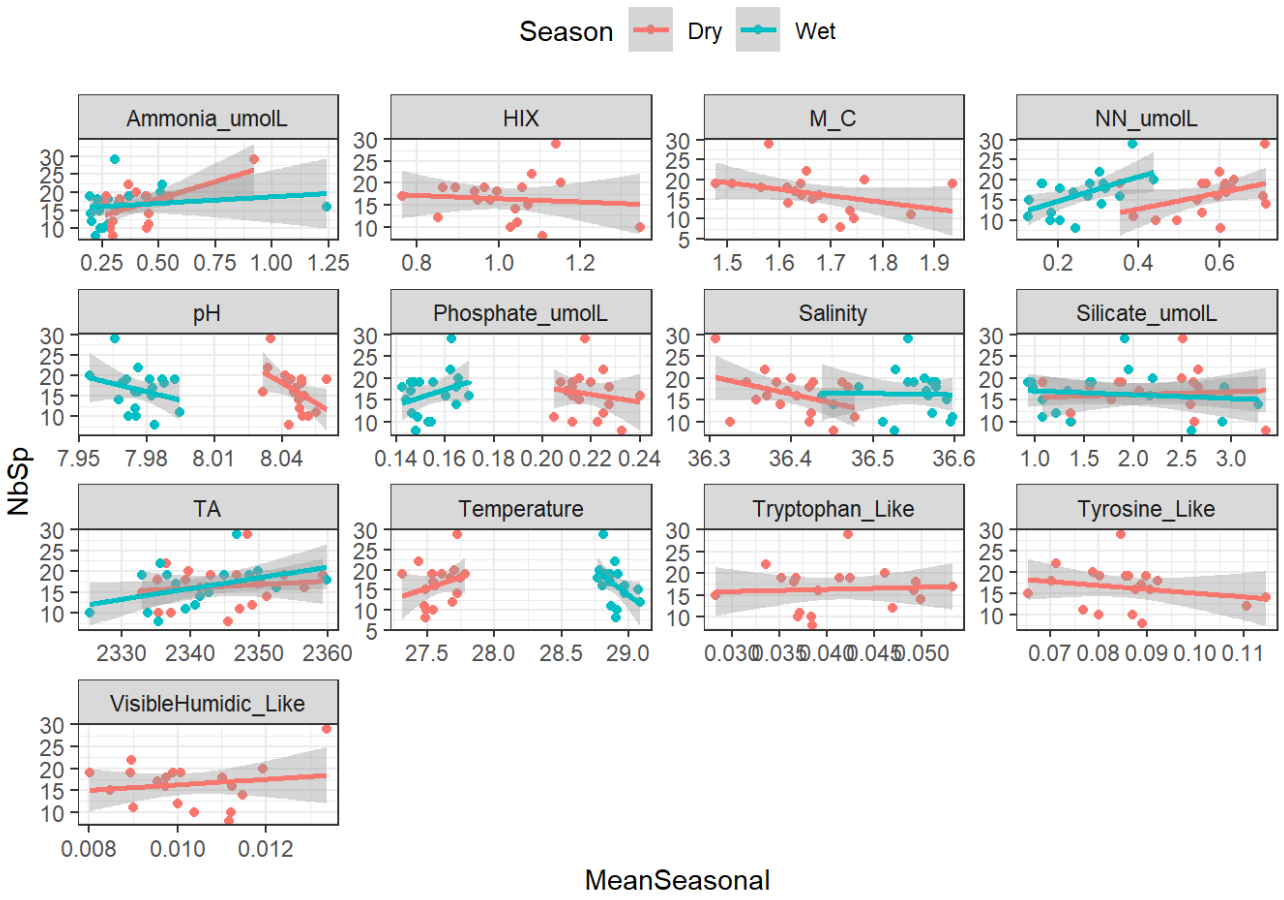
```
p3b <- paramPlot(mydata = Full_data, ParamType = Range, PTname = "Range_poly", myformula
= "y~poly(x,2)")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

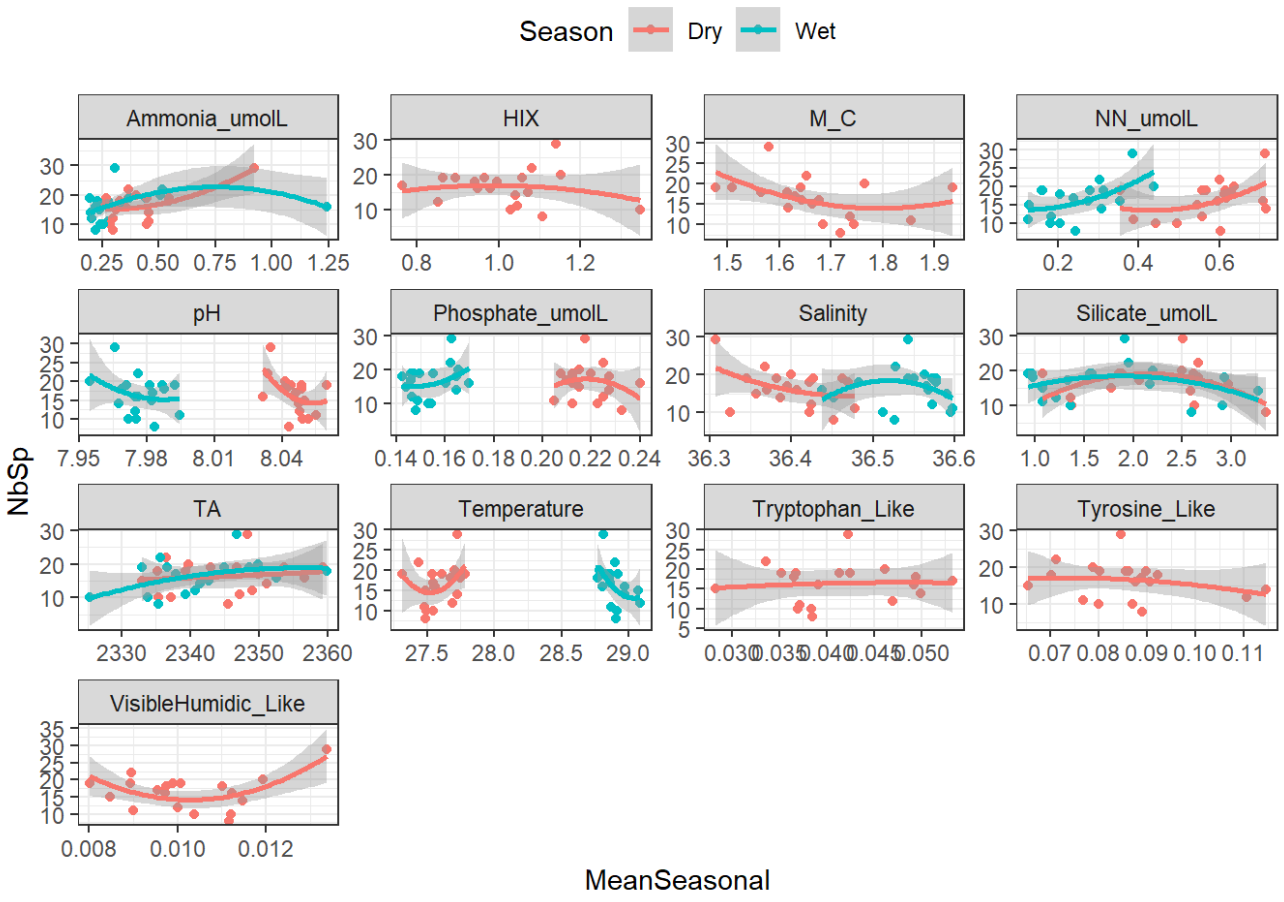
```
## NULL
## NULL
```

MEAN VALUES BY SEASON

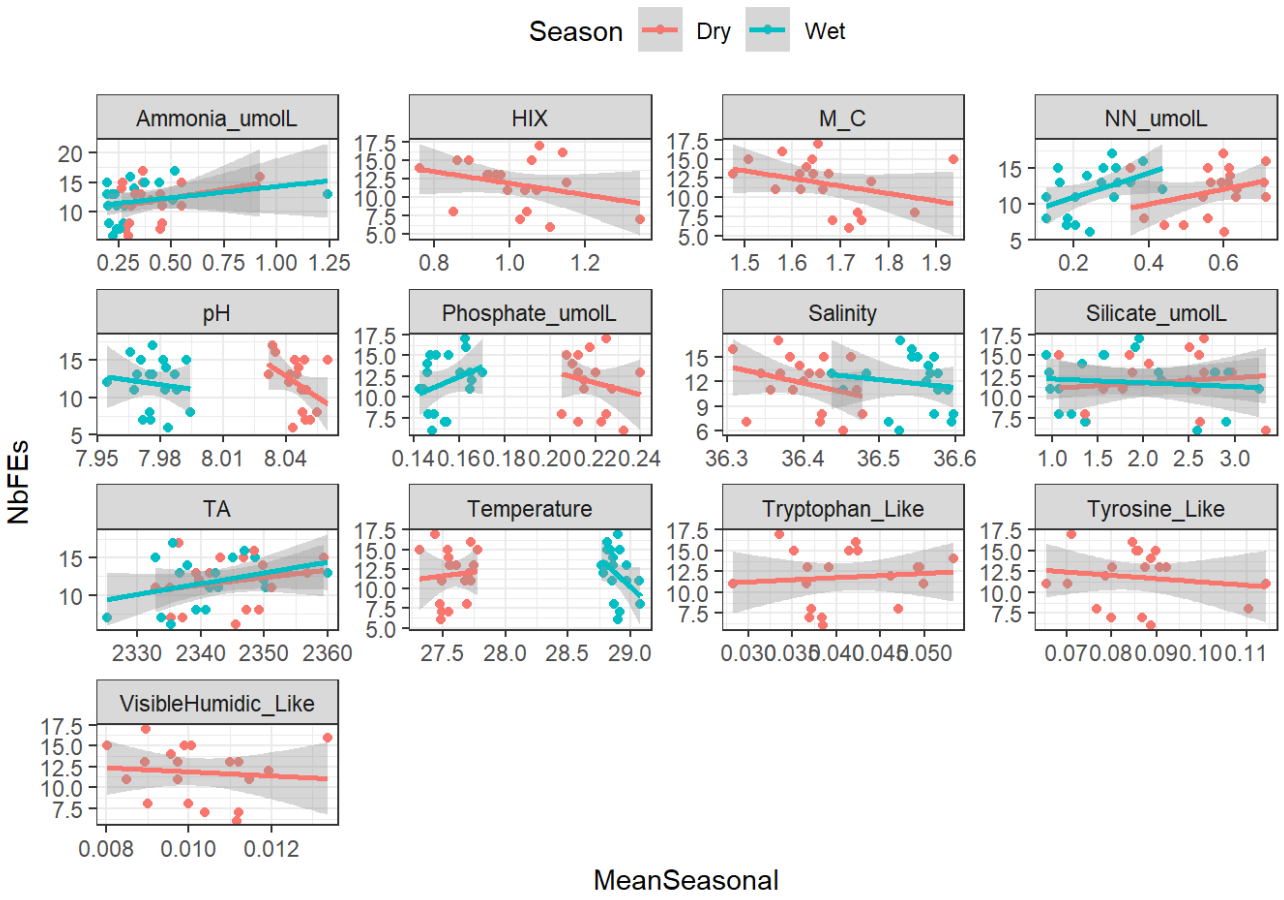
```
plotfun(y = NbSp, x = MeanSeasonal, myfacet = Parameters, myformula = "y~x")
```



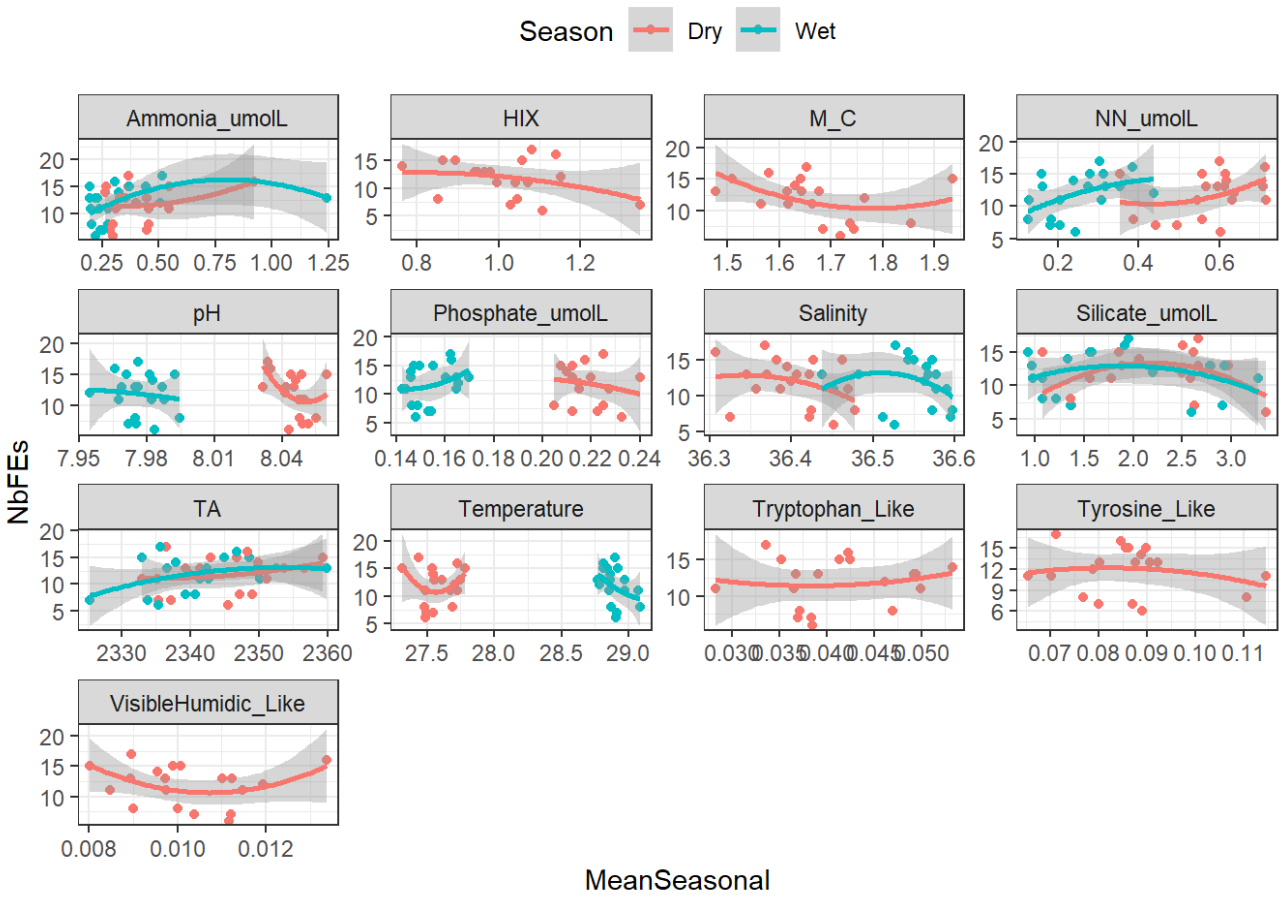

```
plotfun(y = NbSp, x = MeanSeasonal, myfacet = Parameters, myformula = "y~poly(x,2)")
```



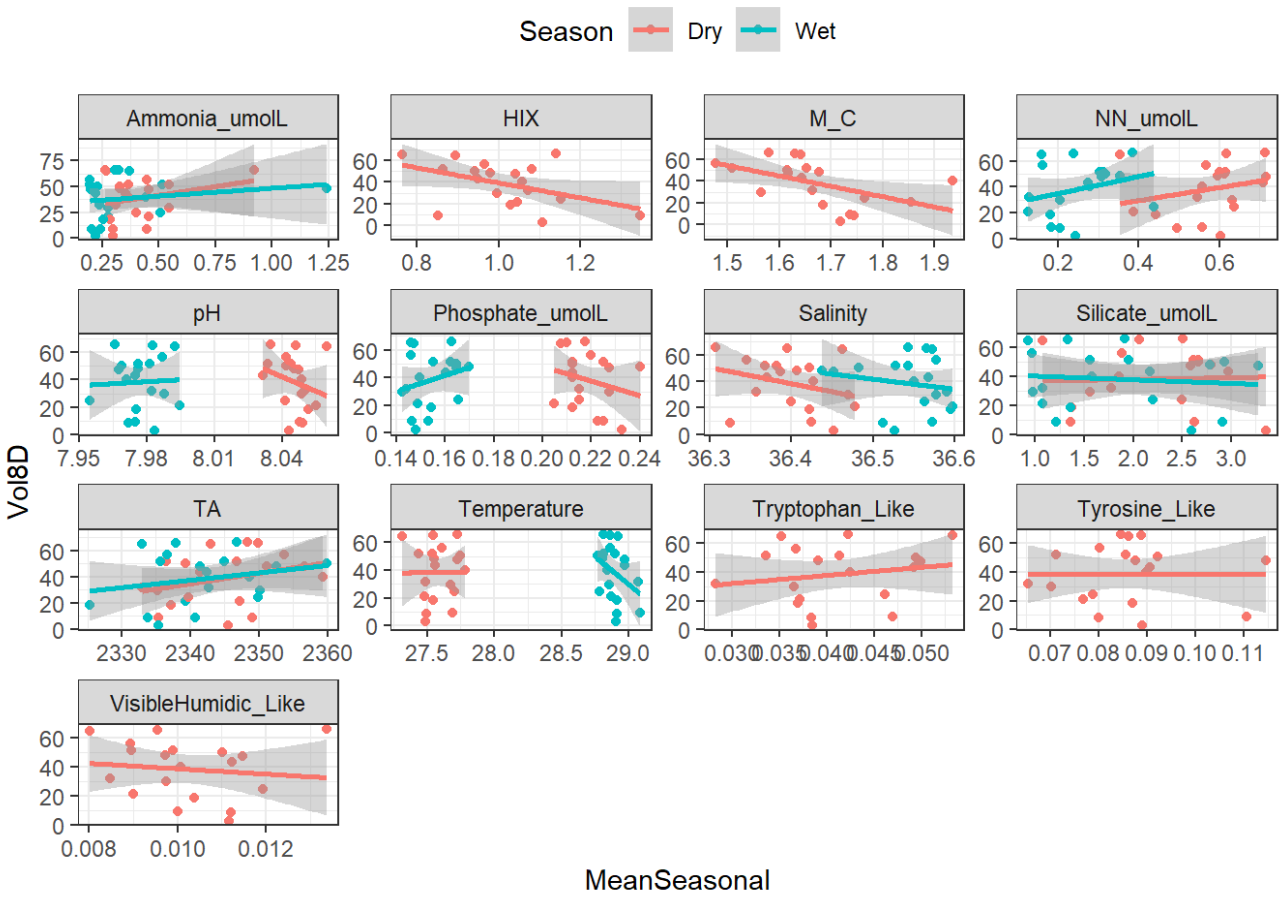

```
plotfun(y = NbFEs, x = MeanSeasonal, myfacet = Parameters, myformula = "y~x")
```



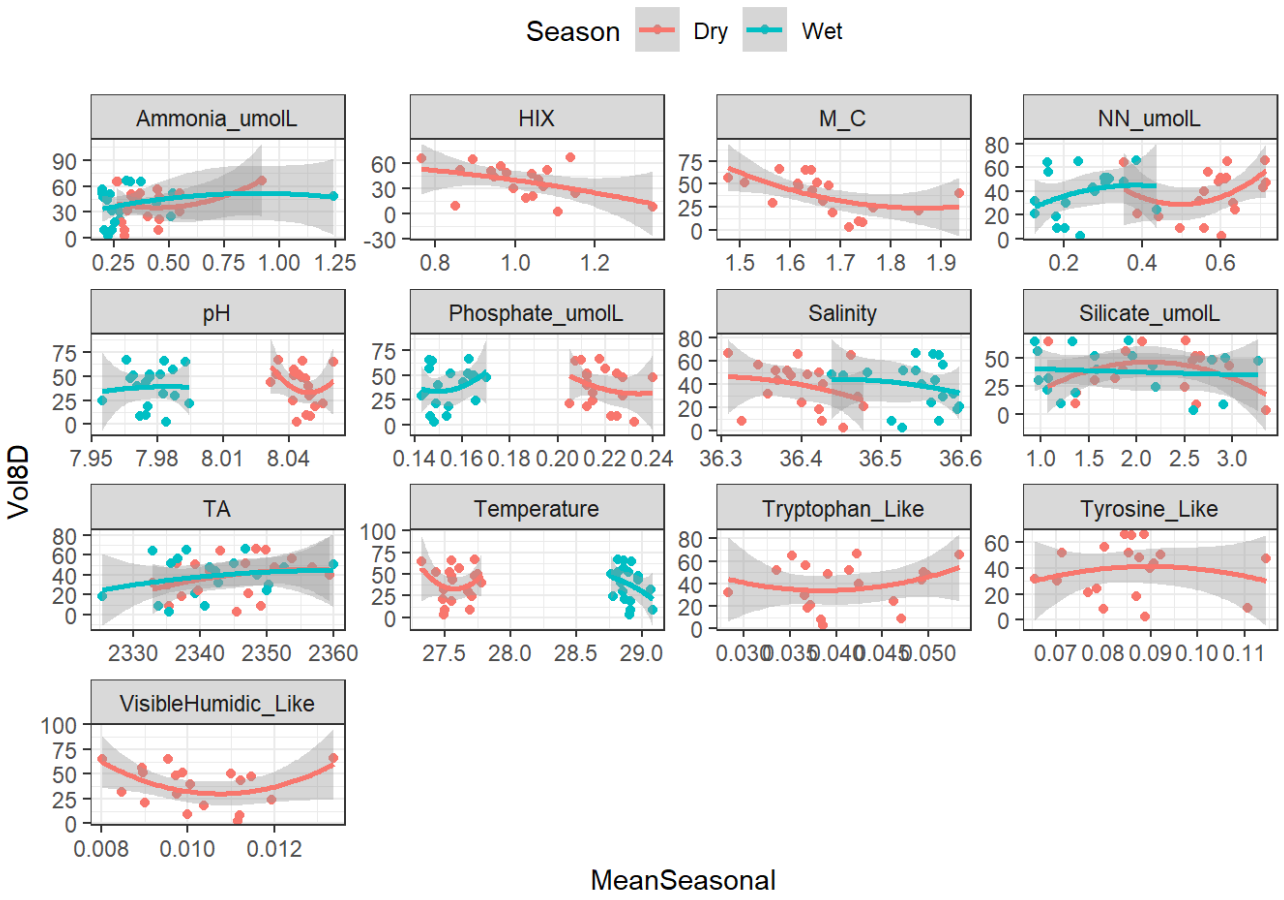

```
plotfun(y = NbFEs, x = MeanSeasonal, myfacet = Parameters, myformula = "y~poly(x,2)")
```




```
plotfun(y = Vol8D, x = MeanSeasonal, myfacet = Parameters, myformula = "y~x")
```




```
plotfun(y = Vol8D, x = MeanSeasonal, myfacet = Parameters, myformula = "y~poly(x,2)")
```



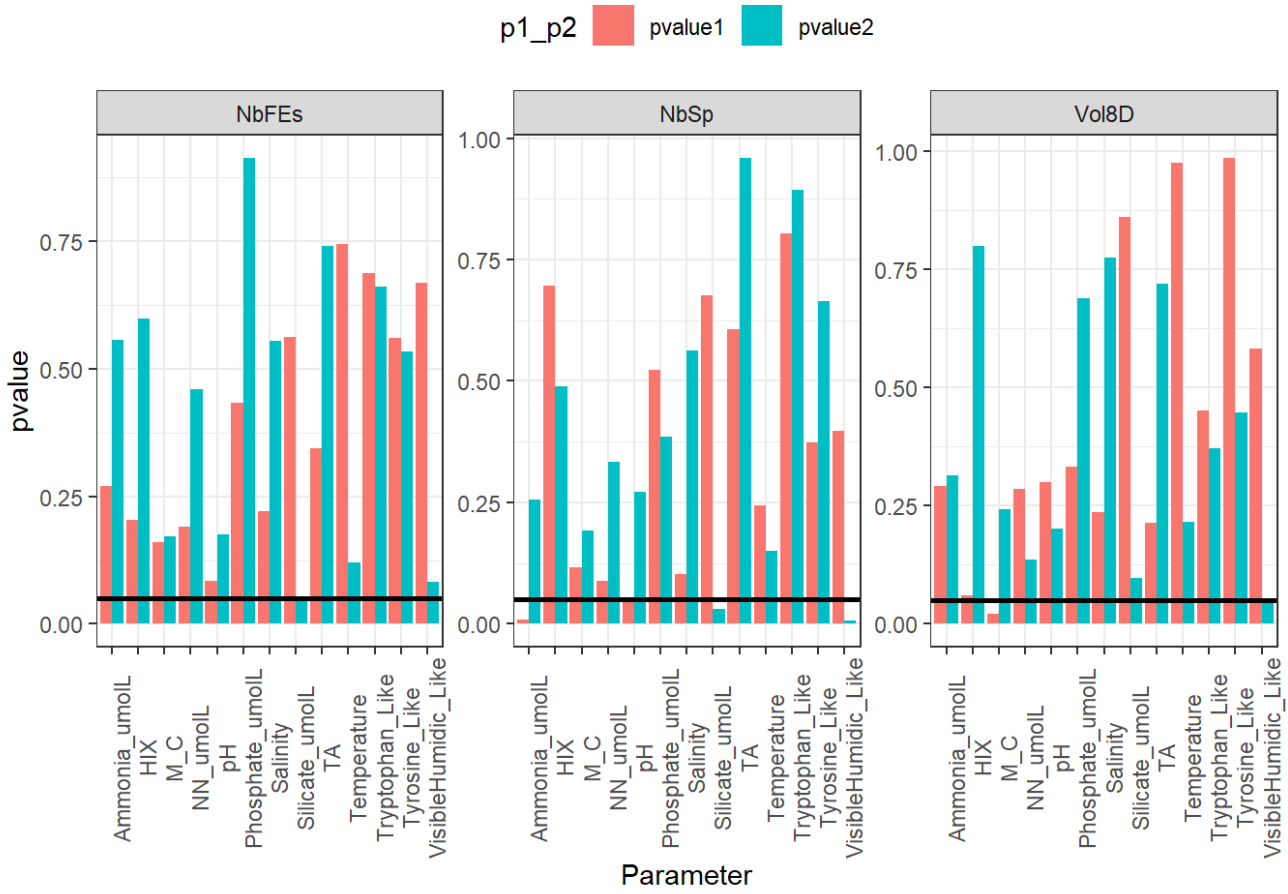

```
# get pvalues
MeanS3<-pvalpoly(myparam = "MeanSeasonal", myseason = "Dry")
MeanS4<-pvalpoly(myparam = "MeanSeasonal", myseason = "Wet")

MeanS <- full_join(MeanS3, MeanS4)
```

```
## Joining, by = c("Parameter", "ParamType", "Dependent", "Season", "pvalue1",
## "pvalue2", "r_squared", "adj_r_squared")
```

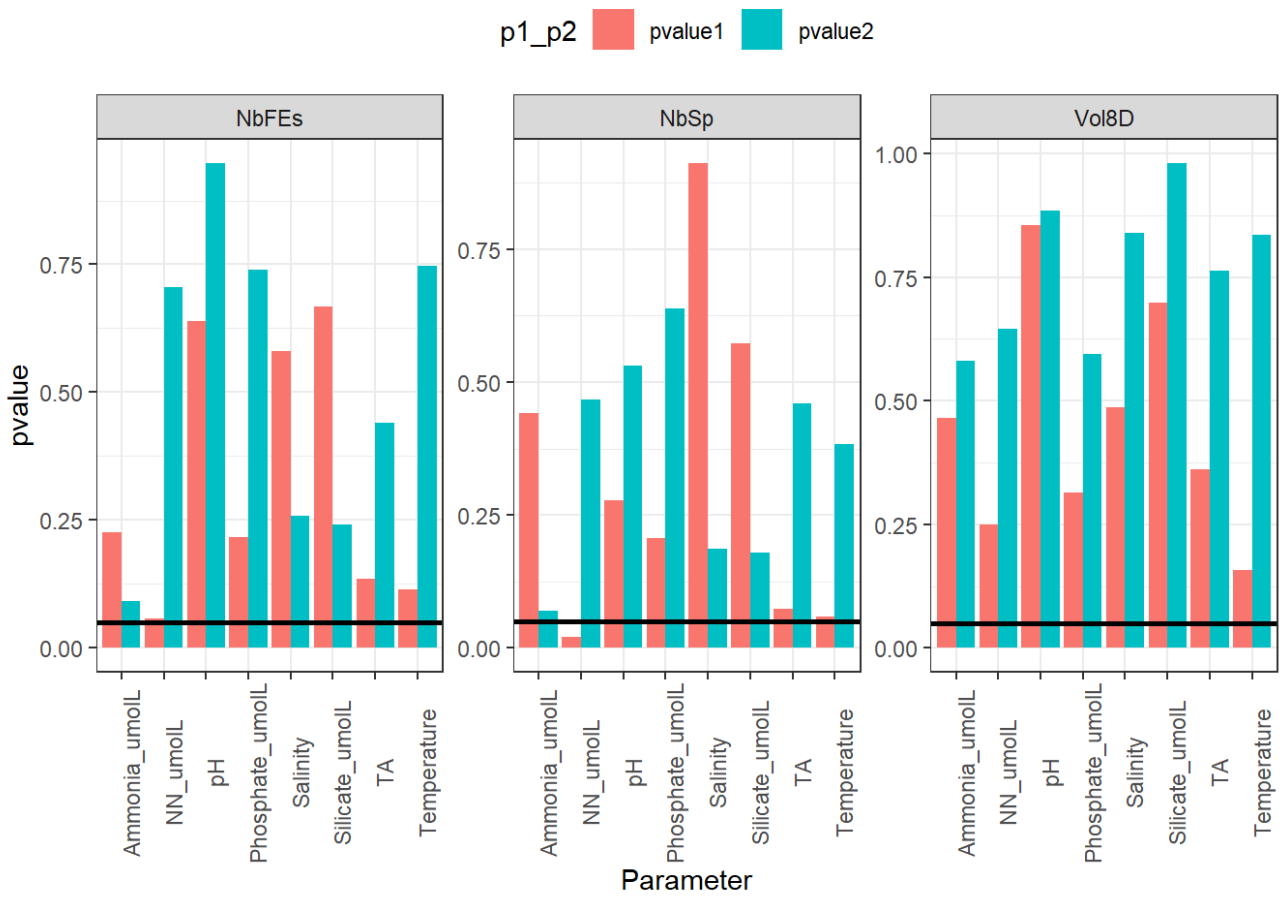
```
MeanS
```

```
## # A tibble: 105 × 8
##    Parameter       ParamType    Dependent Season pvalue1 pvalue2 r_squ…¹ adj_r…²
##    <chr>           <chr>        <chr>     <chr>    <dbl>   <dbl>   <dbl>   <dbl>
##  1 Salinity        MeanSeasonal NbSp      Dry     0.102    0.562   0.173   0.0701
##  2 Temperature     MeanSeasonal NbSp      Dry     0.244    0.151   0.190   0.0883
##  3 TA              MeanSeasonal NbSp      Dry     0.606    0.959   0.0172 -0.106
##  4 pH              MeanSeasonal NbSp      Dry     0.0445   0.272   0.274   0.184
##  5 Phosphate_umolL MeanSeasonal NbSp      Dry     0.524    0.386   0.0709 -0.0453
##  6 Silicate_umolL  MeanSeasonal NbSp      Dry     0.676    0.0301  0.268   0.176
##  7 NN_umolL        MeanSeasonal NbSp      Dry     0.0890   0.334   0.211   0.112
##  8 Ammonia_umolL   MeanSeasonal NbSp      Dry     0.00863  0.256   0.392   0.317
##  9 M_C             MeanSeasonal NbSp      Dry     0.116    0.192   0.224   0.127
## 10 HIX             MeanSeasonal NbSp      Dry     0.696    0.488   0.0397 -0.0804
## # … with 95 more rows, and abbreviated variable names ¹r_squared,
## #   ²adj_r_squared
```

```
pvalplot(mydata = MeanS, season = "Dry")
```




```
pvalplot(mydata = MeanS, season = "Wet")
```




```
p4 <- paramPlot(mydata = Full_data, ParamType = MeanSeasonal, PTname = "MeanSeasonal")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

```
## NULL
## NULL
```

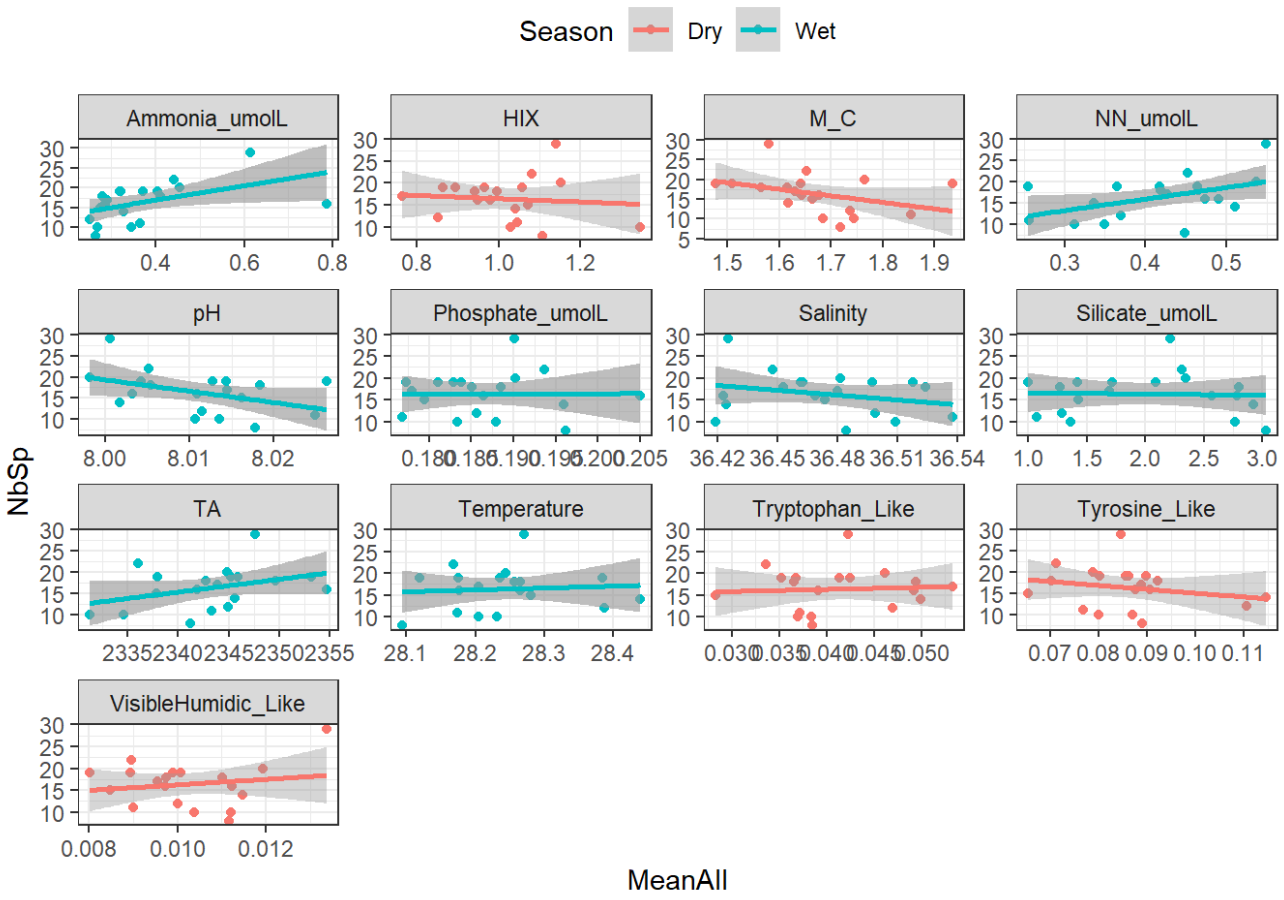
```
p4b <- paramPlot(mydata = Full_data, ParamType = MeanSeasonal, PTname = "MeanSeasonal_po
ly", myformula = "y~poly(x,2)")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

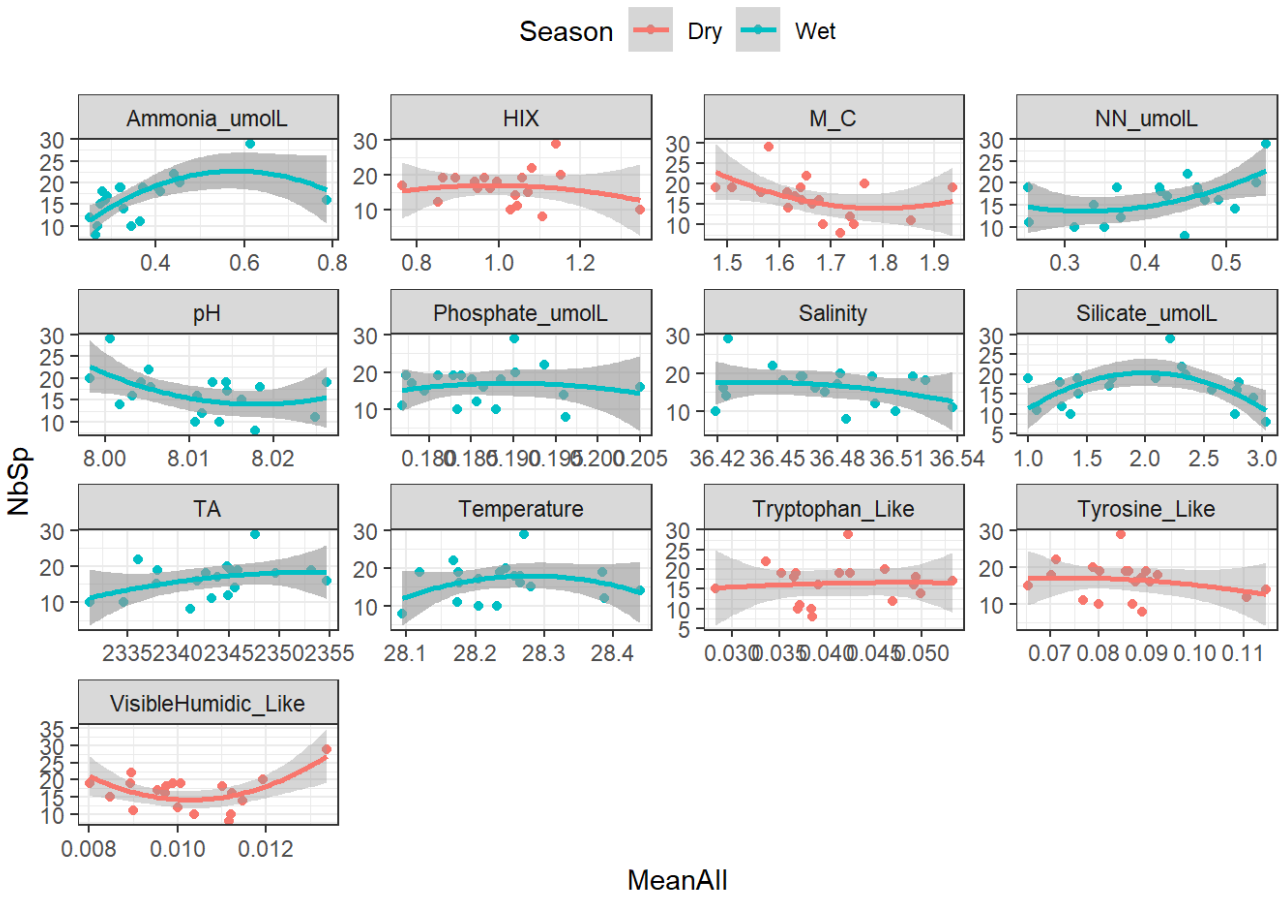
```
## NULL
## NULL
```

MEAN VALUES (ALL SEASONS)

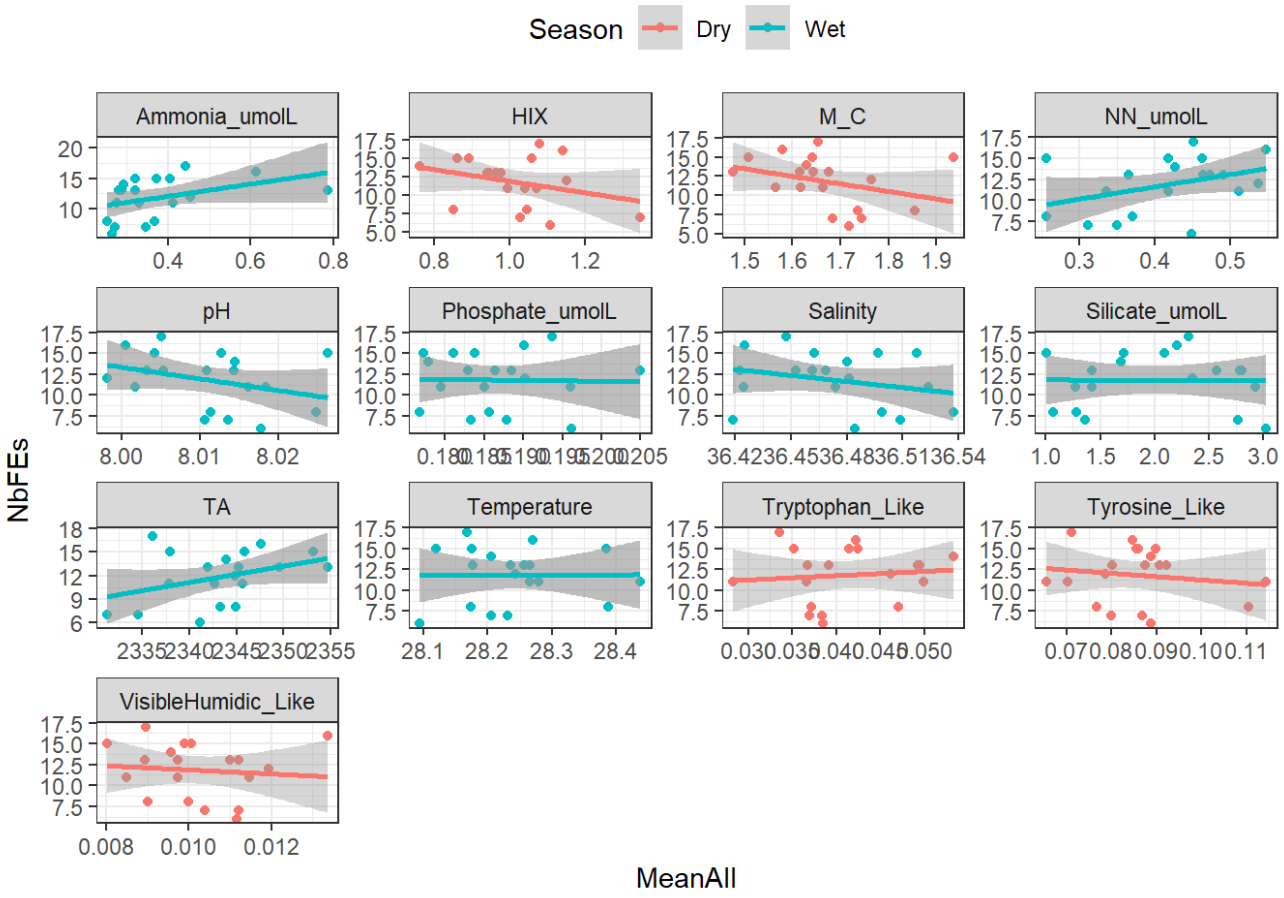
```
plotfun(y = NbSp, x = MeanAll, myfacet = Parameters, myformula = "y~x")
```



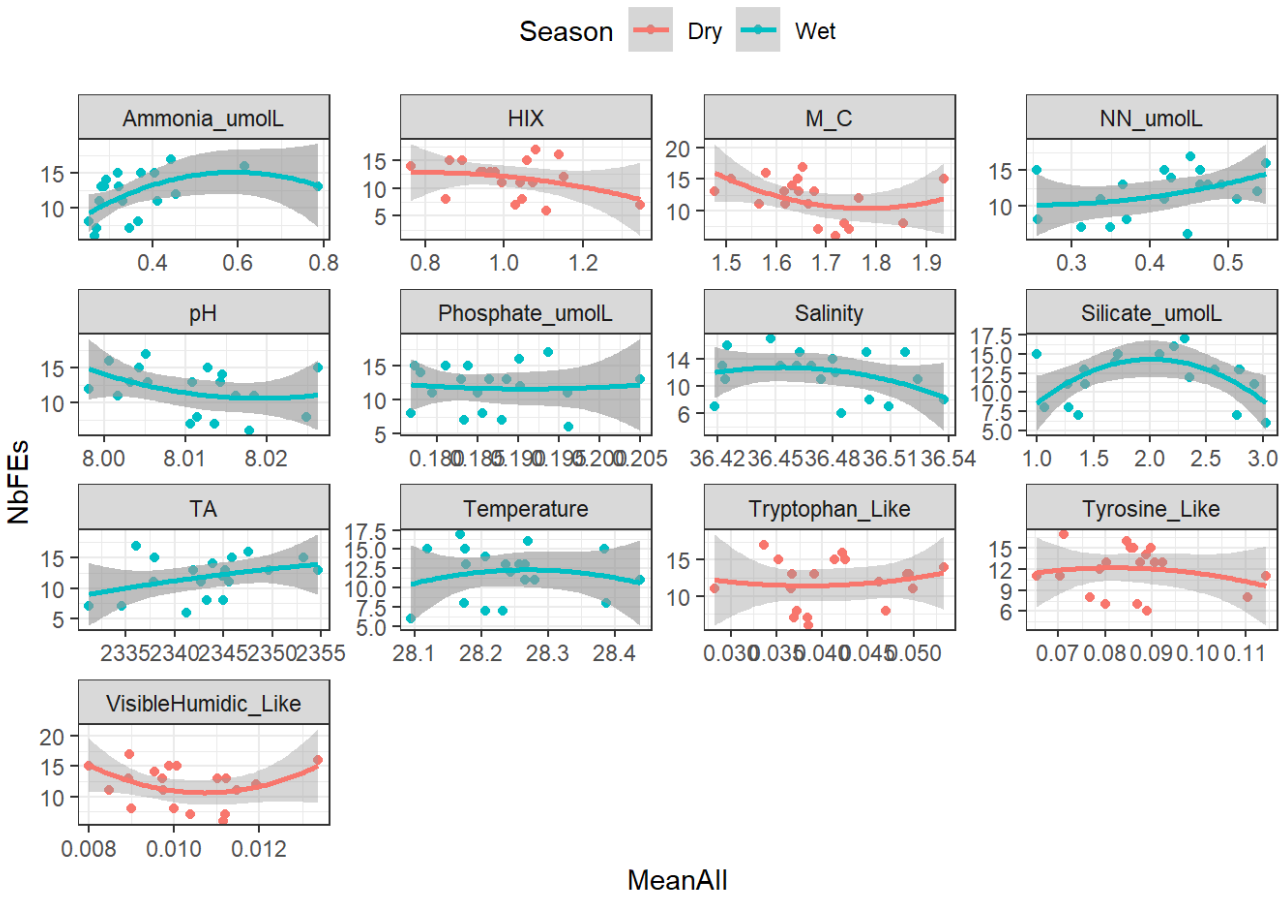

```
plotfun(y = NbSp, x = MeanAll, myfacet = Parameters, myformula = "y~poly(x,2)")
```



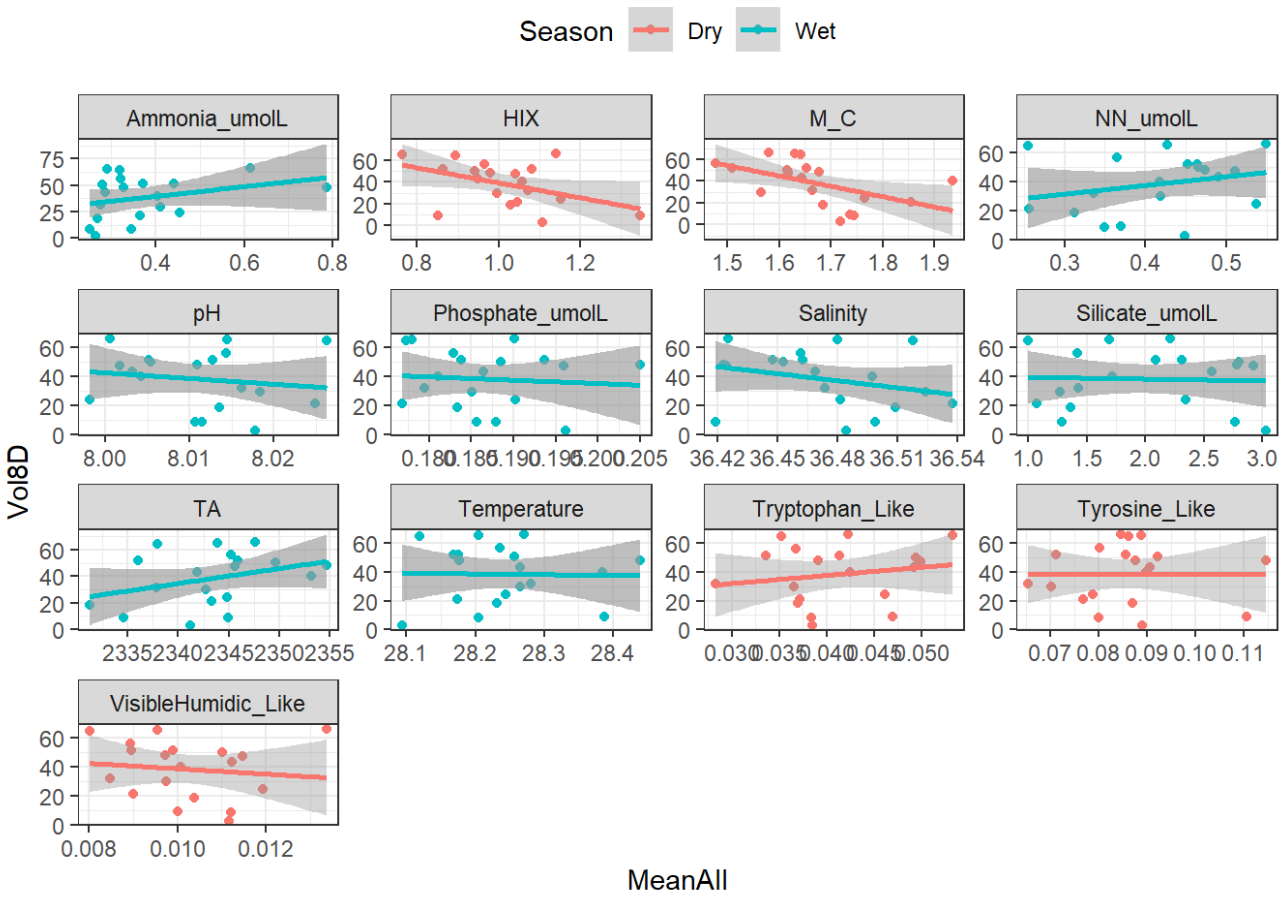

```
plotfun(y = NbFEs, x = MeanAll, myfacet = Parameters, myformula = "y~x")
```



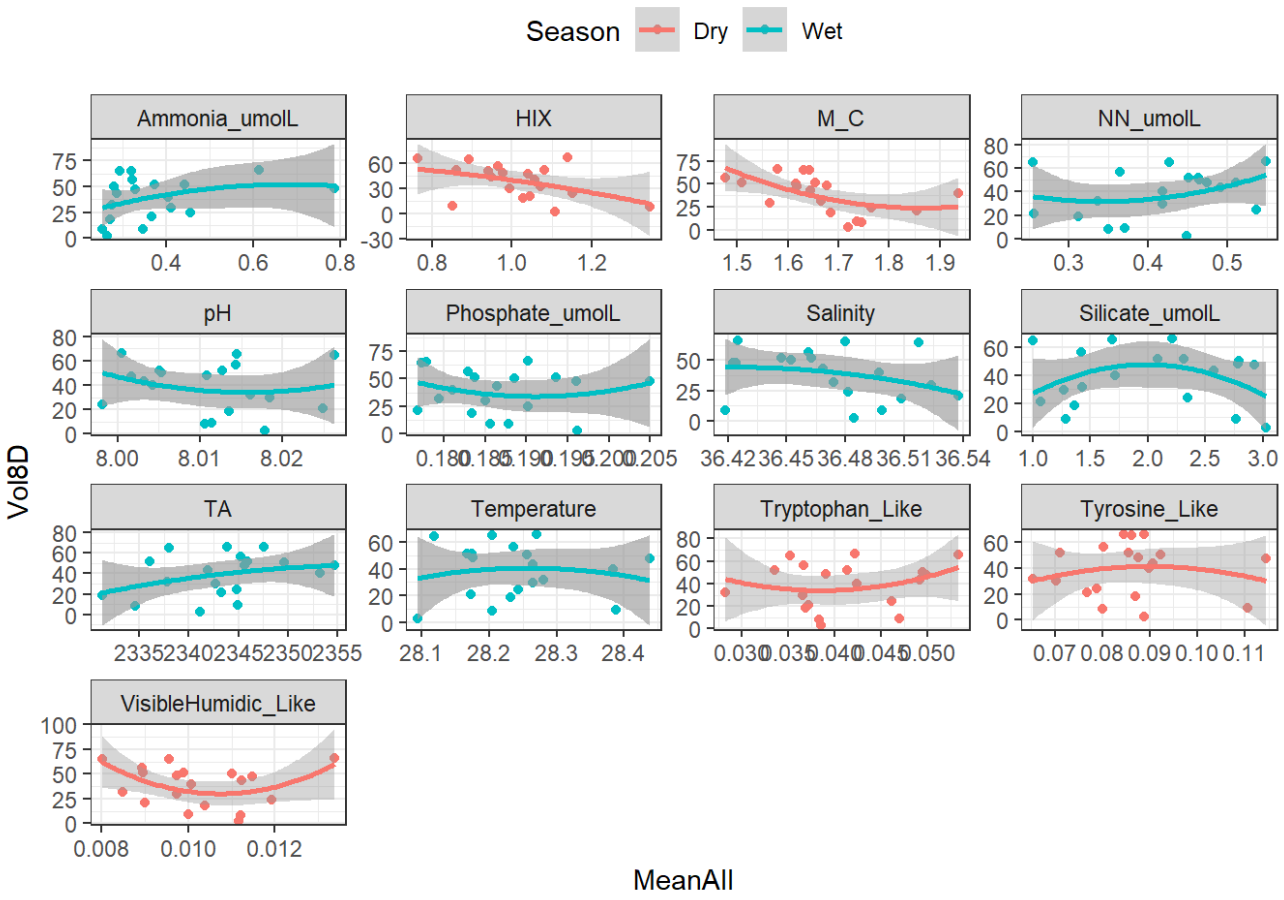

```
plotfun(y = NbFEs, x = MeanAll, myfacet = Parameters, myformula = "y~poly(x,2)")
```




```
plotfun(y = Vol8D, x = MeanAll, myfacet = Parameters, myformula = "y~x")
```




```
plotfun(y = Vol8D, x = MeanAll, myfacet = Parameters, myformula = "y~poly(x,2)")
```



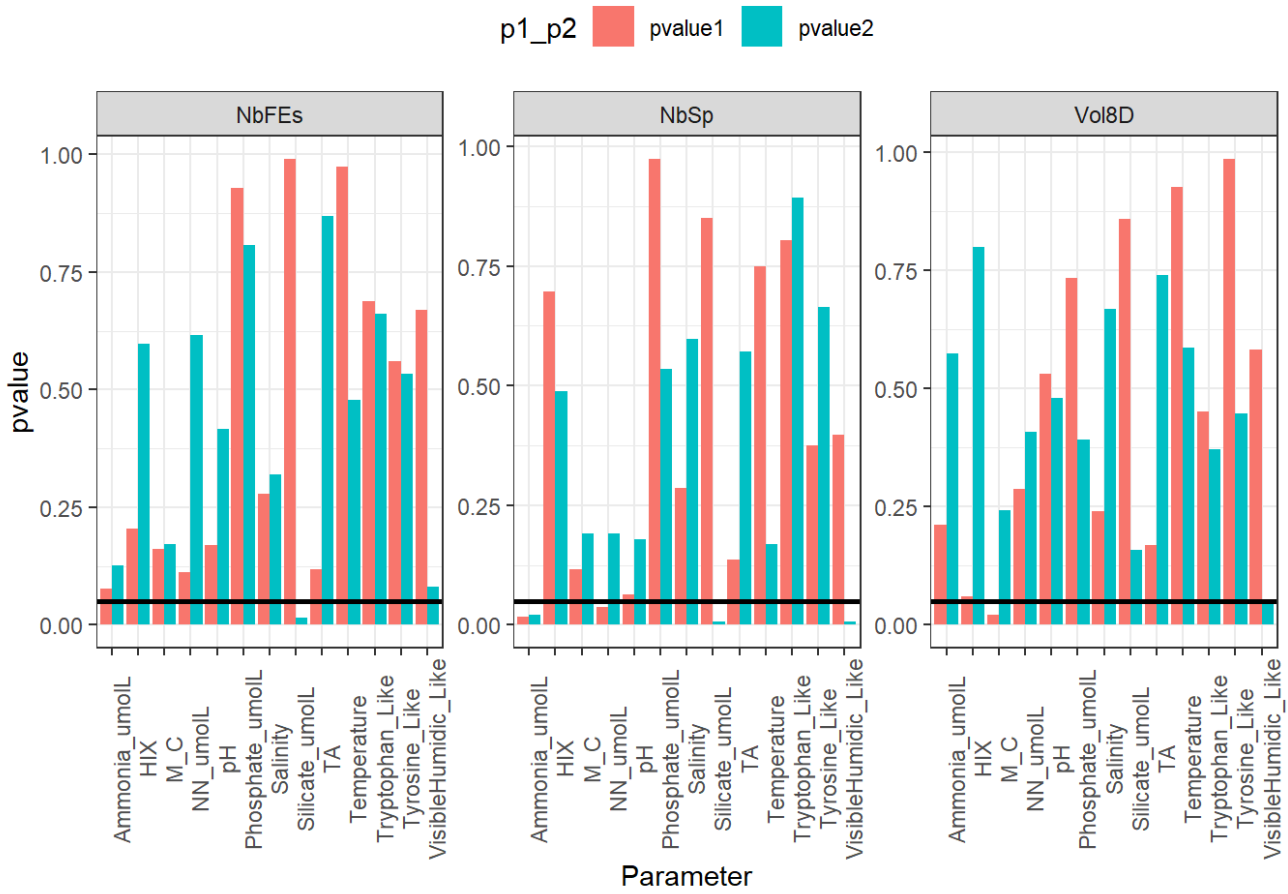

```
# get pvalues
MeanA3<-pvalpoly(myparam = "MeanAll", myseason = "Dry")
MeanA4<-pvalpoly(myparam = "MeanAll", myseason = "Wet")

MeanA <- full_join(MeanA3, MeanA4)
```

```
## Joining, by = c("Parameter", "ParamType", "Dependent", "Season", "pvalue1",
## "pvalue2", "r_squared", "adj_r_squared")
```

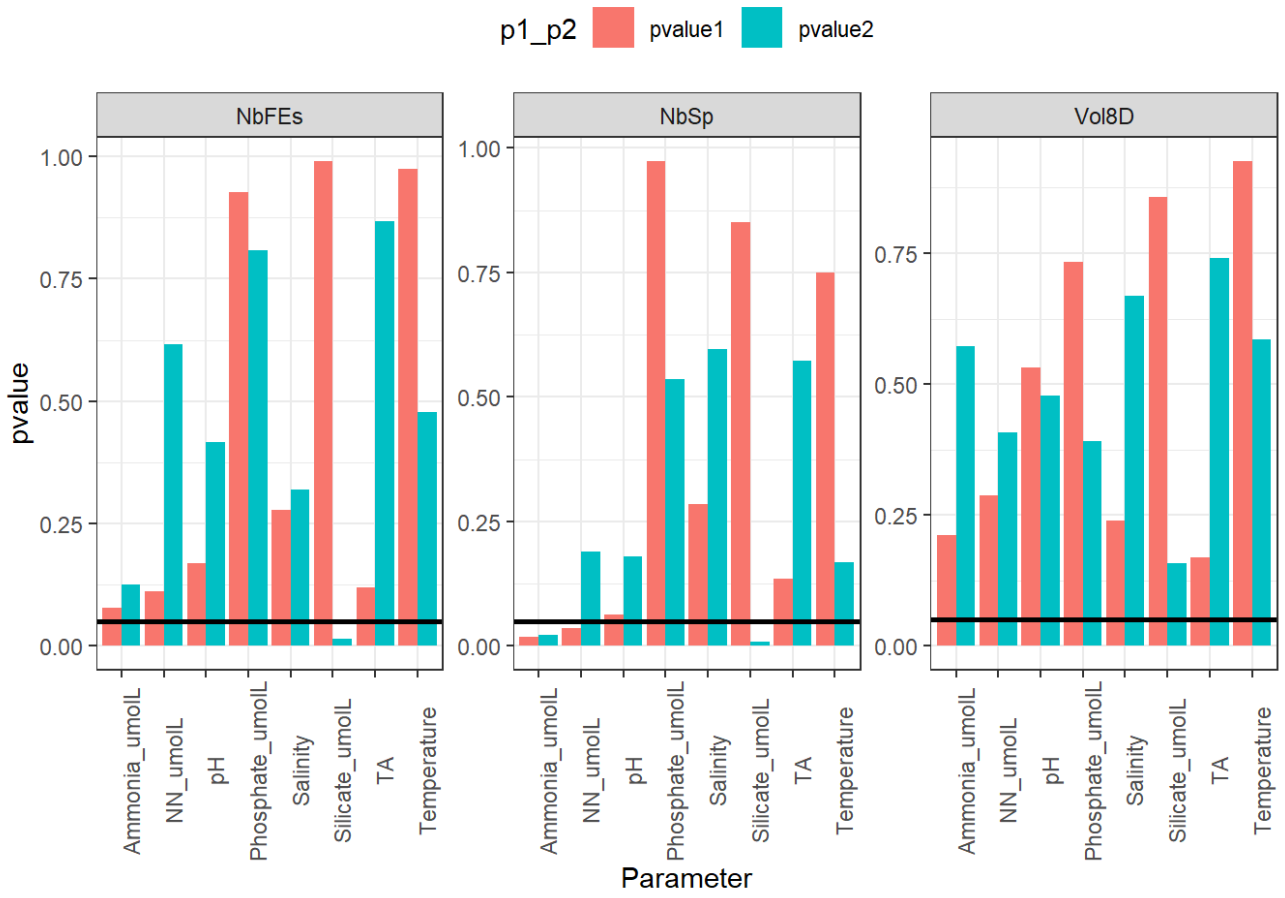
```
MeanA
```

```
## # A tibble: 105 × 8
##    Parameter       ParamType Dependent Season pvalue1 pvalue2 r_squared adj_r_…¹
##    <chr>           <chr>     <chr>     <chr>    <dbl>   <dbl>     <dbl>    <dbl>
##  1 Salinity        MeanAll   NbSp      Dry     0.285  0.597      0.0865  -0.0277
##  2 Temperature     MeanAll   NbSp      Dry     0.749  0.168      0.120    0.0104
##  3 TA              MeanAll   NbSp      Dry     0.136  0.572      0.149    0.0425
##  4 pH              MeanAll   NbSp      Dry     0.0635 0.180      0.271    0.180
##  5 Phosphate_umolL MeanAll   NbSp      Dry     0.973  0.535      0.0246  -0.0973
##  6 Silicate_umolL  MeanAll   NbSp      Dry     0.851  0.00769    0.368    0.289
##  7 NN_umolL        MeanAll   NbSp      Dry     0.0363 0.190      0.307    0.221
##  8 Ammonia_umolL   MeanAll   NbSp      Dry     0.0177 0.0219     0.456    0.388
##  9 M_C             MeanAll   NbSp      Dry     0.116  0.192      0.224    0.127
## 10 HIX             MeanAll   NbSp      Dry     0.696  0.488      0.0397  -0.0804
## # … with 95 more rows, and abbreviated variable name ¹adj_r_squared
```

```
pvalplot(mydata = MeanA, season = "Dry")
```




```
pvalplot(mydata = MeanA, season = "Wet")
```




```
p5 <- paramPlot(mydata = Full_data, ParamType = MeanAll, PTname = "MeanAll")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

```
## NULL
## NULL
```

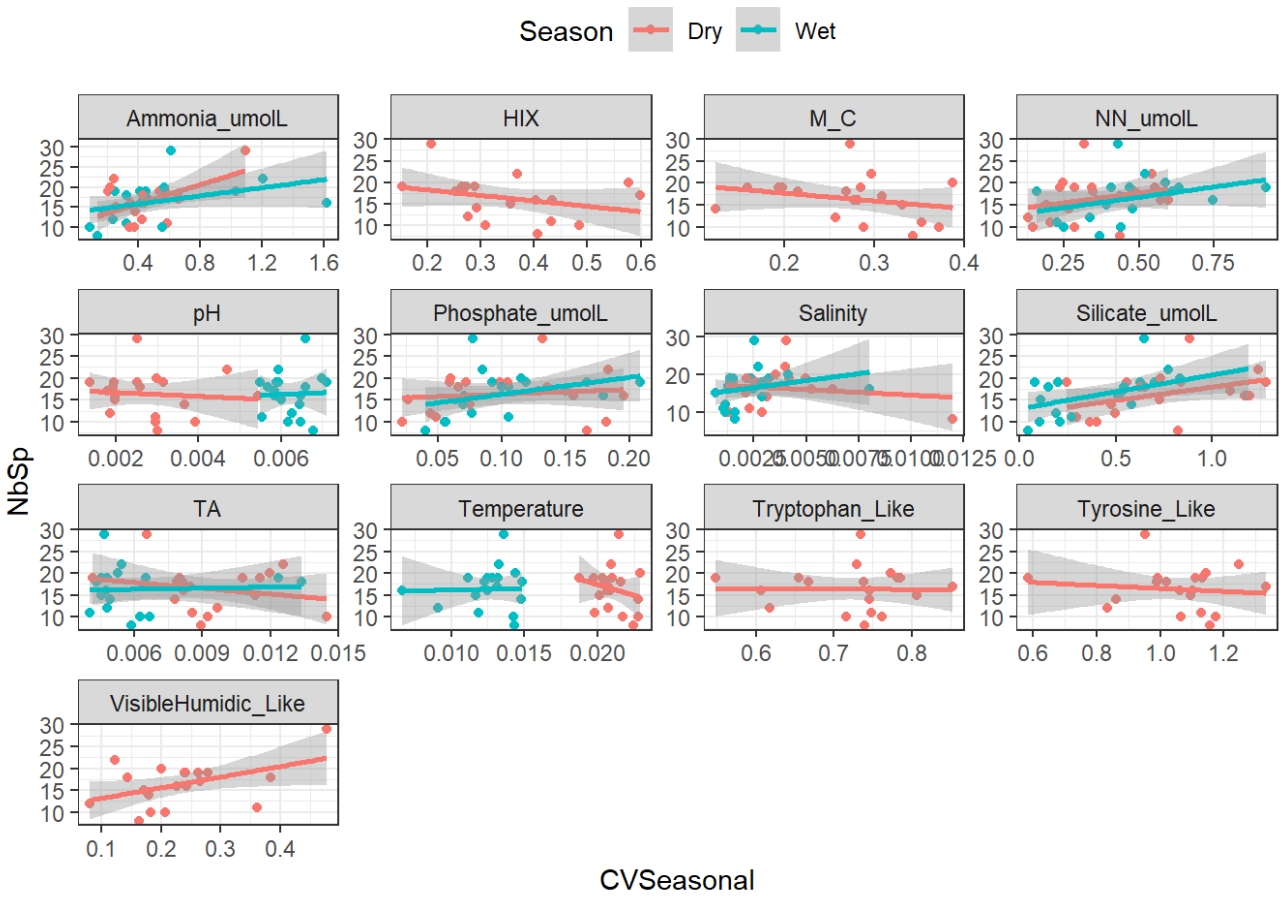
```
p5b <- paramPlot(mydata = Full_data, ParamType = MeanAll, PTname = "MeanAll_poly", myfor
mula = "y~poly(x,2)")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

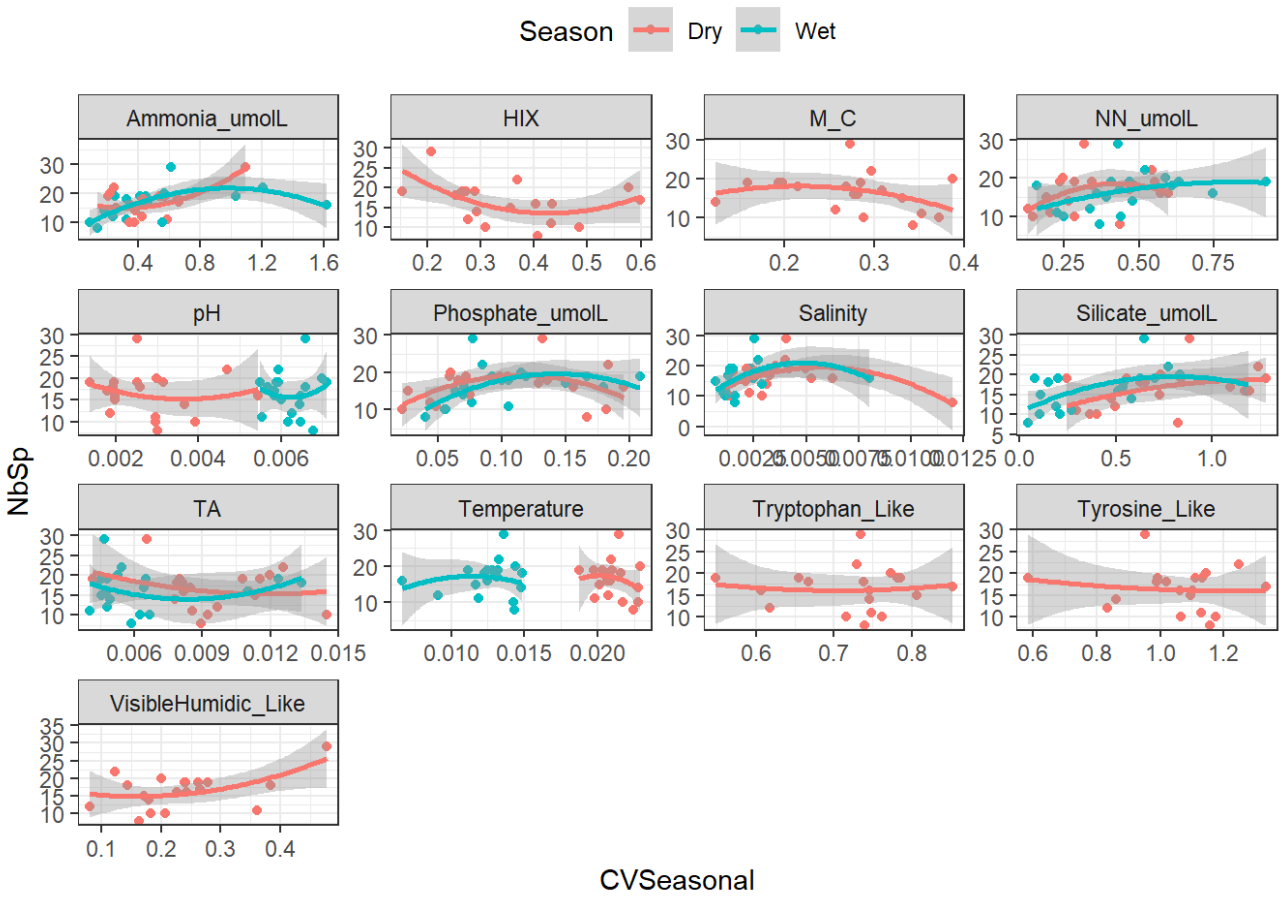
```
## NULL
## NULL
```

CV VALUES BY SEASON

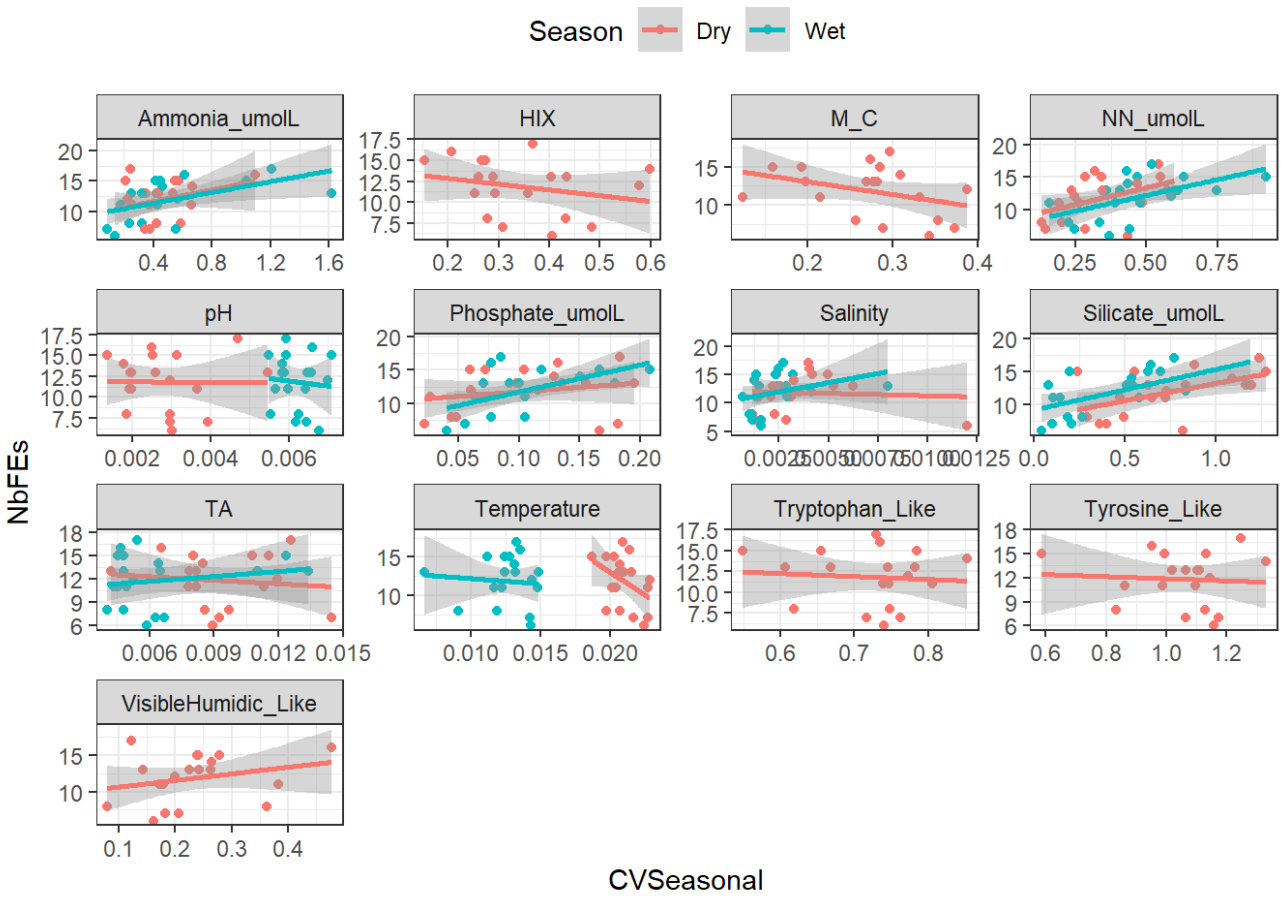
```
plotfun(y = NbSp, x = CVSeasonal, myfacet = Parameters, myformula = "y~x")
```



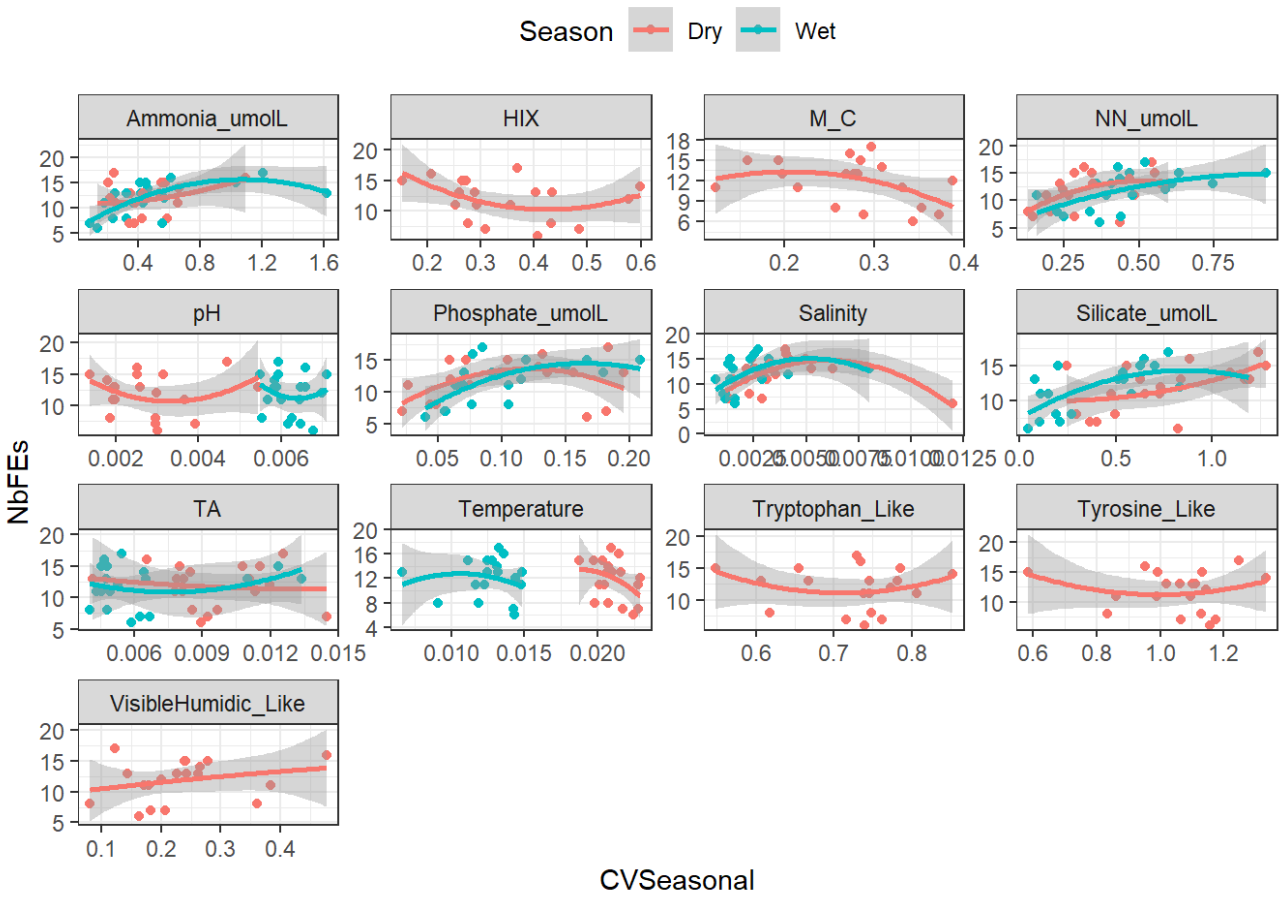

```
plotfun(y = NbSp, x = CVSeasonal, myfacet = Parameters, myformula = "y~poly(x,2)")
```



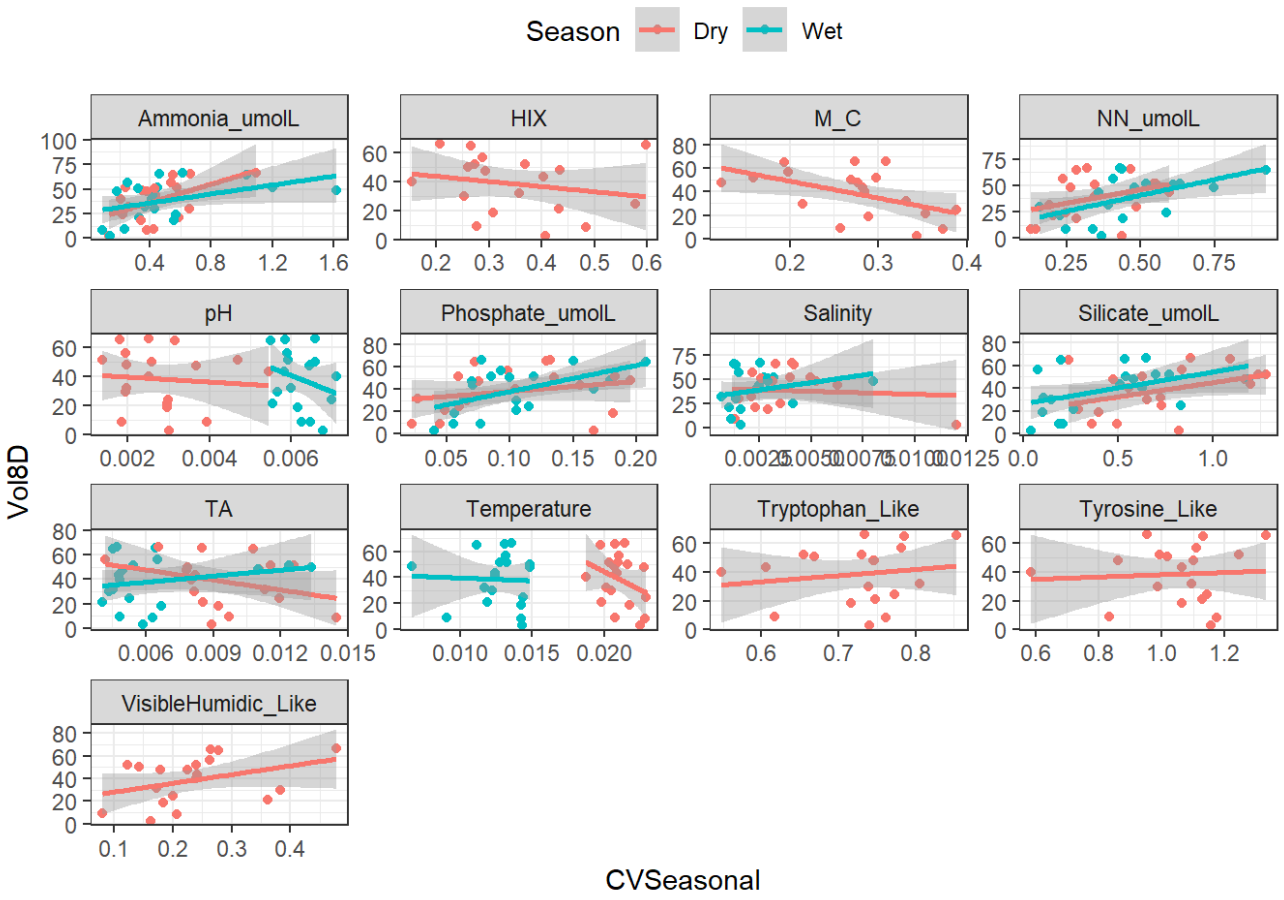

```
plotfun(y = NbFEs, x = CVSeasonal, myfacet = Parameters, myformula = "y~x")
```



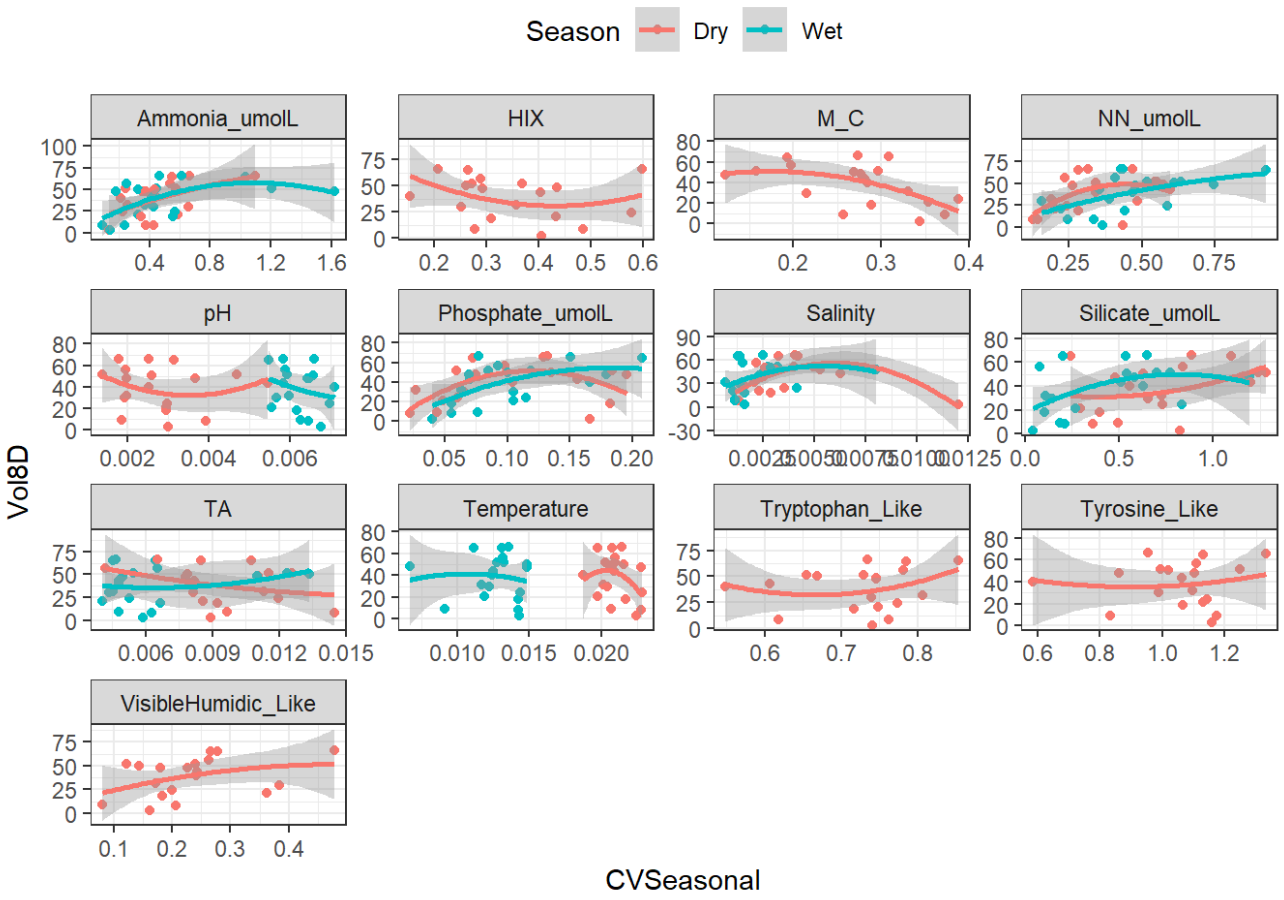

```
plotfun(y = NbFEs, x = CVSeasonal, myfacet = Parameters, myformula = "y~poly(x,2)")
```




```
plotfun(y = Vol8D, x = CVSeasonal, myfacet = Parameters, myformula = "y~x")
```




```
plotfun(y = Vol8D, x = CVSeasonal, myfacet = Parameters, myformula = "y~poly(x,2)")
```



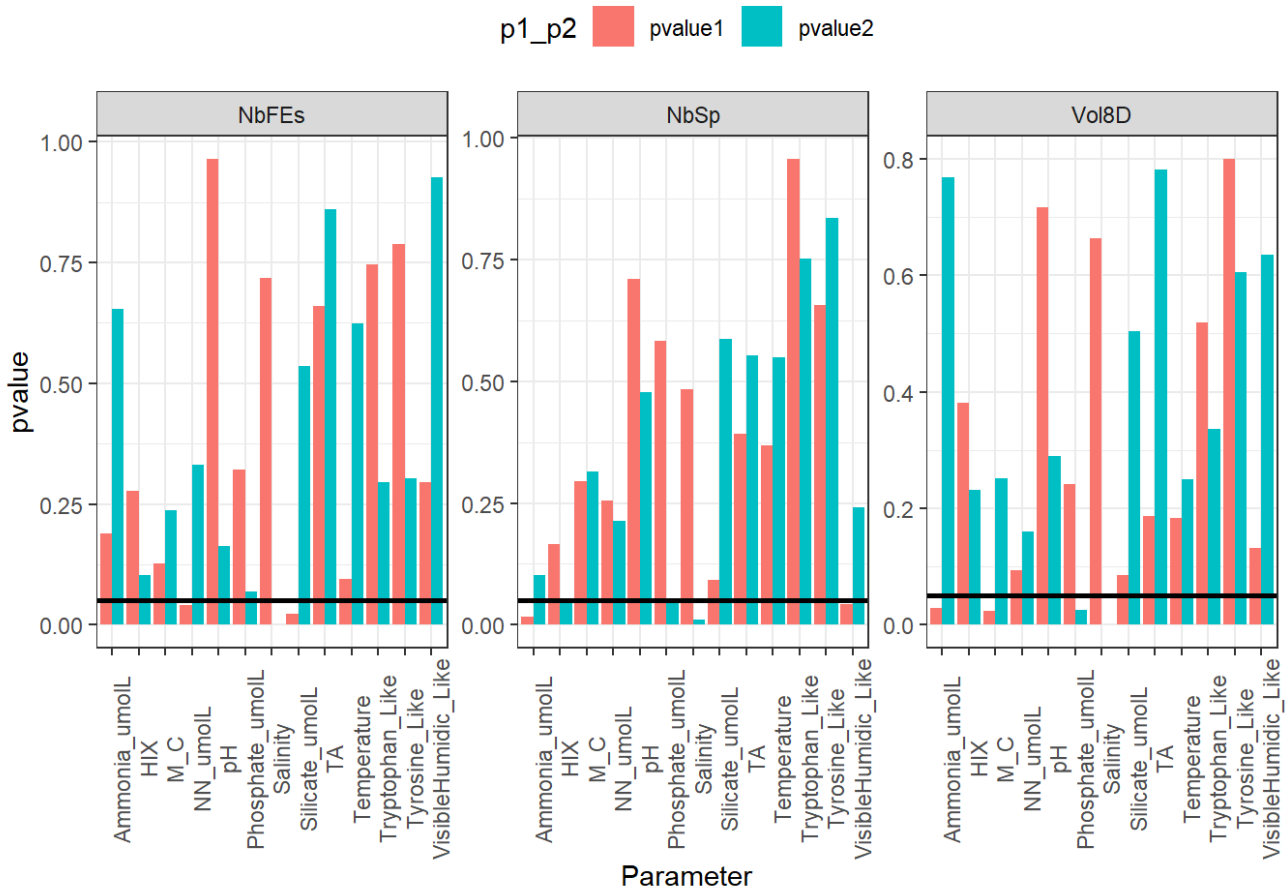

```
# get pvalues
CVS3<-pvalpoly(myparam = "CVSeasonal", myseason = "Dry")
CVS4<-pvalpoly(myparam = "CVSeasonal", myseason = "Wet")

CVS <- full_join(CVS3, CVS4)
```

```
## Joining, by = c("Parameter", "ParamType", "Dependent", "Season", "pvalue1",
## "pvalue2", "r_squared", "adj_r_squared")
```

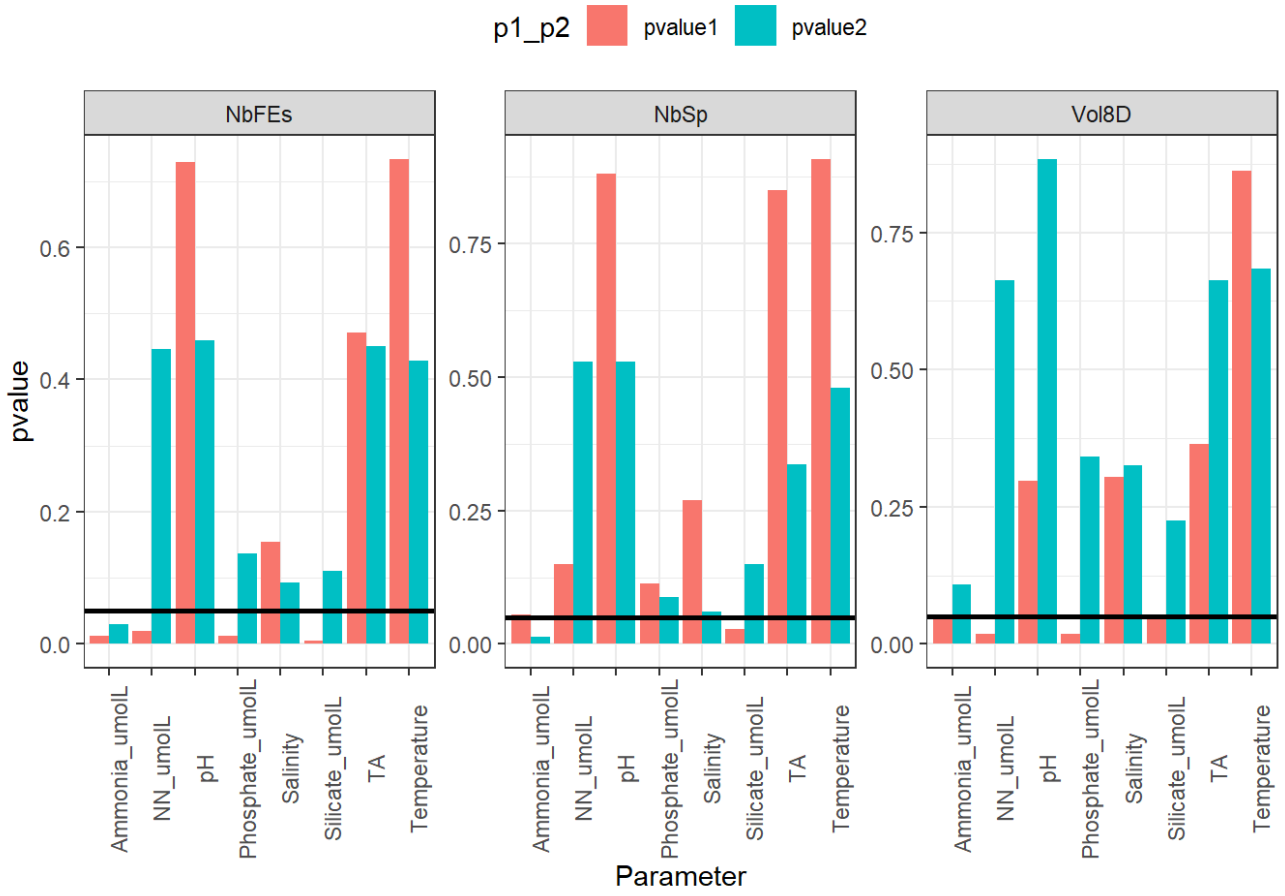
```
CVS
```

```
## # A tibble: 105 × 8
##    Parameter       ParamType  Dependent Season pvalue1 pvalue2 r_squared adj_r…¹
##    <chr>           <chr>      <chr>     <chr>    <dbl>   <dbl>     <dbl>   <dbl>
##  1 Salinity        CVSeasonal NbSp      Dry     0.484   0.0101    0.360   0.280
##  2 Temperature     CVSeasonal NbSp      Dry     0.368   0.548     0.0716 -0.0444
##  3 TA              CVSeasonal NbSp      Dry     0.393   0.553     0.0664 -0.0504
##  4 pH              CVSeasonal NbSp      Dry     0.710   0.477     0.0404 -0.0796
##  5 Phosphate_umolL CVSeasonal NbSp      Dry     0.583   0.0499    0.231   0.135
##  6 Silicate_umolL  CVSeasonal NbSp      Dry     0.0915  0.586     0.181   0.0784
##  7 NN_umolL        CVSeasonal NbSp      Dry     0.255   0.212     0.161   0.0566
##  8 Ammonia_umolL   CVSeasonal NbSp      Dry     0.0162  0.101     0.390   0.314
##  9 M_C             CVSeasonal NbSp      Dry     0.294   0.316     0.123   0.0136
## 10 HIX             CVSeasonal NbSp      Dry     0.166   0.0471    0.296   0.208
## # … with 95 more rows, and abbreviated variable name ¹adj_r_squared
```

```
pvalplot(mydata = CVS, season = "Dry")
```




```
pvalplot(mydata = CVS, season = "Wet")
```




```
p6 <- paramPlot(mydata = Full_data, ParamType = CVSeasonal, PTname = "CVSeasonal")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

```
## NULL
## NULL
```

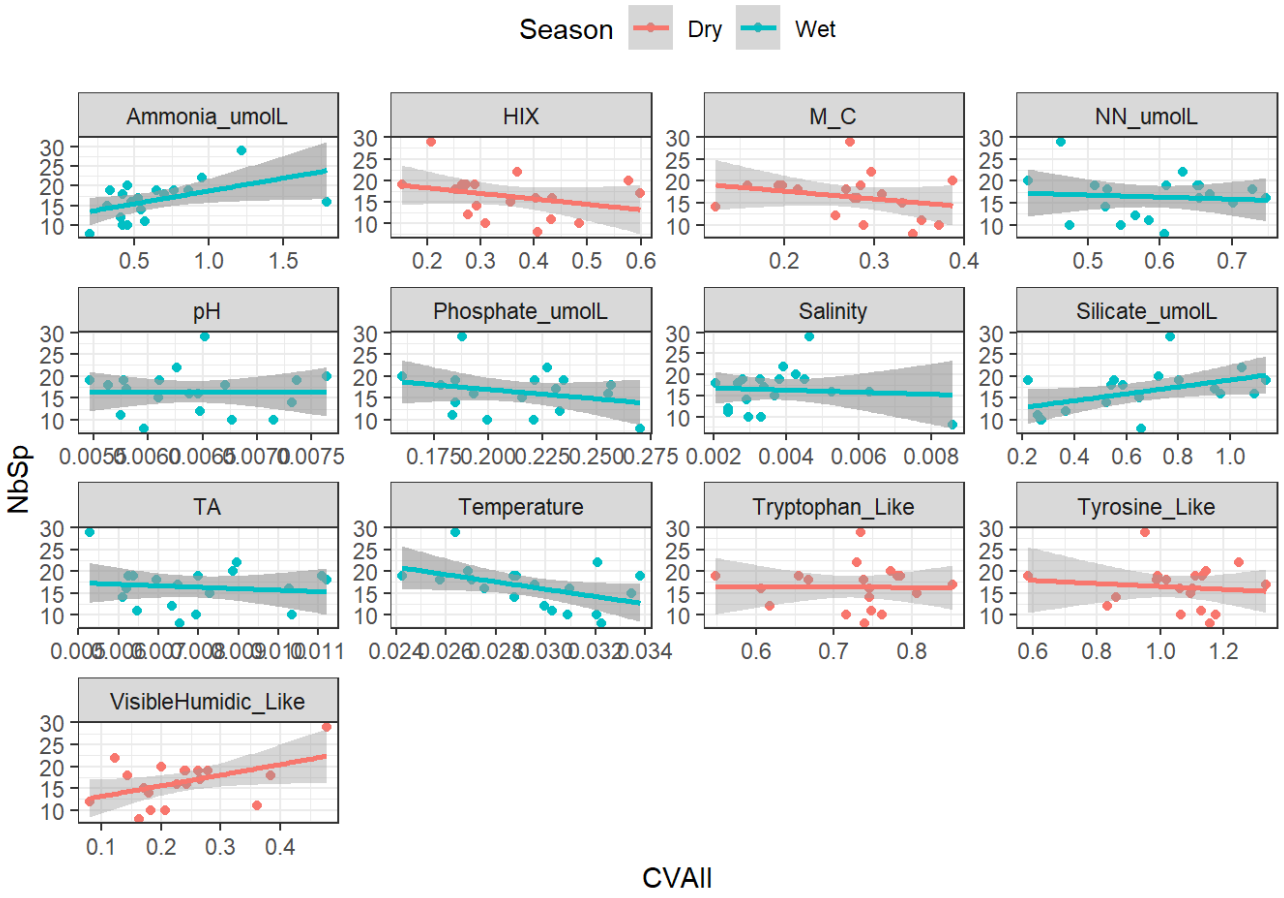
```
p6b <- paramPlot(mydata = Full_data, ParamType = CVSeasonal, PTname = "CVSeasonal_poly",
myformula = "y~poly(x,2)")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

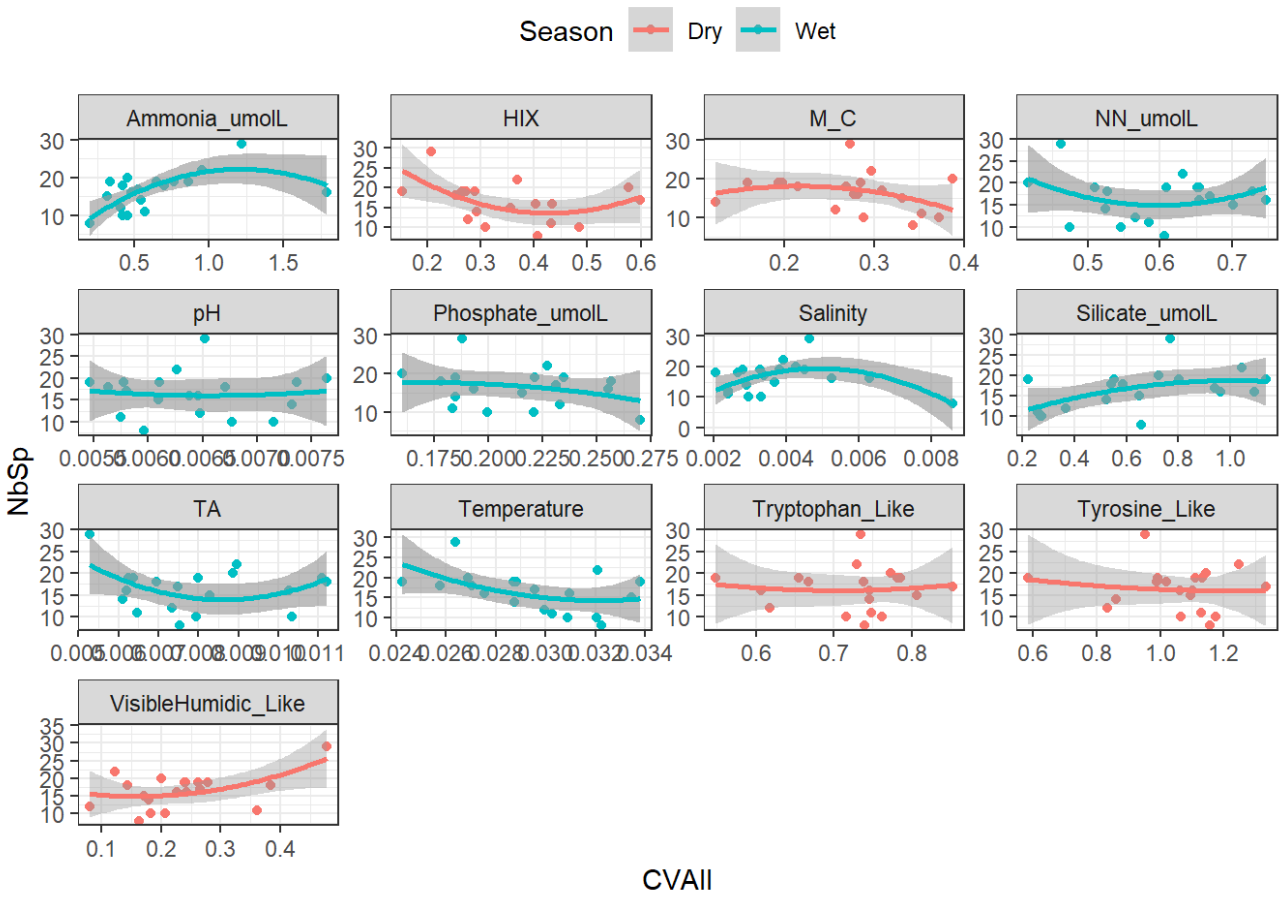
```
## NULL
## NULL
```

CV VALUES (ALL SEASONS)

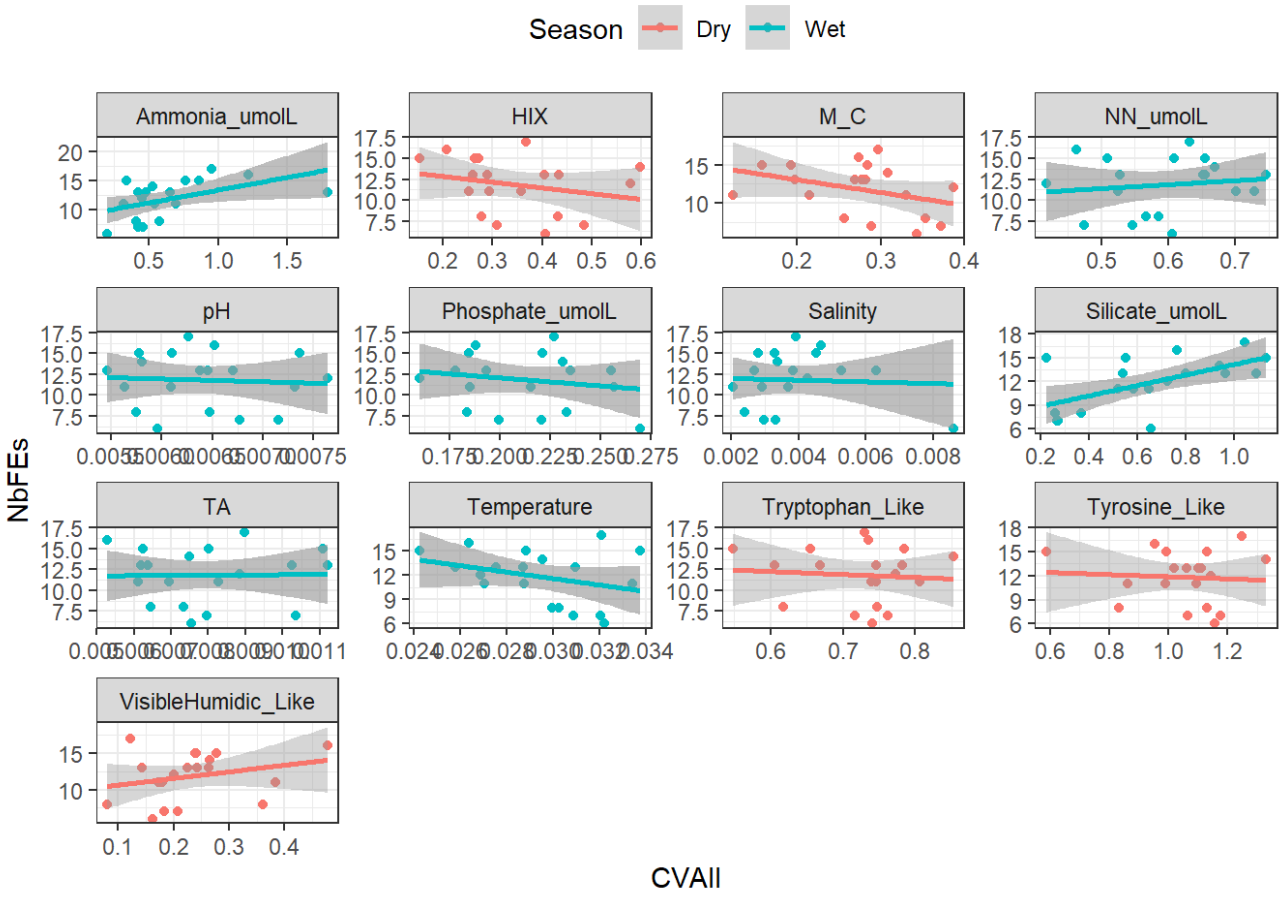
```
plotfun(y = NbSp, x = CVAll, myfacet = Parameters, myformula = "y~x")
```



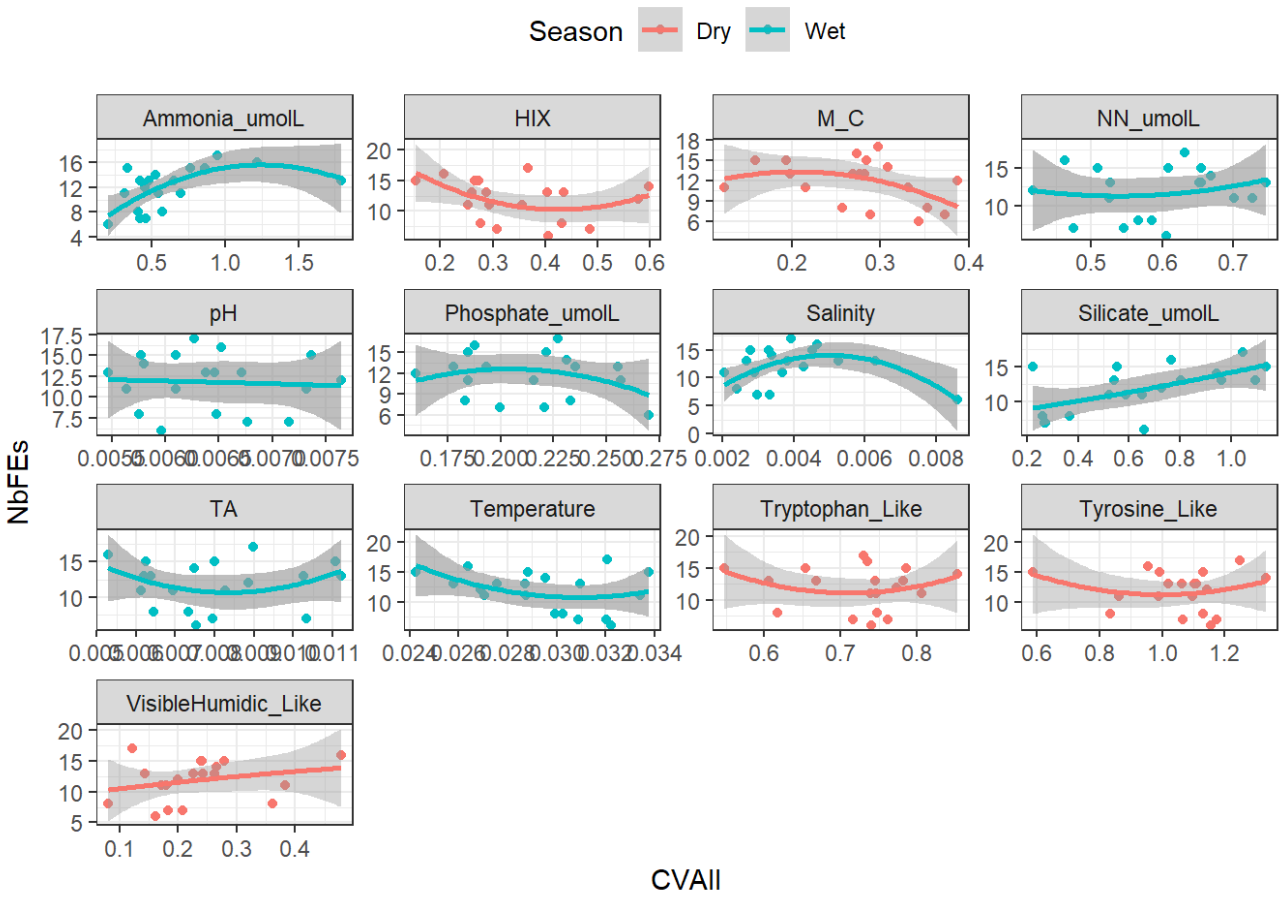

```
plotfun(y = NbSp, x = CVAll, myfacet = Parameters, myformula = "y~poly(x,2)")
```



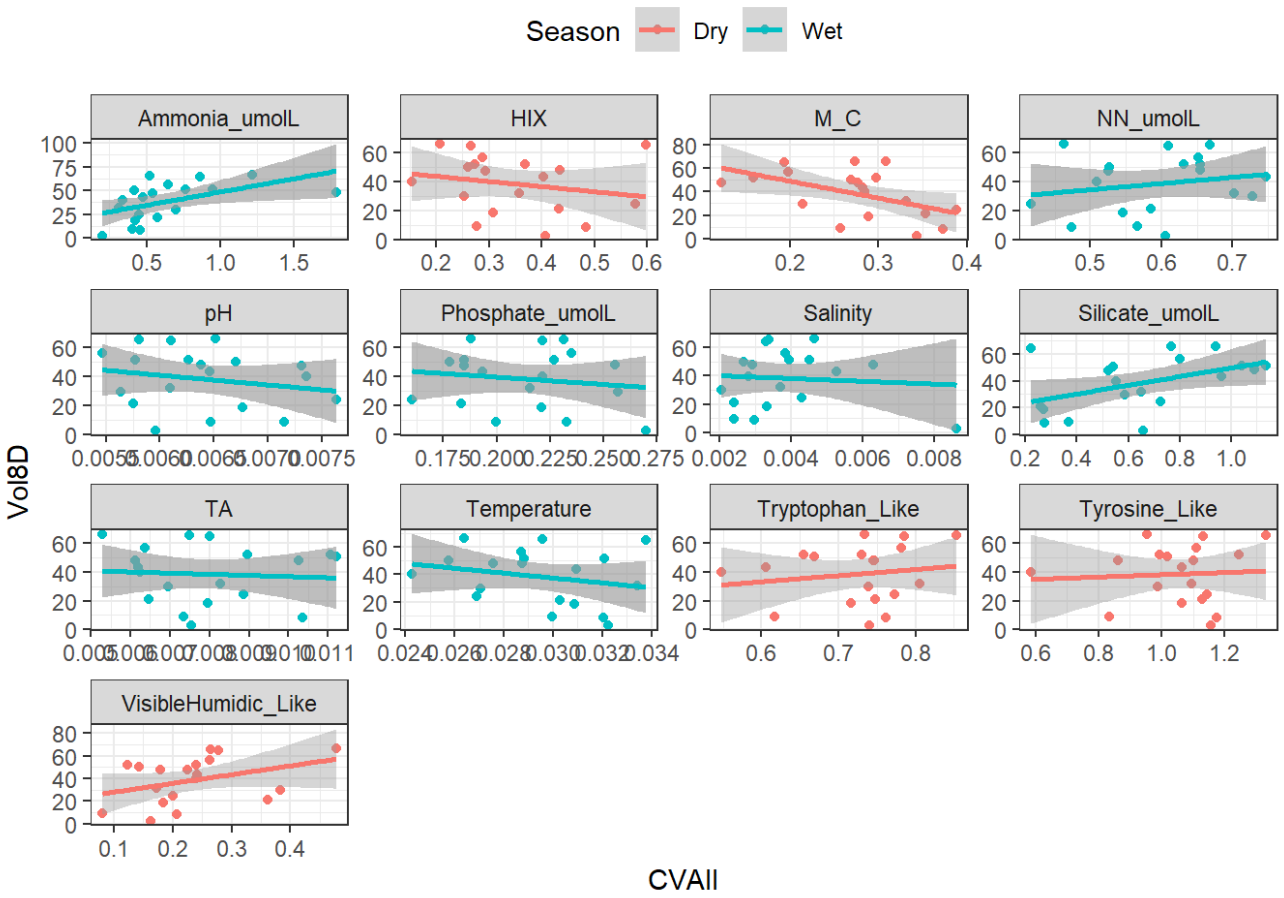

```
plotfun(y = NbFEs, x = CVAll, myfacet = Parameters, myformula = "y~x")
```



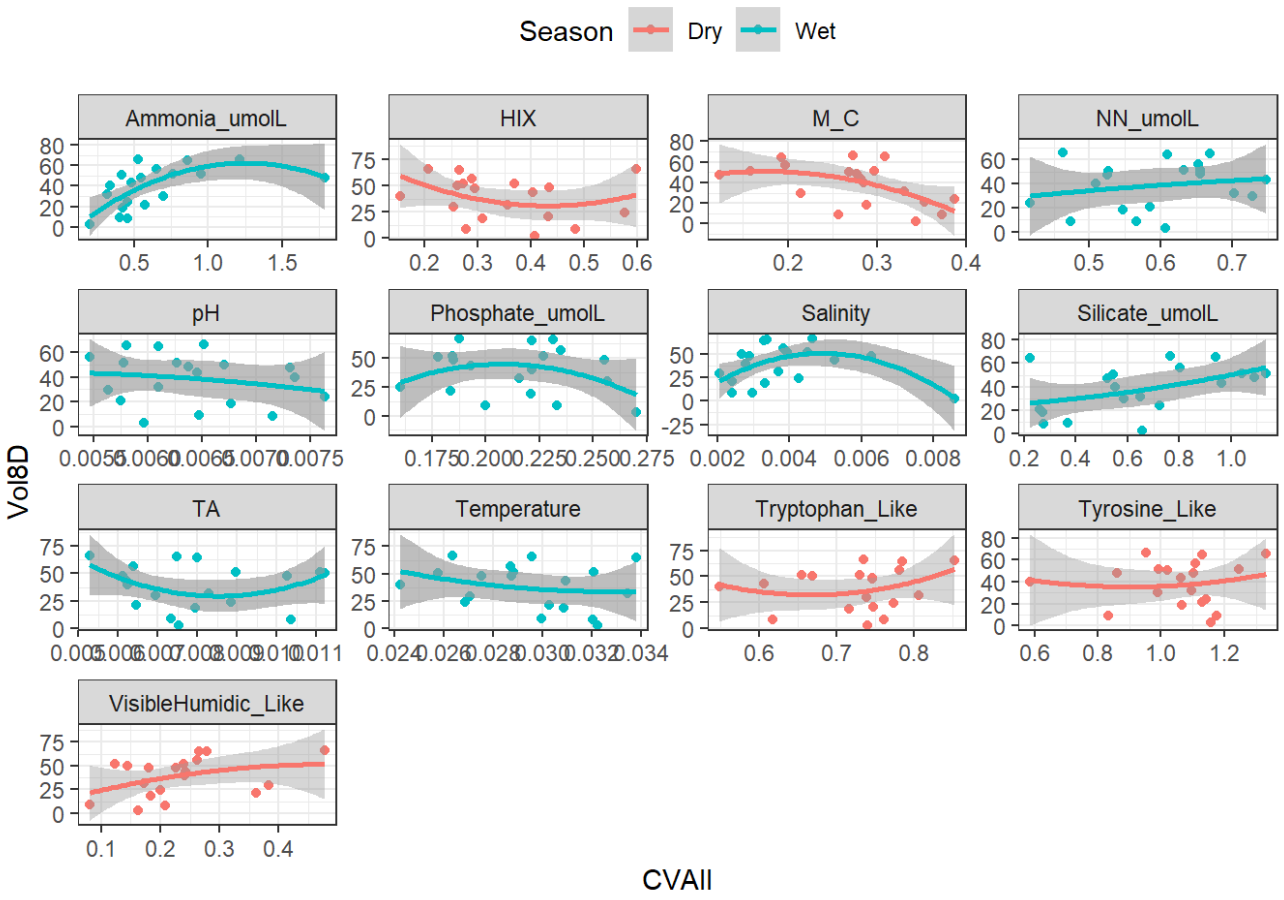

```
plotfun(y = NbFEs, x = CVAll, myfacet = Parameters, myformula = "y~poly(x,2)")
```




```
plotfun(y = Vol8D, x = CVAll, myfacet = Parameters, myformula = "y~x")
```




```
plotfun(y = Vol8D, x = CVAll, myfacet = Parameters, myformula = "y~poly(x,2)")
```



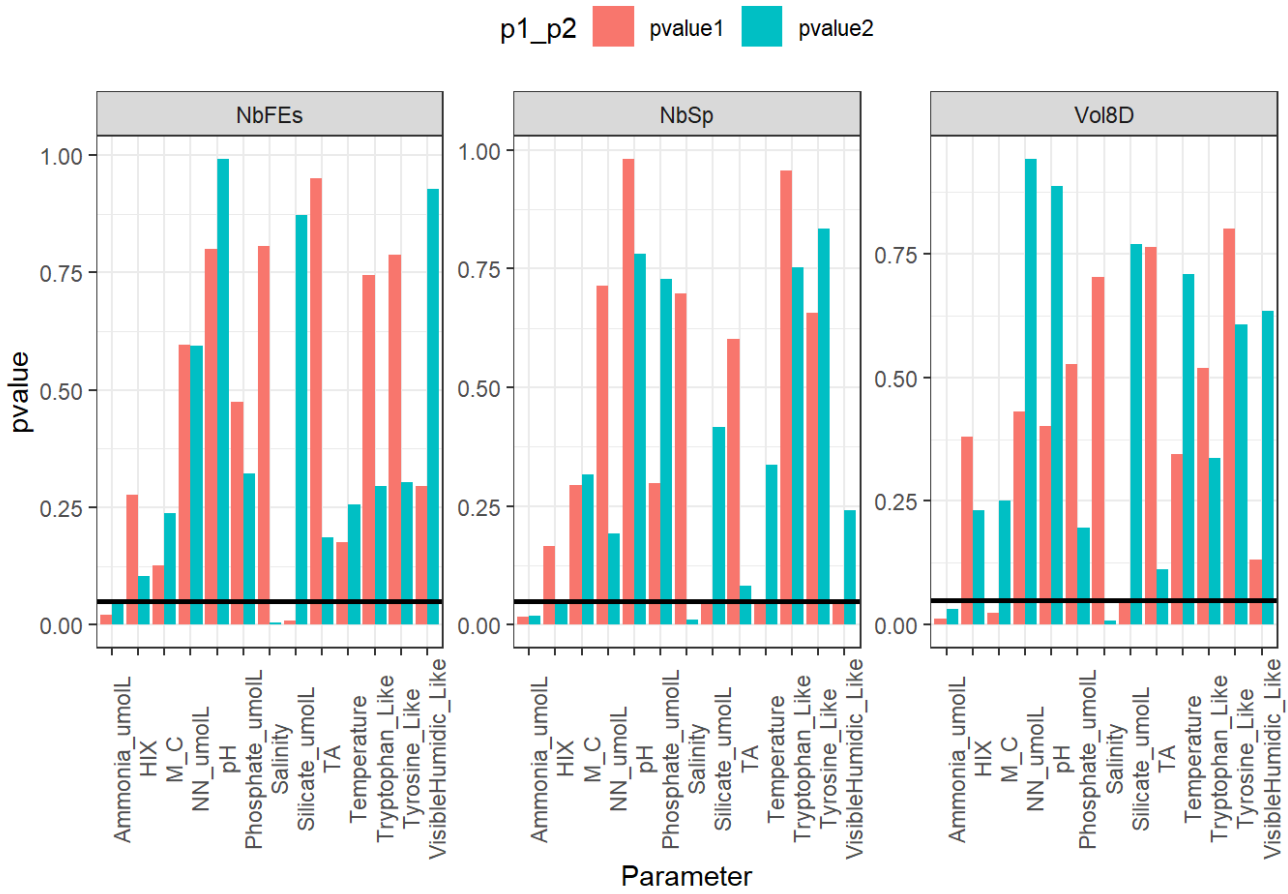

```
# get pvalues
CVA3<-pvalpoly(myparam = "CVAll", myseason = "Dry")
CVA4<-pvalpoly(myparam = "CVAll", myseason = "Wet")

CVA <- full_join(CVA3, CVA4)
```

```
## Joining, by = c("Parameter", "ParamType", "Dependent", "Season", "pvalue1",
## "pvalue2", "r_squared", "adj_r_squared")
```

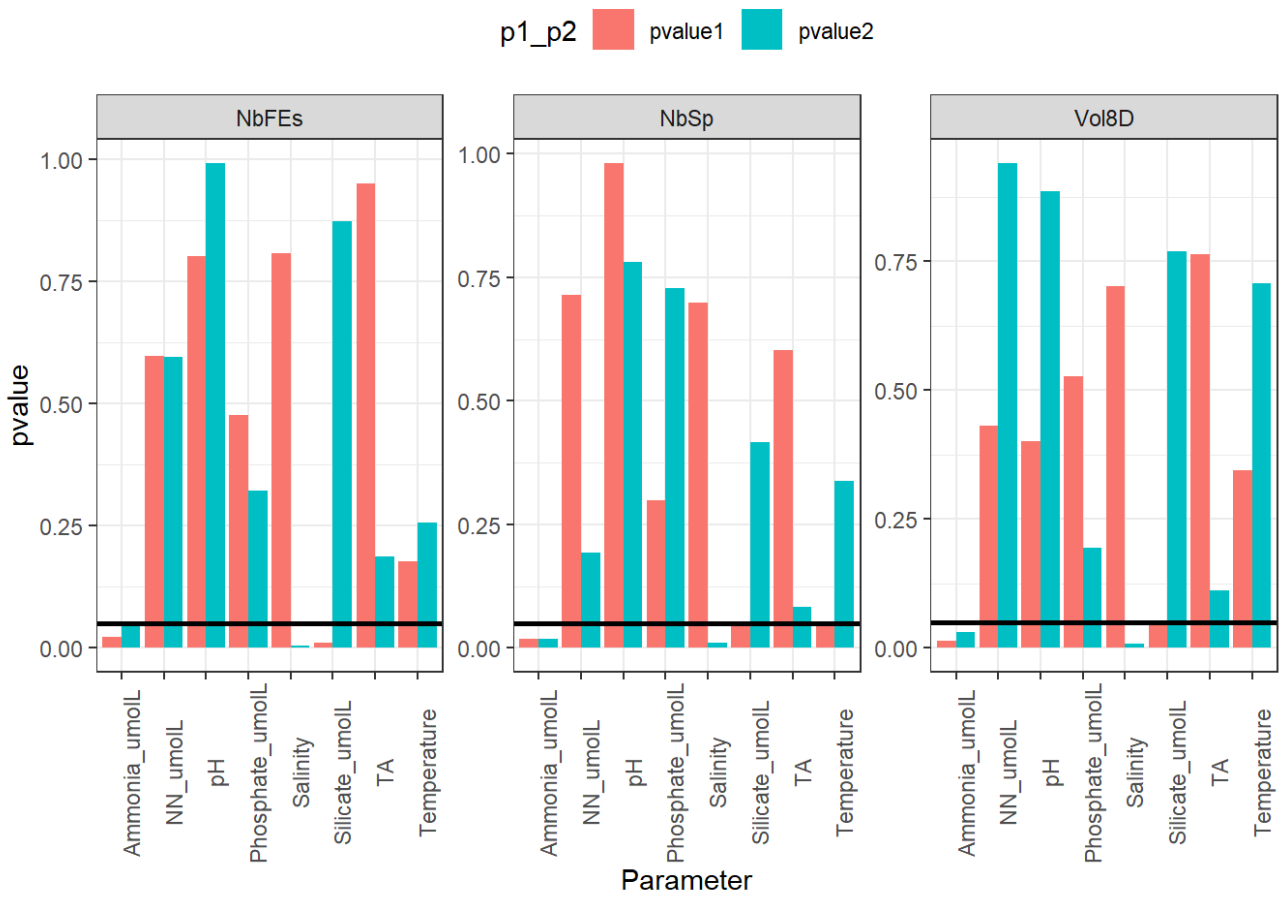
```
CVA
```

```
## # A tibble: 105 × 8
##    Parameter       ParamType Dependent Season pvalue1 pvalue2 r_squared adj_r_…¹
##    <chr>           <chr>     <chr>     <chr>    <dbl>   <dbl>     <dbl>    <dbl>
##  1 Salinity        CVAll     NbSp      Dry     0.698   0.0114   0.342    2.60e-1
##  2 Temperature     CVAll     NbSp      Dry     0.0535  0.338    0.250    1.56e-1
##  3 TA              CVAll     NbSp      Dry     0.602   0.0829   0.188    8.65e-2
##  4 pH              CVAll     NbSp      Dry     0.981   0.781    0.00500 -1.19e-1
##  5 Phosphate_umolL CVAll     NbSp      Dry     0.299   0.728    0.0740  -4.18e-2
##  6 Silicate_umolL  CVAll     NbSp      Dry     0.0466  0.416    0.251    1.57e-1
##  7 NN_umolL        CVAll     NbSp      Dry     0.714   0.193    0.110   -8.27e-4
##  8 Ammonia_umolL   CVAll     NbSp      Dry     0.0177  0.0189   0.463    3.96e-1
##  9 M_C             CVAll     NbSp      Dry     0.294   0.316    0.123    1.36e-2
## 10 HIX             CVAll     NbSp      Dry     0.166   0.0471   0.296    2.08e-1
## # … with 95 more rows, and abbreviated variable name ¹adj_r_squared
```

```
pvalplot(mydata = CVA, season = "Dry")
```




```
pvalplot(mydata = CVA, season = "Wet")
```




```
p7 <- paramPlot(mydata = Full_data, ParamType = CVAll, PTname = "CVAll")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

```
## NULL
## NULL
```

```
p7b <- paramPlot(mydata = Full_data, ParamType = CVAll, PTname = "CVAll_poly", myformula
= "y~poly(x,2)")
```

```
## Joining, by = c("CowTagID", "Season", "Parameters")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
## Joining, by = c("CowTagID", "Season")
```

```
## NULL
## NULL
```