##

library(lubridate)

### Load dataset =================

ctd<- read.csv(paste(input\_path, "ctd\_surface\_cond\_moorings2023.csv", sep="/"))

ctd$date\_time<- ymd\_hms(ctd$date\_time, tz = "America/Vancouver")

ctd$temperature\_C<- as.numeric(ctd$temperature\_C)

ctd$salinity\_psu<- as.numeric(ctd$salinity\_psu)

ctd$depth\_m<- as.numeric(ctd$depth\_m)

# Add year month and day in separated columns

ctd$year<- year(ctd$date\_time)

ctd$month<- month(ctd$date\_time)

ctd$day<- day(ctd$date\_time)

ctd$dmy = dmy(paste(ctd$day, ctd$month, ctd$year, sep="-"))

colnames(ctd)[13]<- "ymd"

# classify moorings based on environmental clusters to merge and plot

ctd$cluster<- NA

ctd[ctd$site == "mooring1", "cluster"]<- "5"

ctd[ctd$site == "mooring2", "cluster"]<- "5"

ctd[ctd$site == "mooring3", "cluster"]<- "5"

ctd[ctd$site == "mooring4", "cluster"]<- "2"

ctd[ctd$site == "mooring5", "cluster"]<- "2"

ctd[ctd$site == "mooring6", "cluster"]<- "4"

ctd[ctd$site == "mooring7", "cluster"]<- "4"

ctd[ctd$site == "mooring8", "cluster"]<- "5"

# Plots to visualize the data

ggplot(ctd)+

geom\_point(aes(x= date\_time, y=temperature\_C\*1.2),size=0.4, color="blue")+

# lims(y=c(5, 22))+

geom\_point( aes(x= date\_time, y=salinity\_psu), size=0.4, color="darkgreen")+

facet\_wrap(~site, ncol = 2)+

scale\_y\_continuous("Salinity (psu)", sec.axis = sec\_axis(~ (.)/1.2, name = "Temperature (C)")) +

# scale\_x\_continuous("Month", breaks = 1:7) +

labs(x= "Date", y= "temperature (C)", title = "CTDs surface (0.5m depth) - Moorings")+

theme\_classic()

ggplot(ctd)+

geom\_point(aes(x= date\_time, y=temperature\_C, color=site),size=0.4, alpha=0.5)+

geom\_line(aes(x= date\_time, y=temperature\_C, color=site),size=0.5, alpha=0.5)+

# lims(y=c(5, 22))+

# geom\_point( aes(x= date\_time, y=salinity\_psu), size=0.4, color="darkgreen")+

facet\_wrap(~cluster, ncol = 3)+

# scale\_y\_continuous("Salinity (psu)", sec.axis = sec\_axis(~ (.)/1.2, name = "Temperature (C)")) +

# scale\_x\_continuous("Month", breaks = 1:7) +

scale\_color\_manual(values= c("yellow1", "yellow3", "gold", "lightblue", "blue", "lightgrey", "darkgrey","gold3"))+

labs(x= "Date", y= "temperature (C)", title = "CTDs surface (0.5m depth) - Moorings")+

theme\_classic()

ggplot(ctd)+

geom\_point(aes(x= date\_time, y=salinity\_psu, color=site),size=0.4, alpha=0.5)+

geom\_line(aes(x= date\_time, y=salinity\_psu, color=site),size=0.5, alpha=0.5)+

facet\_wrap(~cluster, ncol = 3)+

# scale\_y\_continuous("Salinity (psu)", sec.axis = sec\_axis(~ (.)/1.2, name = "Temperature (C)")) +

# scale\_x\_continuous("Month", breaks = 1:7) +

scale\_color\_manual(values= c("yellow2", "yellow3", "gold", "lightblue", "blue", "lightgrey", "darkgrey","gold3"))+

labs(x= "Date", y= "Salinity (psu)", title = "CTDs surface (0.5m depth) salinity - Moorings")+

theme\_classic()

###==================================================================

### Load dataset for HOBO temperature records ================================

data<- read.csv(“Hobos\_EnvLoggers\_temp\_2023\_moorings.csv")

data$dmy<- ymd(data$dmy)

colnames(data)[9]<- "ymd"