

# 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$treat[i]==1000){
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    tank=group
  }
  if (OA_Summary$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)

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}
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kable(OA_Summary,align="c")
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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

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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$treat==1000]^2,na.rm=T))/
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      sqrt(sum(OA_Summary$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]="pCO2 (~ (μatm)"
colnames(treatment.sum)[4]="Alkalinity (~ (μmol kg-1)"
colnames(treatment.sum)[5]="Salinity (PSU)"

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

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Treatment	pCO <sub>2</sub> (μatm)	pH	Alkalinity (μmol kg <sup>-1</sup> )	Salinity (PSU)
Control	1083±48	7.621±0.019	2068±7	30±0.4
Elevated CO <sub>2</sub>	1767±94	7.422±0.022	2066±4	30.1±0.4