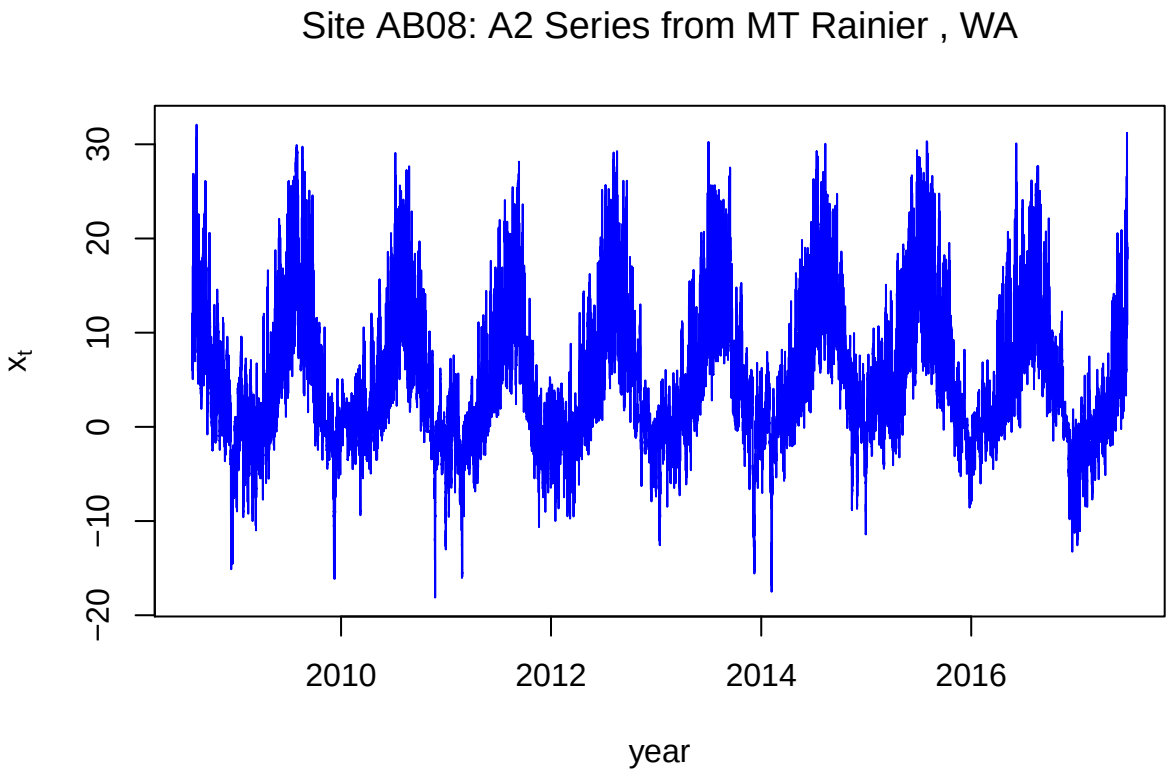
Analysis-RTS

Analysis Mt Rainier

I analyze the Mt Rainier data to see if the sites are warming at the same pace or not. My hypothesis is that there would be warming across the mountain, but some sites would be more buffered than the other.

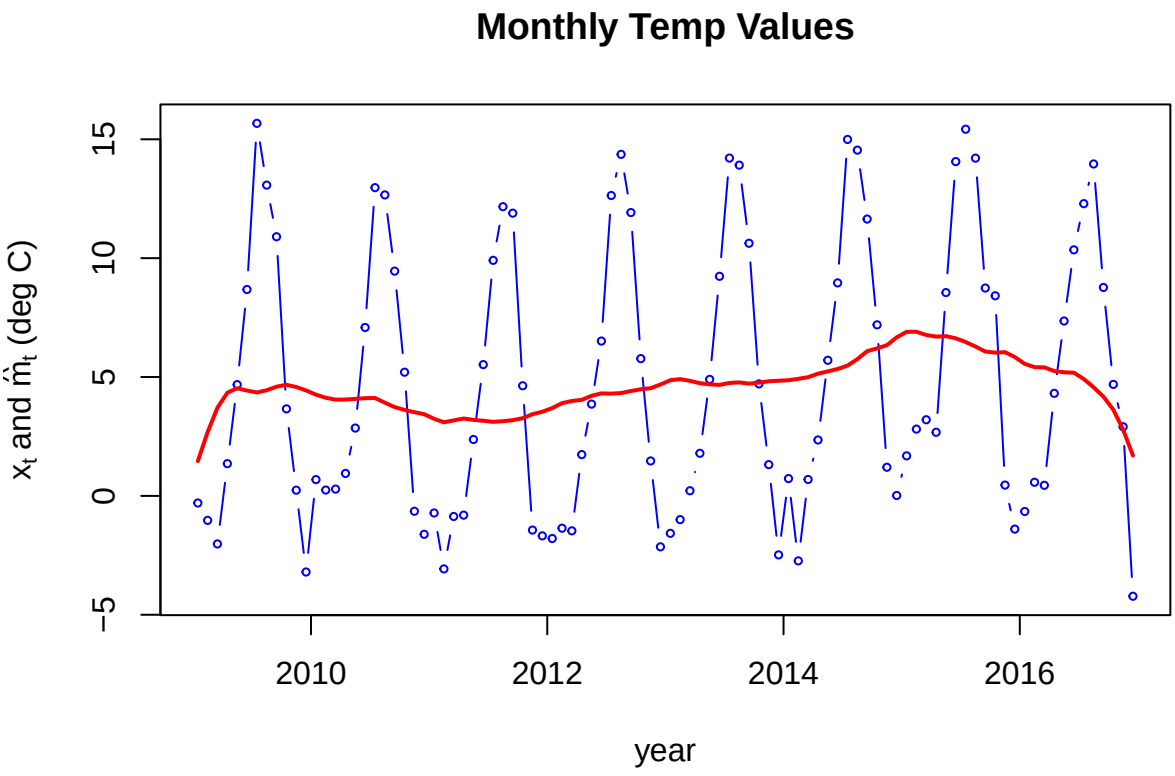
Several studies have shown that anthrogrenic impacts have evidenced as regions warming(cite). The melting of ice in Arctic to the increase in CO2(cite) are some of the prominent studies affirming the impacts. Although many studies show the perils, there are many who have assesed the conservation efforts to help preserve what is left(cite).

Mt Rainier was an important choice, as montanes hold some of the worlds preserved biodiversity.

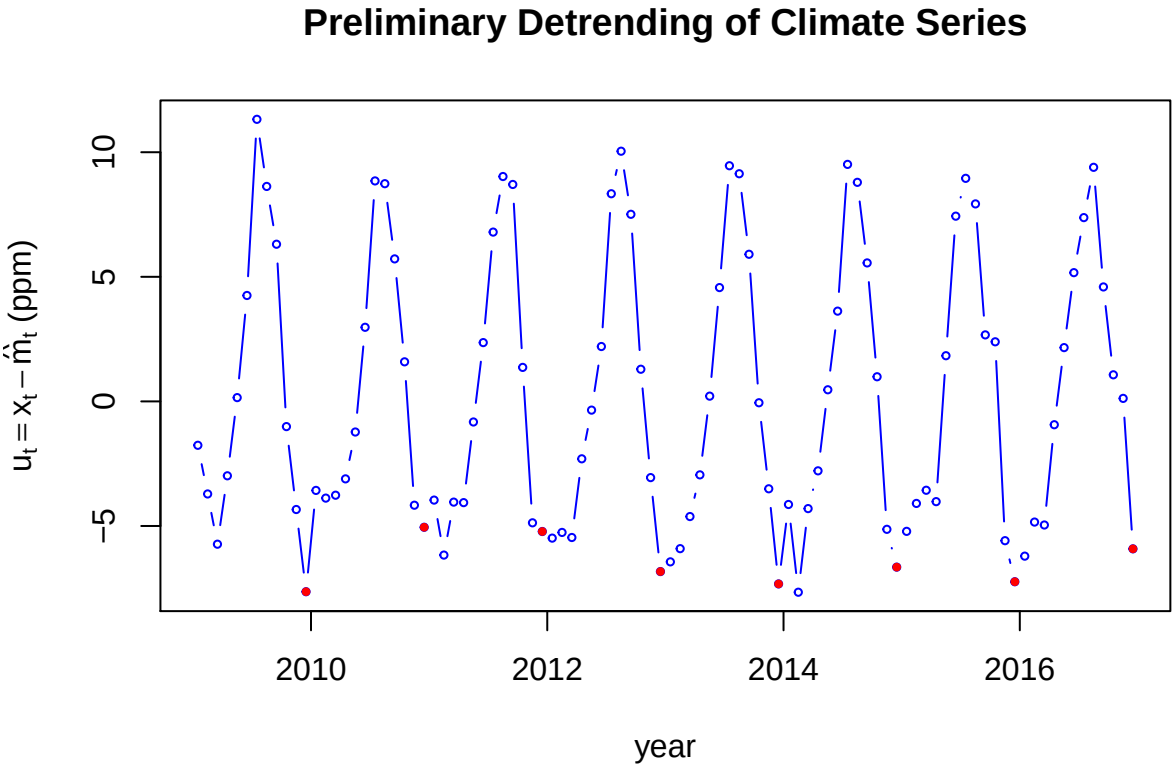


Seasonal component taken out

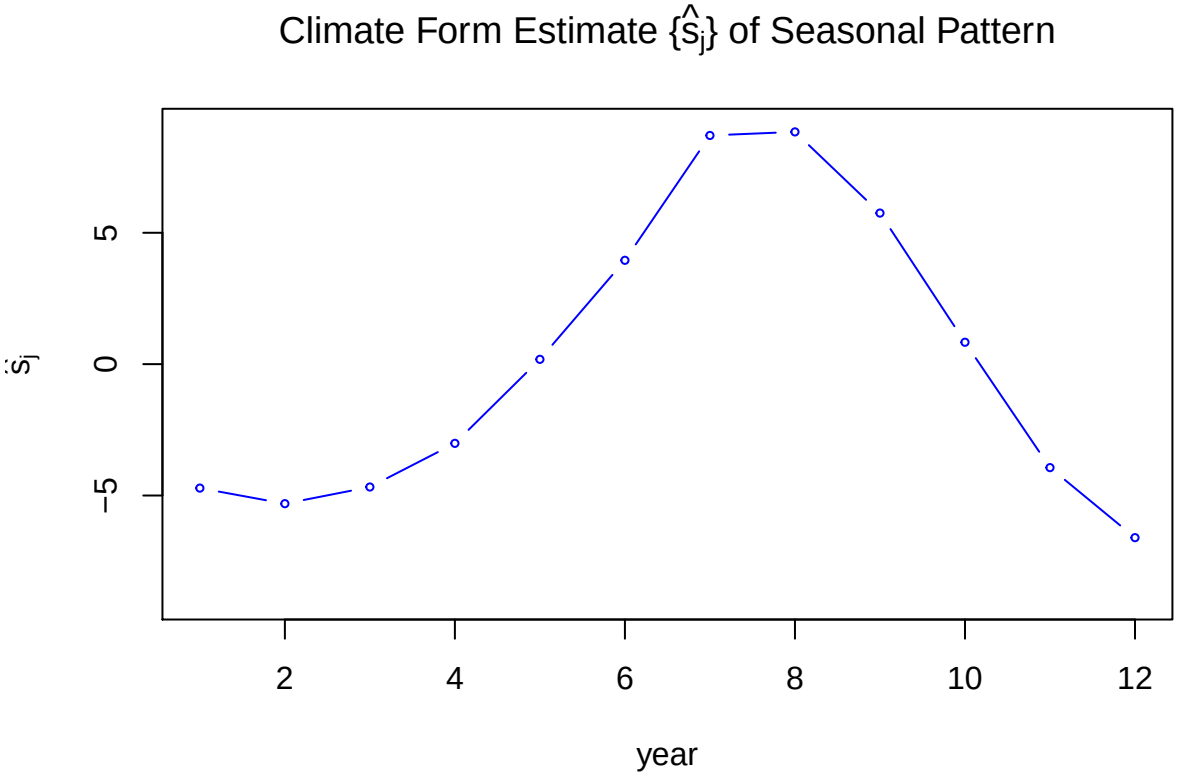
Use a smoothing filter to take the seasonal component out



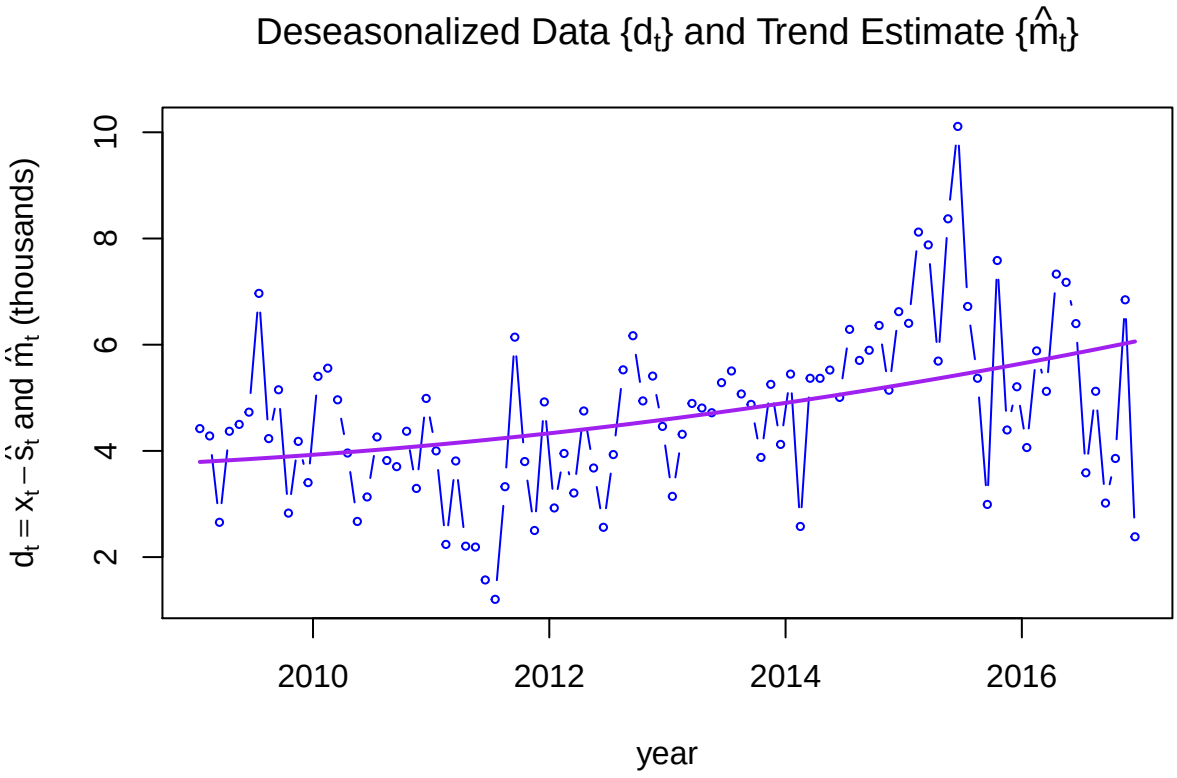
Removing the trend component.



Extracting for one year to show the seasonal pattern.

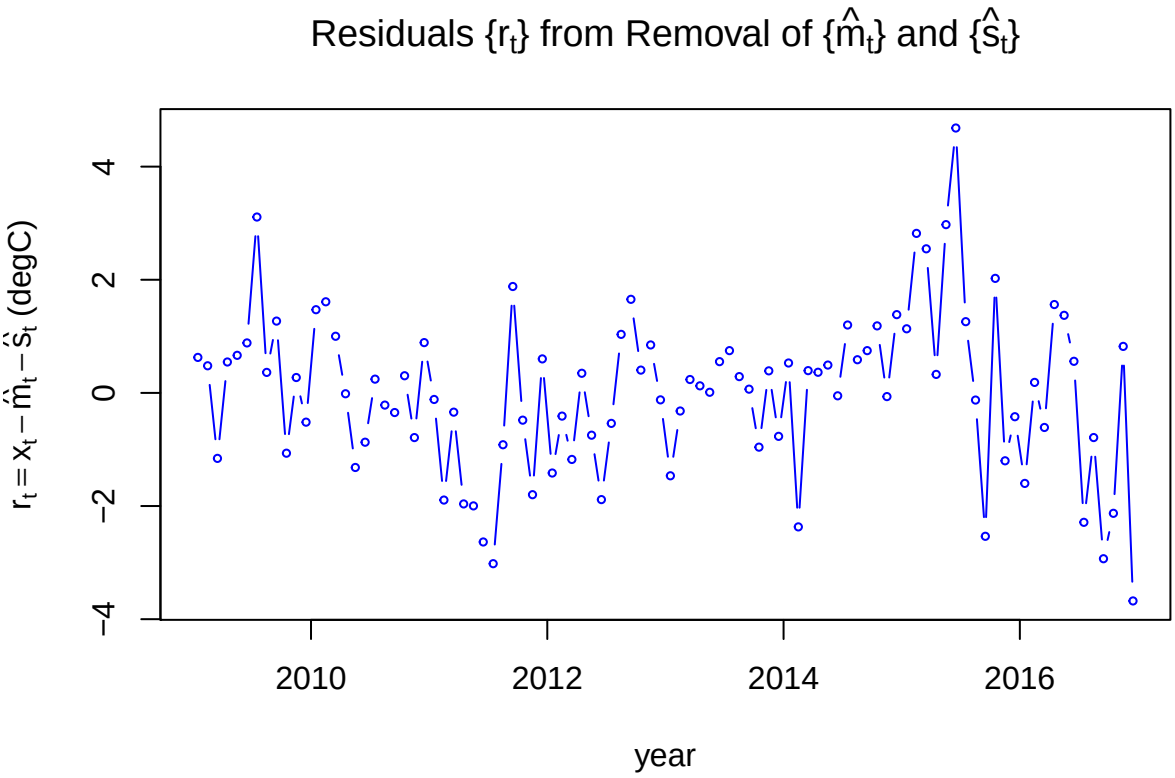


Deasonalized data with trend estimate



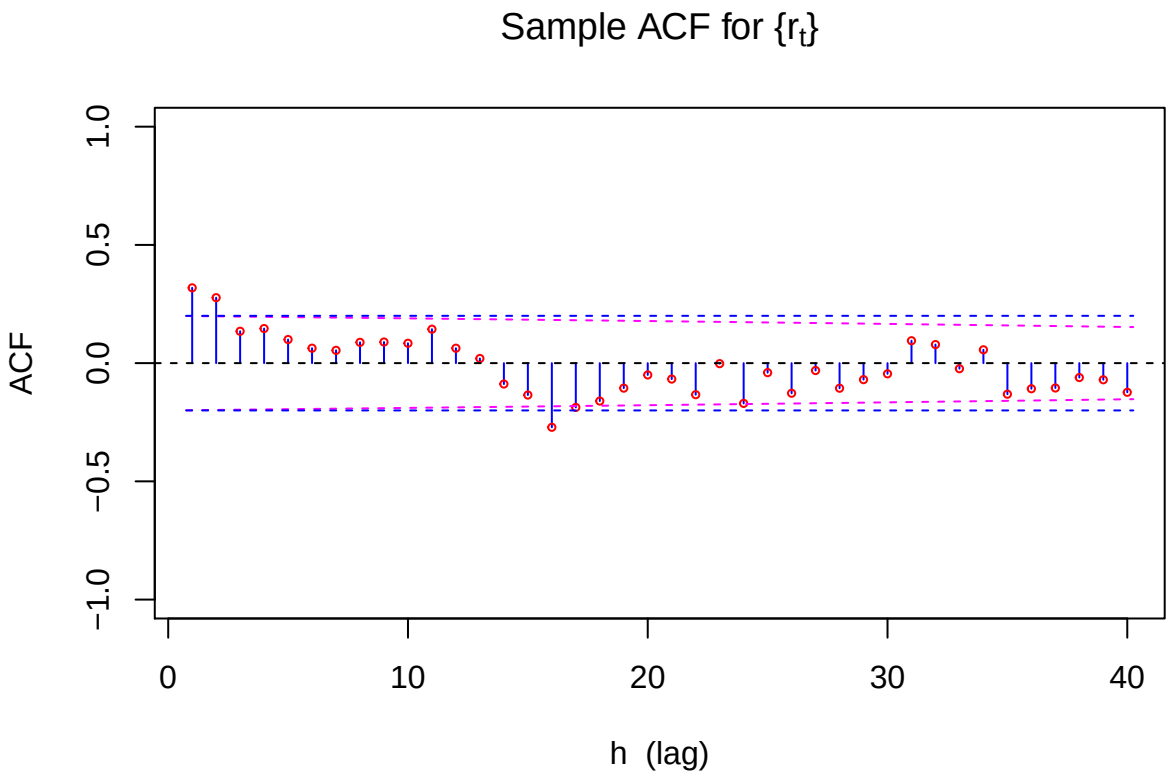
#

Residuals removed (WN ?)



ACF of Residuals

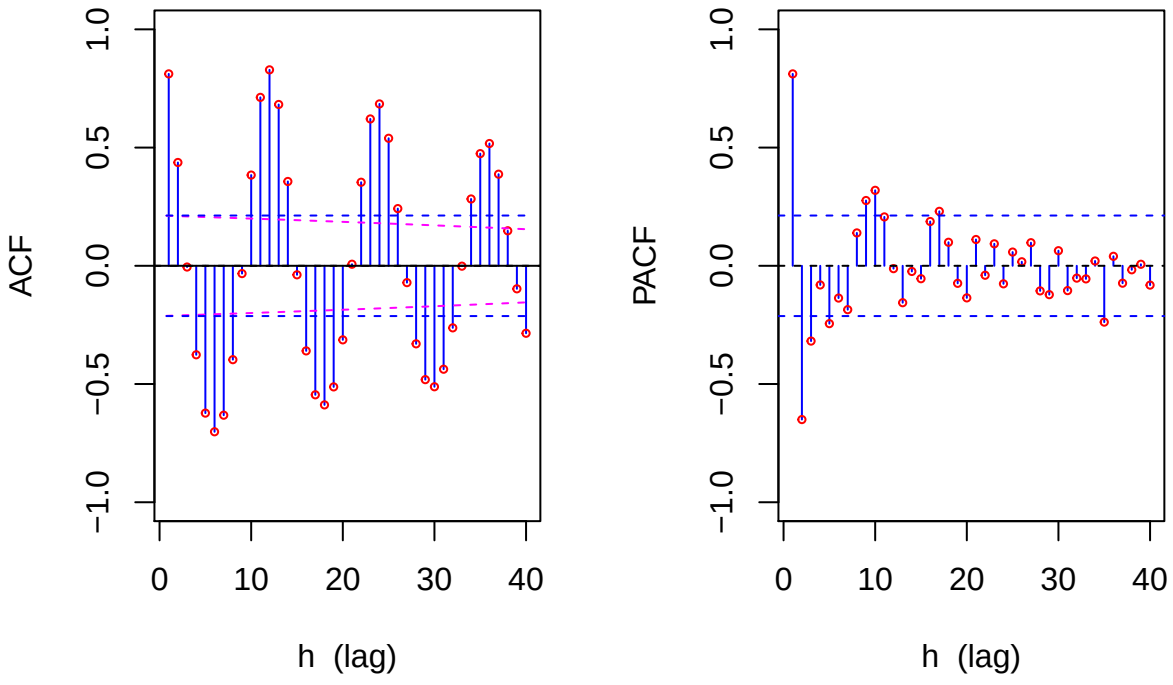
5% test



Comparison when not deasonalized

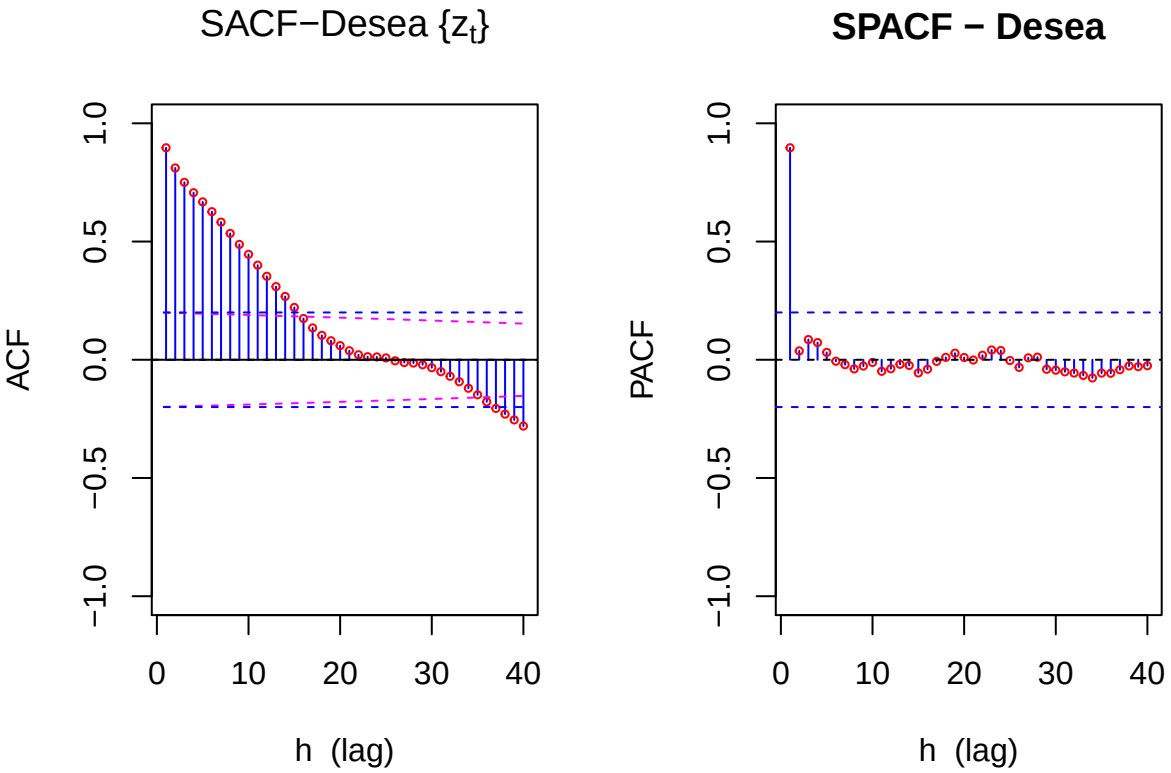
```
## [1] 0.8116755
```

Sample ACF Mt Rainier for (Water Yea**nple PACF for Mt Rainier Series(Wat**



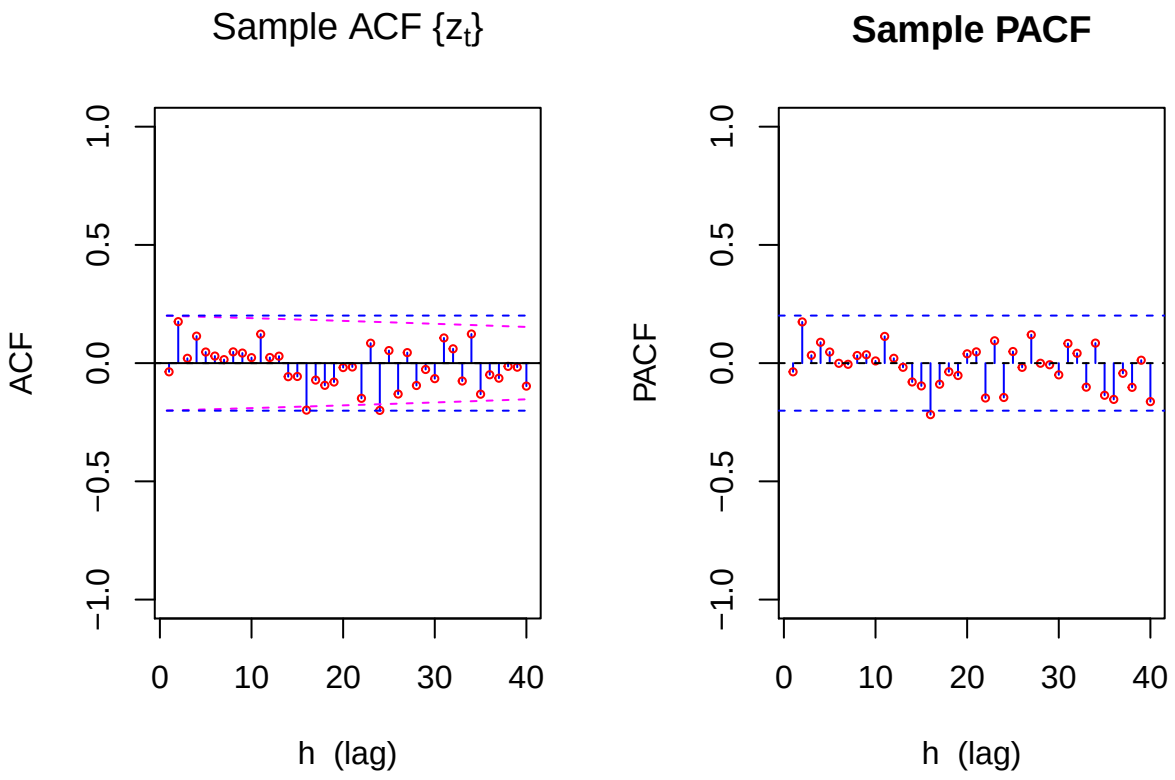
lets just analyze deseasonalized PACF and ACF (calendar year)

```
## [1] 0.8966148
```

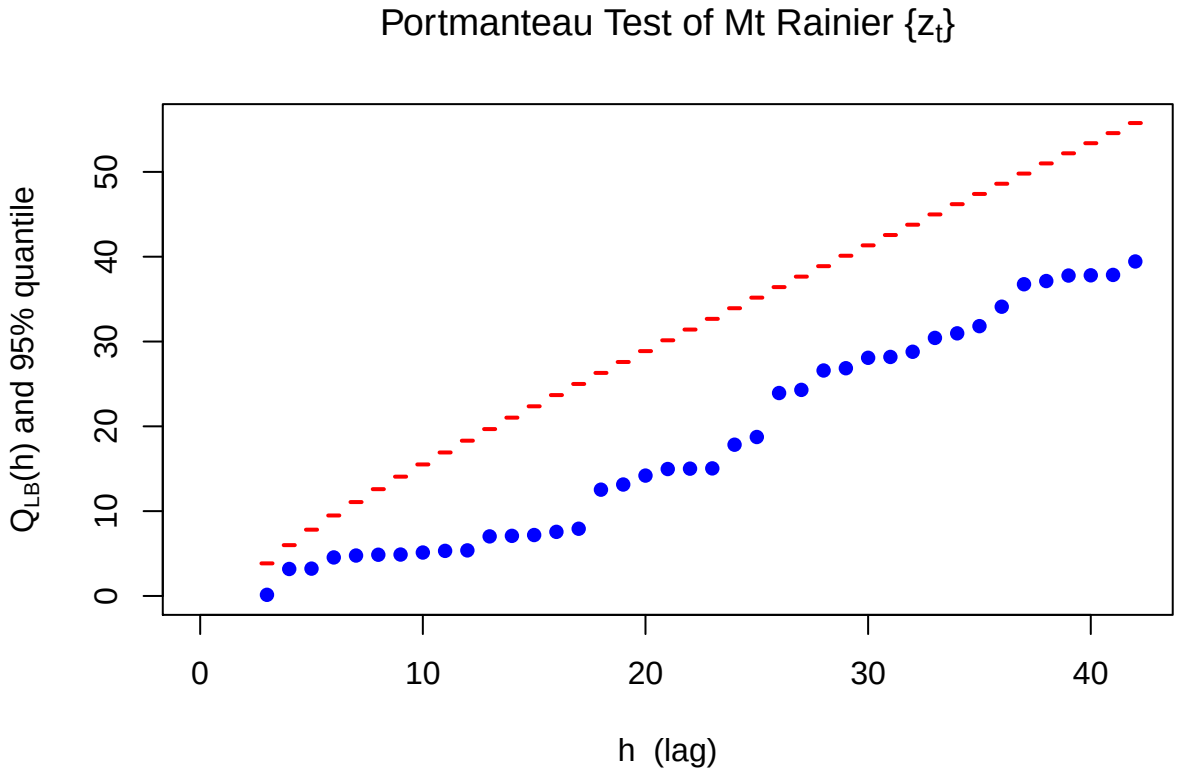


Inspect the ACF and PACF of the desea/detre series

```
## [1] -0.03679968
```



Do a test of IID White Noise



Do turning point test

```
## [1] 62
```

```
## [1] 66
```

```
## [1] 0.326
```

We fail to reject using turning point

Do different sign test

```
## [1] 47
```

```
## [1] 44
```

```
## [1] 0.289
```

We fail to reject using different sign test

We next do Rank test

```
## [1] 2232.5
```

```
## [1] 2277
```

```
## [1] 0.775
```

We fail to reject using rank test

We next do Runs test

```
## [1] 48.4
```

```
## [1] 54
```

```
## [1] 0.244
```

We fail to reject using Runs test

We next do ia AICC to determine if we get any AR orders

```
ar(oneset.z,method="yw")$order
```

```
## [1] 0
```

```
ar(oneset.z,method="burg")$order
```

```
## [1] 0
```

```
ar(oneset.z,method="ols")$order  # 3(?!)
```

```
## [1] 0
```

```r
ar(oneset.z,method="mle")$order
```

```
## [1] 0
```

Confirming, YW,Burg and MLE saying its not AR, but finding orders in others

Below doing it without detrending/desea ACF

```r
ss.acf <- acf(oneset_9yrs_by_month$mean_t, lag.max=40, plot=FALSE)
xs <- 1:40
ys <- ss.acf$acf[2:41]
plot(xs,ys,typ="h",xlab="h  (lag)",ylab="ACF",ylim=c(-1,1),col="blue",main="Sample ACF for Mt Rainier S
points(xs,ys,col="red",cex=0.5)
n.ss <- length(oneset_9yrs_by_month$mean_t)
CI.hw <- 1.96/sqrt(n.ss)
abline(h=0,lty="dashed")
abline(h=c(-CI.hw,CI.hw),col="blue",lty="dashed")
xs <- 1:50
lines(xs,1.96*sqrt(n.ss-xs)/n.ss,col="magenta",lty="dashed")
lines(xs,-1.96*sqrt(n.ss-xs)/n.ss,col="magenta",lty="dashed")
```