#setwd("XXXXX")

require(maps)

require(mapdata)

require(ggplot2)

require(grid)

Aus<-map("worldHires", regions=c("Australia"), fill=TRUE, col="grey90")

Pall <- read.csv("FakePrevWNA.csv", header =TRUE, row.names = 1)

Pall2\_im <- read.csv("FakePrev.csv", header=TRUE, row.names = 1)

Pall <- Pall[,colnames(Pall2\_im)]

colnames(Pall2\_im) <- c("Cairns Central", "Tannum Sands", "Boonah", "Alstonville", "Lismore", "Bellingen",

"Nambucca Heads", "Port Macquarie", "Wingham", "Singleton", "Sydney CP")

colnames(Pall) <- colnames(Pall2\_im)

LABS2012<-c(

"Jan12","Feb12","Mar12","Apr12","May12","Jun12","Jul12","Aug12","Sept12","Oct12","Nov12","Dec12",

"Jan13","Feb13","Mar13","Apr13","May13","Jun13","Jul13","Aug13","Sept13","Oct13","Nov13","Dec13",

"Jan14","Feb14","Mar14","Apr14","May14","Jun14","Jul14","Aug14","Sept14","Oct14","Nov14")

DATES <- c(

"Jul11", "Aug11", "Sep11", "Oct11", "Nov11", "Dec11", "Jan12", "Feb12", "Mar12",

"Apr12", "May12", "Jun12", "Jul12", "Aug12", "Sep12", "Oct12", "Nov12", "Dec12",

"Jan13", "Feb13", "Mar13", "Apr13", "May13", "Jun13", "Jul13", "Aug13", "Sep13",

"Oct13", "Nov13", "Dec13", "Jan14", "Feb14", "Mar14", "Apr14", "May14", "Jun14",

"Jul14", "Aug14", "Sep14", "Oct14", "Nov14")

coords<-rbind(c(-27.992, 152.681),c(-28.481, 153.439),c(-30.642, 153.003),

c(-23.943, 151.358),c(-33.902662, 151.237756 ),c(-32.562, 151.175),c(-16.92, 145.775),

c(-28.807, 153.277),c(-30.452, 152.897),c(-31.871, 152.376),c(-31.431, 152.908))

locs<-c('Boonah','Alstonville','Nambucca Heads','Tannum Sands','Sydney CP',

'Singleton','Cairns Central','Lismore','Bellingen','Wingham','Port Macquarie')

cooLoc <- data.frame(locs, coords)

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

############################################NEW inlet :dot map time series

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

DD <- data.frame(sites = colnames(Pall))

COOR <- cooLoc

COOR <- merge(DD, COOR, by.x = "sites", by.y = "locs", all.x=TRUE)

COOR <- COOR[order(COOR$X1, decreasing=TRUE),-c(1)]

row.names(COOR) <- 1:nrow(COOR)

DP2<- data.frame(cbind(COOR,rbind(t(Pall2\_im))))

names(DP2)<-c("latitude", "longitude", paste("M", 1:41, sep=""))

PT<-matrix(ncol=11, nrow=41)

COL<-matrix(ncol=11, nrow=41)

for(i in 1:11){

D<-as.numeric(DP2[i,3:43])

DNA<-as.numeric(Pall[,i])

XX<-.2

PT[,i]<- ifelse(D < .012, 1,

ifelse(D >= .012 & D < 0.025, 1.6,

ifelse(D >= .025 & D < .05, 2.1,

ifelse(D >= .05 & D < .075, 2.4+XX,

ifelse(D >= .075 & D < .1, 2.7+XX,

ifelse(D >= .1 & D < .125, 3+XX,

ifelse(D >= .125 & D < .15, 3.3+XX,

ifelse(D >= .15 & D < .175, 3.6+XX,

ifelse(D >= .175 & D < .2, 3.9+XX,

ifelse(D >= .2 & D < .225, 4.2+XX,

ifelse(D >= .225 & D < .25, 4.5+XX,

ifelse(D >= .25 & D < .275, 4.8+XX,

ifelse(D >= .275 & D < .3, 5.1+XX,

ifelse(D >= .3 & D < .325, 5.4+XX,

ifelse(D >= .325 & D < .35, 5.7+XX,

ifelse(D >= .35 & D < .375, 6+XX,

ifelse(D >= .375 & D < .4, 6.3+XX,

ifelse(D >= .4 & D < .425, 6.6+XX,

ifelse(D >= .425 & D < .45, 6.9 + XX,

ifelse(D >= .45 & D < .475, 7.2+XX,

ifelse(D >= .475 & D < .55, 7.5 + XX, 100)))))))))))))))))))))

COL[,i]<-ifelse(is.na(DNA),"lemonchiffon1", "forestgreen")

}

########Color and point thinkness

PrevMeans<-apply(Pall,2, mean, na.rm=TRUE)

Ntimes<-apply(Pall, 2, function(x)length(which(!is.na(x))))

NAM<-data.frame(sitePall=names(PrevMeans), cooLocloc=

c(11,10,9,8,7,6,5,4,3,2,1),

mprev=as.numeric(PrevMeans), nsamp=as.numeric(Ntimes))

cooLoc <- cooLoc[order(cooLoc$X1, decreasing=TRUE),]

row.names(cooLoc) <- 1:nrow(cooLoc)

NAM <- merge(cooLoc, NAM, by.x="locs", by.y = "sitePall", all.x=T)

NAM <-NAM[order(NAM$X1, decreasing=TRUE),]

rownames(NAM)<-1:nrow(NAM)

ColVec<-heat.colors(12)

####Point thikness mean HeV

X2 <- 0.3

NAM$pointThik<-ifelse(NAM$mprev<=.005, 1+X2,

ifelse(NAM$mprev<=.01 & NAM$mprev>.005, 1.3+X2,

ifelse(NAM$mprev<=.02 & NAM$mprev>.01, 1.6+X2,

ifelse(NAM$mprev<=.03 & NAM$mprev>.02, 1.8+X2,

ifelse(NAM$mprev<=.04 & NAM$mprev>.03, 2+X2,

ifelse(NAM$mprev<=.05 & NAM$mprev>.04, 2.2+X2,

ifelse(NAM$mprev<=.06 & NAM$mprev>.05, 2.6+X2,

ifelse(NAM$mprev<=.07 & NAM$mprev>.02, 2.9+X2,

ifelse(NAM$mprev<=.08 & NAM$mprev>.02, 3.3+X2,

ifelse(NAM$mprev<=.09 & NAM$mprev>.02, 3.7+X2,

ifelse(NAM$mprev<=.1 & NAM$mprev>.02, 4.1+X2,

ifelse(NAM$mprev<=.2 & NAM$mprev>.02, 4.5+X2, "ATTT"))))))))))))

####color Sample intensity

NAM$colprev<- ifelse(NAM$nsamp>=30, "lightsteelblue4",

ifelse(NAM$nsamp<30&NAM$nsamp>=20, "lightsteelblue3",

ifelse(NAM$nsamp<20&NAM$nsamp>=10, "lightsteelblue2",

ifelse(NAM$nsamp<10, "lightsteelblue1", "maroon2"))))

row.names(NAM)<-1:nrow(NAM)

###########################figure below

png("FakeMap.png", width=15, height=10, units="in", res=200)

nf<-layout(matrix(c(1,1,2,3), 2, 2, byrow = FALSE), height=c(1,1,1))

layout.show(nf)

par(mar=c(4,6,1,1))

map("worldHires", regions=c("Australia"), fill=TRUE, col="grey90",

xlim=c(144,154), ylim=c(-35,-15), lwd=1.4, ylab="",

xlab="",mar=c(7, 5, .5, 0.1))

map.scale(relwidth=.15,ratio=FALSE, cex=.8)

axis(1, at=seq(144,154,2),cex.axis=1.25)

axis(2, at=seq(-35,-15,5), las=1, cex.axis=1.25)

mtext("Latitude",line=3, side=2, cex=2)

mtext("Longitude",line=2.5, side=1, cex=2)

points(y=cooLoc$X1,

x=cooLoc$X2, pch=16, cex=as.numeric(NAM$pointThik),

col=NAM$colprev)

points(y=cooLoc$X1,

x=cooLoc$X2, pch=1, cex=as.numeric(NAM$pointThik))

text(COOR$X2, y=COOR[1:11,]$X1, labels="\*", font=2, cex=1.5)

qp <- qplot(Aus$x, Aus$y, geom="path", ylab="", xlab="",

xlim=c(108,155), ylim=c(-45,-9))+

theme(panel.grid.major = element\_blank(),

panel.border = element\_blank(),

panel.grid.minor = element\_blank(),

panel.background = element\_blank())+

theme(axis.ticks = element\_blank(), axis.text.x = element\_blank(),

axis.text.y = element\_blank()) +

geom\_polygon(aes(x=Aus$x, y=Aus$y), fill="grey90")+

geom\_segment(aes(x =144, y = -34, xend = 144, yend = -13)) +

geom\_segment(aes(x =155, y = -34, xend = 155, yend = -13)) +

geom\_segment(aes(x =144, y = -34, xend = 155, yend = -34)) +

geom\_segment(aes(x =144, y = -13, xend = 155, yend = -13))

print(qp, vp=viewport(.7, .85, .3, .3))

xp<-c(149,150)#c(155,156)

dash<-xp[1]+.5

con<-xp[2]+.5

y<- c(-15,-16,-17,-18)

tp<- xp[2]+4

cext<-1.75

text(x=xp[2]+1.4, y=y[1], labels="Mean HeV prevalence", cex=1.75)

points(x=xp, y=c(y[2],y[2]), cex=c(1,4), pch=1,

lwd=1)

text(y=y[2], x=dash, labels="-", cex=cext)

text(y=y[2], x=con, labels=":", cex=cext)

text(y=y[2], x=tp, labels="Low - high prevalence", cex=cext)

points(x=xp, y=c(y[3],y[3]), cex=2, pch=16,

col=c("lightsteelblue1","lightsteelblue4"))

text(y=y[3], x=dash, labels="-", cex=cext)

text(y=y[3], x=con, labels=":", cex=cext)

text(y=y[3], x=tp, labels="Small - large sampling", cex=cext)

###########################Below is the dot time series

test <- data.frame(x = 1:41, y = seq(1,11, len = 41))

qp <- ggplot(test, aes(factor(x), factor(y)))+ geom\_line()+

theme(panel.grid.major = element\_blank(),

panel.border = element\_blank(),

panel.grid.minor = element\_blank(),

panel.background = element\_blank())+

scale\_x\_discrete(breaks=c(1:41)[c(TRUE,rep(FALSE,5))], labels=DATES[c(TRUE,rep(FALSE,5))])+

scale\_y\_discrete(breaks=c(11:1),

labels=paste(colnames(Pall), paste("(", round(DP2$latitude,1), ")", sep="")))+

theme(axis.title.x = element\_text(size=20),

axis.title.y = element\_text(size=20),

axis.text.x = element\_text(color="black", size=12),

axis.text.y = element\_text(color="black", size=10),

axis.ticks = element\_line(color="black"),

axis.line = element\_line(color="black", lineend="butt"))+

geom\_point(aes(y=rep("11",41), x=1:41),pch=16, col=COL[,1], cex=PT[,1])+

geom\_point(aes(y=rep("11",41), x=1:41),pch=1, cex=PT[,1])+

geom\_point(aes(y=rep("10",41), x=1:41), col=COL[,2], cex=PT[,2])+

geom\_point(aes(y=rep("10",41), x=1:41),pch=1, cex=PT[,2])+

geom\_point(aes(y=rep("9",41), x=1:41),

col=COL[,3], cex=PT[,3])+

geom\_point(aes(y=rep("9",41), x=1:41),pch=1, cex=PT[,3])+

geom\_point(aes(y=rep("8",41), x=1:41),

col=COL[,4], cex=PT[,4])+

geom\_point(aes(y=rep("8",41), x=1:41),pch=1, cex=PT[,4])+

geom\_point(aes(y=rep("7",41), x=1:41),

col=COL[,5], cex=PT[,5])+

geom\_point(aes(y=rep("7",41), x=1:41),pch=1, cex=PT[,5])+

geom\_point(aes(y=rep("6",41), x=1:41),

col=COL[,6], cex=PT[,6])+

geom\_point(aes(y=rep("6",41), x=1:41),pch=1, cex=PT[,6])+

geom\_point(aes(y=rep("5",41), x=1:41),

col=COL[,7], cex=PT[,7])+

geom\_point(aes(y=rep("5",41), x=1:41),pch=1, cex=PT[,7])+

geom\_point(aes(y=rep("4",41), x=1:41),

col=COL[,8], cex=PT[,8])+

geom\_point(aes(y=rep("4",41), x=1:41),pch=1, cex=PT[,8])+

geom\_point(aes(y=rep("3",41), x=1:41),

col=COL[,9], cex=PT[,9])+

geom\_point(aes(y=rep("3",41), x=1:41),pch=1, cex=PT[,9])+

geom\_point(aes(y=rep("2",41), x=1:41),

col=COL[,10], cex=PT[,10])+

geom\_point(aes(y=rep("2",41), x=1:41),pch=1, cex=PT[,10])+

geom\_point(aes(y=rep("1",41), x=1:41),

col=COL[,11], cex=PT[,11])+

geom\_point(aes(y=rep("1",41), x=1:41),pch=1, cex=PT[,11])+

xlab("Date")+ ylab("Site")

print(qp, vp=viewport(.68, .4, .5, .7))

dev.off()