library(lme4)

setwd("XXX")

Epi <- read.csv("fake\_epi.csv", header = TRUE)

##########

##########################################################

#####################Plots mag vs timing

####Notice that these plots are redrawn using fake data, therefore we do not draw model fits

#tiff("peakMagTemp.tiff", height=8, width=8, units="in", res=300)

par(mar=c(5,5,3,3))

plot(Epi$MEpi,Epi$Mag, bty="n", xlab="Pulse timing",

ylab = "Pulse amplitude", cex.lab=2, cex.axis=1.5,

pch=16, cex=1.25,col="grey27", xlim=c(1,12), type="n")

axis(1, at=1:12, cex.axis=1.5)

SITE<-as.character(unique(Epi$site))

YEAR <- as.character(unique(Epi$y))

S <- FALSE

Y <- TRUE

colorp<-gray.colors(12)

for(i in 1:11){

if(S){

D<-Epi[Epi$site==SITE[i],]

points(D$MEpi,D$Mag, col=colorp[i], cex=2, pch=16)

}

if(Y){

colorp <- c("grey25", "grey45", "grey65", "grey85")

D<-Epi[Epi$y==YEAR[i],]

points(D$MEpi,D$Mag, col=colorp[i], cex=2, pch=16)

}

}

points(x=1,y=Epi[14,4], col="white", pch=8, cex=2)

points(x=1,y=Epi[14,4], pch=1, cex=2)

legend("topright", pch=16, col=colorp, legend=c(2011, 2012, 2013, 2014),

bty="n", cex=2)

#dev.off()

#######plots peak

##Finding best fitting lines for black and Grey

ModpeakBSAb <- glmer(cbind(Mprev,MTot)~ BSpeak+ (1|site) +

(1|y), data=Epi, "binomial",

control=glmerControl(optimizer="bobyqa",

optCtrl=list(maxfun=2e5)))

summary(ModpeakBSAb)

ModpeakGAb <- glmer(cbind(Mprev,MTot)~ Gpeak + I(Gpeak^2)+ (1|site) +

(1|y), data=Epi, "binomial",

control=glmerControl(optimizer="bobyqa",

optCtrl=list(maxfun=2e5)))

summary(ModpeakGAb)

#######removing 0s

ModpeakGAb2 <- glmer(cbind(Mprev,MTot)~ Gpeak + (1|site) +

(1|y), data=Epi[Epi$Gpeak!=0,], "binomial",

control=glmerControl(optimizer="bobyqa",

optCtrl=list(maxfun=2e5)))

summary(ModpeakGAb2)

####################################################################

####################################################################

########plot main text peak abundance black and grey

par(mfrow=c(3,2), mar=c(5,5,2,2))

# png("AbdClimMagMainText.png", width=10, height=8, units="in", res=300)

par(mfrow=c(2,2), mar=c(5,5,2,2))

plot(Epi$BSpeak, Epi$Mag, xlab="P. alecto abundance", ylab="Pulse amplitude",

cex.lab=2, cex.axis=1.5, bty="n", las=1, pch = 16, col = "slategray1")

points(Epi$BSpeak, Epi$Mag)

ModTimPrSprprec <- lmer(MEpi~ precPrSpr + (1|site) + (1|y), data=Epi, REML=F)

summary(ModTimPrSprprec)

plot(Epi$precPrSpr, Epi$MEpi, xlab="Precipitation previous spring (mm)", ylab="Pulse timing",

cex.lab=2, cex.axis=1.5, bty="n", las=1, pch = 16, col = "slategray1")

points(Epi$precPrSpr, Epi$MEpi)

####precipitation previous winter and fall

ModPrWinprec<- glmer(cbind(Mprev,MTot)~ precPrwin + (1|site) + (1|y), data=Epi, "binomial",

control=glmerControl(optimizer="bobyqa",

optCtrl=list(maxfun=2e5)))

print(summary(ModPrWinprec))

plot(Epi$precPrwin, Epi$Mag, xlab="Precipitation previous winter (mm)", ylab="Pulse amplitude",

cex.lab=2, cex.axis=1.5, bty="n", las=1, xlim=c(0,120), pch = 16, col = "slategray1")

points(Epi$precPrwin, Epi$Mag)

######

ModPrSprprec<-glmer(cbind(Mprev,MTot)~ precPrSpr + (1|site) + (1|y), data=Epi, "binomial",

control=glmerControl(optimizer="bobyqa",

optCtrl=list(maxfun=2e5)))

print(summary(ModPrSprprec))

plot(Epi$precPrSpr, Epi$Mag, xlab="Precipitation previous spring (mm)", ylab="",

cex.lab=2, cex.axis=1.5, bty="n", las=1, pch = 16, col = "slategray1")

points(Epi$precPrSpr, Epi$Mag)

#dev.off()