

Observed Data Prep for Model Analysis - Soils

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Purpose

Generate BEACH soil calibration data with:

- Time.csv (Julian day marker)
- Composite soils (MonitoringScopeSoils_R.csv)
- Detailed soils (DetailConc.csv & DetailIsotopes.csv)

```
if (MAC) {  
  if (WIN){  
    path = file.path("C:/Users/DayTimeChunks/Documents/PhD/HydrologicalMonitoring")  
  
  } else {  
    # path = file.path("/Users/DayTightChunks/Documents/PhD/HydrologicalMonitoring")  
    path = file.path("/Users/DayTightChunks/Documents/PhD/hydrological-monitoring")  
    time = read.csv2("/Users/DayTightChunks/Documents/PhD/Models/phd-model-master/Analysis/Data/Time.csv")  
    time$DayMoYr = as.POSIXct(strptime(time$Date, "%d/%m/%Y", tz="EST"))  
  }  
} else {  
  path = file.path("D:/Documents/these_pablo/Alteckendorf2016/HydrologicalMonitoring")  
  time = read.csv2("D:/Documents/these_pablo/Models/BEACH2016/Analysis/Data/Time.csv")  
  time$DayMoYr = as.POSIXct(strptime(time$Date, "%d/%m/%Y", tz="EST"))  
}  
  
# Lab parameters and field constants  
source(file.path(path, "global.R"))
```

Packages

```
# Plotting functions  
library("scales")  
library("tidyr")  
  
library("reshape")  
library("zoo") # na.approx()  
  
library("plyr")  
library("dplyr")
```

Working directory

```
# setwd("D:/Documents/these_pablo/Alteckendorf2016/R")  
  
# MAC
```

```
# setwd("/Users/DayTightChunks/Documents/PhD/Routput/Alteck/R")

# Mac-WIN
# setwd("C:/Users/DayTightChunks/Documents/Models/pesti-beach16/Analysis/Data")
getwd()

## [1] "/Users/DayTightChunks/Documents/PhD/Models/phd-model-master/Analysis/Data"
```

Merge Transects with Time (Julian Days)

```
s = read.csv2(file.path(path, "Data/MonitoringScopeSoils_R.csv"))

#q$Date = as.POSIXct(strptime(q$DateCheck, "%d/%m/%Y %H:%M", tz="EST"))
s$DayMoYr = as.POSIXct(strptime(s$Date.Soil, "%d/%m/%Y", tz="EST"))
s = subset(s, s$Wnum > 0)

north = subset(s, Transect == "N")
valley = subset(s, Transect == "T")
south = subset(s, Transect == "S")

mean(north$Conc.mug.g.dry.soil)

## [1] 2.090009

mean(valley$Conc.mug.g.dry.soil)

## [1] 2.498216

mean(south$Conc.mug.g.dry.soil)

## [1] 2.454024

njd = merge(time, north, by = "DayMoYr", all = T)
vjd = merge(time, valley, by = "DayMoYr", all = T)
sjd = merge(time, south, by = "DayMoYr", all = T)

norConc_tss = njd[, c("Jdays", "Conc.mug.g.dry.soil")]
valConc_tss = vjd[, c("Jdays", "Conc.mug.g.dry.soil")]
souConc_tss = sjd[, c("Jdays", "Conc.mug.g.dry.soil")]

norConc_tss$Conc.mug.g.dry.soil = ifelse(is.na(norConc_tss$Conc.mug.g.dry.soil),
                                         -1e9, norConc_tss$Conc.mug.g.dry.soil)
valConc_tss$Conc.mug.g.dry.soil = ifelse(is.na(valConc_tss$Conc.mug.g.dry.soil),
                                         -1e9, valConc_tss$Conc.mug.g.dry.soil)
souConc_tss$Conc.mug.g.dry.soil = ifelse(is.na(souConc_tss$Conc.mug.g.dry.soil),
                                         -1e9, souConc_tss$Conc.mug.g.dry.soil)

norDelta_tss = njd[, c("Jdays", "comp.d13C")]
valDelta_tss = vjd[, c("Jdays", "comp.d13C")]
souDelta_tss = sjd[, c("Jdays", "comp.d13C")]

norDelta_tss$comp.d13C = ifelse(is.na(norDelta_tss$comp.d13C),
                                1e9, norDelta_tss$comp.d13C)
valDelta_tss$comp.d13C = ifelse(is.na(valDelta_tss$comp.d13C),
```

```

                                1e9, valDelta_tss$comp.d13C)
souDelta_tss$comp.d13C = ifelse(is.na(souDelta_tss$comp.d13C),
                                1e9, souDelta_tss$comp.d13C)

if (F) {
  write.table(njd, "BEACH_R/north.tss", sep="\t", row.names = F)
  write.table(vjd, "BEACH_R/valley.tss", sep="\t", row.names = F)
  write.table(sjd, "BEACH_R/south.tss", sep="\t", row.names = F)
  write.table(norConc_tss, "BEACH_R/northConc.tss", sep="\t", row.names = F)
  write.table(valConc_tss, "BEACH_R/valleyConc.tss", sep="\t", row.names = F)
  write.table(souConc_tss, "BEACH_R/southConc.tss", sep="\t", row.names = F)
  write.table(norDelta_tss, "BEACH_R/northDelta.tss", sep="\t", row.names = F)
  write.table(valDelta_tss, "BEACH_R/valleyDelta.tss", sep="\t", row.names = F)
  write.table(souDelta_tss, "BEACH_R/southDelta.tss", sep="\t", row.names = F)
}

```

Merge detail concentration and isotopes

Steps

- group isotope values by ID
- evaluate standard deviations
- compute means
- merge with concentrations

```

co = read.csv("DetailConc.csv")
is = read.csv("DetailIsotopes.csv")

if (length(is) == 1) {
  is = read.csv("DetailIsotopes.csv", sep = ";")
}

if (length(co) == 1) {
  co = read.csv("DetailConc.csv")
}

is = subset(is, !is.na(d13C))

```

Group

```

# Same procedure as in Book 06_MassSoils_Composite
siso <- is[, c("ID", "d13C")]
sumIS = ddply(siso, c("ID"),
              summarise,
                N_detsoil = length(d13C),
                det.d13C = mean(d13C),
                det.d13C.SD = sd(d13C)
              )
sumIS = subset(sumIS, N_detsoil > 1 & det.d13C.SD < 0.8)

```

Merge conc and isotopes

```
ci = merge(co, sumIS, by = "ID", all = T)
ci$DayMoYr = as.POSIXct(strptime(ci$Sampled, "%d/%m/%Y", tz="EST"))
ci = subset(ci, !is.na(ci$DayMoYr))

ci$Plot = paste(ci$Transect, ci$Plot, sep = "-")
ci = ci[, c("DayMoYr", "ID", "Plot", "ug.g", "det.d13C", "det.d13C.SD")]
detailed = merge(time, ci, by = "DayMoYr", all = T)
```

Create plot subsets

```
N1 = subset(detailed, is.na(Plot) | Plot == "N-1")
N2 = subset(detailed, is.na(Plot) | Plot == "N-2")
N3 = subset(detailed, is.na(Plot) | Plot == "N-3")
N4 = subset(detailed, is.na(Plot) | Plot == "N-4")
N5 = subset(detailed, is.na(Plot) | Plot == "N-5")
N7 = subset(detailed, is.na(Plot) | Plot == "N-7")
N8 = subset(detailed, is.na(Plot) | Plot == "N-8")

T4 = subset(detailed, is.na(Plot) | Plot == "T-4")
T5 = subset(detailed, is.na(Plot) | Plot == "T-5")
T7 = subset(detailed, is.na(Plot) | Plot == "T-7")
T8 = subset(detailed, is.na(Plot) | Plot == "T-8")
T9 = subset(detailed, is.na(Plot) | Plot == "T-9")
T10 = subset(detailed, is.na(Plot) | Plot == "T-10")

S11 = subset(detailed, is.na(Plot) | Plot == "S-11")
S12 = subset(detailed, is.na(Plot) | Plot == "S-12")
S13 = subset(detailed, is.na(Plot) | Plot == "S-13")

nor = list(N1, N2, N3, N4, N5, N7, N8)
val = list(T4, T5, T7, T8, T9, T10)
sou = list(S11, S12, S13)
```

Save detailed

```
if (SAVE) {
  counter = 0
  for (d in nor) {
    counter = counter + 1
    transect = "N"
    if (counter < 6) {
      name = paste(transect, as.character(counter), ".tss", sep = "")
    }
    else if (counter == 6) {
      counter = counter + 1
      name = paste(transect, as.character(counter), ".tss", sep = "")
    } else {
```

```

    name = paste(transect, as.character(counter), ".tss", sep = "")
  }
  write.table(d, paste("BEACH_R/", name, sep = ""), sep="\t", row.names = F)
}

counter = 3
for (d in val) {
  counter = counter + 1
  transect = "T"
  if (counter < 6) {
    name = paste(transect, as.character(counter), ".tss", sep = "")
  }
  else if (counter == 6) {
    counter = counter + 1
    name = paste(transect, as.character(counter), ".tss", sep = "")
  } else {
    name = paste(transect, as.character(counter), ".tss", sep = "")
  }
  write.table(d, paste("BEACH_R/", name, sep = ""), sep="\t", row.names = F)
}

counter = 10
for (d in sou) {
  counter = counter + 1
  transect = "S"
  name = paste(transect, as.character(counter), ".tss", sep = "")
  write.table(d, paste("BEACH_R/", name, sep = ""), sep="\t", row.names = F)
}
}

```