Jess's Practice Code

Jess Garcia

4/18/2021

View & Wrangle data

```
#install.packages("tseries")

library(tidyverse)
library(trend)
library(zoo)
library(Kendall)
library(tseries)
library(lubridate)
library(cowplot)


Radiance_data_long <- read.csv('../Data/Long_20210419.csv')

#Set date as date, create month & day column then join
class(Radiance_data_long$Year)
```

```
## [1] "integer"
```

```
Radiance_data_long$Month <- 1
Radiance_data_long$Day <-1

Radiance_data_long <-
  Radiance_data_long %>%
  mutate(Date=(paste0(Year,"-",Month,"-",Day)))


Radiance_data_long$Date <- as.Date(Radiance_data_long$Date, format= "%Y-%m-%d")


class(Radiance_data_long$Date)
```

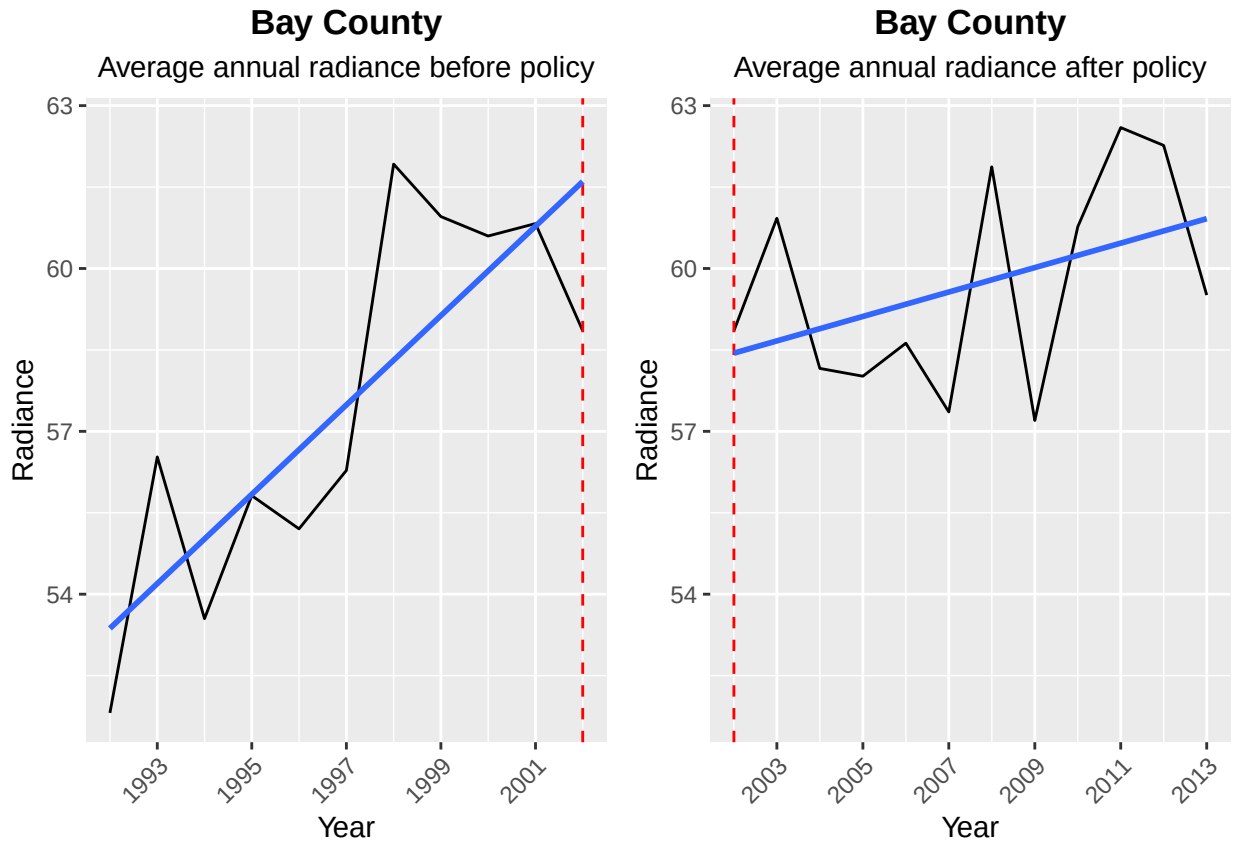
```
## [1] "Date"
```

```
#Filter for Cities/Counties with policy implementation between 2000-2005

Radiance_data_long_filtered <-
  Radiance_data_long %>%
  filter(Implemented %in% 2000:2005)
```

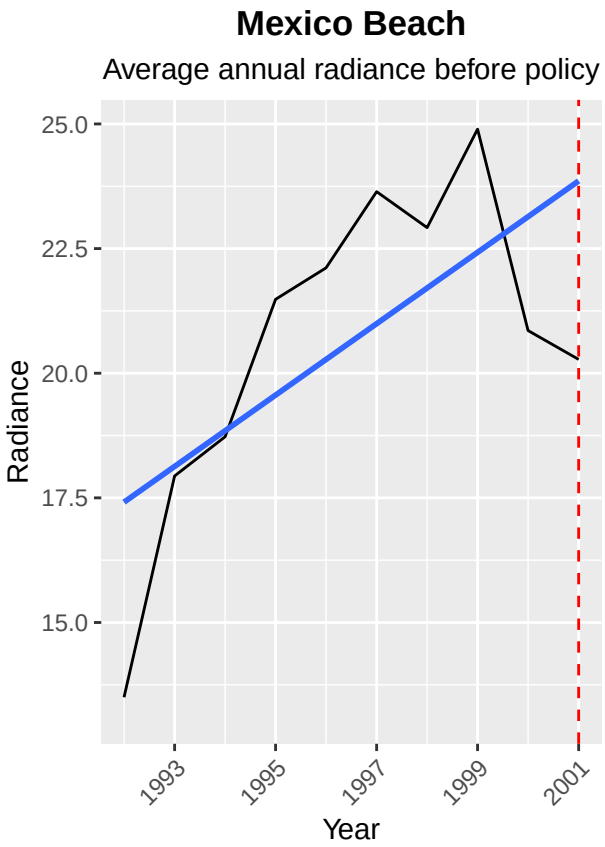
Time Series

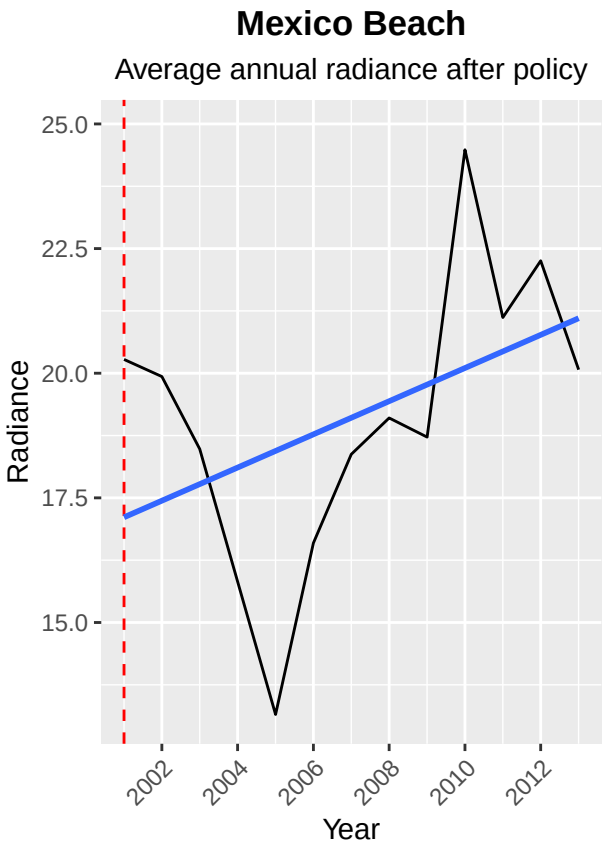
Locations with increasing radiance trend before and after policy

```
plot_grid(BayCounty.plotA, BayCounty.plotB, nrow=1, align='h')
```



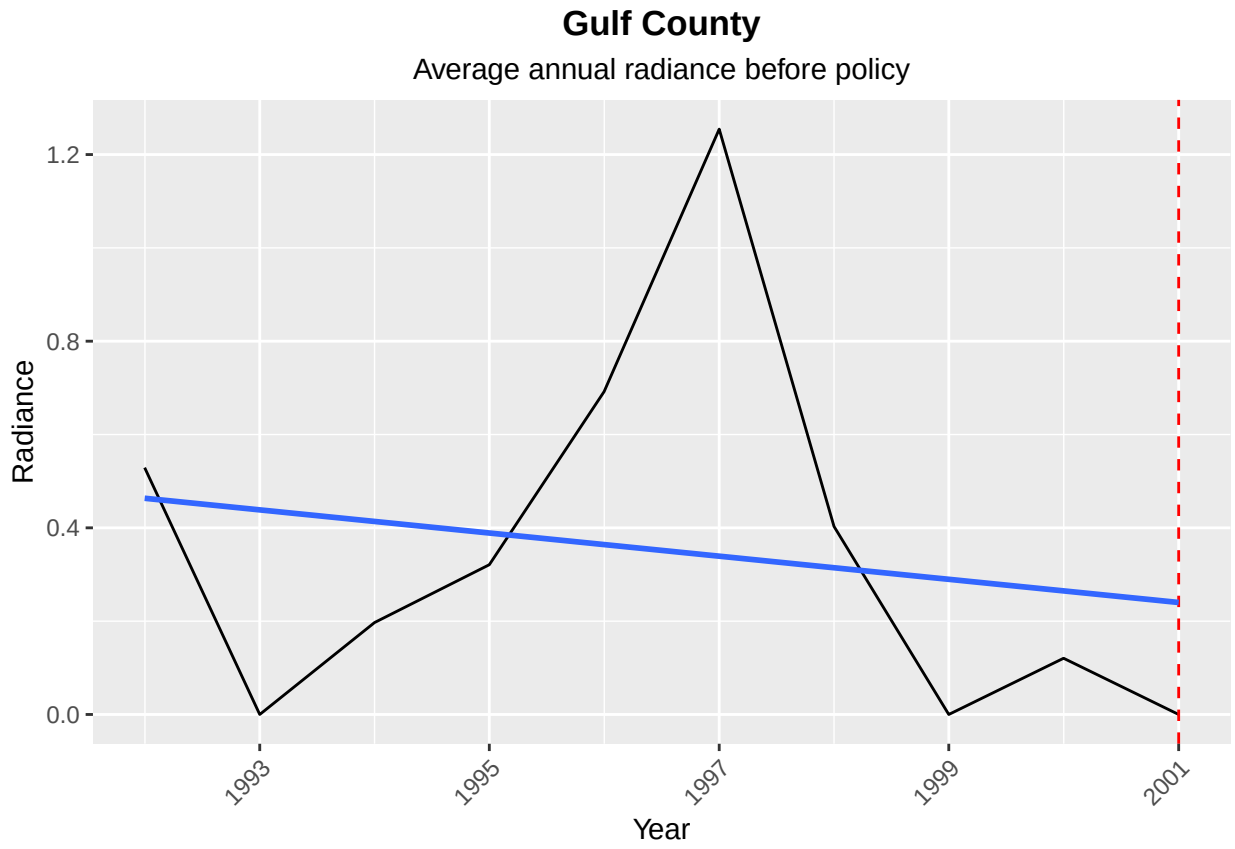

```
plot_grid(MexicoBeach.plotA, MexicoBeach.plotB, nrow=1, align='h')
```



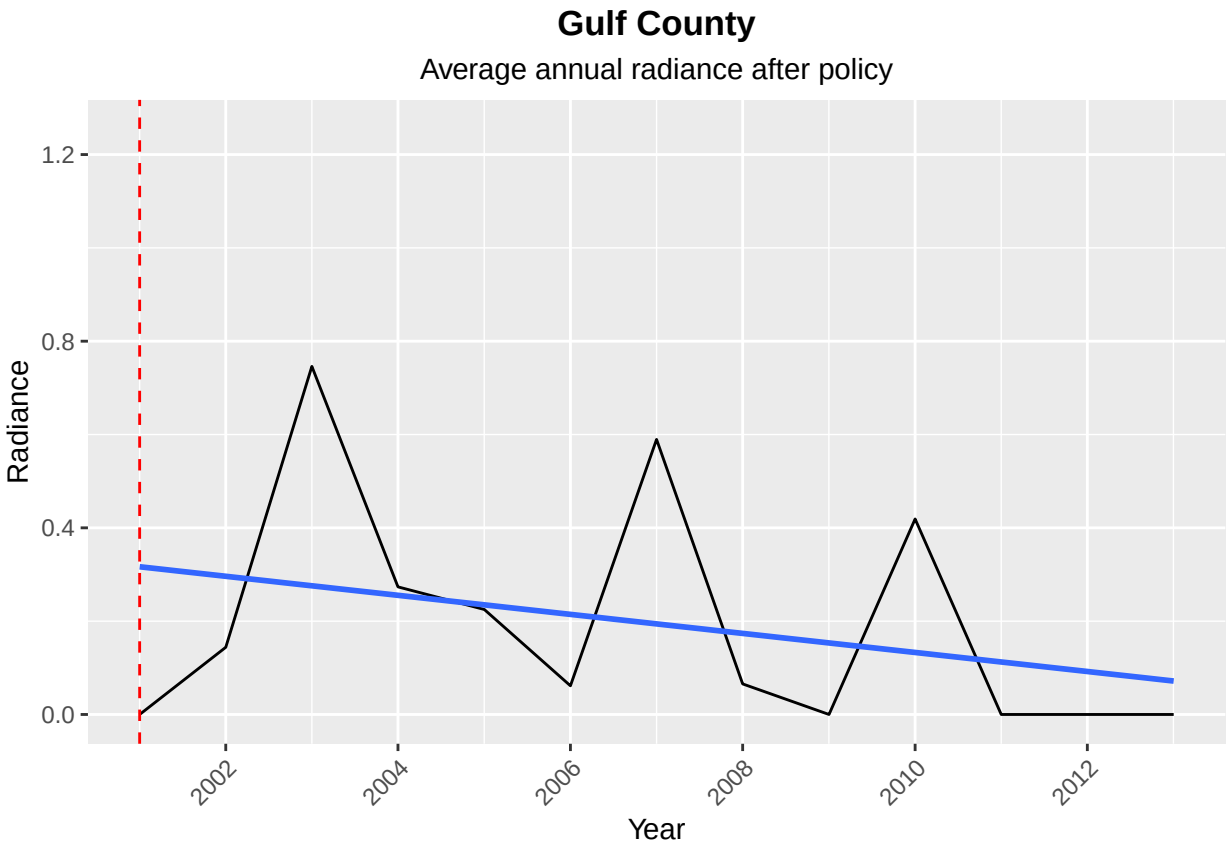


Locations with decreasing radiance trends before and after policy

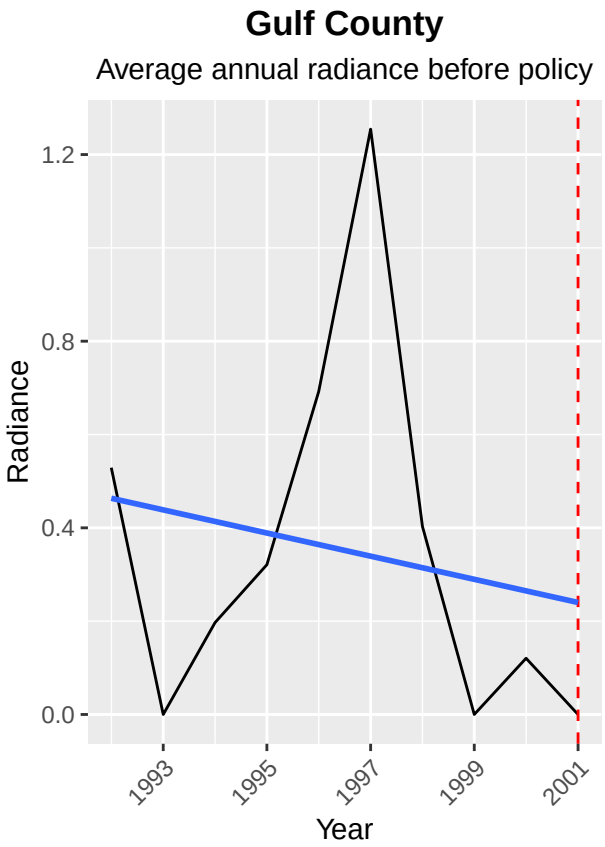
```
#Gulf County
GulfCounty <- Radiance_data_long_filtered %>%
  filter(County == "GUlf COunty")

GulfCounty.plotA <-
 ggplot(GulfCounty, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Gulf County", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2001-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2001-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

GulfCounty.plotA
```

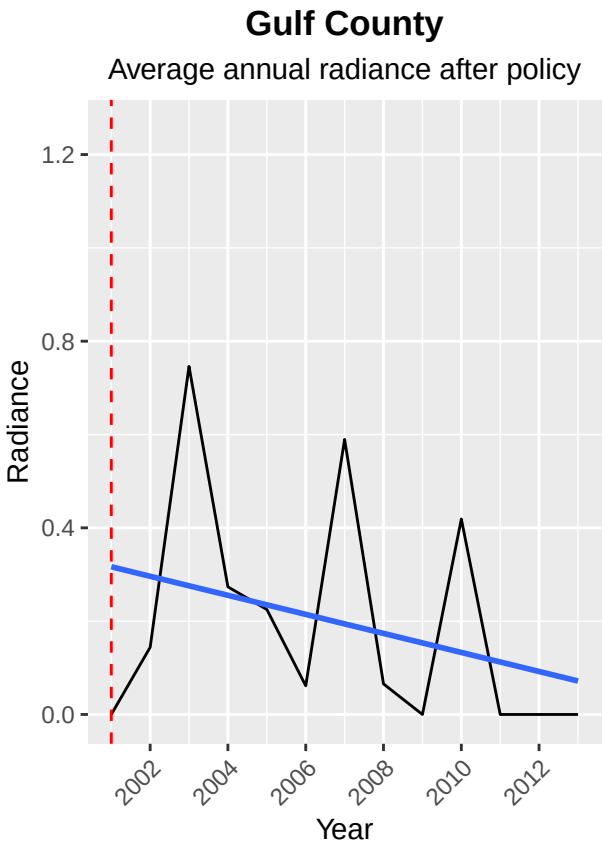



```
GulfCounty.plotB <-
 ggplot(GulfCounty, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Gulf County", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2001-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2001-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

GulfCounty.plotB
```

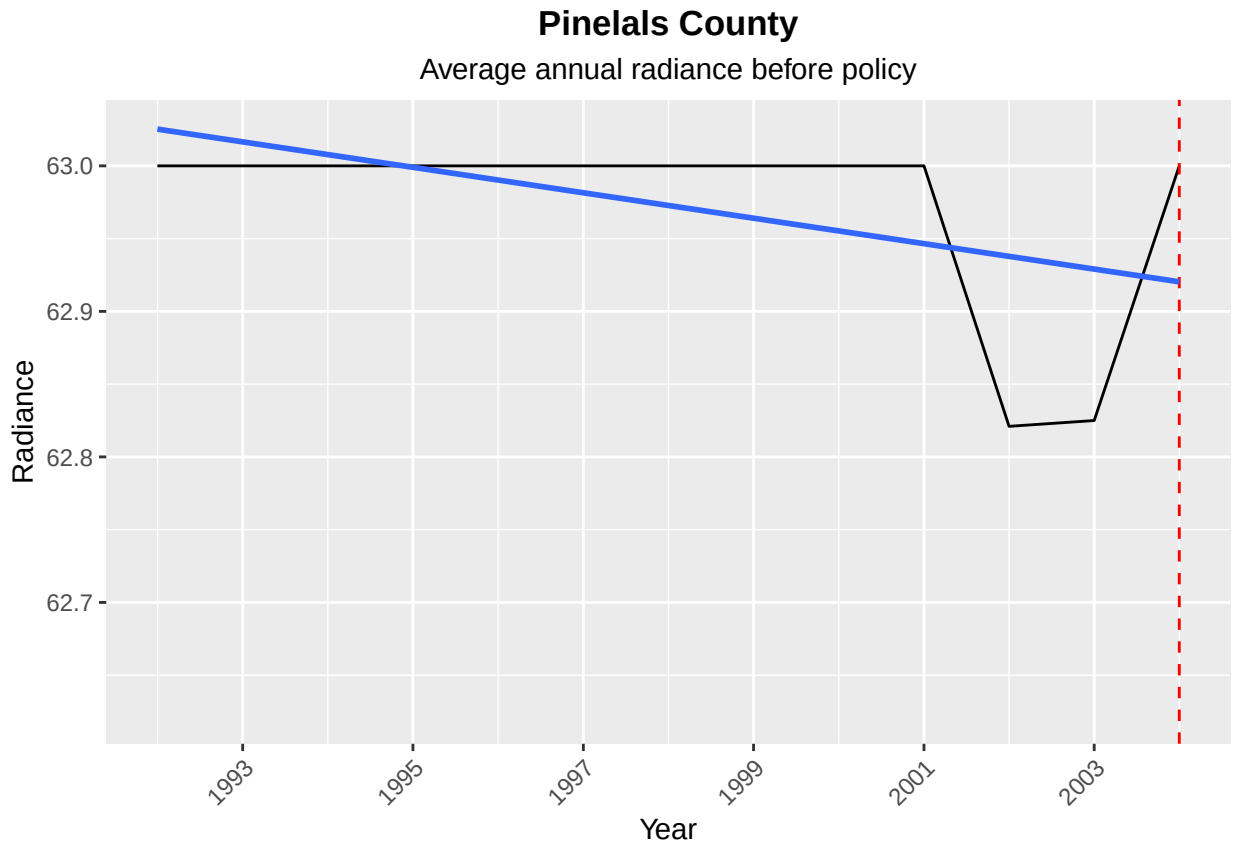



```
plot_grid(GulfCounty.plotA, GulfCounty.plotB, nrow=1, align='h')
```

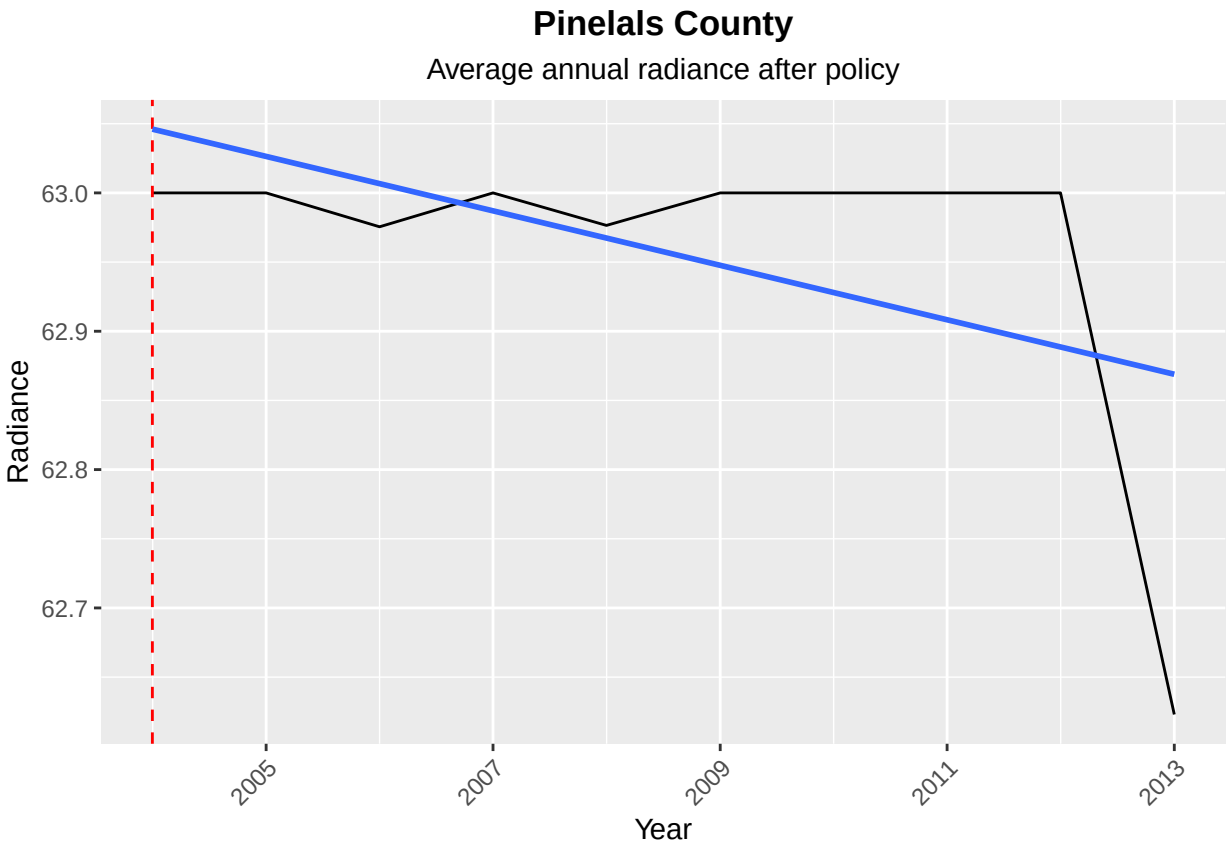




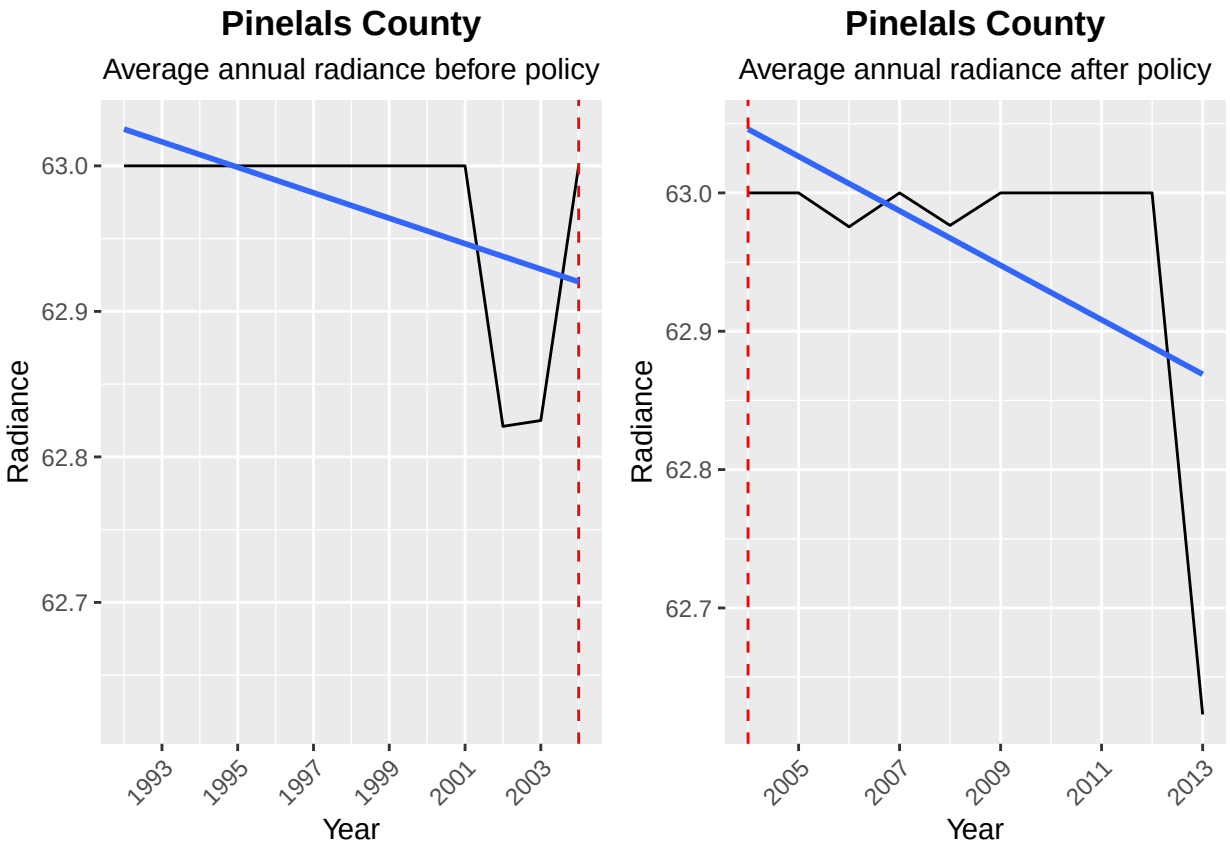

```
#Pinelals County
PinelalsCounty <- Radiance_data_long_filtered %>%
  filter(County == "Pinelals County")

PinelalsCounty.plotA <-
 ggplot(PinelalsCounty, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Pinelals County", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2004-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2004-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

PinelalsCounty.plotA
```




```
PinelalsCounty.plotB <-
 ggplot(PinelalsCounty, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Pinelals County", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2004-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2004-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

PinelalsCounty.plotB
```

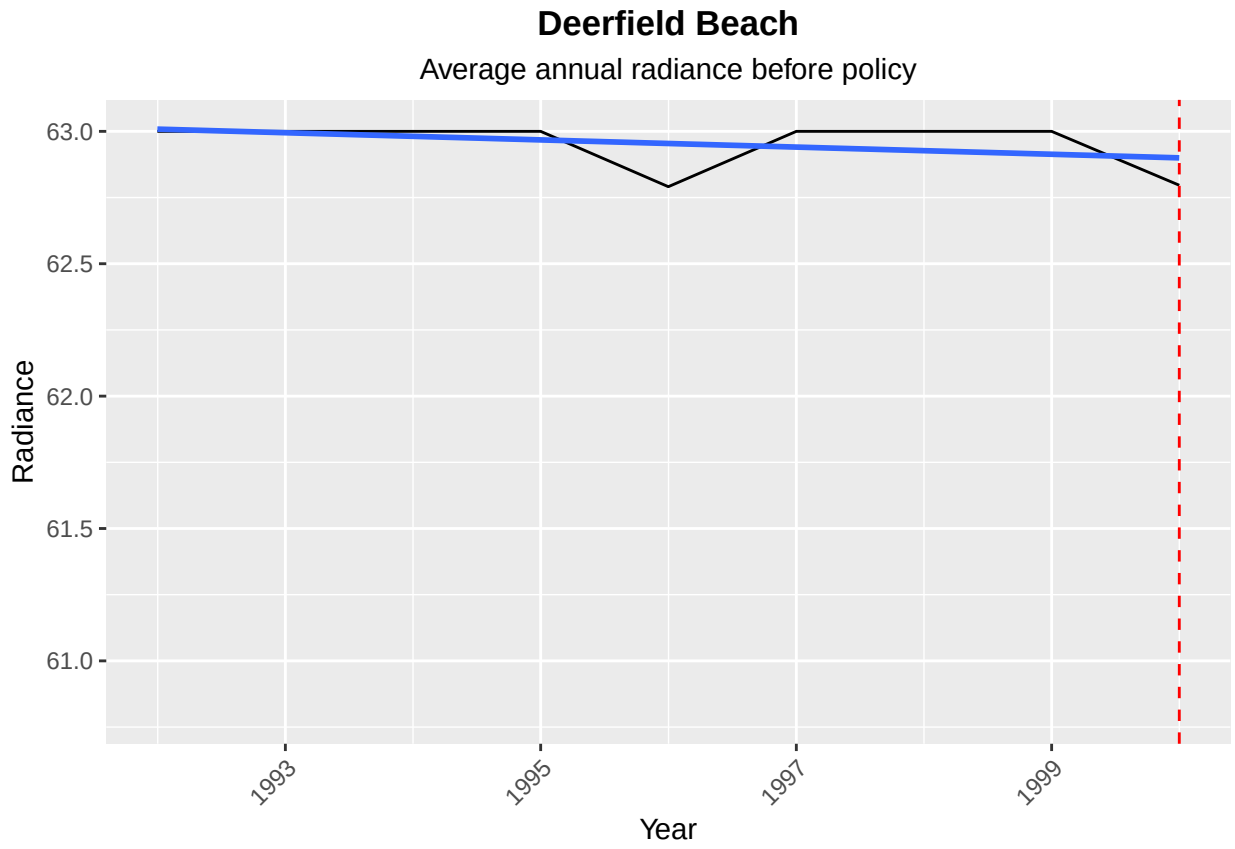



```
plot_grid(PinelalsCounty.plotA, PinelalsCounty.plotB, nrow=1, align='h')
```

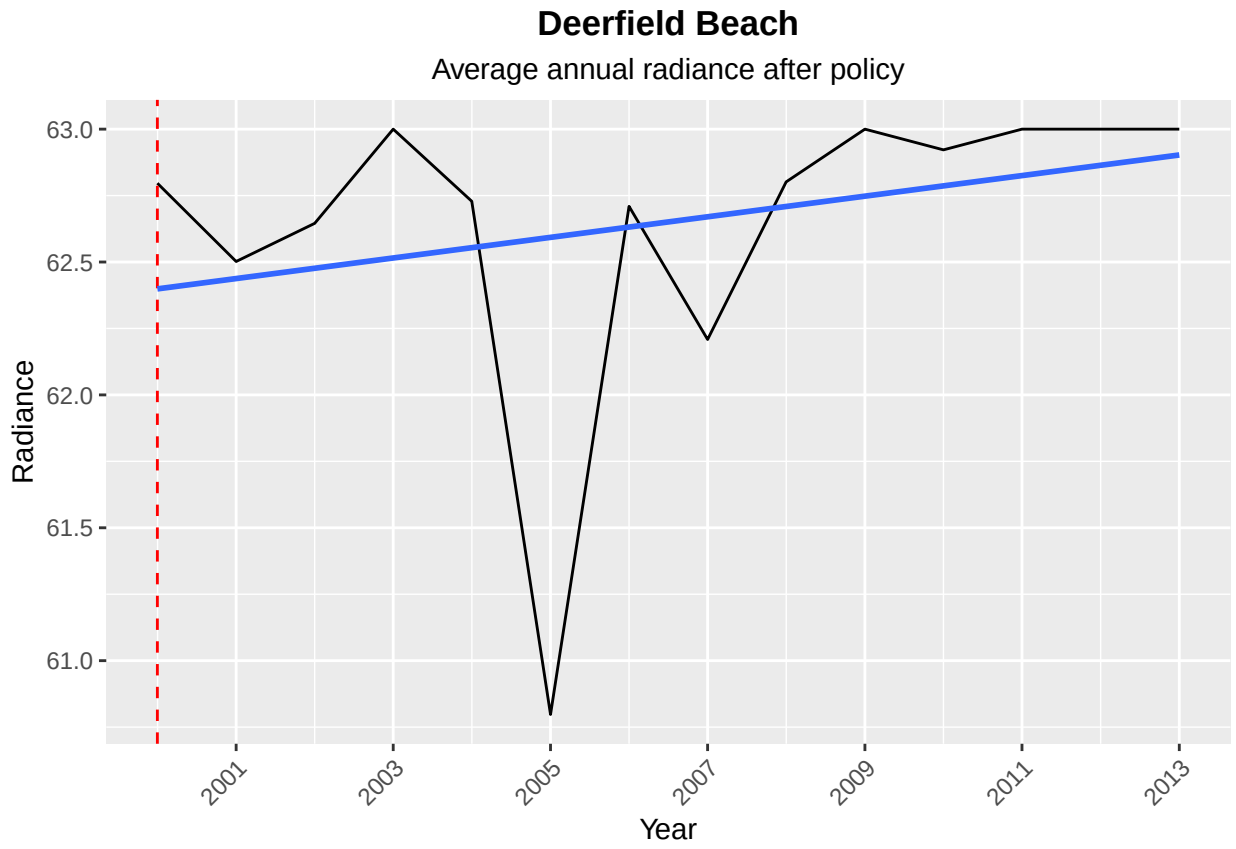


Locations decreasing before policy and increasing after policy

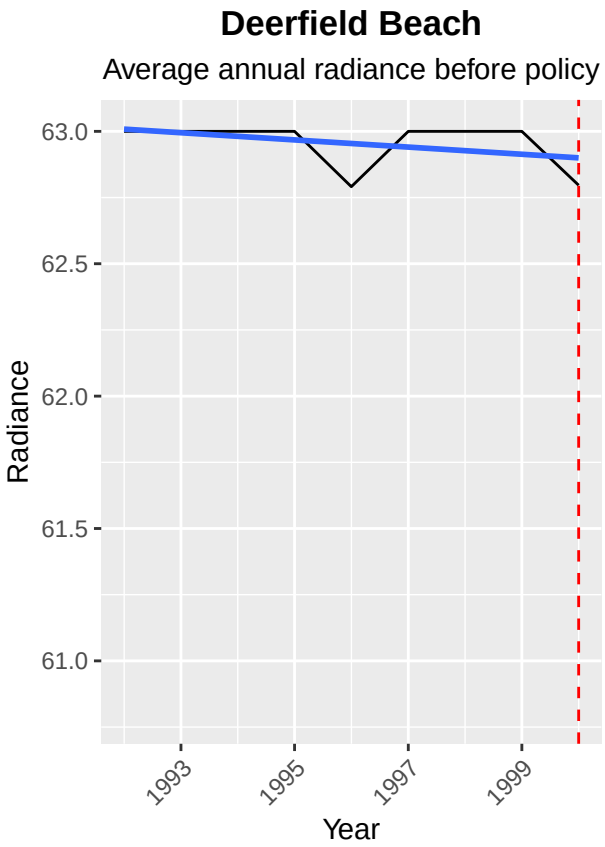
```
#Deerfield Beach
DeerfieldBeach <- Radiance_data_long_filtered %>%
  filter(County == "Deerfield Beach")

DeerfieldBeach.plotA <-
 ggplot(DeerfieldBeach, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Deerfield Beach", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2000-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2000-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

DeerfieldBeach.plotA
```



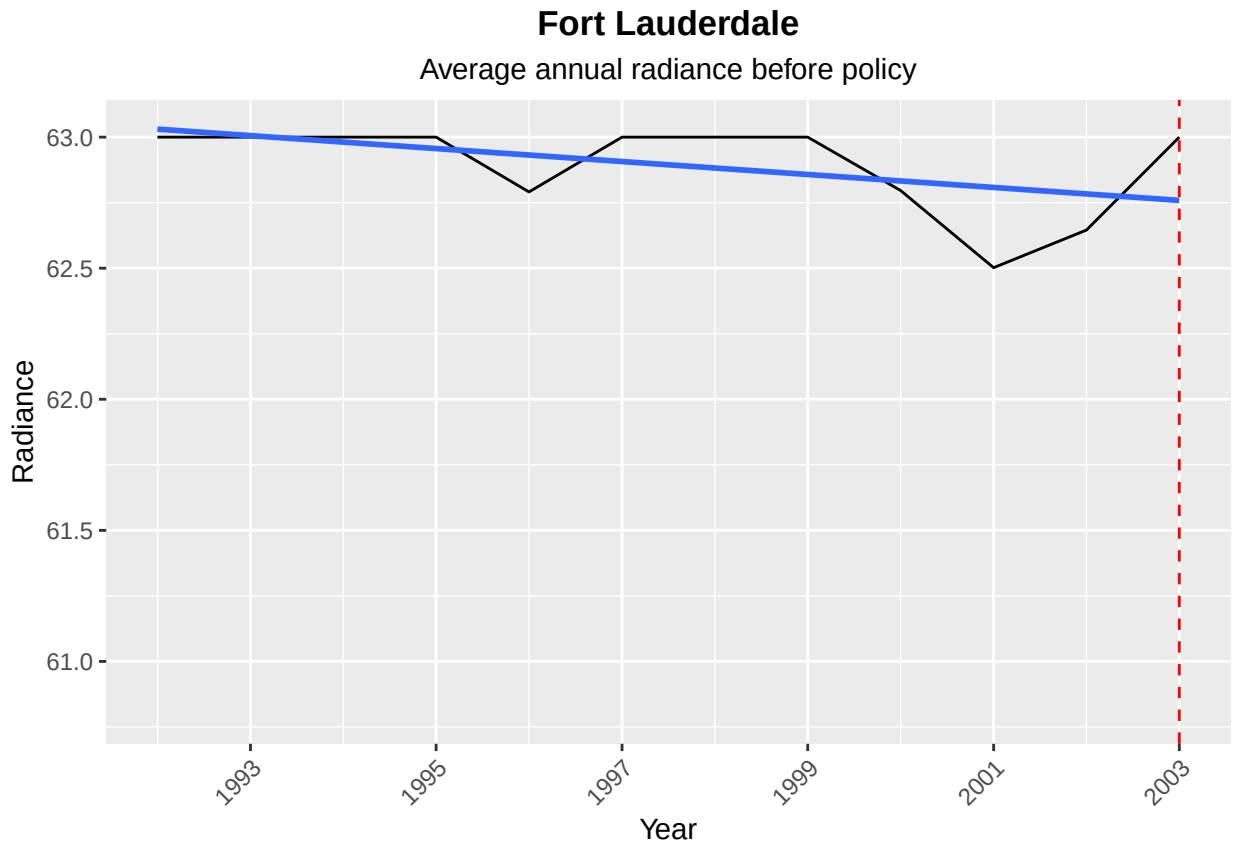

```
DeerfieldBeach.plotB <-
 ggplot(DeerfieldBeach, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Deerfield Beach", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2000-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2000-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

DeerfieldBeach.plotB
```



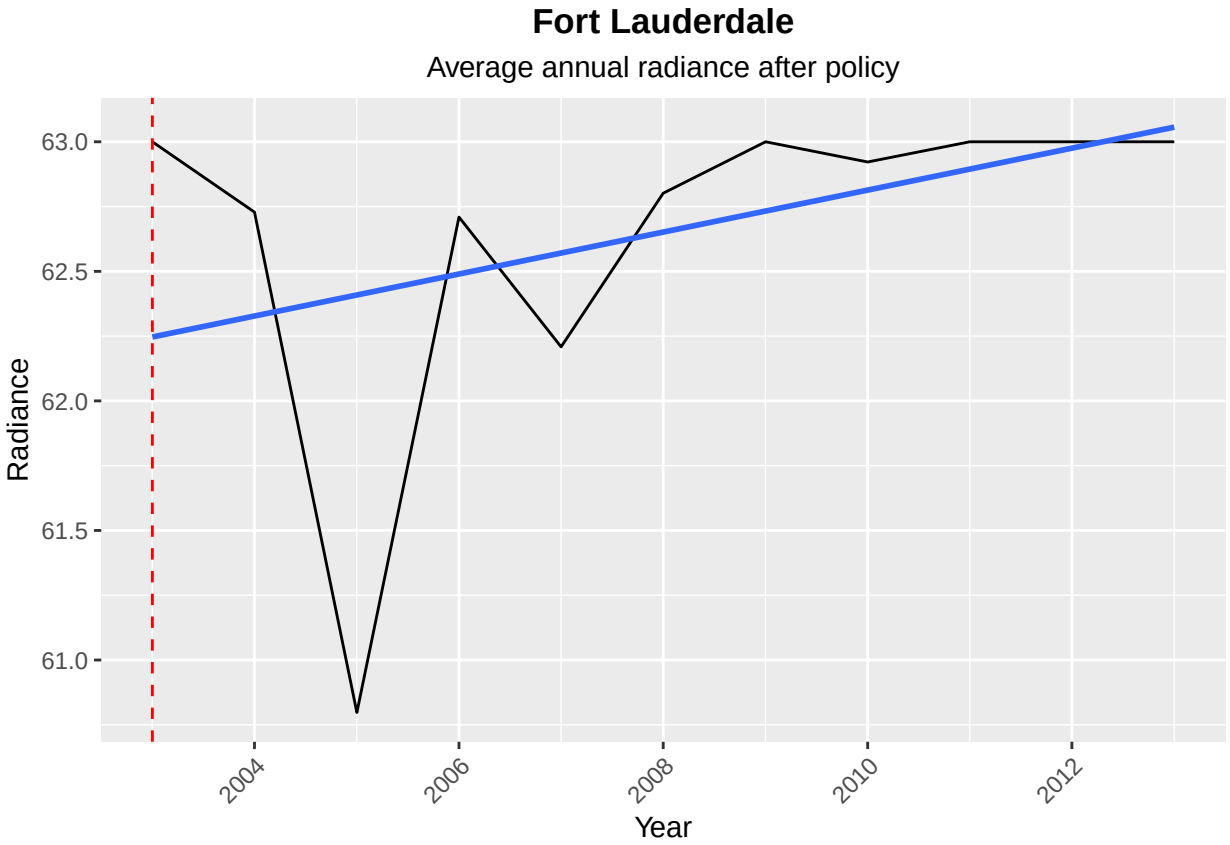

```
plot_grid(DeerfieldBeach.plotA, DeerfieldBeach.plotB, nrow=1, align='h')
```



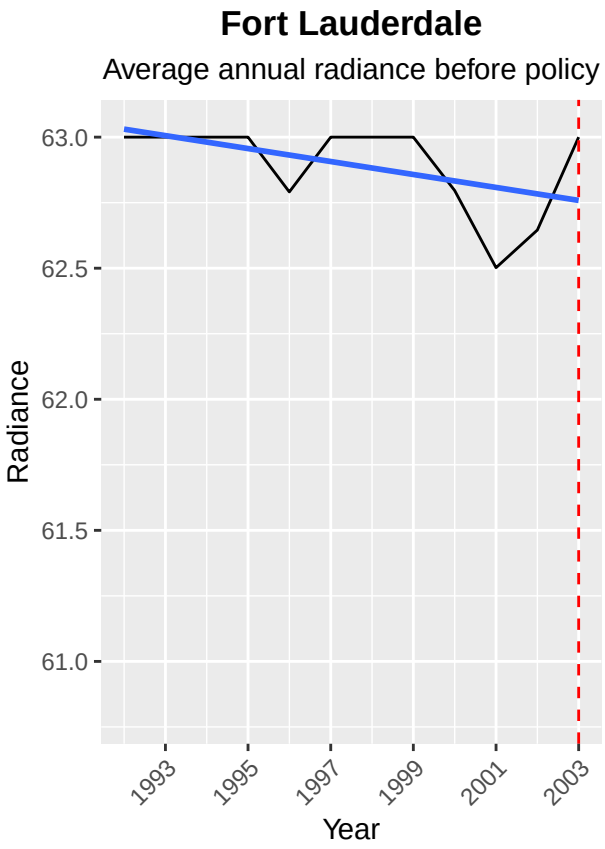

```
#Fort Lauderdale
FortLauderdale <- Radiance_data_long_filtered %>%
  filter(County == "Fort Lauderdale")

FortLauderdale.plotA <-
 ggplot(DeerfieldBeach, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Fort Lauderdale", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2003-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2003-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

FortLauderdale.plotA
```

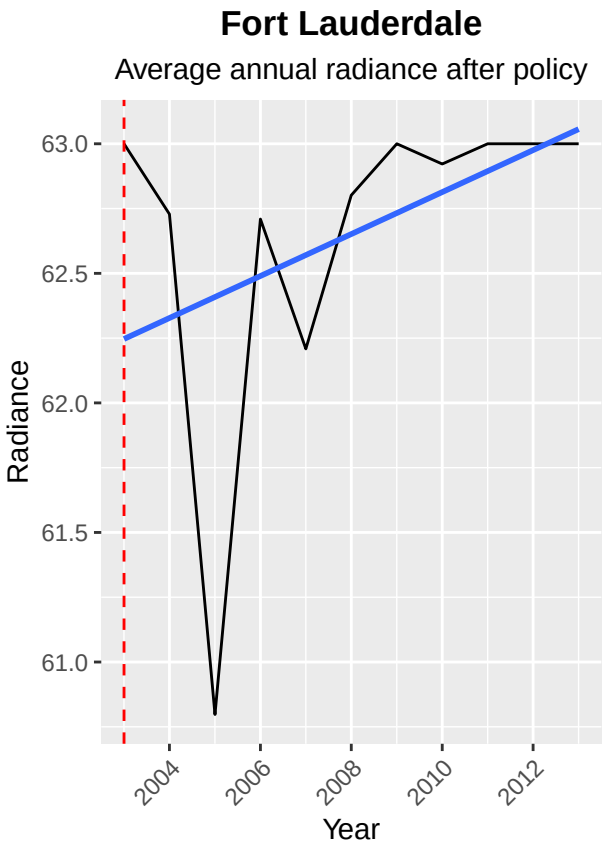



```
FortLauderdale.plotB <-
 ggplot(DeerfieldBeach, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Fort Lauderdale", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2003-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2003-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

FortLauderdale.plotB
```

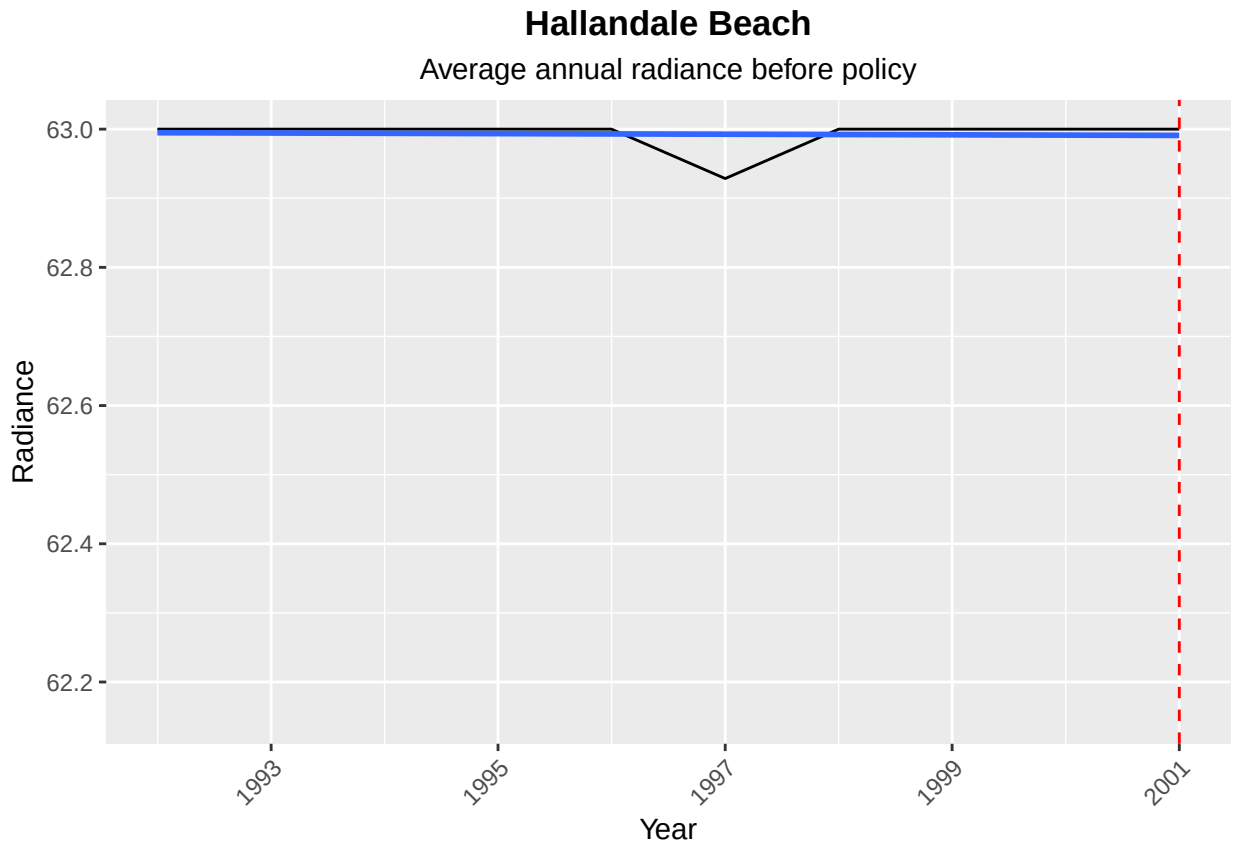



```
plot_grid(FortLauderdale.plotA, FortLauderdale.plotB, nrow=1, align='h')
```

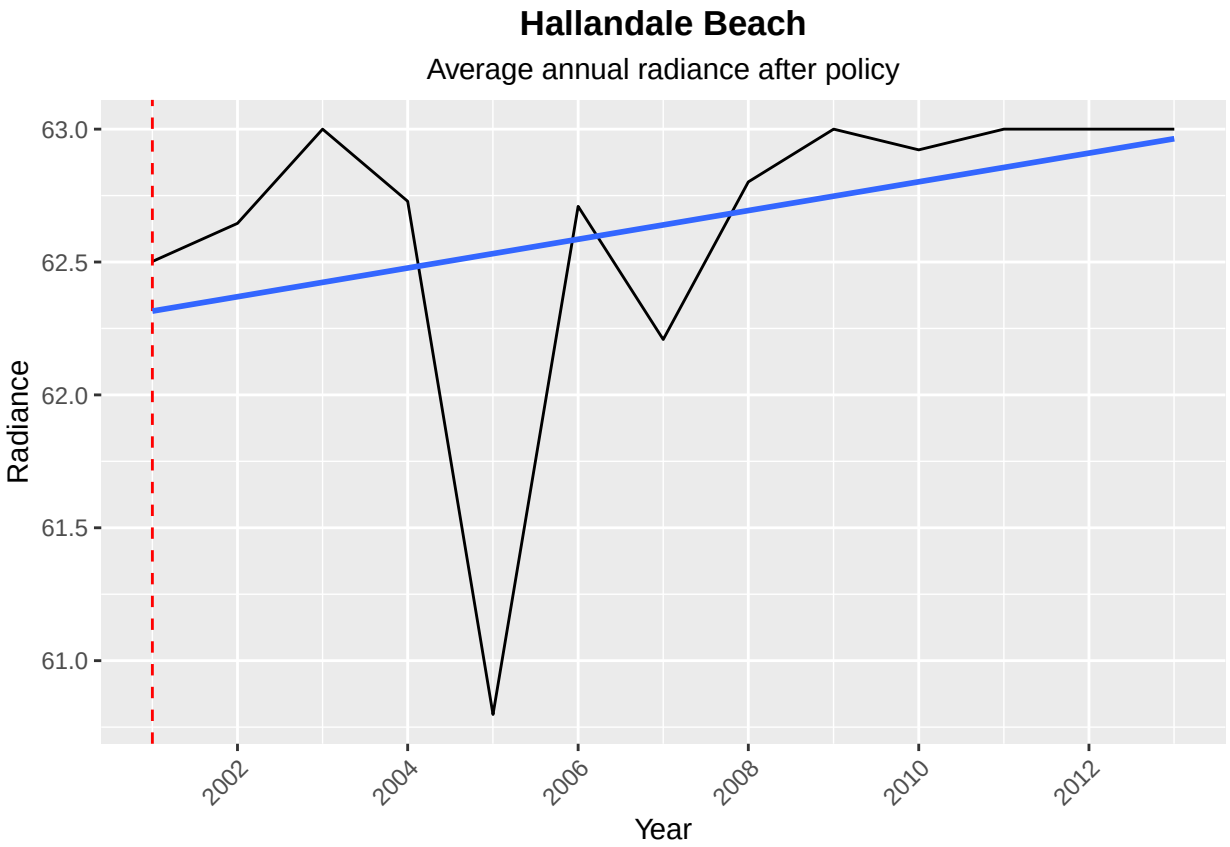




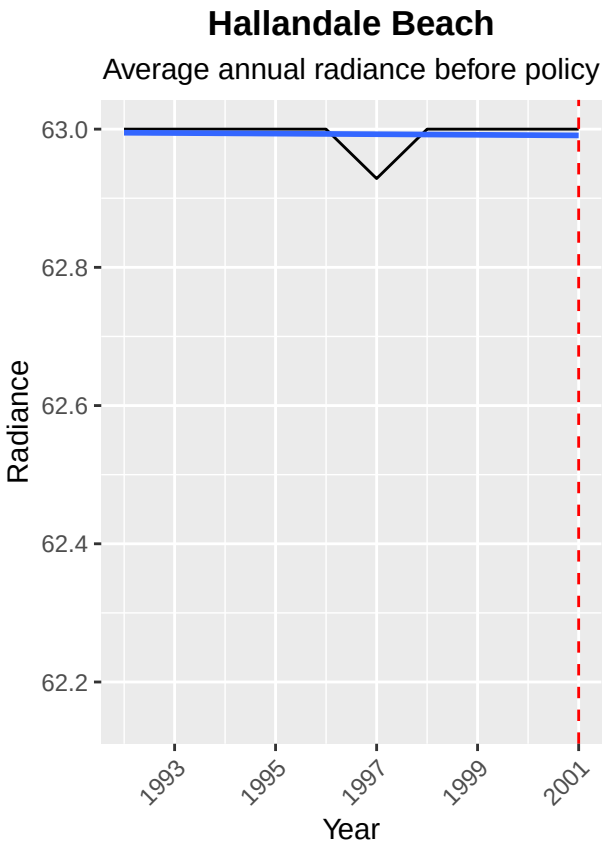

```
#Hallandale Beach
HallandaleBeach <- Radiance_data_long_filtered %>%
  filter(County == "Hallandale Beach")

HallandaleBeach.plotA <-
 ggplot(HallandaleBeach, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Hallandale Beach", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2001-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2001-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

HallandaleBeach.plotA
```

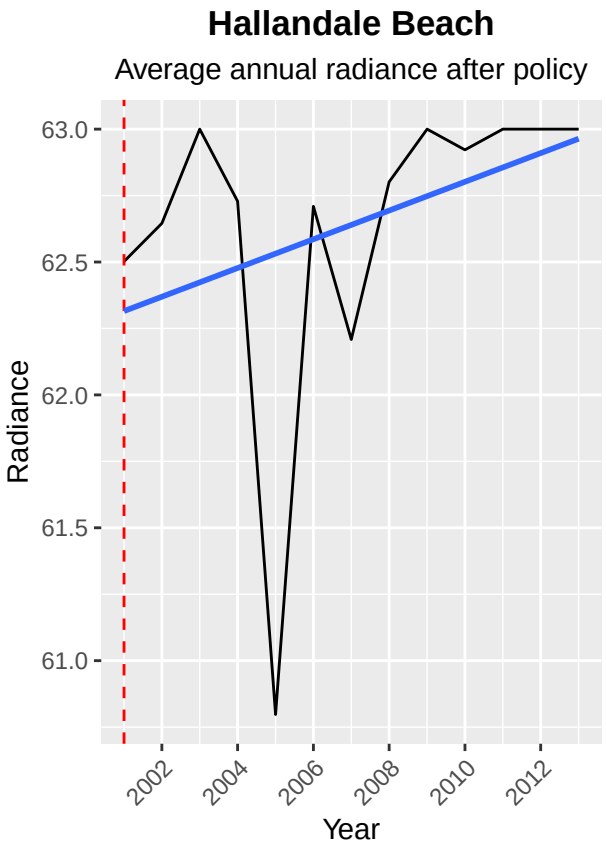



```
HallandaleBeach.plotB <-
 ggplot(DeerfieldBeach, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Hallandale Beach", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2001-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2001-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

HallandaleBeach.plotB
```

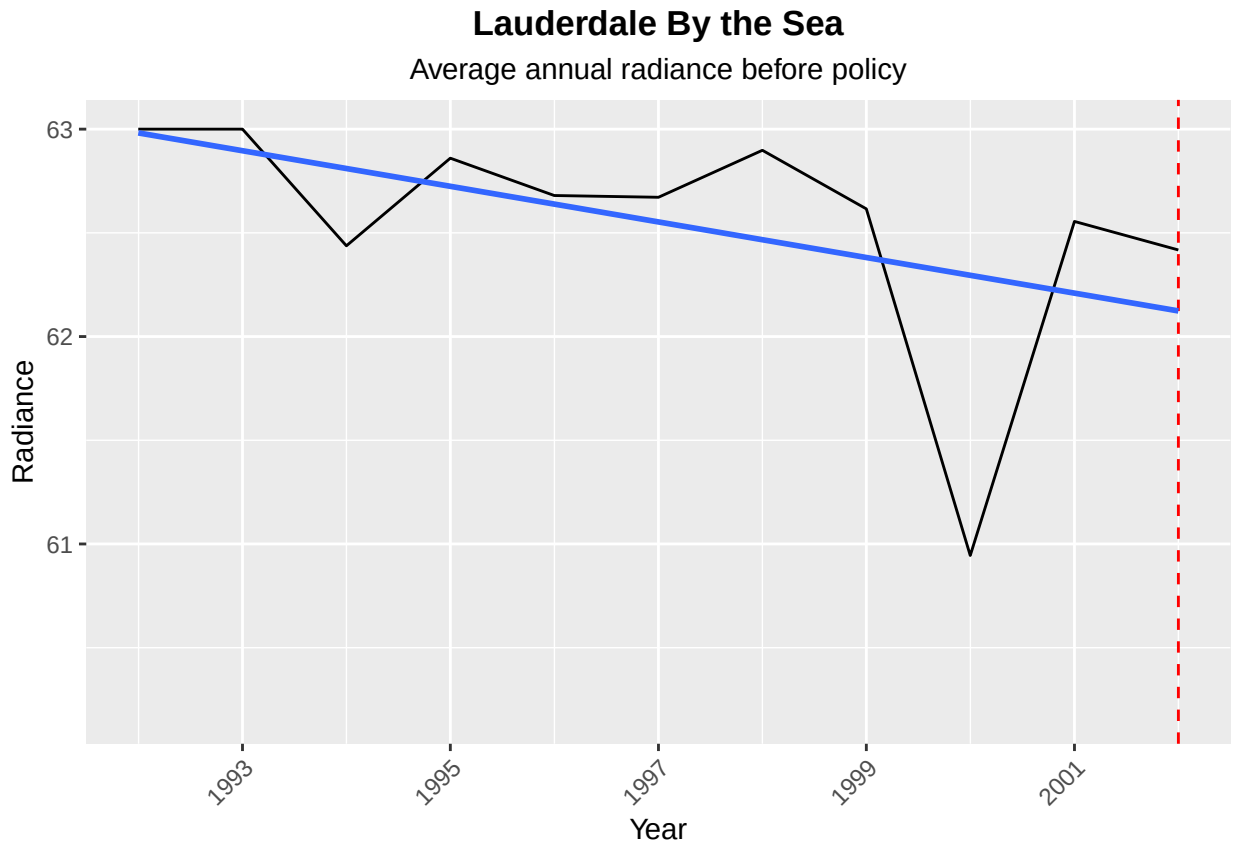



```
plot_grid(HallandaleBeach.plotA, HallandaleBeach.plotB, nrow=1, align='h')
```

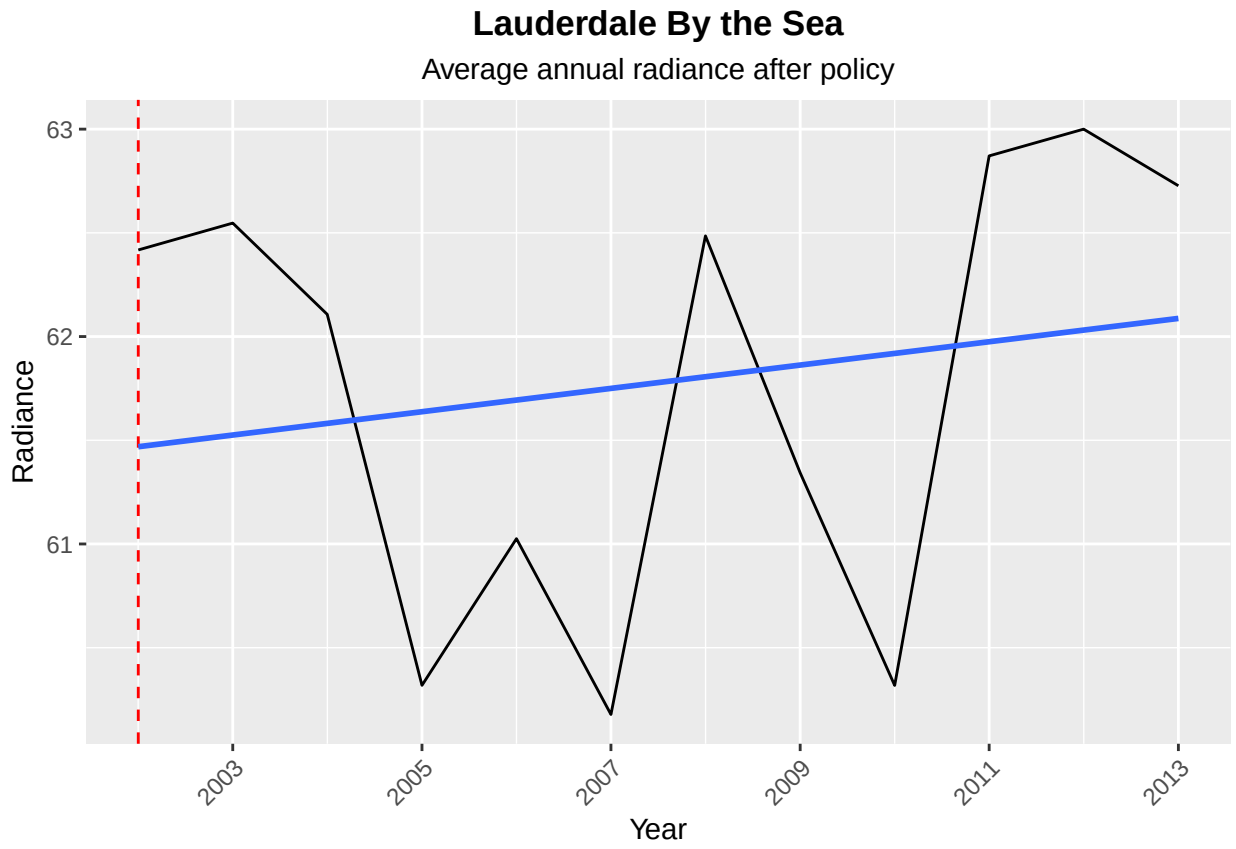




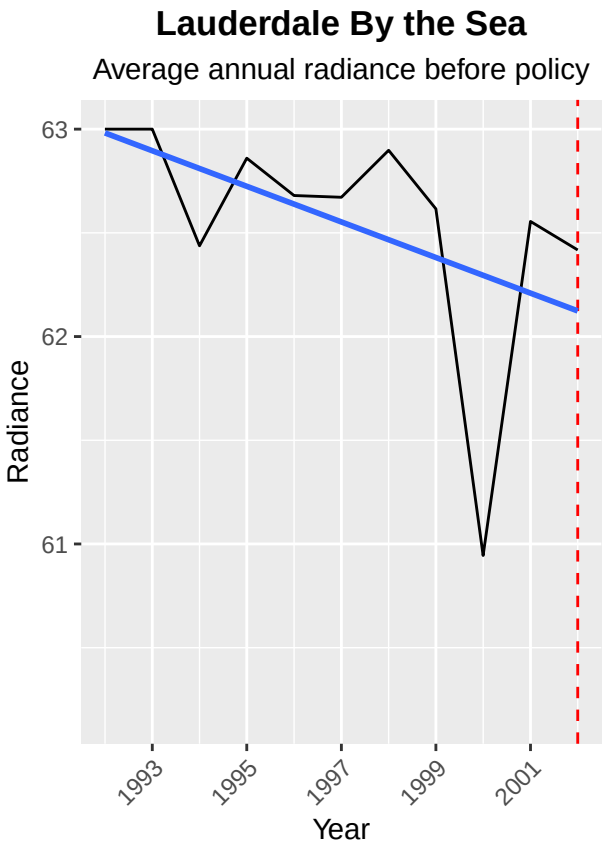

```
#Lauderdale By the Sea
LauderdaleBySea <- Radiance_data_long_filtered %>%
  filter(County == "Lauderdale By the Sea")

LauderdaleBySea.plotA <-
 ggplot(LauderdaleBySea, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Lauderdale By the Sea", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2002-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2002-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

LauderdaleBySea.plotA
```

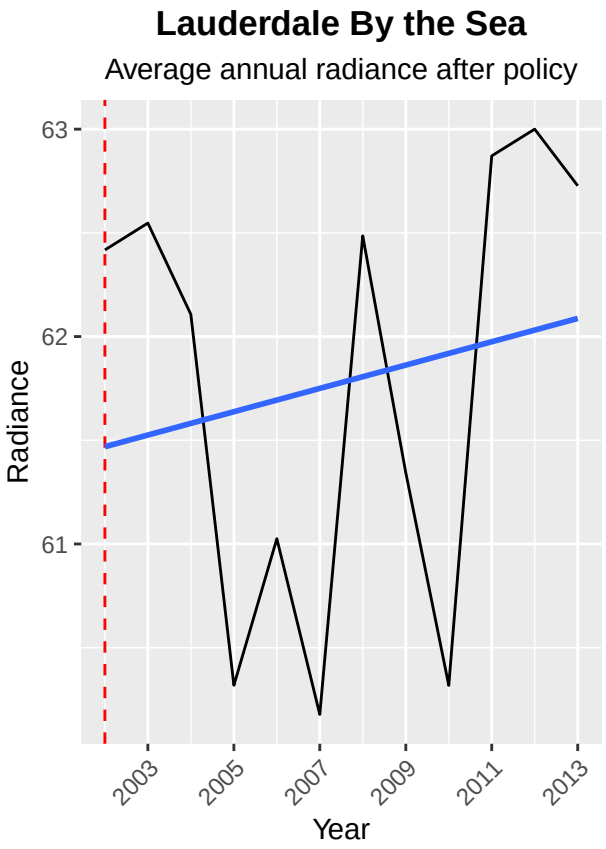



```
LauderdaleBySea.plotB <-
 ggplot(LauderdaleBySea, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Lauderdale By the Sea", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2002-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2002-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

LauderdaleBySea.plotB
```

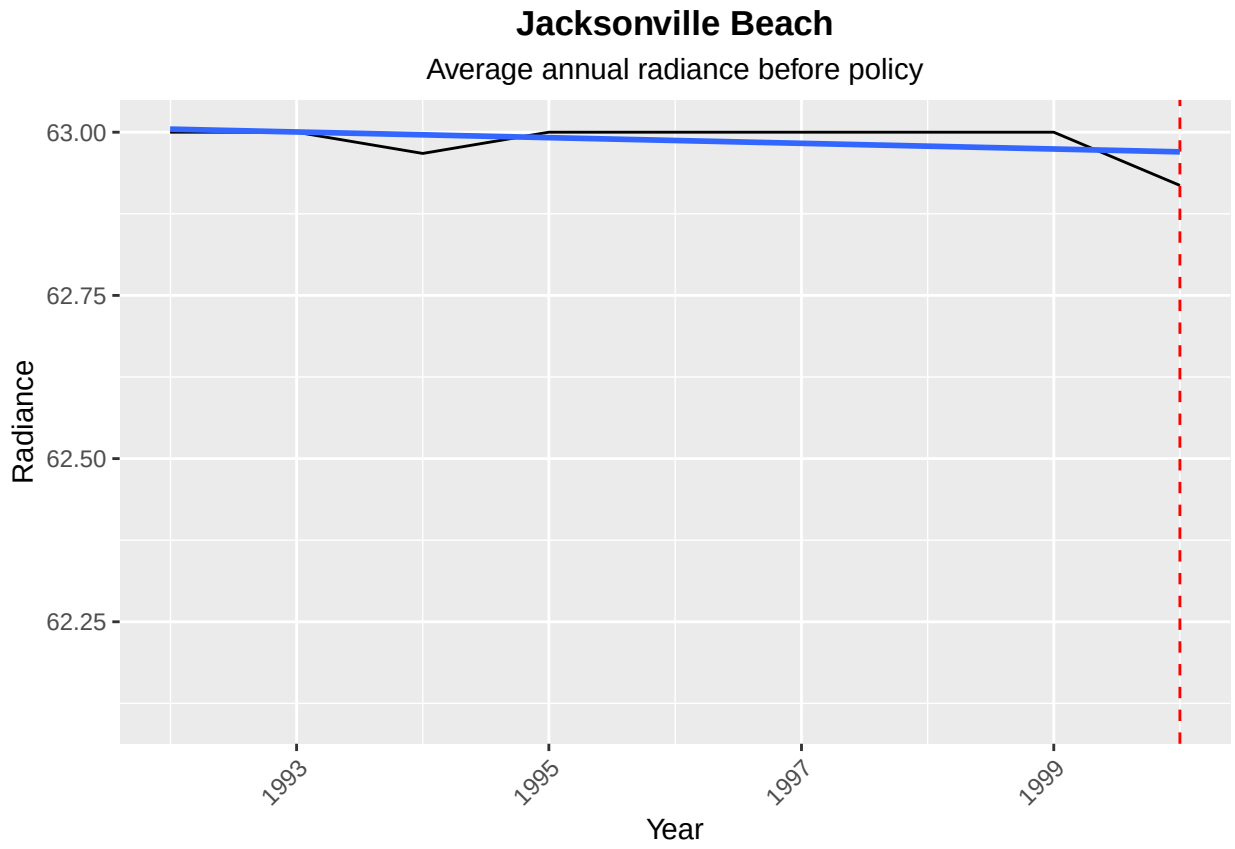



```
plot_grid(LauderdaleBySea.plotA, LauderdaleBySea.plotB, nrow=1, align='h')
```

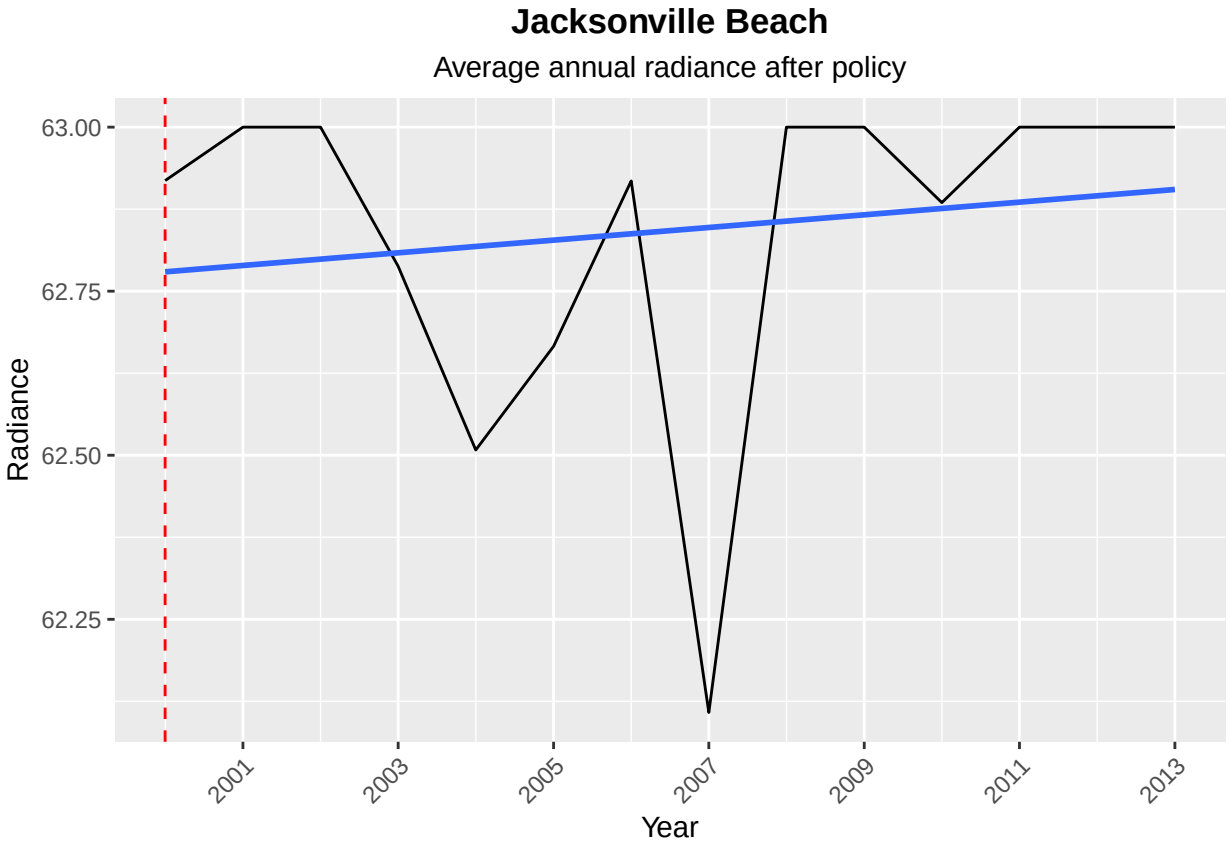




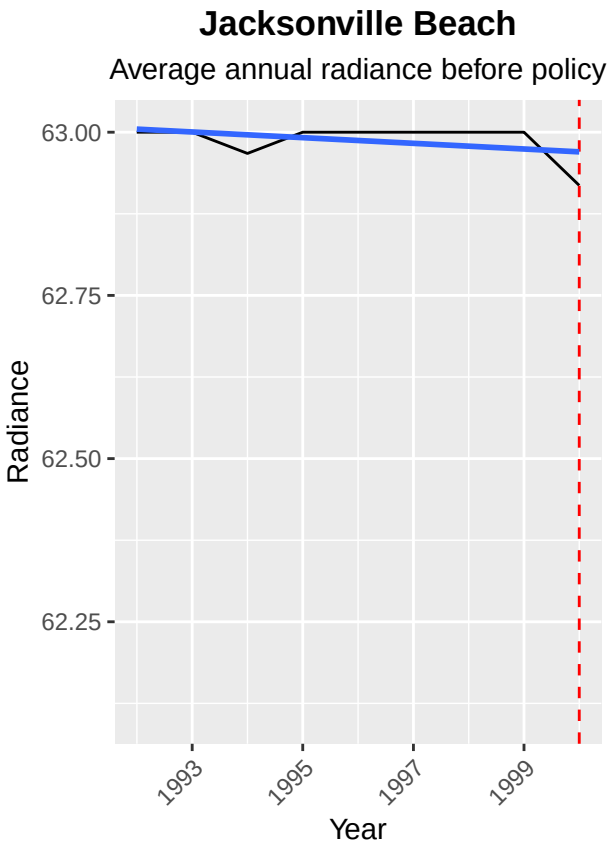

```
#Jacksonville Beach
JacksonvilleBeach <- Radiance_data_long_filtered %>%
  filter(County == "Jacksonville beach")

JacksonvilleBeach.plotA <-
 ggplot(JacksonvilleBeach, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Jacksonville Beach", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2000-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2000-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

JacksonvilleBeach.plotA
```

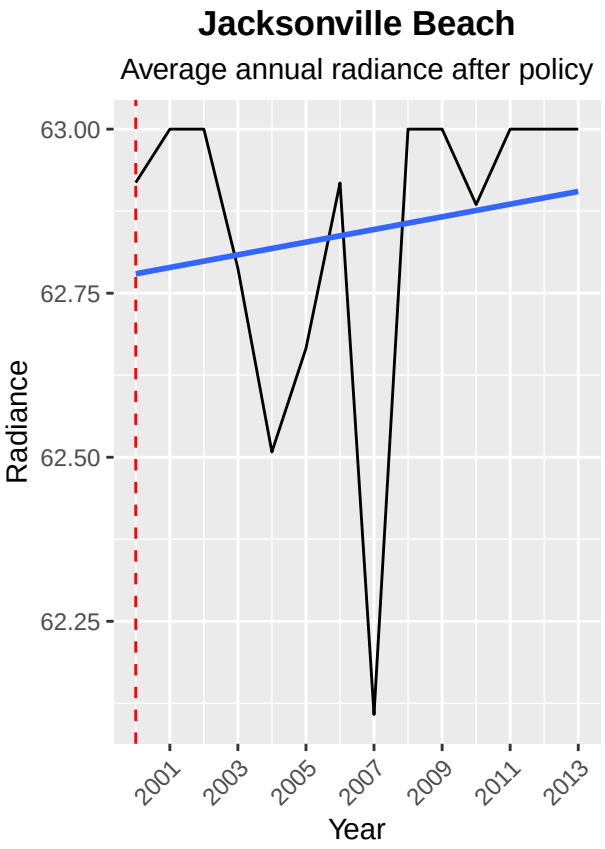



```
JacksonvilleBeach.plotB <-
 ggplot(JacksonvilleBeach, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Jacksonville Beach", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2000-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2000-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

JacksonvilleBeach.plotB
```

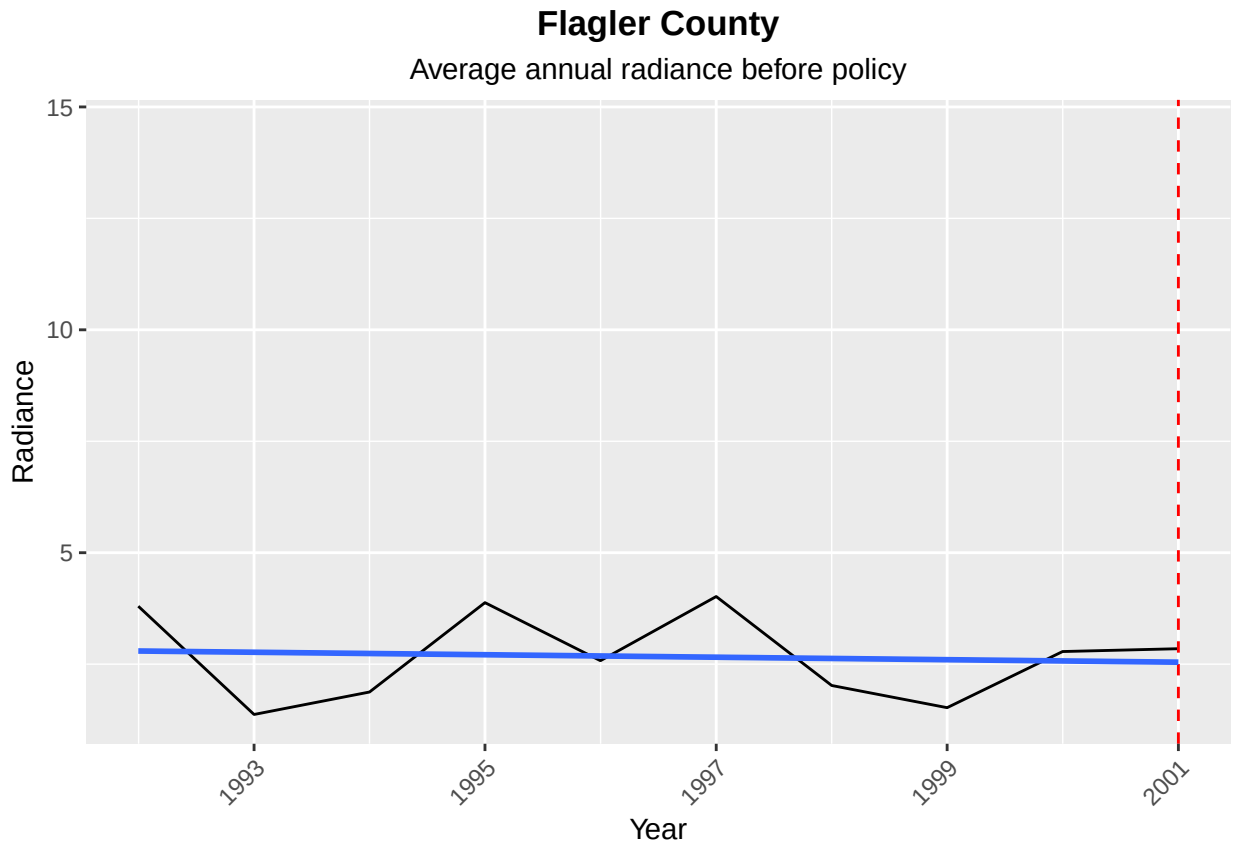



```
plot_grid(JacksonvilleBeach.plotA, JacksonvilleBeach.plotB, nrow=1, align='h')
```

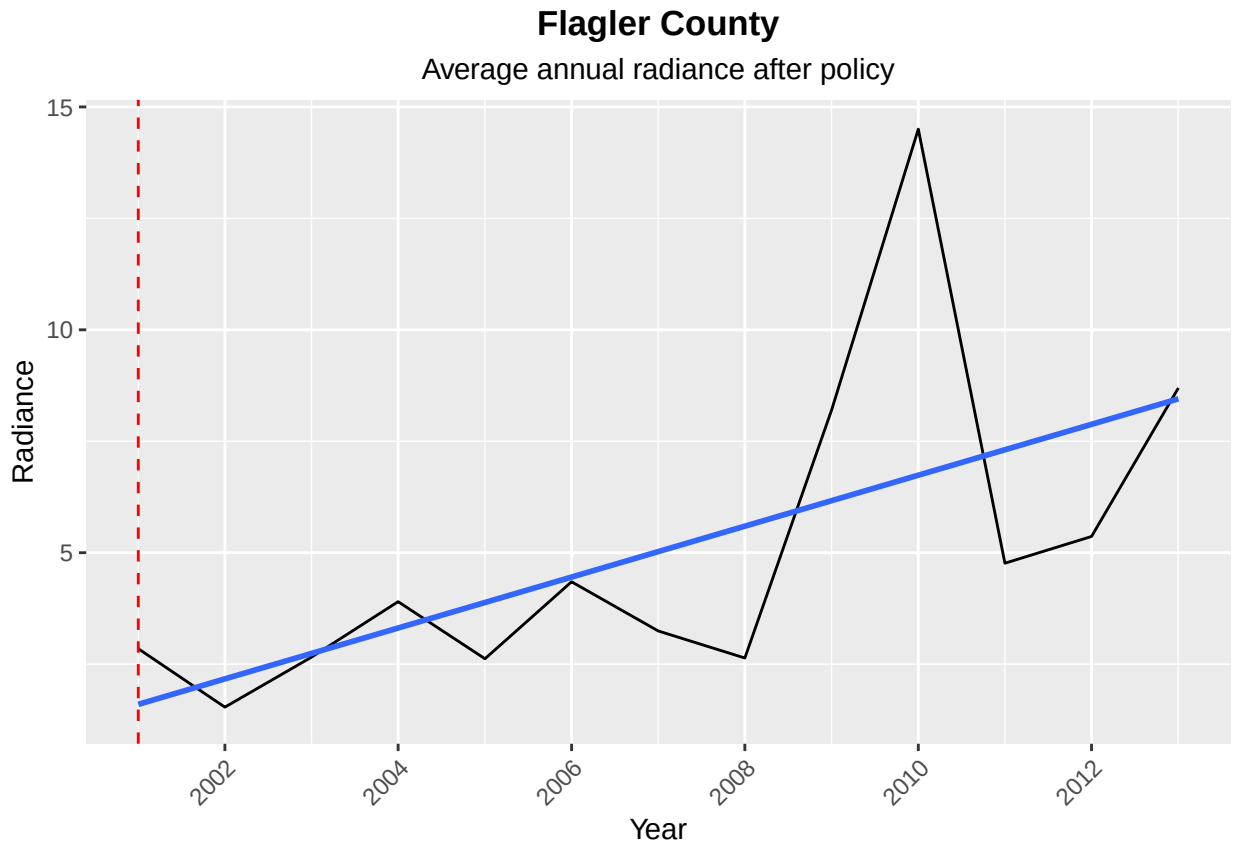




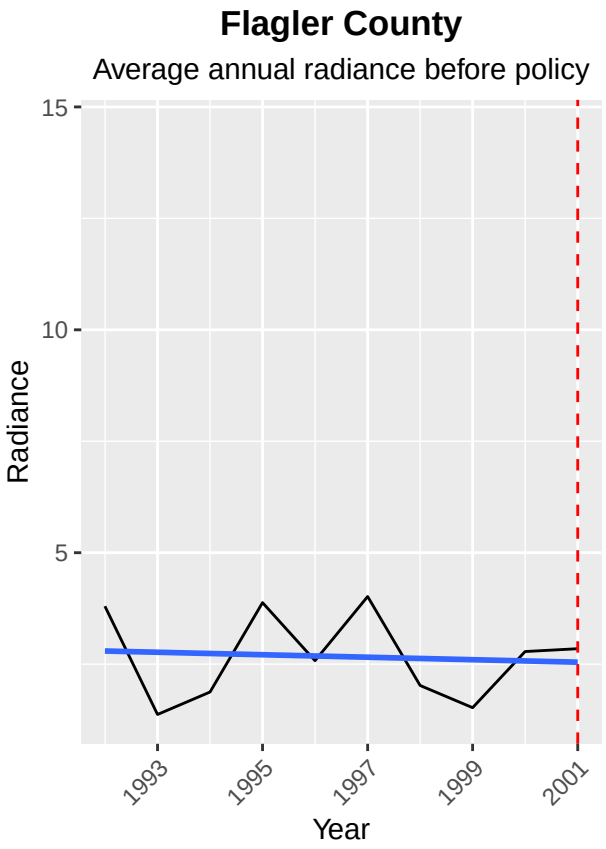

```
#Flagler County
FlaglerCounty <- Radiance_data_long_filtered %>%
  filter(County == "Flagler COunty")

FlaglerCounty.plotA <-
 ggplot(FlaglerCounty, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Flagler County", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2001-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2001-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

FlaglerCounty.plotA
```

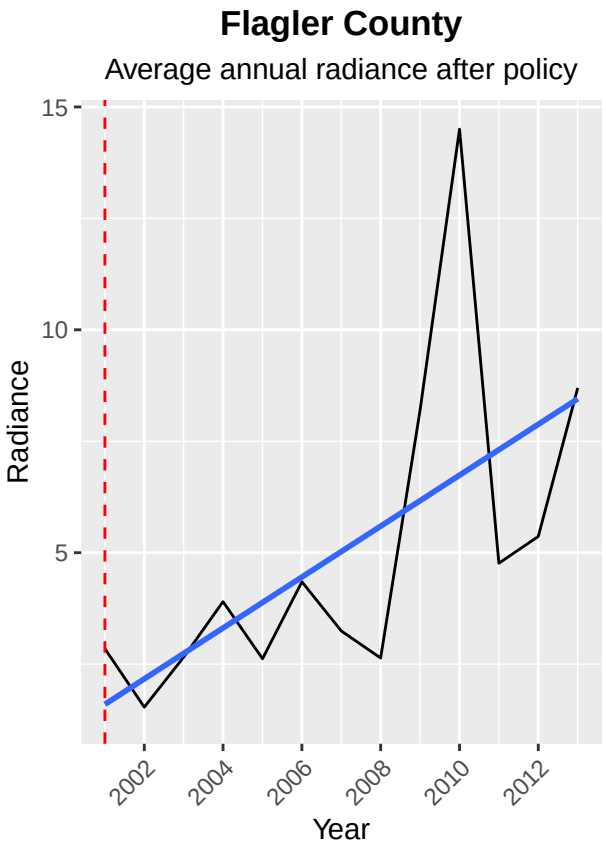



```
FlaglerCounty.plotB <-
 ggplot(FlaglerCounty, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Flagler County", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2001-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2001-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

FlaglerCounty.plotB
```

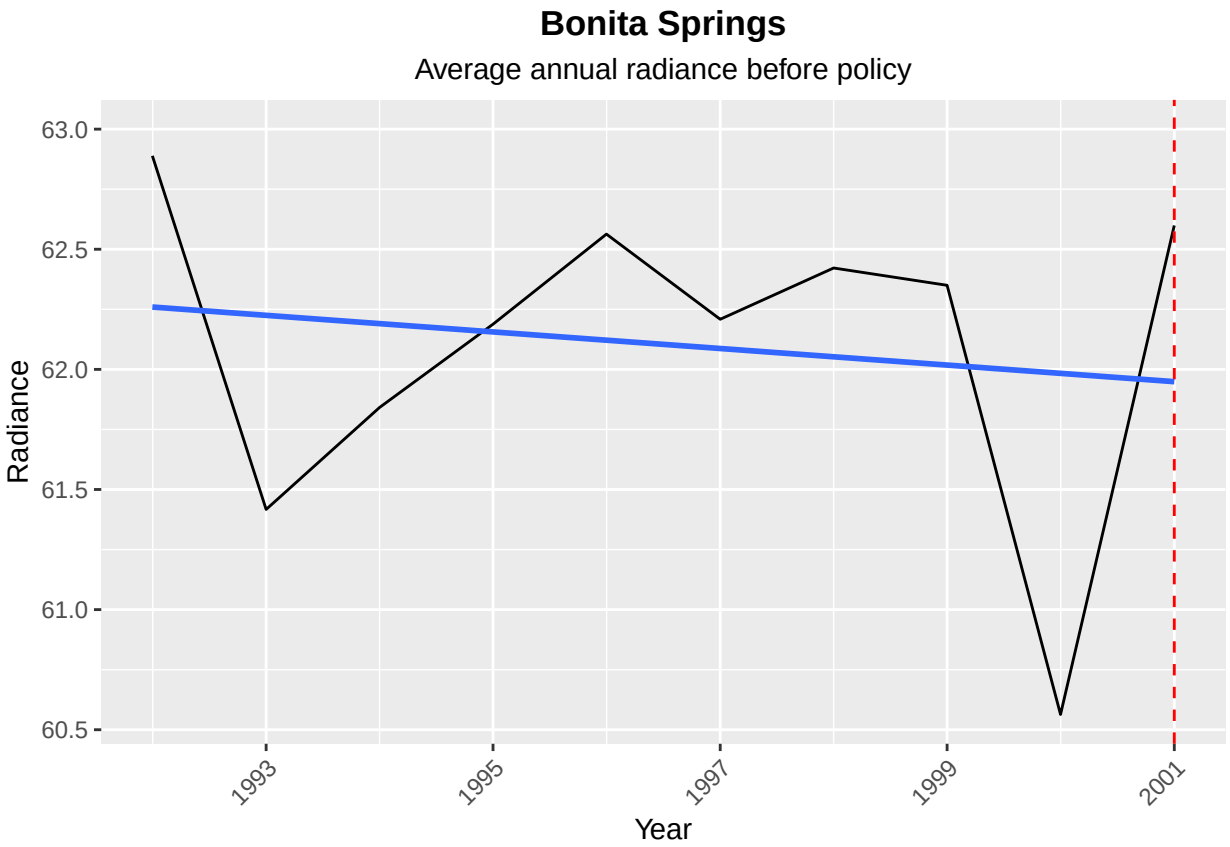



```
plot_grid(FlaglerCounty.plotA, FlaglerCounty.plotB, nrow=1, align='h')
```

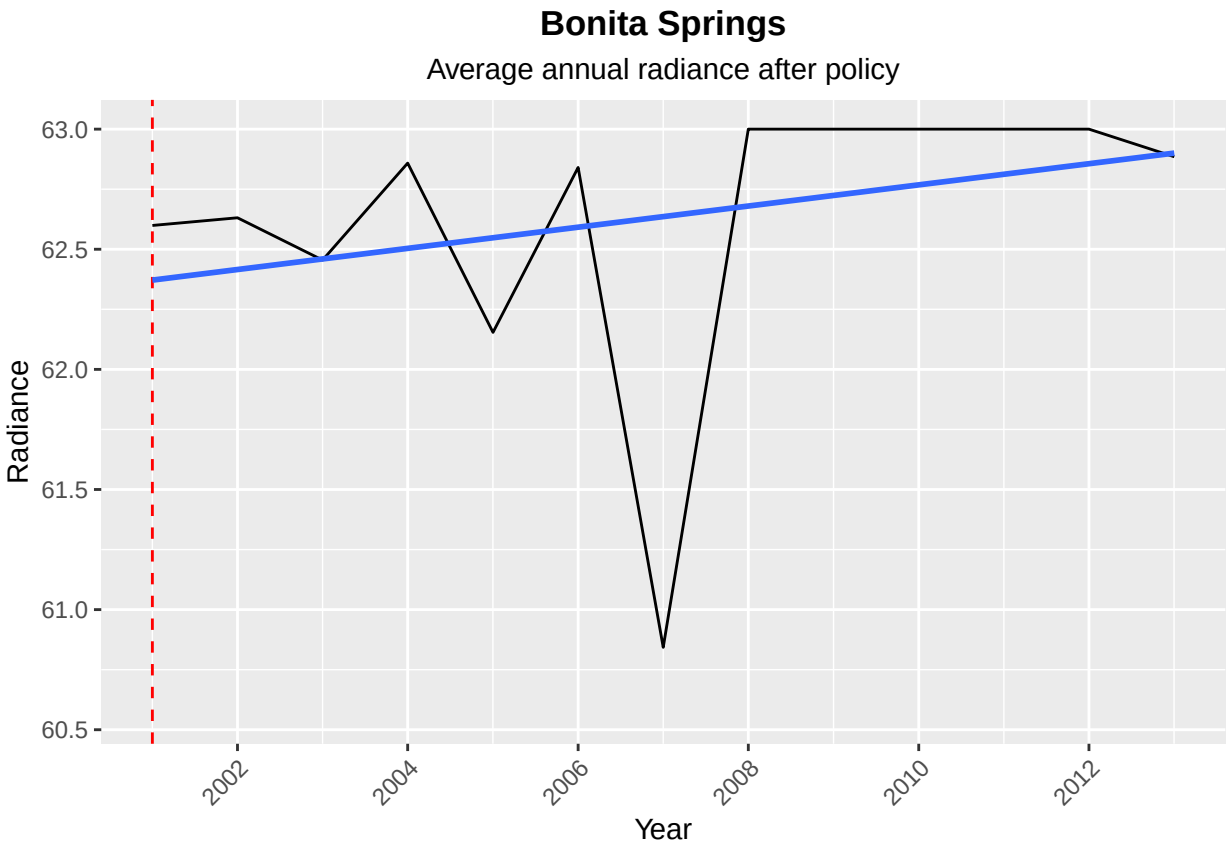




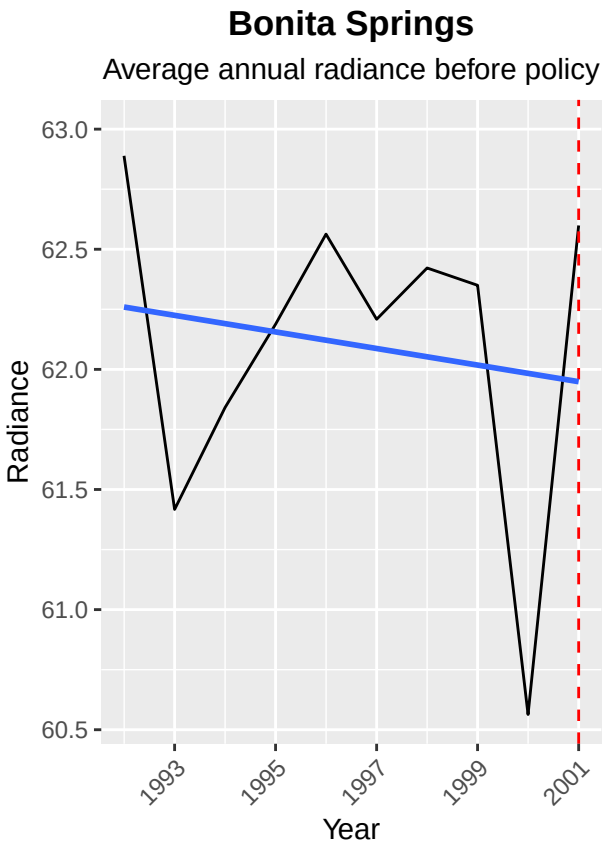

```
#Bonita Springs
BonitaSprings <- Radiance_data_long_filtered %>%
  filter(County == "Bonita SPrings")

BonitaSprings.plotA <-
 ggplot(BonitaSprings, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Bonita Springs", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2001-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2001-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

BonitaSprings.plotA
```

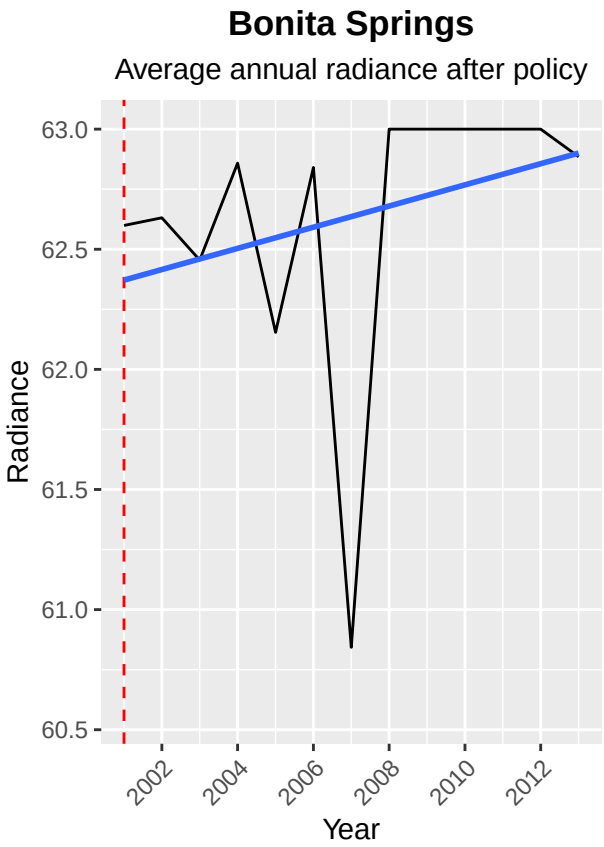



```
BonitaSprings.plotB <-
 ggplot(BonitaSprings, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Bonita Springs", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2001-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2001-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

BonitaSprings.plotB
```

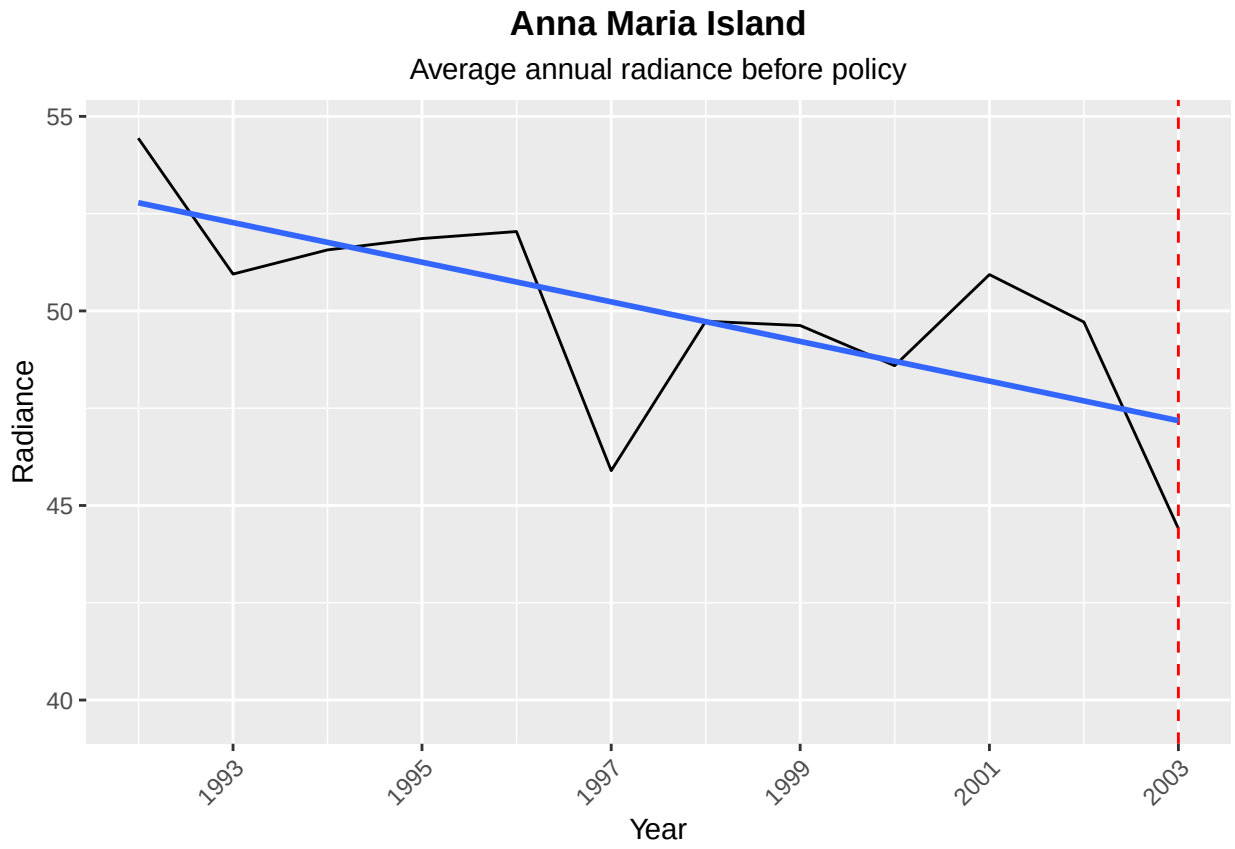



```
plot_grid(BonitaSprings.plotA, BonitaSprings.plotB, nrow=1, align='h')
```

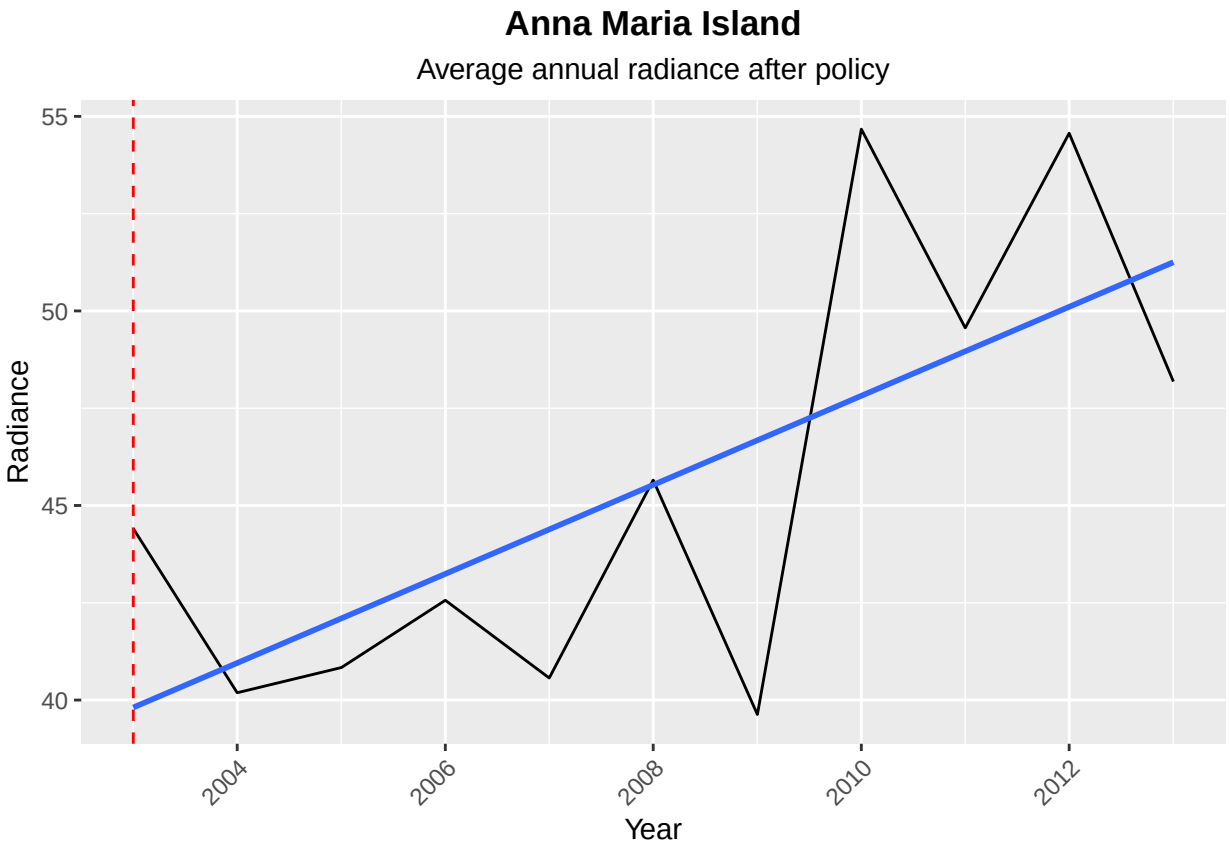




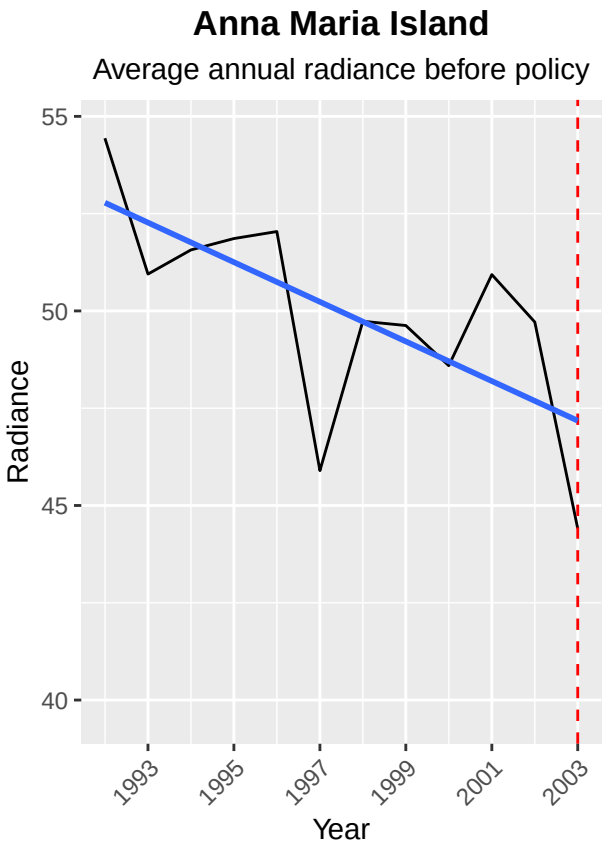

```
#Anna Maria Island
AnnaMariaIsland <- Radiance_data_long_filtered %>%
  filter(County == "Anna Maria Island")

AnnaMariaIsland.plotA <-
 ggplot(AnnaMariaIsland, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Anna Maria Island", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2003-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2003-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

AnnaMariaIsland.plotA
```

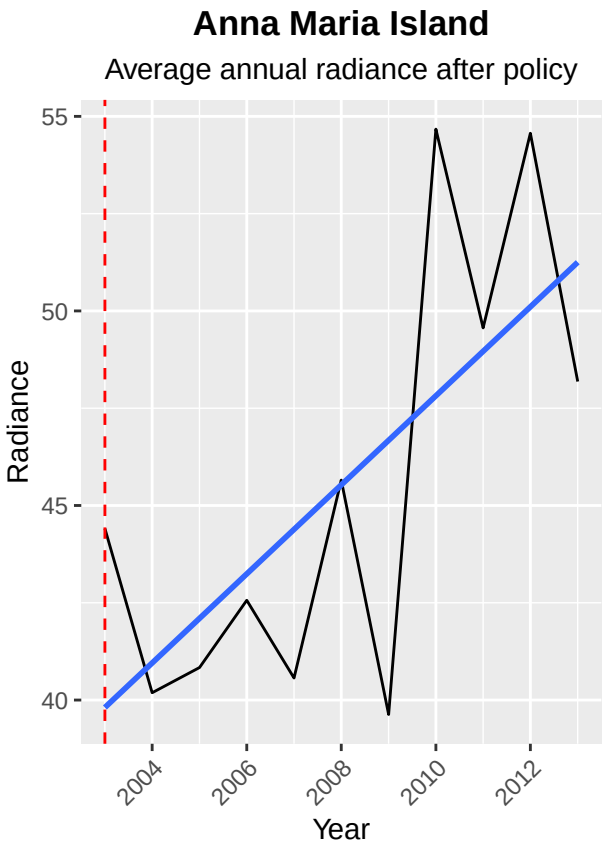



```
AnnaMariaIsland.plotB <-
 ggplot(AnnaMariaIsland, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Anna Maria Island", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2003-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2003-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

AnnaMariaIsland.plotB
```

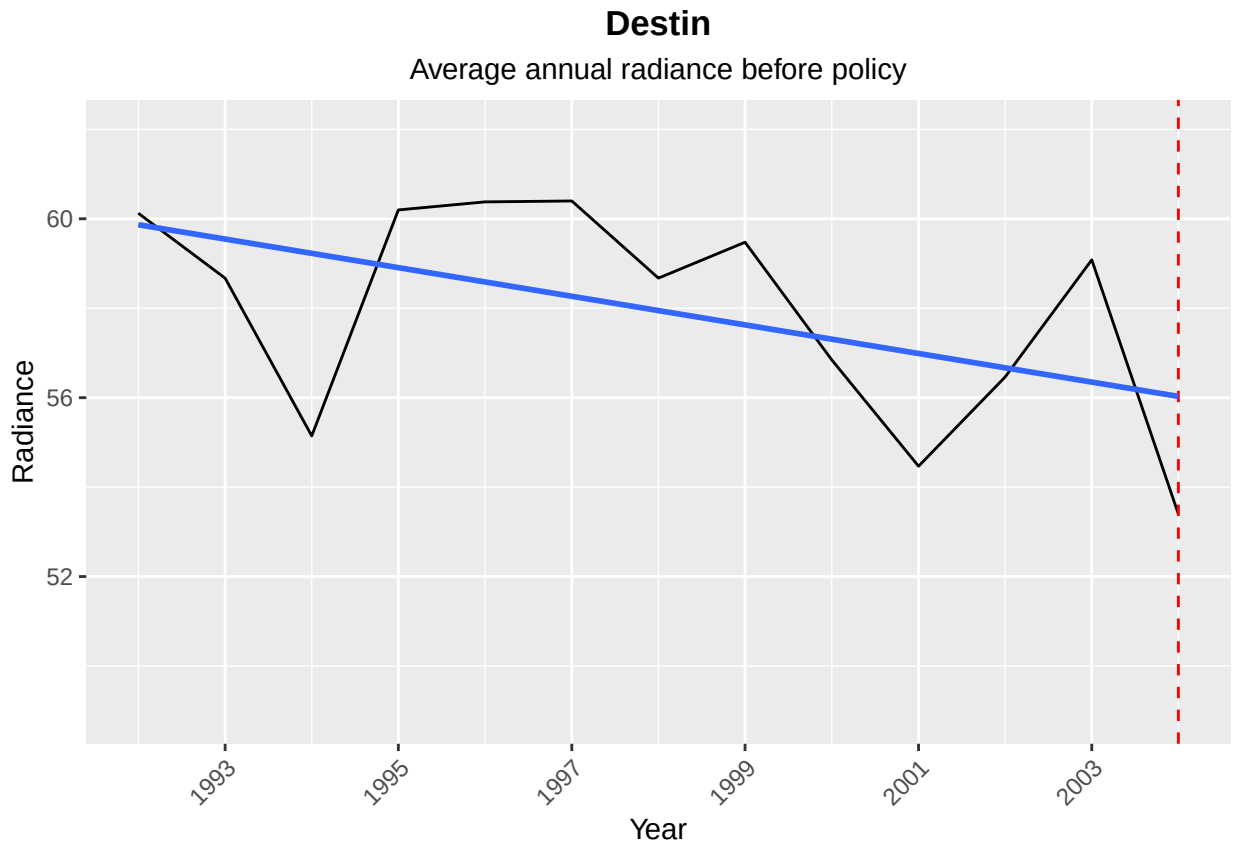



```
plot_grid(AnnaMariaIsland.plotA, AnnaMariaIsland.plotB, nrow=1, align='h')
```

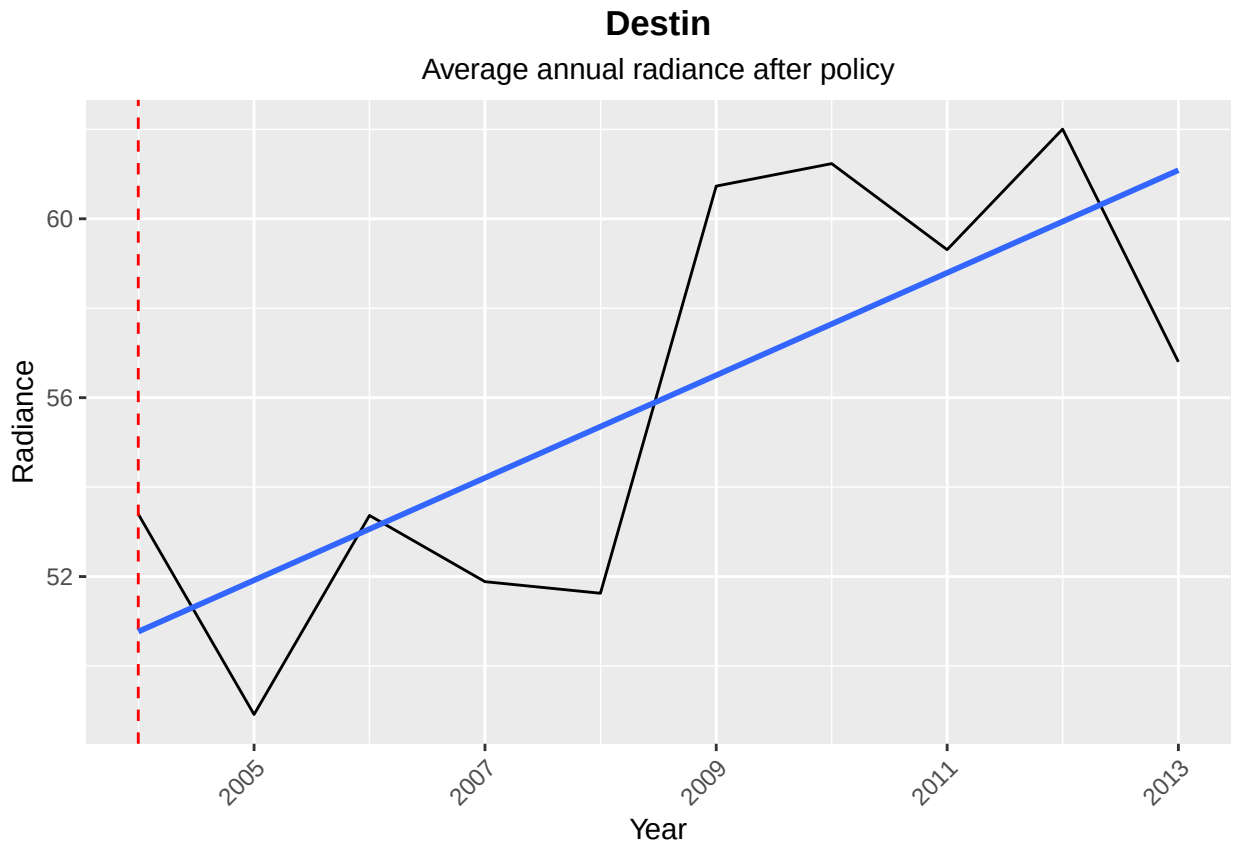




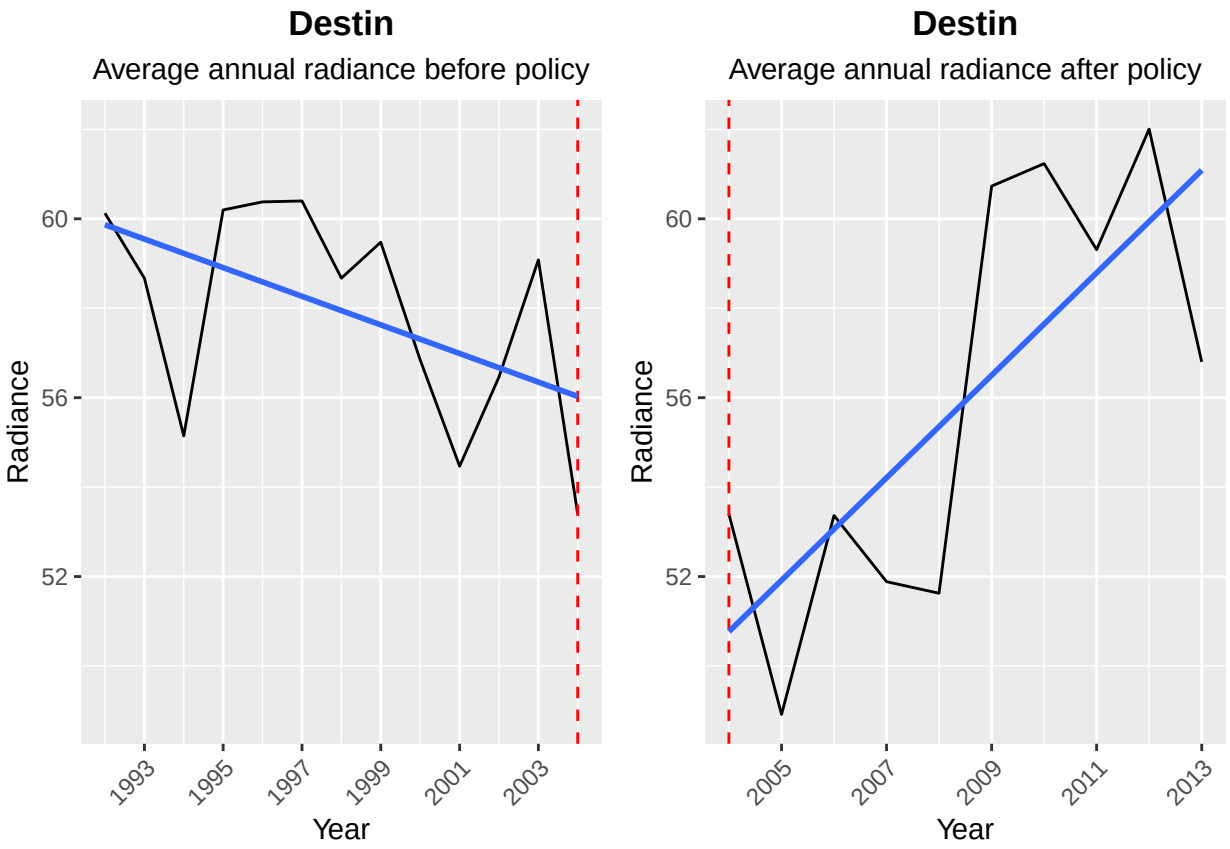

```
#Destin
Destin <- Radiance_data_long_filtered %>%
  filter(County == "Destin")

Destin.plotA <-
 ggplot(Destin, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Destin", subtitle= "Average annual radiance before policy")+
  geom_vline(xintercept = as.numeric(ymd("2004-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("1992-01-01","2004-01-01")), date_breaks = "2 years", date_labels = "%Y
  geom_smooth(method = "lm", se = FALSE)

Destin.plotA
```




```
Destin.plotB <-
 ggplot(Destin, aes (x=Date, y=value))+
  geom_line()+
  labs(x="Year", y="Radiance")+
  ggtitle("Destin", subtitle= "Average annual radiance after policy")+
  geom_vline(xintercept = as.numeric(ymd("2004-01-01")), lty=2, color ="red")+
  theme(plot.title=element_text(hjust=0.5, face="bold"), plot.subtitle = element_text(hjust=0.5))+
  theme(axis.text.x = element_text(angle=45, hjust=1))+
  scale_x_date(limits=as.Date(c("2004-01-01", "2013-01-01")), date_breaks = "2 years", date_labels = "%
  geom_smooth(method = "lm", se = FALSE)

Destin.plotB
```




```
plot_grid(Destin.plotA, Destin.plotB, nrow=1, align='h')
```



Locations with no obvious differences before and after policy (whether increasing or decreasing trends)

Results Summary *

Analysis