CedarNearshoreOffshoreTemperatureDifference

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2023-11-22

# Initial stuff, including loading packages and importing data

##loading packages

library(here)  
library(rstatix)  
library(ggplot2)  
library(tidyverse)  
library(dplyr)  
library(lubridate)  
library(scales)  
library(ggpubr)  
library(reshape2)  
library(RColorBrewer)  
require(ggplot2)  
require(reshape2)

## loading files

# Tell R where files are stored  
here::i\_am("scripts/CedarNearshoreOffshoreTemperatureDifference.Rmd")  
  
# Load Files  
a <- readr::read\_csv(here("data/Cedar\_Basin\_Nearshore.csv"))

z <- strptime(a$Date, format = "%m/%d/%y %H:%M")  
l <- as.POSIXct(z,format="%m/%d/%y %H:%M",tz=Sys.timezone())  
  
C.TDiff.1 <- a$Diff.1  
C.TDiff.2 <- a$Diff.2  
C.TDiff.3 <- a$Diff.3  
  
df.CTDiff1 <- data.frame(check.names = FALSE, time = l,  
 "1m" = C.TDiff.1)  
  
df.CTDiff1 <- melt(df.CTDiff1 , id.vars = 'time', variable.name = 'series')  
  
CTdiff1 = ggplot(df.CTDiff1, aes(time,value)) + geom\_line(aes(colour = series)) +  
 theme\_bw() +  
 theme(panel.border = element\_blank(),   
 panel.grid.major = element\_blank(),  
 panel.grid.minor = element\_blank(),   
 axis.line = element\_line(colour = "black")) +  
 scale\_y\_continuous(limits = c(-1.5, 1.5), breaks = seq(-1.5, 1.5, 0.5))+  
 labs(x = "",  
 y = (expression(bold("Temperature Difference " ( degree\*C))))) +  
 ggtitle("Thermal Difference at 1m in Cedar") +  
 theme(plot.title = element\_text(face = "bold",size = 14)) +  
 theme(axis.text=element\_text(size=11, face = "bold"),   
 axis.title=element\_text(size=14,face="bold")) +  
 theme(legend.title = element\_text(face = "bold",size = 14),  
 legend.text=element\_text(size=11,face="bold")) +   
 scale\_x\_datetime(breaks = date\_breaks("14 days"), labels = date\_format("%m/%d/%y")) +  
 ##labs(colour = "Depth") +  
 theme(legend.position = "none") +  
 geom\_hline(yintercept=0)  
  
  
##########################################################################################  
## 2m  
  
df.CTDiff2 <- data.frame(check.names = FALSE, time = l,  
 "2m" = C.TDiff.2)  
  
df.CTDiff2 <- melt(df.CTDiff2 , id.vars = 'time', variable.name = 'series')  
  
CTdiff2 = ggplot(df.CTDiff2, aes(time,value)) + geom\_line(aes(colour = series)) +  
 scale\_color\_manual(values = "dodgerblue") +  
 theme\_bw() +  
 theme(panel.border = element\_blank(),   
 panel.grid.major = element\_blank(),  
 panel.grid.minor = element\_blank(),   
 axis.line = element\_line(colour = "black")) +  
 scale\_y\_continuous(limits = c(-1.5, 1.5), breaks = seq(-1.5, 1.5, 0.5))+  
 labs(x = "",  
 y = (expression(bold("Temperature Difference " ( degree\*C))))) +  
 ggtitle("Thermal Difference at 2m in Cedar") +  
 theme(plot.title = element\_text(face = "bold",size = 14)) +  
 theme(axis.text=element\_text(size=11, face = "bold"),   
 axis.title=element\_text(size=14,face="bold")) +  
 theme(legend.title = element\_text(face = "bold",size = 14),  
 legend.text=element\_text(size=11,face="bold")) +   
 scale\_x\_datetime(breaks = date\_breaks("14 days"), labels = date\_format("%m/%d/%y")) +  
 theme(legend.position = "none") +  
 geom\_hline(yintercept=0)  
  
  
###########################################################################################  
## 3m  
  
df.CTDiff3 <- data.frame(check.names = FALSE, time = l,  
 "3m" = C.TDiff.3)  
  
df.CTDiff3 <- melt(df.CTDiff3, id.vars = 'time', variable.name = 'series')  
  
CTdiff3 = ggplot(df.CTDiff3, aes(time,value)) + geom\_line(aes(colour = series)) +  
 scale\_color\_manual(values = "forestgreen") +  
 theme\_bw() +  
 theme(panel.border = element\_blank(),   
 panel.grid.major = element\_blank(),  
 panel.grid.minor = element\_blank(),   
 axis.line = element\_line(colour = "black")) +  
 scale\_y\_continuous(limits = c(-1.5, 1.5), breaks = seq(-1.5, 1.5, 0.5))+  
 labs(x = "",  
 y = (expression(bold("Temperature Difference " ( degree\*C))))) +  
 ggtitle("Thermal Difference at 3m in Cedar") +  
 theme(plot.title = element\_text(face = "bold",size = 14)) +  
 theme(axis.text=element\_text(size=11, face = "bold"),   
 axis.title=element\_text(size=14,face="bold")) +  
 theme(legend.title = element\_text(face = "bold",size = 14),  
 legend.text=element\_text(size=11,face="bold")) +   
 scale\_x\_datetime(breaks = date\_breaks("14 days"), labels = date\_format("%m/%d/%y")) +  
 theme(legend.position = "none") +  
 geom\_hline(yintercept=0)  
  
  
###########################################################################################  
  
  
TDiff\_C = ggarrange(CTdiff1, CTdiff2, CTdiff3, nrow = 2, ncol = 2,  
 common.legend = FALSE)  
  
#### saving combined plot  
ggsave(here("figures", "CedarNearshoreOffshoreTemperatureDifference.jpg"), TDiff\_C, width = 18, height = 11, dpi = 300)