OA Treatment Summary

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library(knitr)

RMR=read.csv(file="RMR\_Results.csv")

dates=strptime(gsub(".\*([78]-\\d+-21).\*","\\1",RMR$filename),format="%m-%d-%y")

OA=read.csv("OA\_Data\_Sheet.csv")  
OA$Date=strptime(OA$Date,format="%Y/%m/%d")  
OA$Date=as.Date(OA$Date)

octos=unique(RMR$octo)

OA\_Summary=data.frame(octo=as.character(rep(NA,17)),  
 start.date=rep(as.Date(OA$Date[1]),17),  
 end.date=rep(as.Date(OA$Date[1]),17),  
 treat=as.numeric(rep(NA,17)),  
 pco2=as.numeric(rep(NA,17)),  
 pco2.sd=as.numeric(rep(NA,17)),  
 ph=as.numeric(rep(NA,17)),  
 ph.sd=as.numeric(rep(NA,17)),  
 alk=as.numeric(rep(NA,17)),  
 alk.sd=as.numeric(rep(NA,17)),  
 salinity=as.numeric(rep(NA,17))  
 ,salinity.sd=as.numeric(rep(NA,17))  
 )

for (i in 1:length(octos)){  
 OA\_Summary$octo[i]=octos[i]  
 OA\_Summary$start.date[i]=  
 as.Date(min(dates[RMR$octo==octos[i]]))  
 OA\_Summary$end.date[i]=  
 as.Date(max(dates[RMR$octo==octos[i]]))  
 if(OA\_Summary$end.date[i]==OA\_Summary$start.date[i]){  
 OA\_Summary$start.date[i]=OA\_Summary$end.date[i]-6  
 }  
 OA\_Summary$treat[i]=  
 RMR$pco2[RMR$octo==octos[i]][1]  
 group=  
 as.numeric(gsub("(\\d+)\\-\\d+","\\1",octos[i]))  
 if (OA\_Summary$treat[i]==1000){  
 tank=group  
 }  
 if (OA\_Summary$treat[i]==1800){  
 tank=group+4   
 }  
 if (grepl("5",octos[i])){  
 tank=  
 as.numeric(gsub("5-(\\d)","\\1",octos[i]))  
 }  
 if (octos[i]=="5-5"){  
 tank=5  
 }  
 OA\_Summary$pco2[i]=  
 round(mean(OA[,tank+2][OA$Variable=="pCO2"&  
 OA$Date>=OA\_Summary$start.date[i]&  
 OA$Date<=OA\_Summary$end.date[i]],  
 na.rm=T))  
 OA\_Summary$pco2.sd[i]=  
 round(sd(OA[,tank+2][OA$Variable=="pCO2"&  
 OA$Date>=OA\_Summary$start.date[i]&  
 OA$Date<=OA\_Summary$end.date[i]],  
 na.rm=T))  
 OA\_Summary$ph[i]=  
 round(mean(OA[,tank+2][OA$Variable=="pH"&  
 OA$Date>=OA\_Summary$start.date[i]&  
 OA$Date<=OA\_Summary$end.date[i]],  
 na.rm=T),3)  
 OA\_Summary$ph.sd[i]=  
 round(sd(OA[,tank+2][OA$Variable=="pH"&  
 OA$Date>=OA\_Summary$start.date[i]&  
 OA$Date<=OA\_Summary$end.date[i]],  
 na.rm=T),3)  
 OA\_Summary$alk[i]=  
 round(mean(OA[,tank+2][OA$Variable=="Alkalinity"&  
 OA$Date>=OA\_Summary$start.date[i]&  
 OA$Date<=OA\_Summary$end.date[i]],  
 na.rm=T)\*1000000)  
 OA\_Summary$alk.sd[i]=  
 round(sd(OA[,tank+2][OA$Variable=="Alkalinity"&  
 OA$Date>=OA\_Summary$start.date[i]&  
 OA$Date<=OA\_Summary$end.date[i]],  
 na.rm=T)\*1000000)  
 OA\_Summary$salinity[i]=  
 round(mean(OA[,tank+2][OA$Variable=="Salinity"&  
 OA$Date>=OA\_Summary$start.date[i]&  
 OA$Date<=OA\_Summary$end.date[i]],  
 na.rm=T),1)  
 OA\_Summary$salinity.sd[i]=  
 round(sd(OA[,tank+2][OA$Variable=="Salinity"&  
 OA$Date>=OA\_Summary$start.date[i]&  
 OA$Date<=OA\_Summary$end.date[i]],  
 na.rm=T),1)  
  
 }

kable(OA\_Summary,align="c")

| octo | start.date | end.date | treat | pco2 | pco2.sd | ph | ph.sd | alk | alk.sd | salinity | salinity.sd |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1-3 | 2021-07-26 | 2021-08-02 | 1800 | 1692 | 176 | 7.430 | 0.042 | 2049 | 0 | 30.6 | 0.3 |
| 1-2 | 2021-07-20 | 2021-07-26 | 1000 | 1135 | 121 | 7.600 | 0.045 | 2063 | 4 | 30.5 | 1.0 |
| 1-1 | 2021-07-12 | 2021-07-19 | 1800 | 1716 | 102 | 7.430 | 0.023 | 2070 | 23 | 29.7 | 0.9 |
| 2-2 | 2021-07-20 | 2021-07-26 | 1000 | 1117 | 166 | 7.618 | 0.069 | 2062 | 2 | 29.6 | 3.0 |
| 2-1 | 2021-07-13 | 2021-07-19 | 1800 | 1942 | 386 | 7.387 | 0.072 | 2065 | 11 | 30.1 | 0.5 |
| 2-3 | 2021-07-27 | 2021-08-02 | 1800 | 1738 | 254 | 7.431 | 0.063 | 2093 | 6 | 30.6 | 0.9 |
| 3-2 | 2021-07-20 | 2021-07-26 | 1000 | 1048 | 97 | 7.626 | 0.031 | 2092 | 0 | 30.2 | 0.8 |
| 3-3 | 2021-07-27 | 2021-08-02 | 1800 | 1976 | 339 | 7.375 | 0.069 | 2074 | 0 | 30.2 | 0.5 |
| 3-1 | 2021-07-12 | 2021-07-19 | 1800 | 1580 | 313 | 7.474 | 0.086 | 2040 | 15 | 29.3 | 0.7 |
| 4-2 | 2021-07-21 | 2021-07-26 | 1000 | 1011 | 64 | 7.638 | 0.026 | 2016 | 58 | 30.0 | 0.5 |
| 4-3 | 2021-07-26 | 2021-08-02 | 1800 | 1816 | 65 | 7.406 | 0.015 | 2080 | 22 | 30.7 | 0.7 |
| 4-1 | 2021-07-12 | 2021-07-19 | 1800 | 1678 | 403 | 7.445 | 0.099 | 2056 | 0 | 30.0 | 2.4 |
| 5-1 | 2021-08-10 | 2021-08-18 | 1000 | 1168 | 26 | 7.592 | 0.010 | 2081 | 0 | 29.8 | 0.2 |
| 5-2 | 2021-08-10 | 2021-08-18 | 1000 | 984 | 172 | 7.667 | 0.071 | 2095 | 0 | 30.0 | 0.3 |
| 5-3 | 2021-08-10 | 2021-08-18 | 1000 | 1128 | 242 | 7.607 | 0.091 | 2066 | 0 | 29.6 | 0.1 |
| 5-4 | 2021-08-10 | 2021-08-18 | 1000 | 1075 | 21 | 7.623 | 0.009 | 2070 | 0 | 30.1 | 0.1 |
| 5-5 | 2021-08-12 | 2021-08-19 | 1800 | NaN | NA | NaN | NA | NaN | NA | NaN | NA |

treatment.sum=data.frame(  
 Treatment=c("Control","Elevated CO~2~"),  
 pCO2=paste0(round(aggregate(pco2~treat,data=OA\_Summary,FUN="mean")$pco2),"±",  
 c(round(sqrt(mean(OA\_Summary$pco2.sd[OA\_Summary$treat==1000]^2,na.rm=T))/  
 sqrt(sum(OA\_Summary$treat==1000))),  
 round(sqrt(mean(OA\_Summary$pco2.sd[OA\_Summary$treat==1800]^2,na.rm=T))/  
 sqrt(sum(OA\_Summary$treat==1800))))  
 ),  
# round(aggregate(pco2~treat,data=OA\_Summary,FUN="sd")$pco2)),  
 pH=paste0(round(aggregate(ph~treat,data=OA\_Summary,FUN="mean")$ph,3),"±",  
 c(round(sqrt(mean(OA\_Summary$ph.sd[OA\_Summary$treat==1000]^2,na.rm=T))/  
 sqrt(sum(OA\_Summary$treat==1000)),3),  
 round(sqrt(mean(OA\_Summary$ph.sd[OA\_Summary$treat==1800]^2,na.rm=T))/  
 sqrt(sum(OA\_Summary$treat==1800)),3))  
 ),  
 Alkalinity=paste0(round(aggregate(alk~treat,data=OA\_Summary,FUN="mean")$alk),"±",  
 c(round(sqrt(mean(OA\_Summary$alk.sd[OA\_Summary$treat==1000]^2,na.rm=T))/  
 sqrt(sum(OA\_Summary$treat==1000)),0),  
 round(sqrt(mean(OA\_Summary$alk.sd[OA\_Summary$treat==1800]^2,na.rm=T))/  
 sqrt(sum(OA\_Summary$treat==1800)),0))  
 ),  
 Salinity=paste0(round(aggregate(salinity~treat,data=OA\_Summary,FUN="mean")$salinity,1),"±",  
 c(round(sqrt(mean(OA\_Summary$salinity.sd[OA\_Summary$treat==1000]^2,na.rm=T))/  
 sqrt(sum(OA\_Summary$treat==1000)),1),  
 round(sqrt(mean(OA\_Summary$salinity.sd[OA\_Summary$treat==1800]^2,na.rm=T))/  
 sqrt(sum(OA\_Summary$treat==1800)),1))  
 )  
)  
  
colnames(treatment.sum)[2]="pCO~2~ ($\\mu$atm)"  
colnames(treatment.sum)[4]="Alkalinity ($\\mu$mol kg^-1^)"  
colnames(treatment.sum)[5]="Salinity (PSU)"

kable(treatment.sum,align="c")

| Treatment | pCO2 (atm) | pH | Alkalinity (mol kg-1) | Salinity (PSU) |
| --- | --- | --- | --- | --- |
| Control | 1083±48 | 7.621±0.019 | 2068±7 | 30±0.4 |
| Elevated CO2 | 1767±94 | 7.422±0.022 | 2066±4 | 30.1±0.4 |