**Week 4 final assignment**

**##Plot 1.** Have total emissions from PM2.5 decreased in the United States from 1999 to 2008?

NEI <- readRDS("summarySCC\_PM25.rds")

SCC <- readRDS("Source\_Classification\_Code.rds")

##Calculate yearly totals for US

nei\_usy<-summarize(group\_by(NEI,year),sum(Emissions))

names(nei\_usy)<-c("year","tot\_em")

##Plot and embellish a little, at least for my taste…

with(nei\_usy,plot(year,tot\_em,typ="l",lwd=3,ylim= range(nei\_usy$tot\_em), xaxt="n",yaxt="n",bty="n",ylab="MT PM2.5",main="US total emissions from PM2.5 (tons)"))

axis(2, at= c(min(nei\_usy$tot\_em),max( nei\_usy$tot\_em)),labels=formatC**(**c(min(nei\_usy$tot\_em),max( nei\_usy$tot\_em)),format="f",digits=0,big.mark=","**),**lwd=2)

axis(1, at= year(as.Date(as.character(nei\_usy$year),"%Y")),labels= year(as.Date(as.character(nei\_usy$year),"%Y")),lwd=2)

abline(h=nei\_usy$tot\_em,lwd=1,lty="dashed")

abline(v=nei\_usy$year,lwd=1,lty="dashed")

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dev.copy(png, file = "plot1.png", bg = "white",height=480,width=480)

dev.off()

**##Plot 2.** Have total emissions from PM2.5 decreased in the **Baltimore City**, Maryland (fips=="24510") from 1999 to 2008?

NEI <- readRDS("summarySCC\_PM25.rds")

SCC <- readRDS("Source\_Classification\_Code.rds")

##Calculate yearly totals for Baltimore City, Maryland

nei\_bay<-summarize(group\_by(subset(NEI,fips=="24510"),year),sum(Emissions))

names(nei\_bay)<-c("year","tot\_em")

##Plot and embellish a little, at least for my taste…

with(nei\_bay,plot(year,tot\_em,typ="l",lwd=3,ylim= range(nei\_bay$tot\_em), xaxt="n",yaxt="n",bty="n",ylab="MT PM2.5",main="Baltimore City, Maryland, total emissions from PM2.5 (tons)"))

axis(2, at= c(min(nei\_bay$tot\_em),max( nei\_bay$tot\_em)),labels=formatC**(**c(min(nei\_bay$tot\_em),max( nei\_bay$tot\_em)),format="f",digits=0,big.mark=","**),**lwd=2)

axis(1, at= year(as.Date(as.character(nei\_bay$year),"%Y")),labels= year(as.Date(as.character(nei\_bay$year),"%Y")),lwd=2)

abline(h=nei\_bay$tot\_em,lwd=1,lty="dashed")

abline(v=nei\_bay$year,lwd=1,lty="dashed")

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dev.copy(png, file = "plot2.png", bg = "white",height=480,width=480)

dev.off()

**##Plot 3.** Of the four types of sources indicated by the \color{red}{\verb|type|}type (point, nonpoint, onroad, nonroad) variable, which of these four sources have seen decreases in emissions from 1999–2008 for **Baltimore City**?

NEI <- readRDS("summarySCC\_PM25.rds")

SCC <- readRDS("Source\_Classification\_Code.rds")

##Calculate yearly totals for Baltimore City, Maryland, this time including the category "type"

nei\_bay<-summarize(group\_by(subset(NEI,fips=="24510"),year,type),sum(Emissions))

names(nei\_bay)<-c("year","type","tot\_em")

h<- ggplot(data=nei\_bay, aes(x=year, y=tot\_em,color=type))

h+geom\_point()+geom\_path()+facet\_grid(.~type)+theme\_bw()+ scale\_x\_continuous(breaks=nei\_bay$year)+scale\_y\_continuous(labels = scales::comma,breaks=c(filter(nei\_bay,year=="1999")$tot\_em, filter(nei\_bay,year=="2008")$tot\_em))+labs(x="Year",y="MT PM2.5",title="Baltimore City, Maryland, total PM2.5 emissions by type")+ theme(plot.title = element\_text(hjust = 0.5))+ theme(axis.text.x = element\_text(angle = 45, hjust = 1))+ theme(legend.position="none")

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dev.copy(png, file = "plot3.png", bg = "white",height=480,width=480)

dev.off()