

CBLSWaterTables_WQ_Tracking

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Set Up

```
#Load libraries and data files
```

```
# load packages
library(ggplot2)
library(cowplot)
library(dplyr)
library(reshape2)
library(ggpubr)
library(lubridate)
library(here)
```

```
here
```

```
## function (...)
## {
##   .root_env$root$f(...)
## }
## <bytecode: 0x7fd875621700>
## <environment: namespace:here>
```

```
# load data
dat <- read.csv("../data/CBLS_watertables_waterquality_tracking.csv")
dat$date <- as.factor(dat$date)

#format date using lubridate package
dat$date <- ymd(dat$date)
```

```
#Summarize
```

```
#temp data across date summarized
dat.grouped <- dat %>%
  group_by(date, tank, WQ.type) %>% #tells to group by treatment
  summarise(mean=mean(measurement), se=sd(measurement)/sqrt(n())) #calculates mean and se
dat.grouped
```

```
## # A tibble: 29 x 5
## # Groups:   date, tank [10]
##   date      tank      WQ.type  mean    se
##   <date>    <chr>    <chr>   <dbl>  <dbl>
## 1 2022-01-17 quarantine light    81.5  4.99
## 2 2022-01-17 quarantine sal.psu  34.1  NA
## 3 2022-01-17 quarantine temp    23.9  NA
```

```
## 4 2022-01-17 water table 1 light 60.6 3.36
## 5 2022-01-17 water table 1 sal.psu 36.6 0.0250
## 6 2022-01-17 water table 1 temp 25.9 0
## 7 2022-01-17 water table 2 light 60.1 3.70
## 8 2022-01-17 water table 2 sal.psu 36.5 0.00500
## 9 2022-01-17 water table 2 temp 25.9 0.0200
## 10 2022-01-18 quarantine light 100. 0.645
## # ... with 19 more rows
```

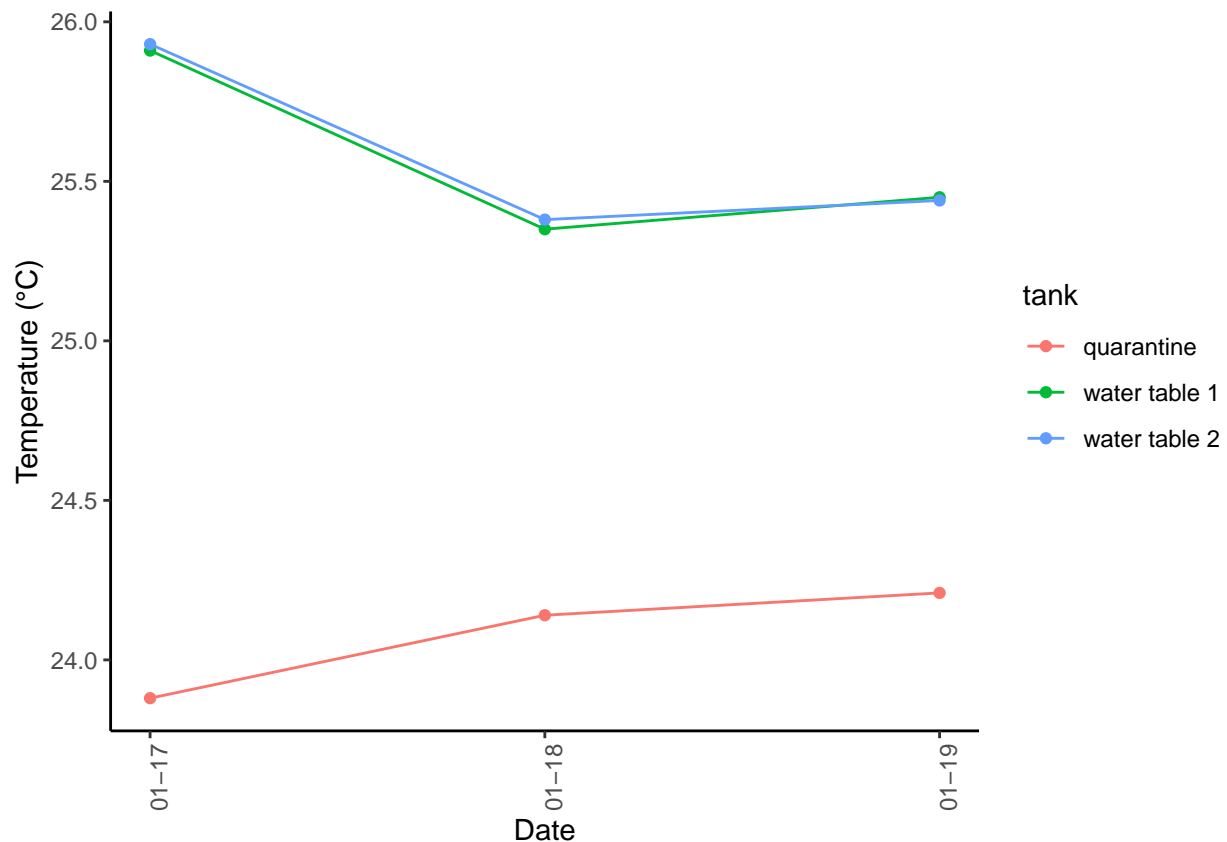
```
#Temperature plot
```

```
#filter for just temp data
```

```
temp.dat <- filter(dat.grouped, WQ.type == "temp")
```

```
#plot mean temp per day by date
```

```
temp_plot <- temp.dat %>%
  ggplot(aes(x=date, y=mean, color = tank))+
  geom_line() +
  geom_point() +
  scale_x_date(date_breaks = "1 day", date_labels = "%m-%d") +
  theme_classic()+
  theme(axis.text.x = element_text(angle = 90)) +
  ylab("Temperature (°C)") +
  xlab("Date");temp_plot
```



```
ggsave(filename="../figures/temperature.plot.pdf", plot=temp_plot, width=10, height=5, units="in")
```

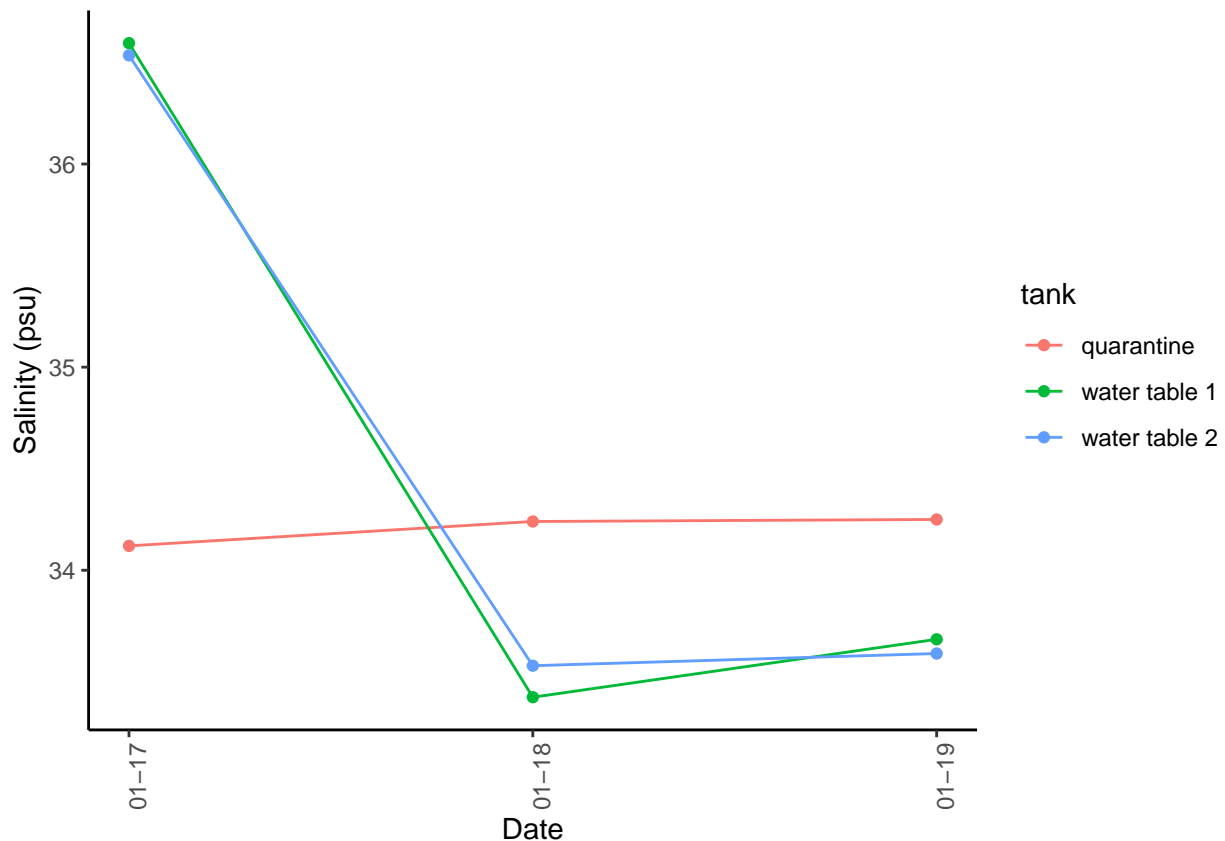
```
#Salinity plot
```

```
#filter for just temp data
```

```
sal.dat <- filter(dat.grouped, WQ.type == "sal.psu")
```

```
#plot mean temp per day by date
```

```
sal_plot <- sal.dat %>%  
  ggplot(aes(x=date, y=mean, color = tank))+  
  geom_line() +  
  geom_point() +  
  scale_x_date(date_breaks = "1 day", date_labels = "%m-%d") +  
  theme_classic()+  
  theme(axis.text.x = element_text(angle = 90)) +  
  ylab("Salinity (psu)") +  
  xlab("Date"); sal_plot
```



```
ggsave(filename="../figures/salinity.plot.pdf", plot=sal_plot, width=10, height=5, units="in")
```

```
#Light plot
```

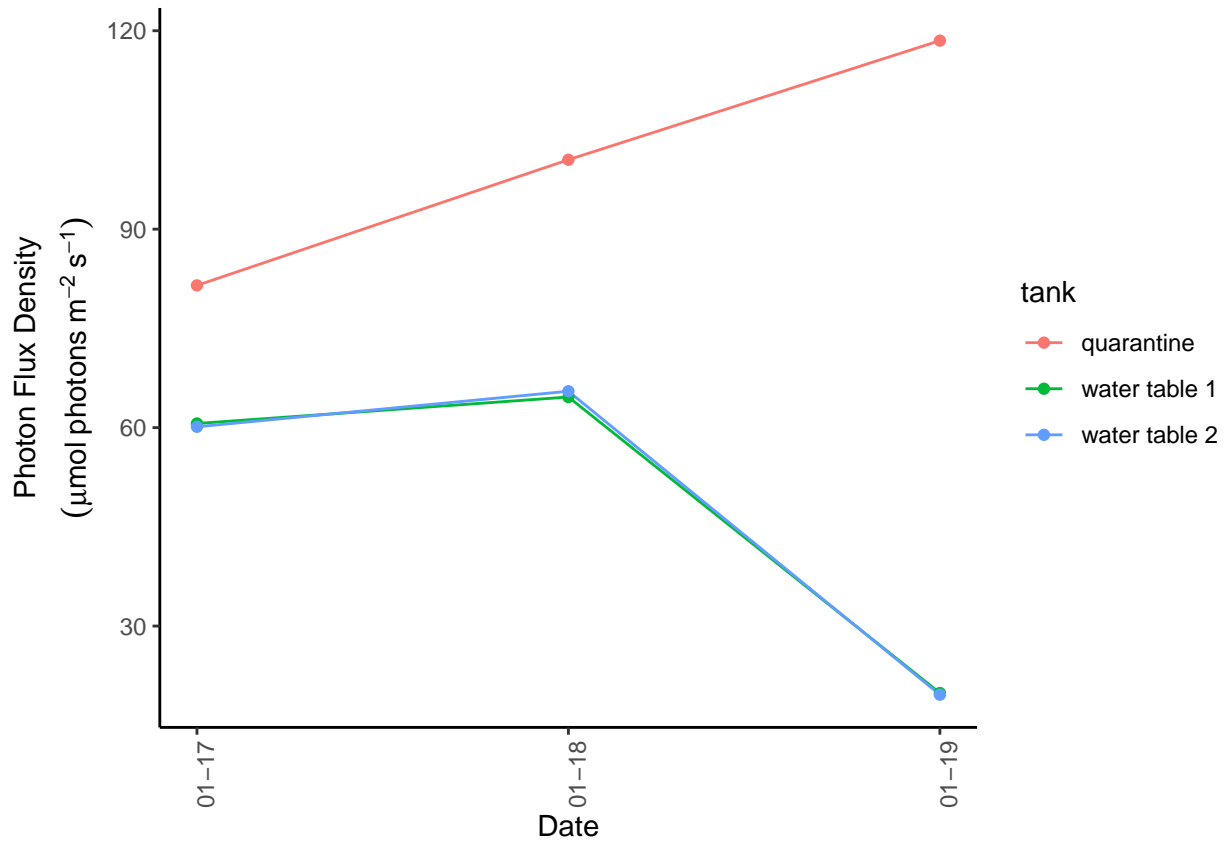
```
#filter for just temp data
```

```
light.dat <- filter(dat.grouped, WQ.type == "light")
```

```
#plot mean temp per day by date
```

```
light_plot <- light.dat %>%
```

```
ggplot(aes(x=date, y=mean, color = tank))+
  geom_line() +
  geom_point() +
  scale_x_date(date_breaks = "1 day", date_labels = "%m-%d") +
  theme_classic()+
  theme(axis.text.x = element_text(angle = 90)) +
  ylab(expression(atop("Photon Flux Density", (mu*mol~photons~m^{-2}~s^{-1})))) +
  xlab("Date");light_plot
```



```
ggsave(filename="../figures/light.plot.pdf", plot=light_plot, width=10, height=5, units="in")
```

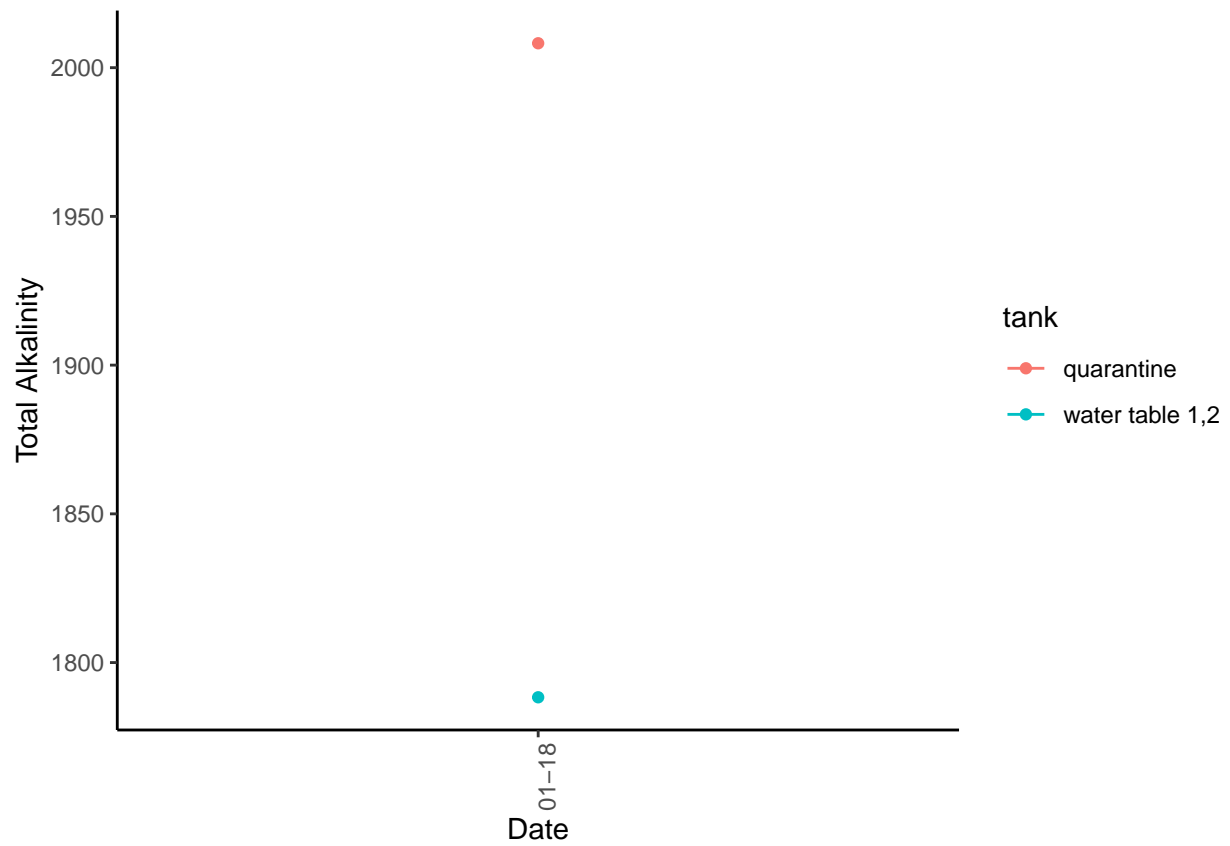
Total alkalinity plot

```
#filter for just temp data

TA.dat <- filter(dat.grouped, WQ.type == "TA")

#plot mean temp per day by date
TA_plot <- TA.dat %>%
  ggplot(aes(x=date, y=mean, color = tank))+
  geom_line() +
  geom_point() +
  scale_x_date(date_breaks = "1 day", date_labels = "%m-%d") +
  theme_classic()+
```

```
theme(axis.text.x = element_text(angle = 90)) +
ylab("Total Alkalinity") +
xlab("Date");TA_plot
```



```
ggsave(filename="../figures/TA.plot.pdf", plot=TA_plot, width=10, height=5, units="in")
```