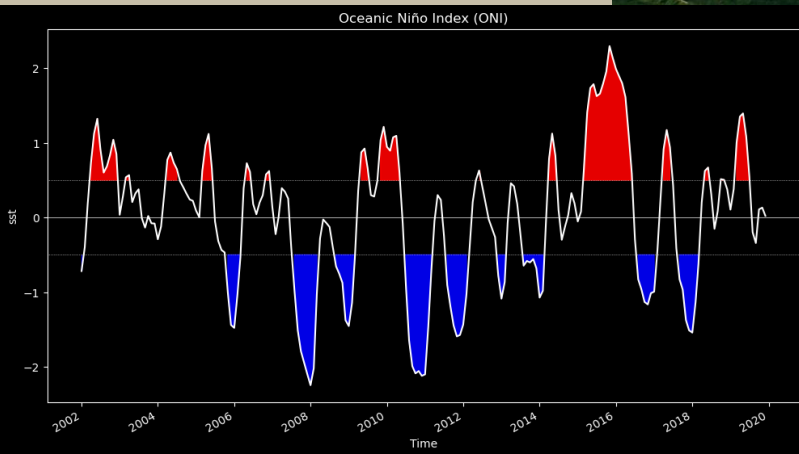


# Impact of ENSO on Wildfires

Group:  
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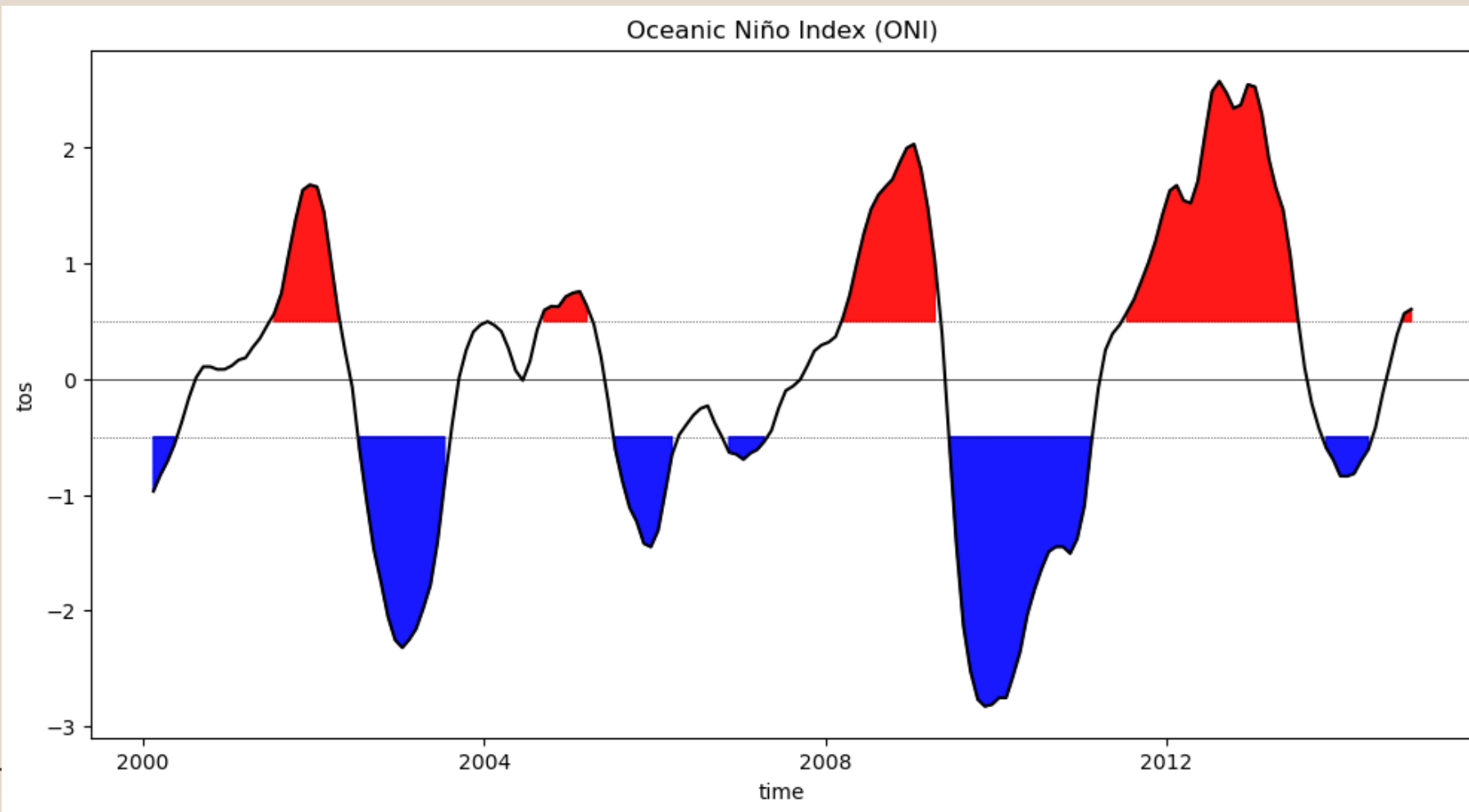
# Problem: ENSO and Wildfire

## Hypotheses

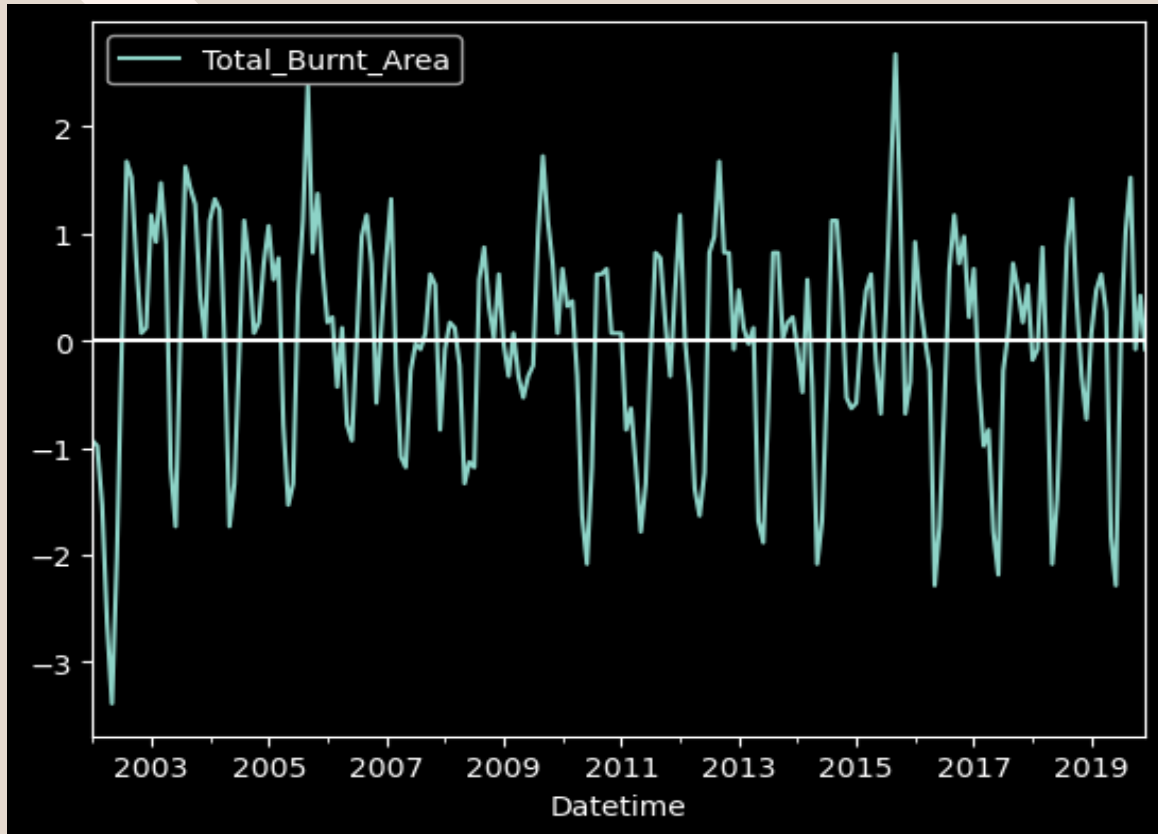
[H1] The Onset of El Nino causes an increase in the frequency and severity (Burnt Area) of Wildfires while onset of La Nina is having a reverse effect. The land Use/land cover has an effect on the frequency distribution of wildfires controlled with ENSO onset

Dataset	Variables	Time resol	WildFire	Land use
Global Wildfire Information System (GWIS)	1. Sea Surface Temperature	Monthly	Frequency	Forest
Monthly global Sea Surface Temperature (SST) data from the CESM2 v2	2. Wildfire frequency	Yearly	Burnt Area	Agriculture
ESA Copernicus Land Use Land Cover dataset	3. Area burnt for each wildfire		Geographical Distribution	Shrub and Grassland
Methodology	4. Land use/Land cover		South America(-5,5: 190,240)	Wetlands
Mutual Info regressor	5. Date Time		Africa(-4,-13: -2,-17)	Settlements
Pearson Correlation			AsiaLat(6,12), Lon(162,176)	Other

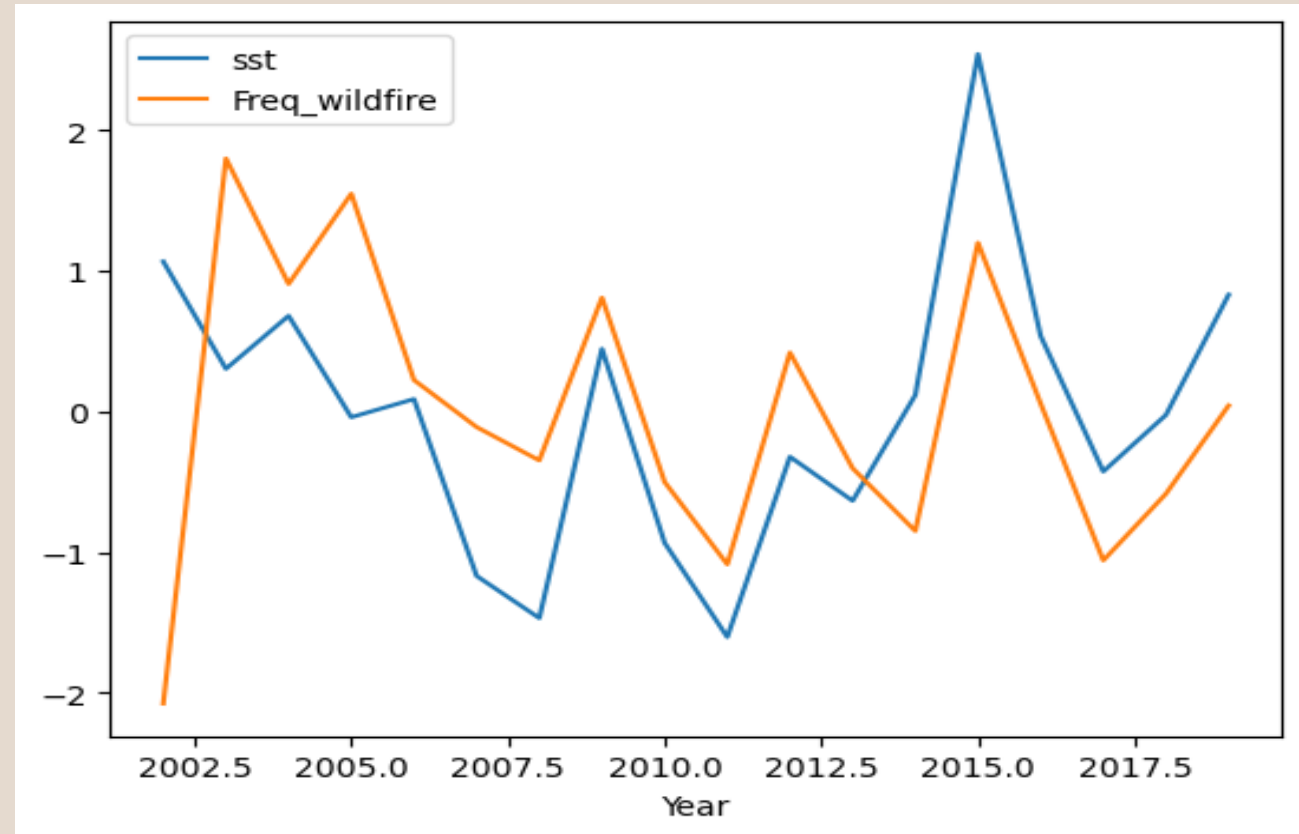
Now We all Know this



El-Nino event of 2015/2016



South America



# Yearly Analysis- Asia

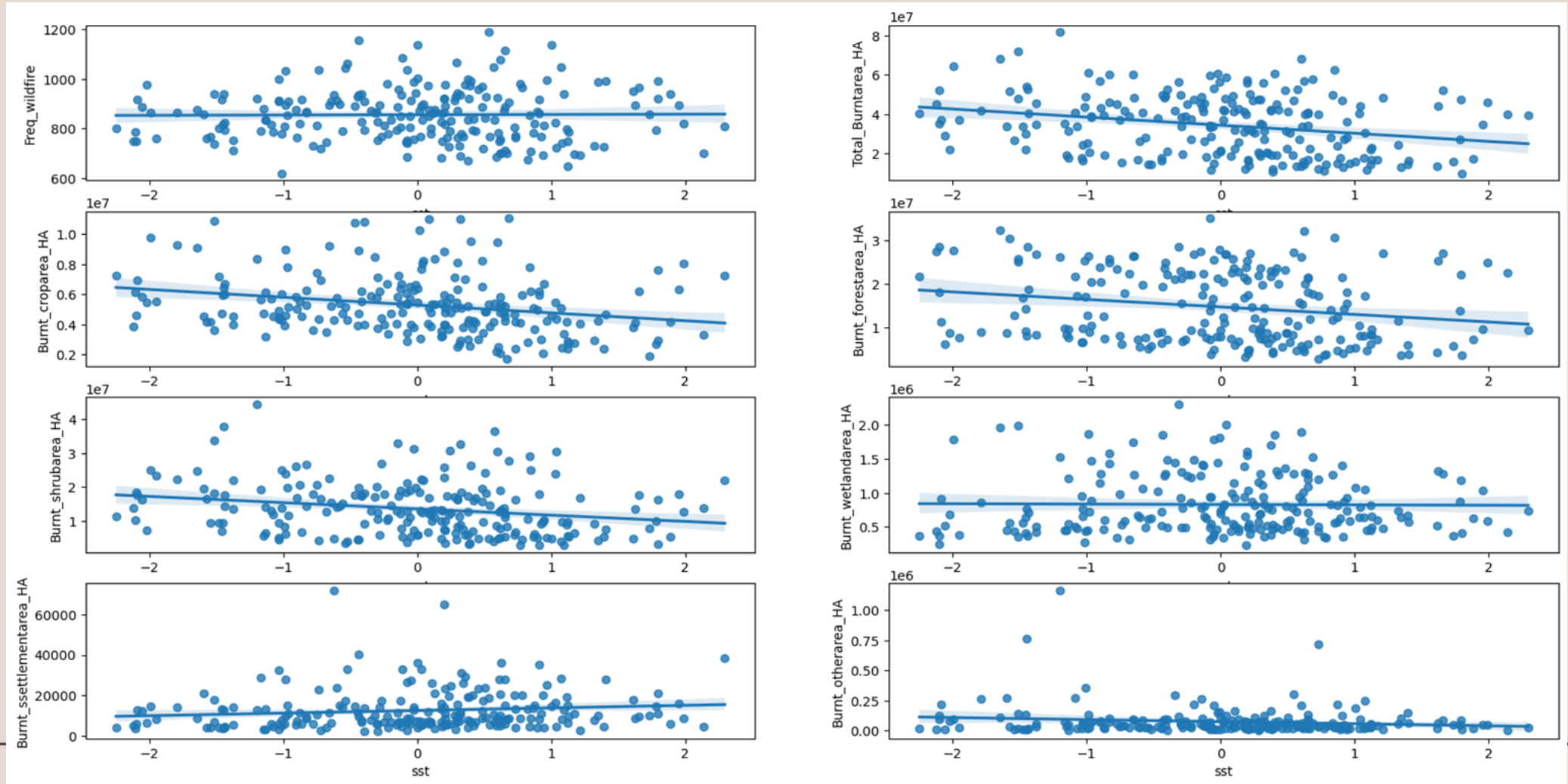
SST near the continent  
Correlation 0.32



SST of ENSO 3.4  
Correlation 0.34

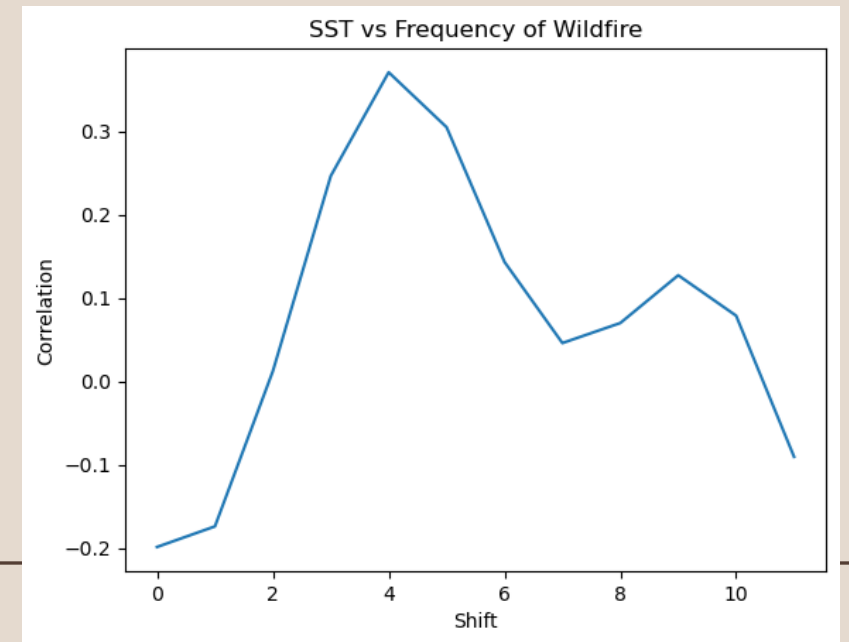
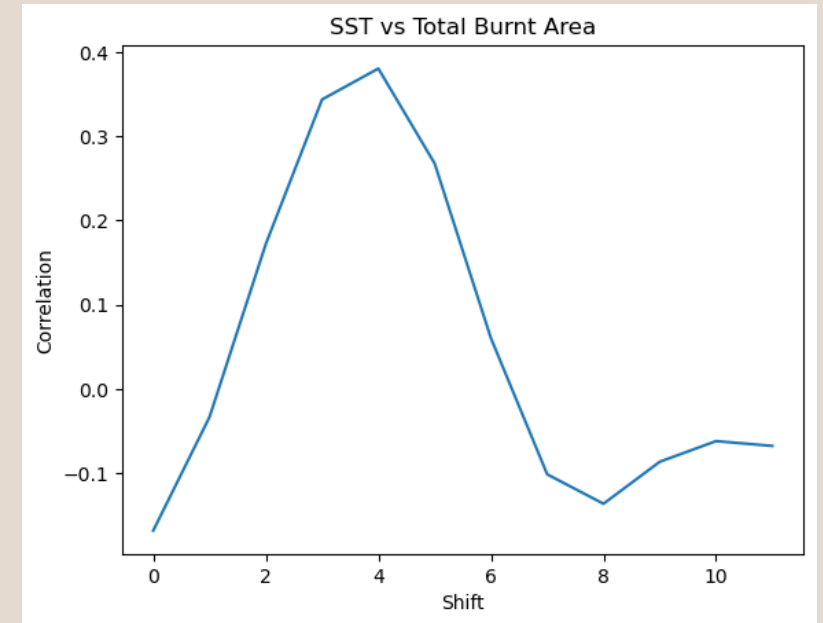
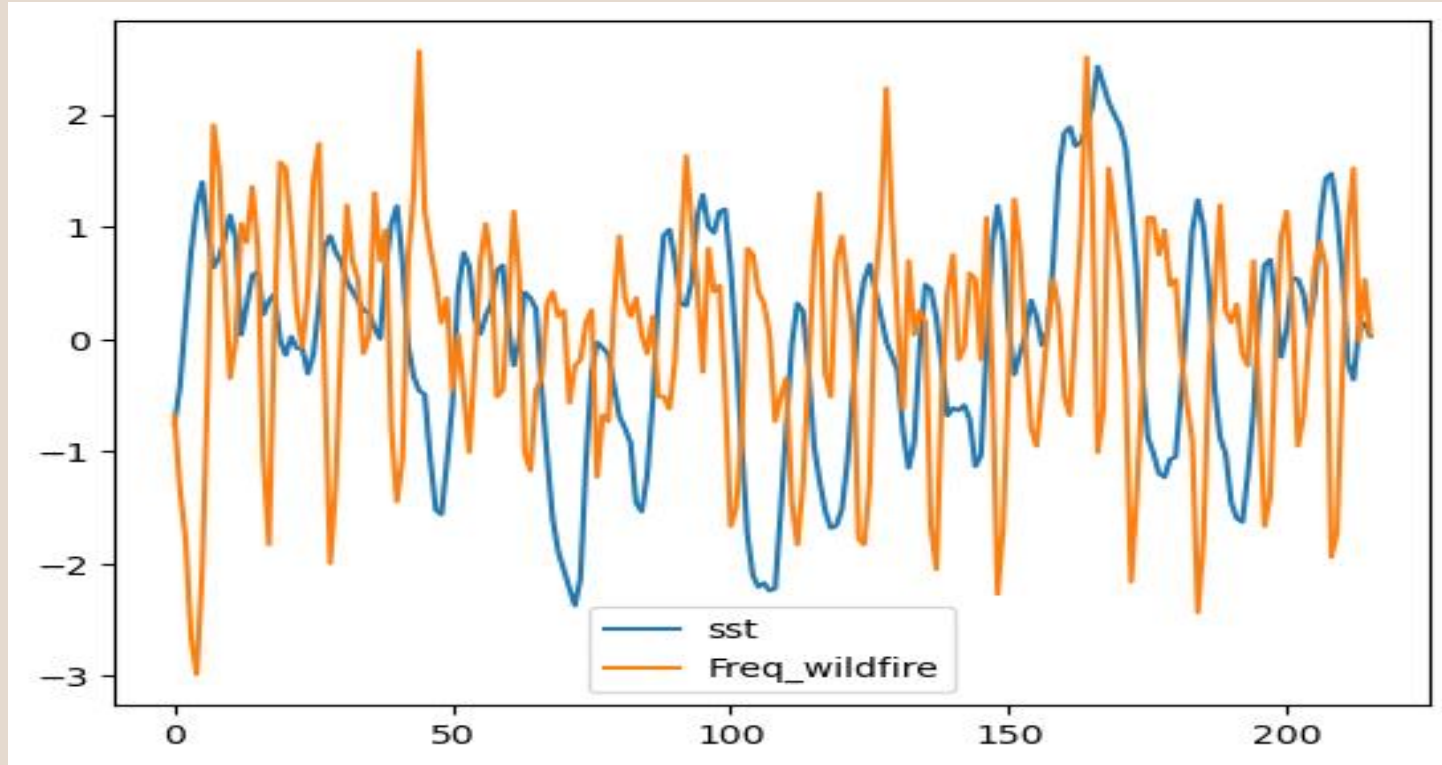


# SST Anomaly vs. wildfire frequency, Land cover specific and total burnt area

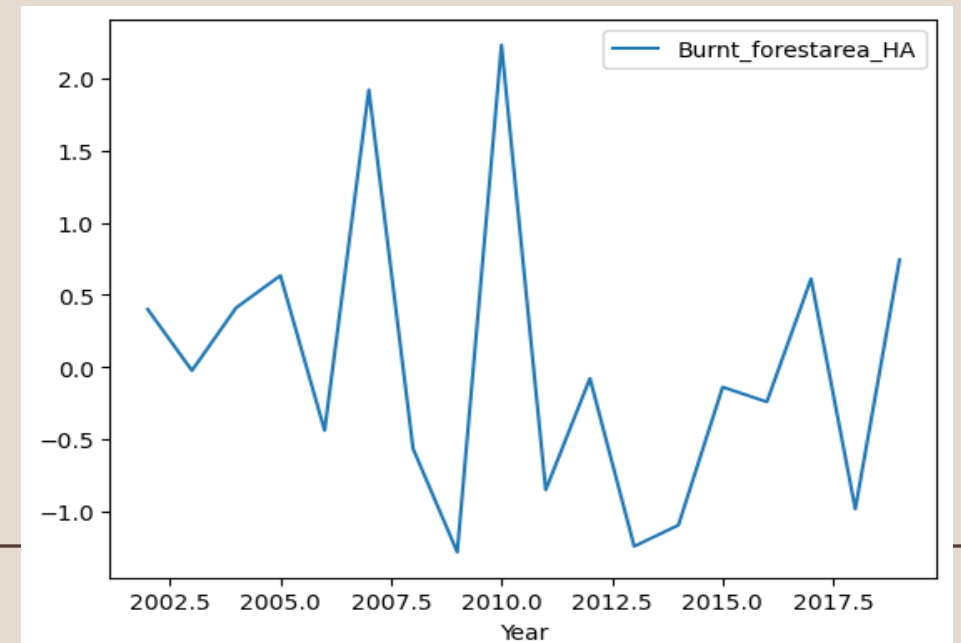
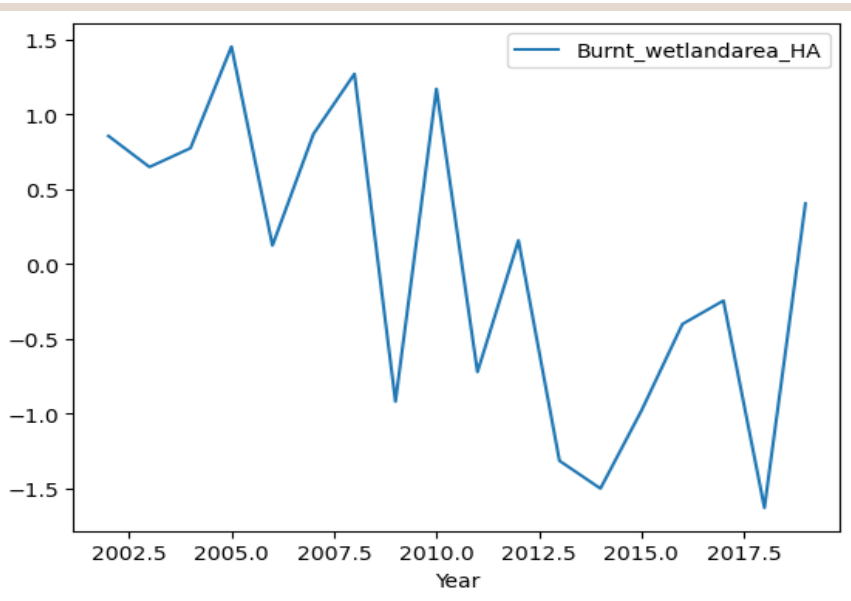
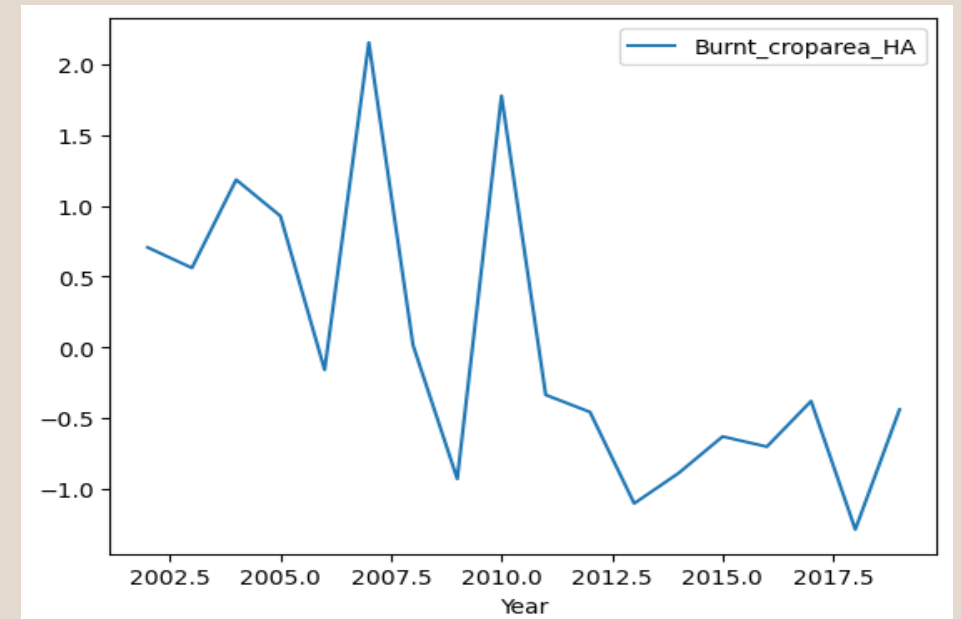
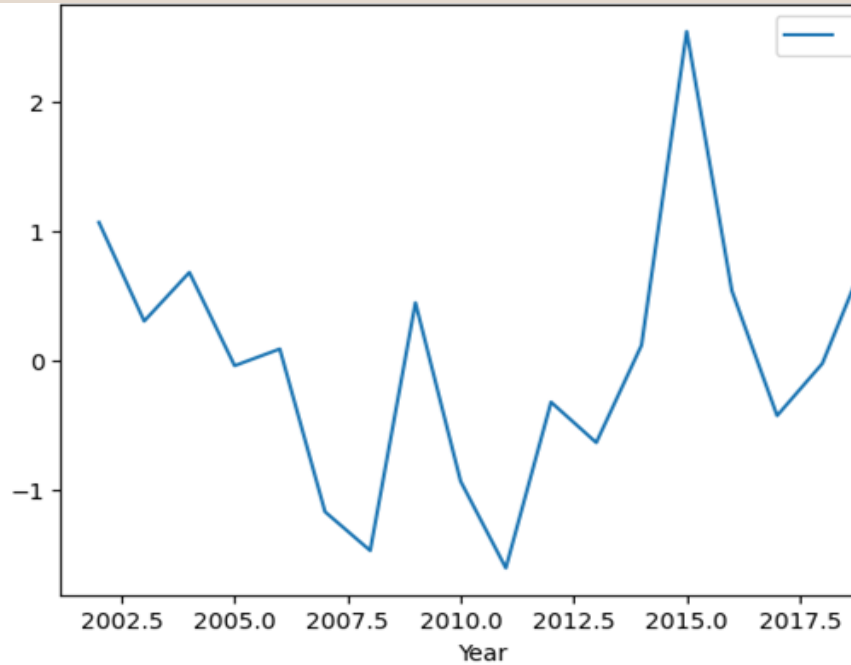




# Monthly Plot- South America



# Severity Based on Land Use/ Land Cover





# Frequency and Total Area Burnt for 2005,2010, 2015,2020

Total global area burnt as a percentage of the total land area for each year (2005, 2010, 2015, 2020).

2005: 2.13  
2010: 2.08  
2015: 1.89  
2020: 1.69

Frequency of Global wildfire for each year (2005, 2010, 2015, 2020):

2005: 127902  
2010: 118803  
2015: 113492  
2020: 106476

So there is decreasing trend in the frequency over 15 years period.

# summary

- ENSO has positive impact on the frequency and severity of Wildfires
- The Monthly analysis is dominated by seasonal fluctuation
- Different Continent have different impact of ENSO on wildfire frequency and severity
- The SST of ENSO 3.4 has greater impact on the wildfires of a continent than SST near the Continent
- Wildfires frequency and severity is agnostic to the Land Use Land Cover
- Second order Chaos??
- Positive feedback??Wildfire feeding into SST feeding into more Wildfire





thank you

Special Thanks to our TA:  
Shashank and Wil