

**Resiliency of SFWMD**

**ET Trends & The  
Influencing Factors and Correlations**



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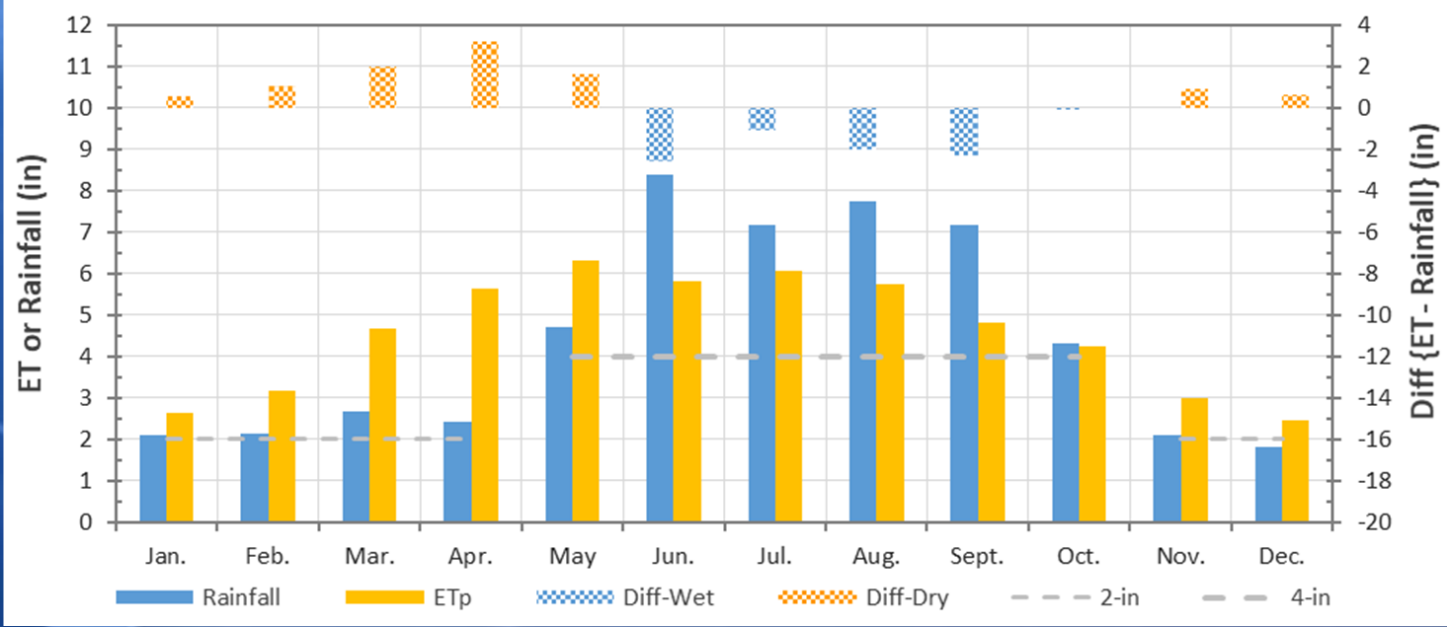
## Presentation Outline

- Introduction & Background
- Datasets & Trend Analyses
- Correlation to Meteorological Variables
- Summary & Conclusions
- Q & A

# Introduction & Background



Average Monthly ETp Rainfall & Differences At SFWMD



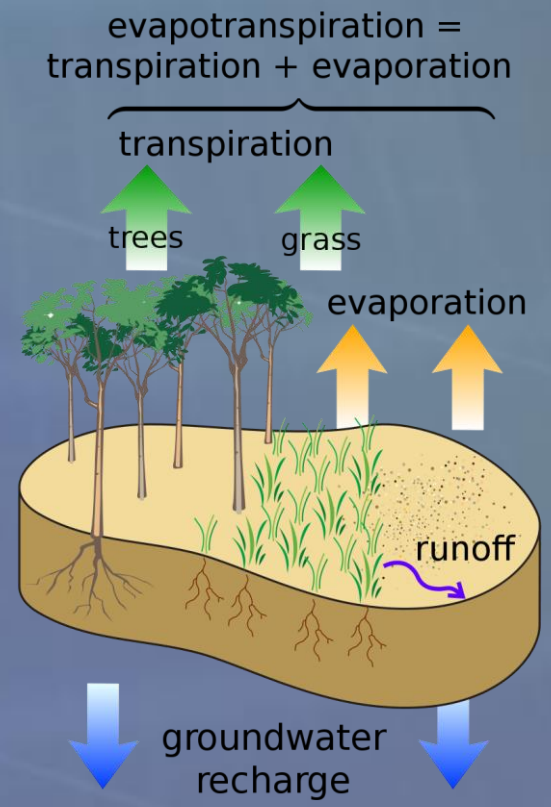
(Rainfall & ET: District-wide Average over 1995 - 2020)



Pan Evaporation (popular most)



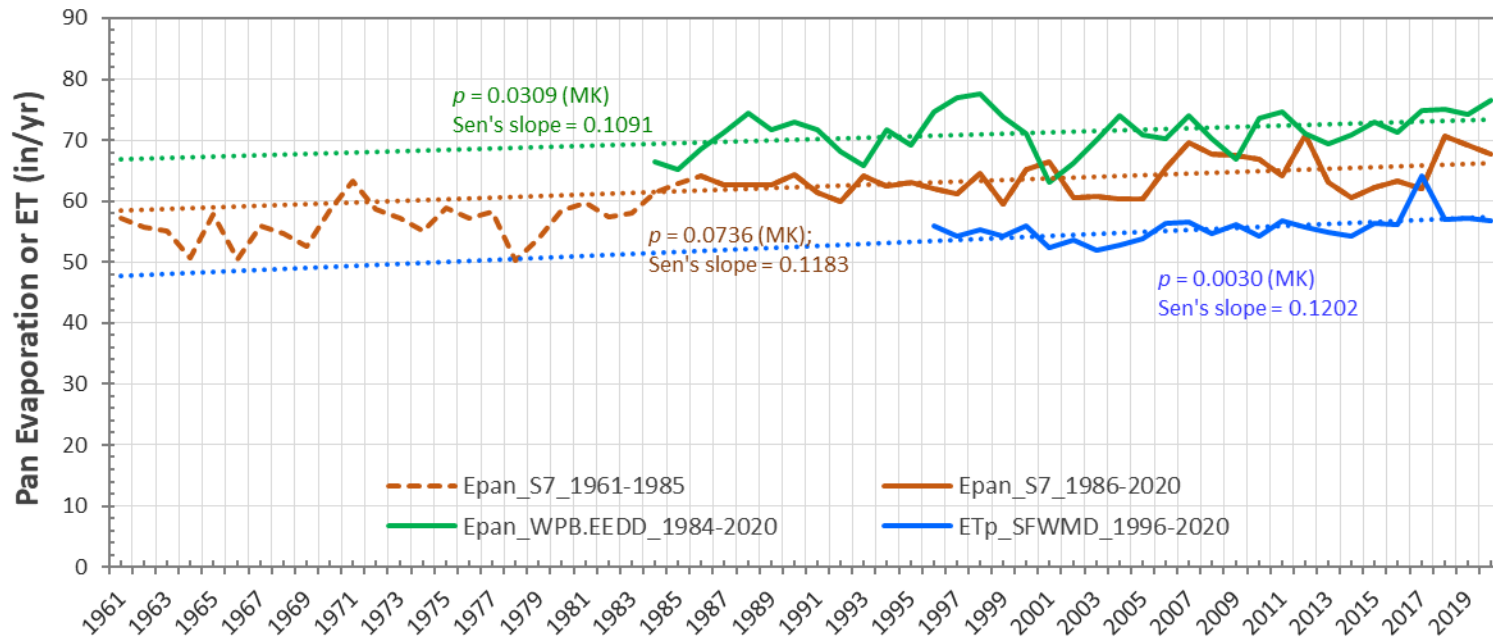
Lysimeter (direct measure of ETp)



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# Datasets & Trend Analyses

## Trends Of Annual Epan & ETp At SFWMD (1961-2020)

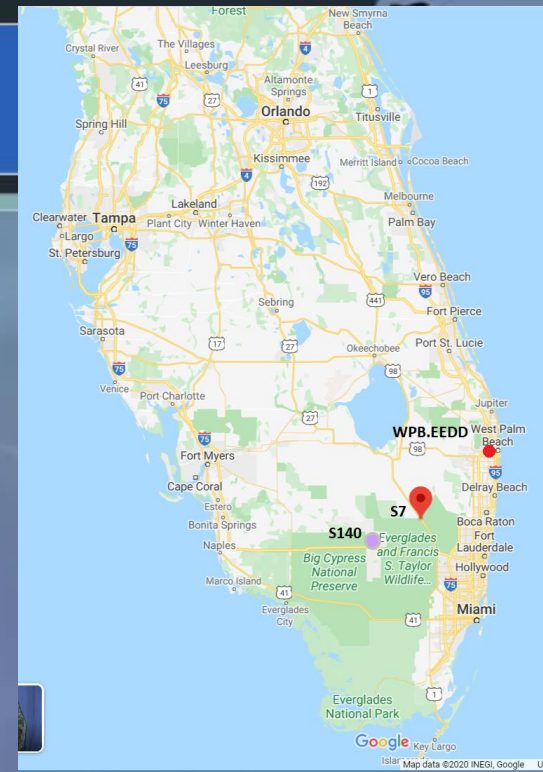


### Selection Criteria:

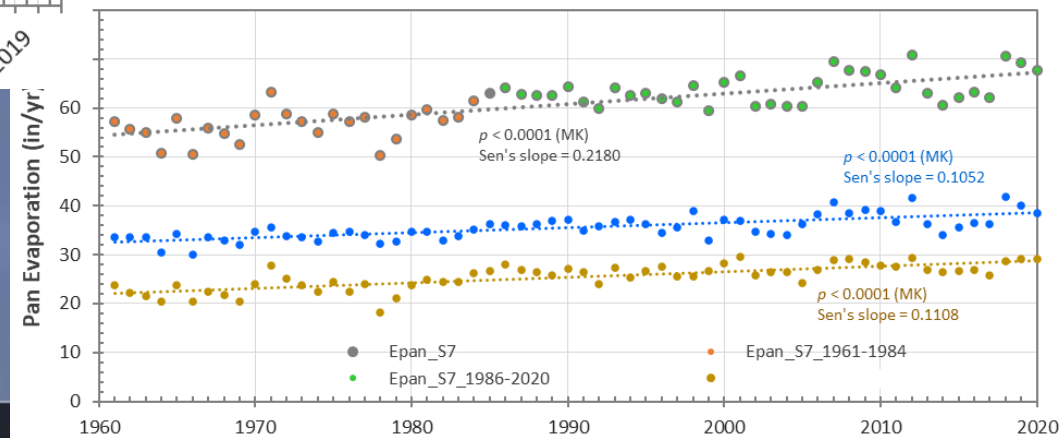
1. Period of Records  $\geq$  25 Years;
2. Still in Operation (for future trend watch).

### Three Selected Stations/Sets:

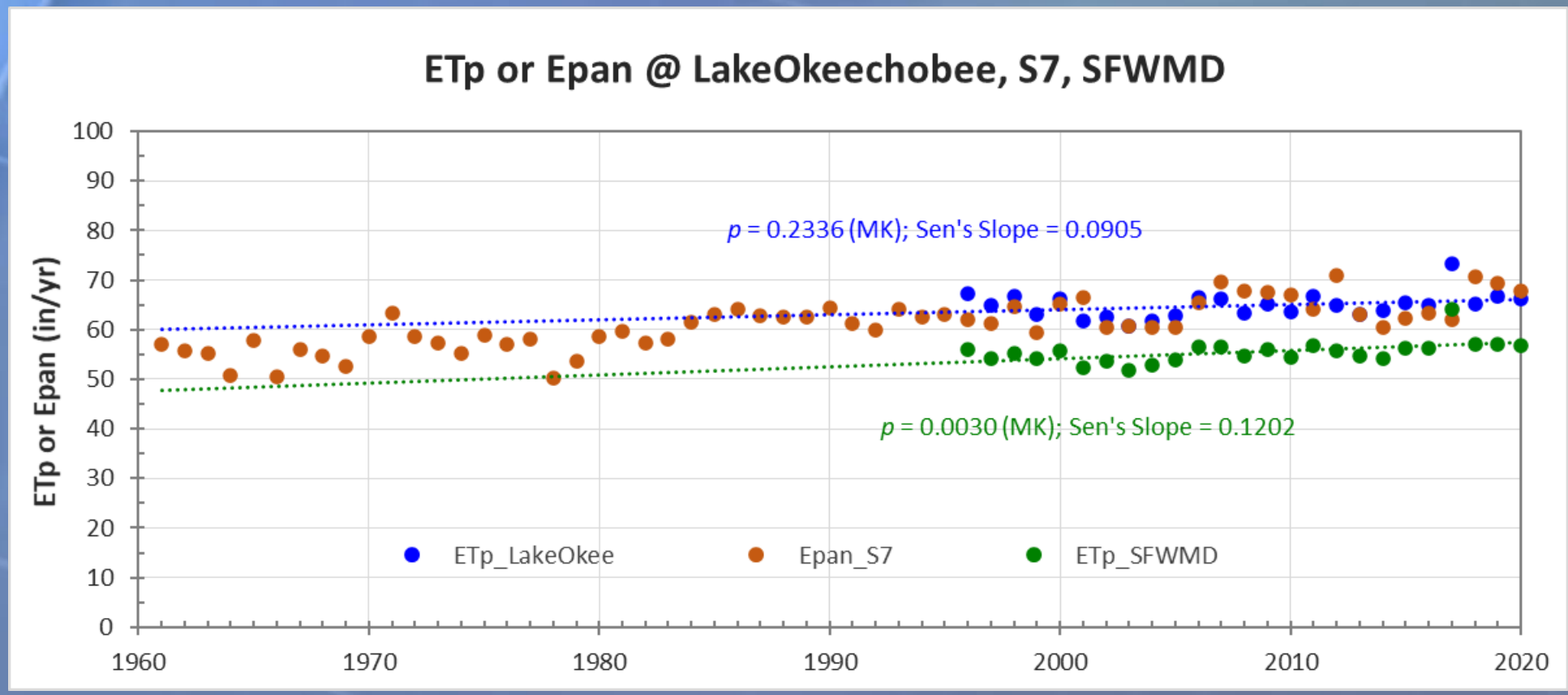
EVAP (2): **S7** (SFWMD), **WPB.EEEDD** (City of WPB)  
 ET (1): **District** (USGS or Univ. of Alabama)



## Trends Of Annual & Seasonal Epan At S7 (1961-2020)



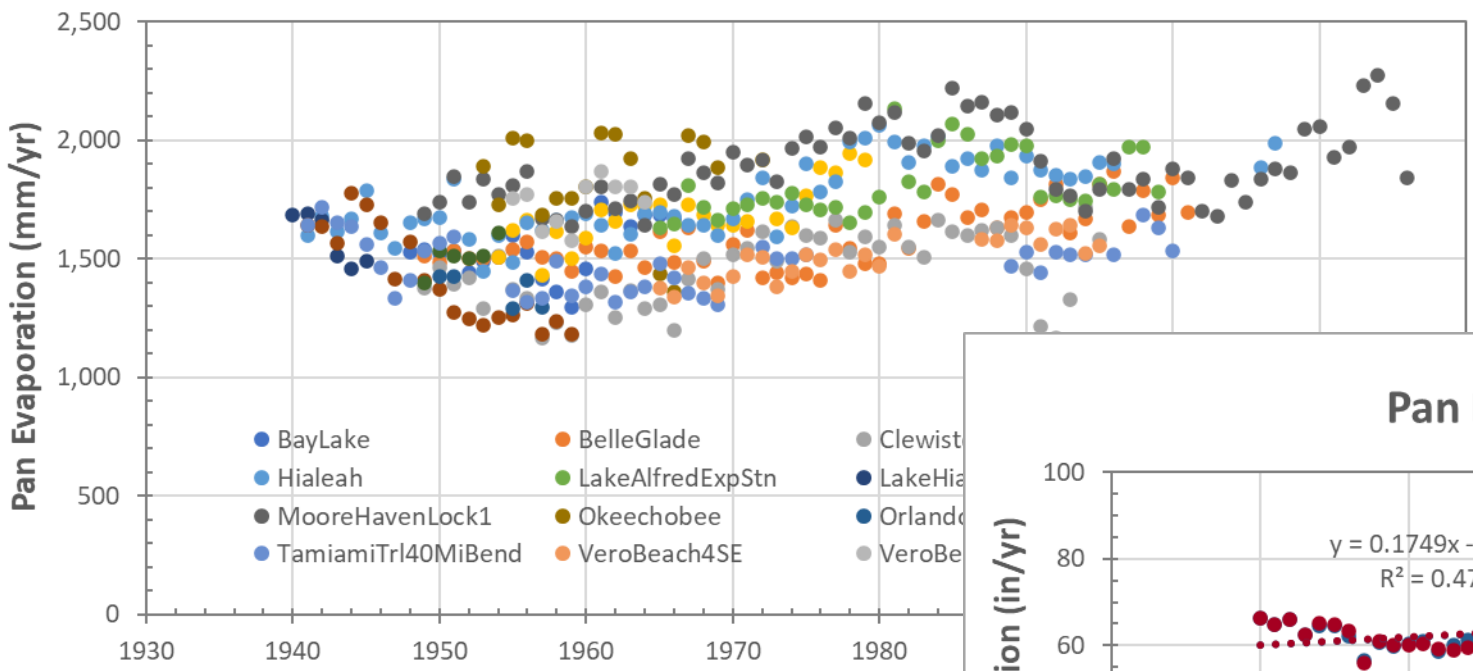
# Lake Okeechobee (ETp) vs. S7 (Epan)



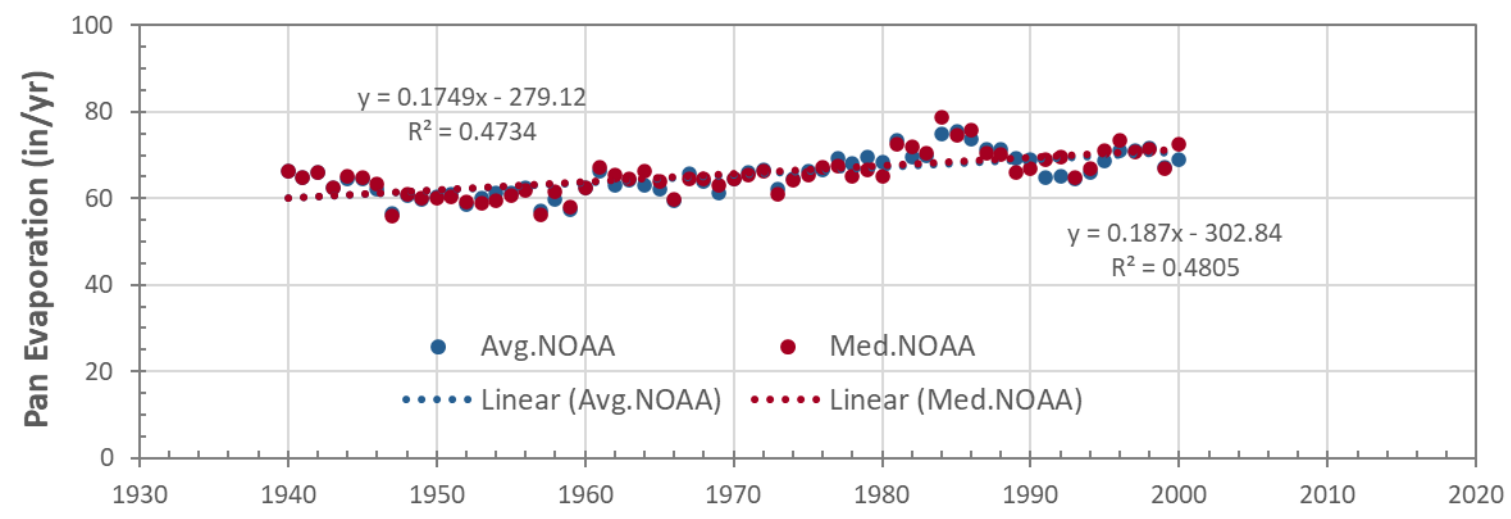
# Additional Pan EVAP Data (NOAA database, 15 stns)



Pan EVAP in South Florida 1940 - 2016



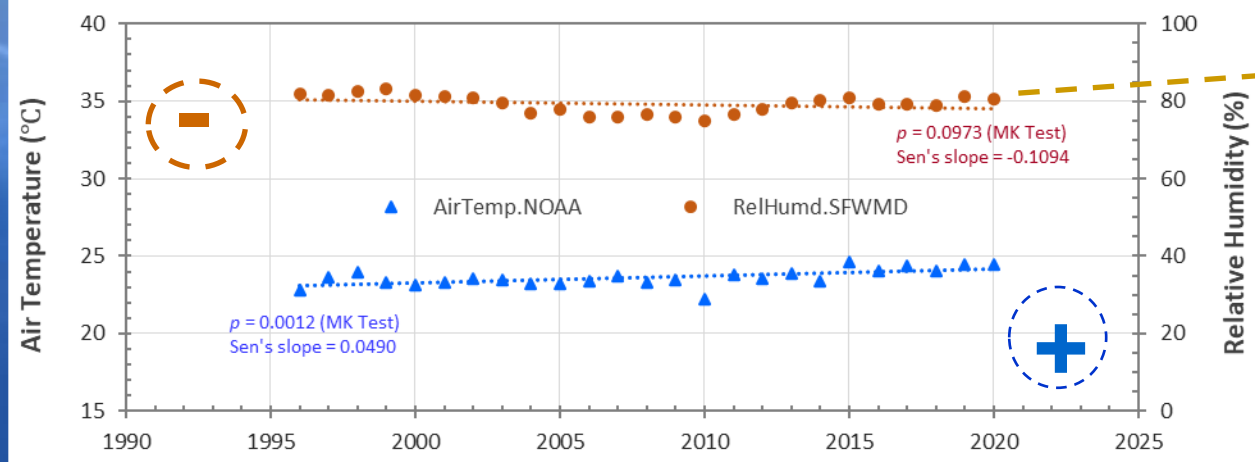
Pan EVAP in South Florida 1940 - 2000



# Trends of Meteorological Variables



Trends Of Air Temperature & Relative Humidity At SFWMD



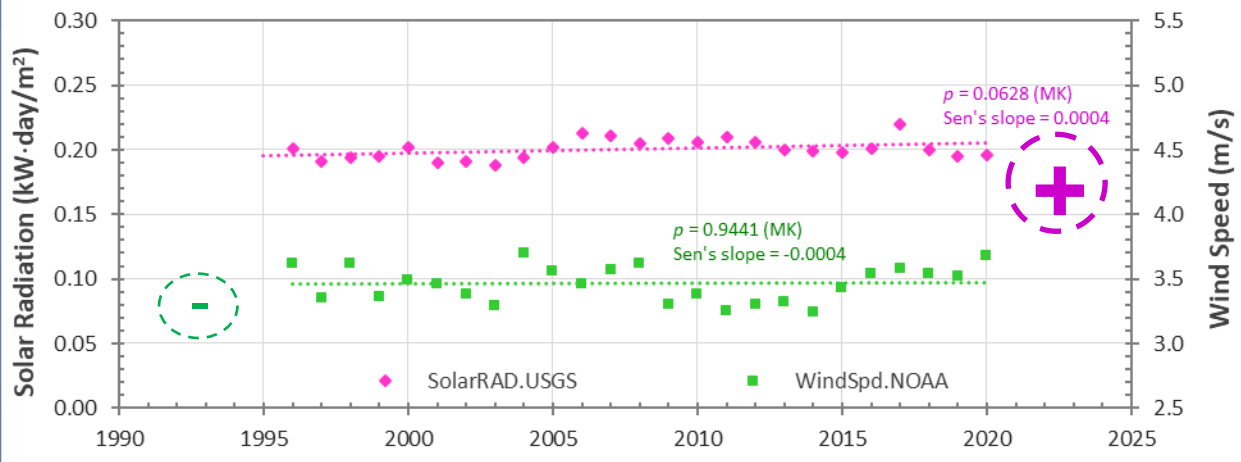
Relative Humidity ↓ = Vapor Pressure Deficit ↑

Period of Records: 1996 - 2020

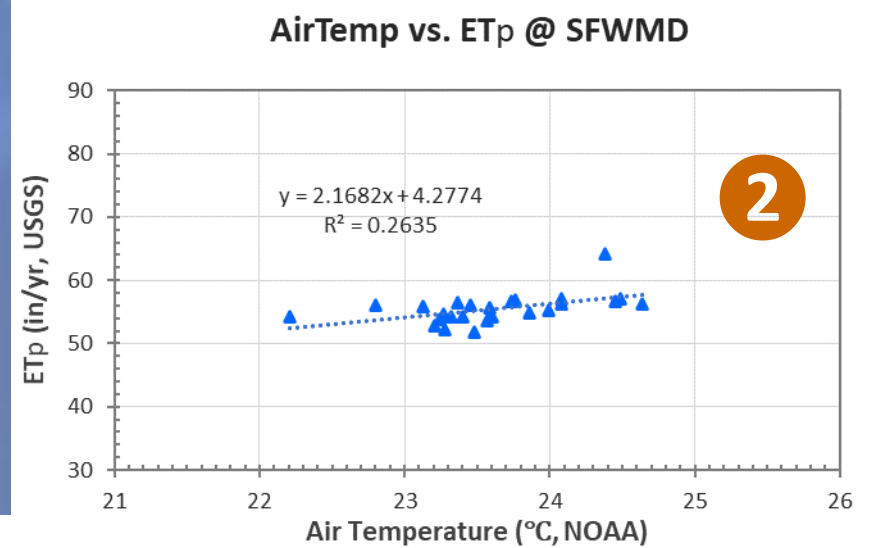
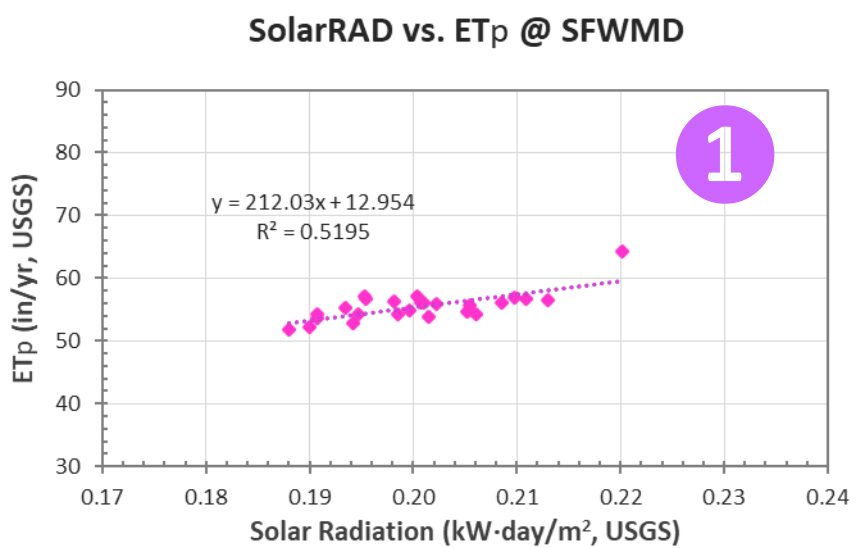
Driving Factors:

1. Solar Radiation
2. Relative Humidity (or Vapor Pressure Deficit)
3. Air Temperature
4. Wind Speed

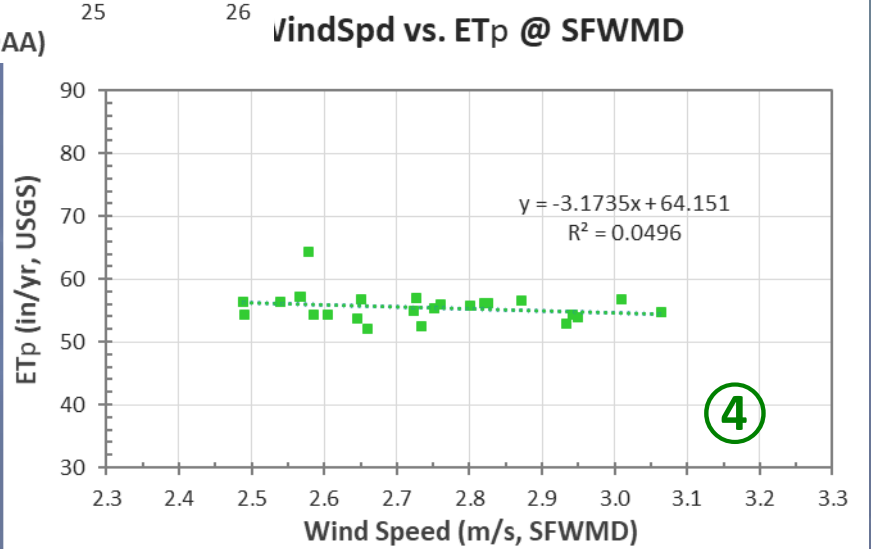
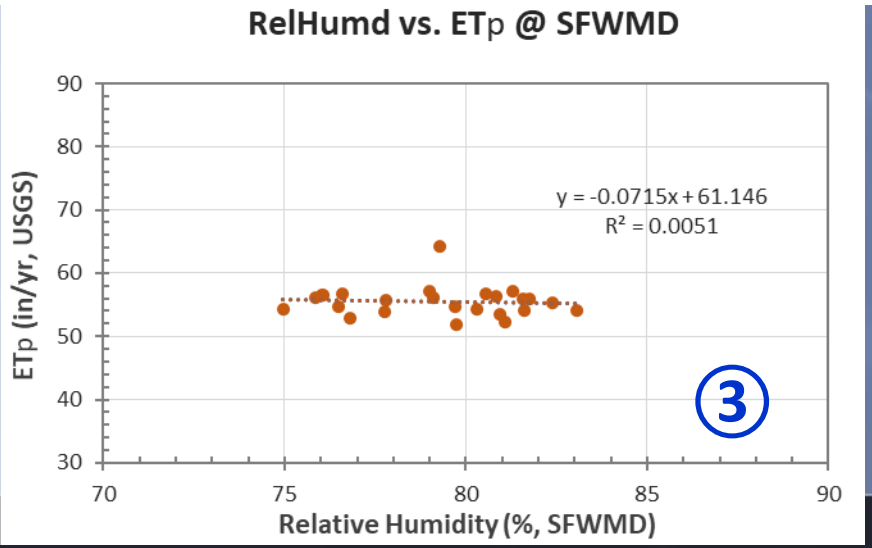
Trends Of Solar Radiation & Wind Speed At SFWMD



# Correlation to Meteorological Variables



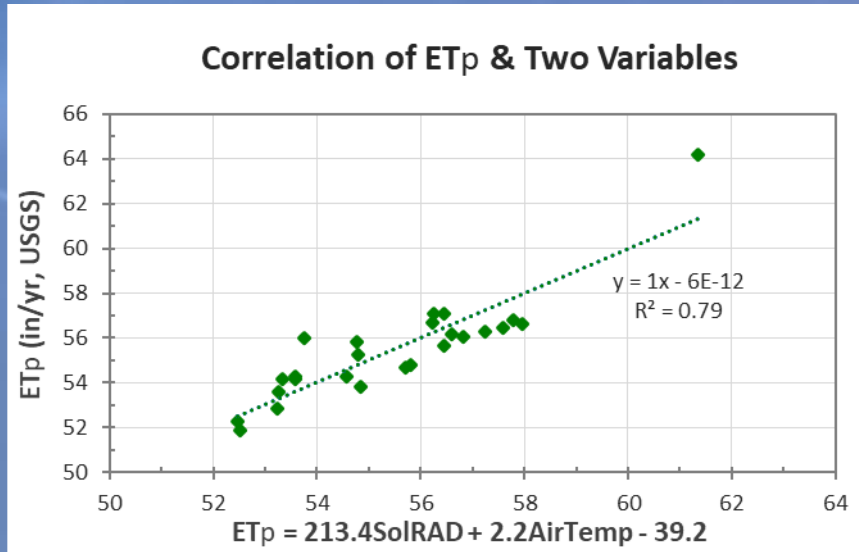
Period of Records:  
1996 - 2020



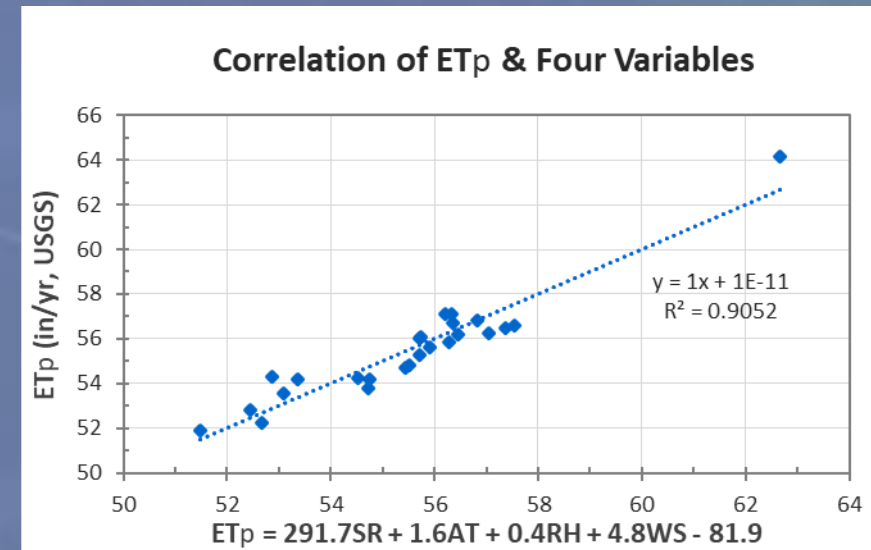




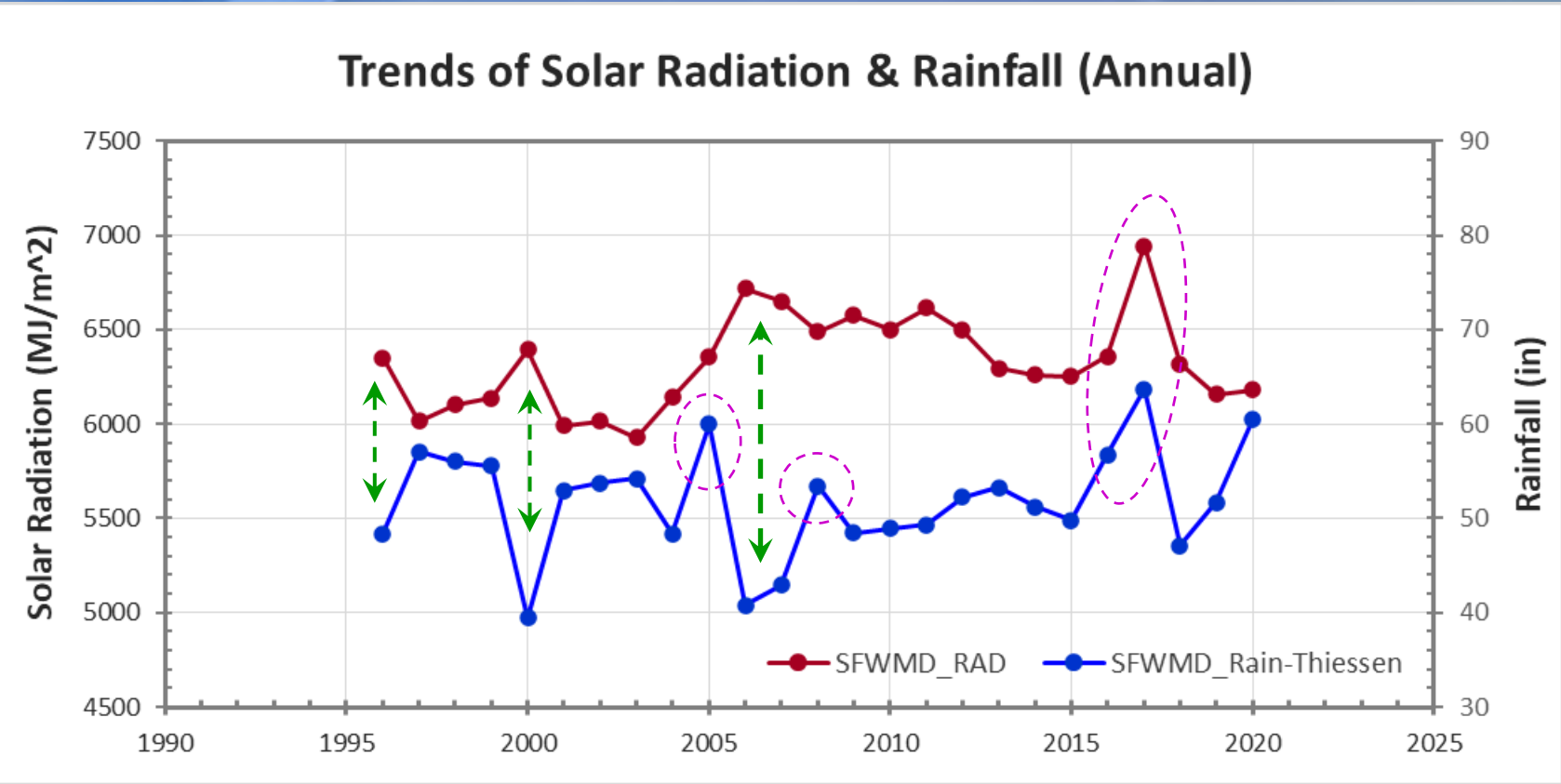
# Multi-Variable Correlation



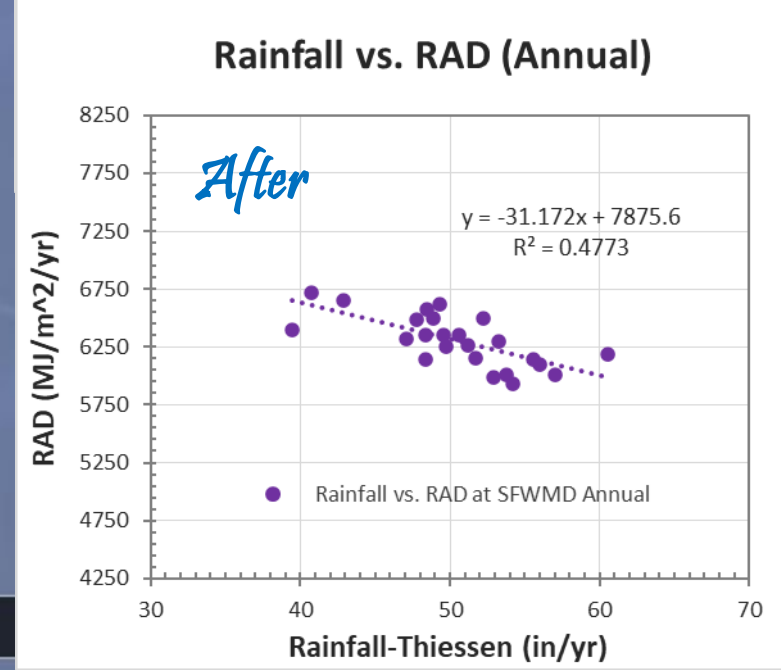
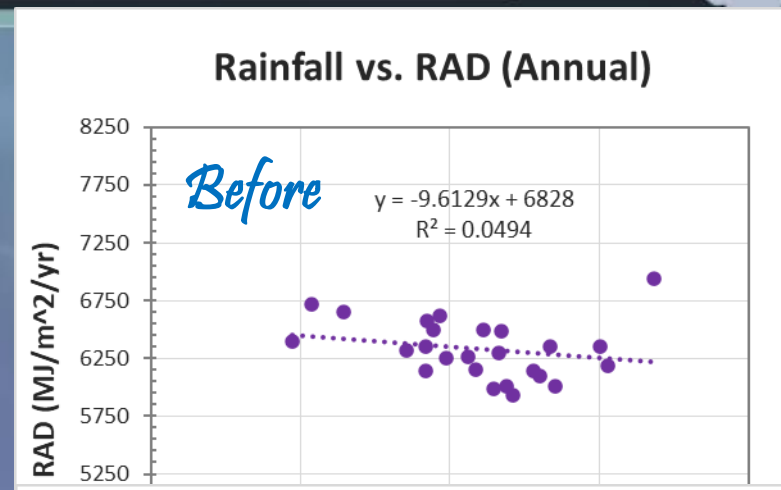
Period of Records:  
1996 - 2020



# Correlation to Rainfall (Annual)



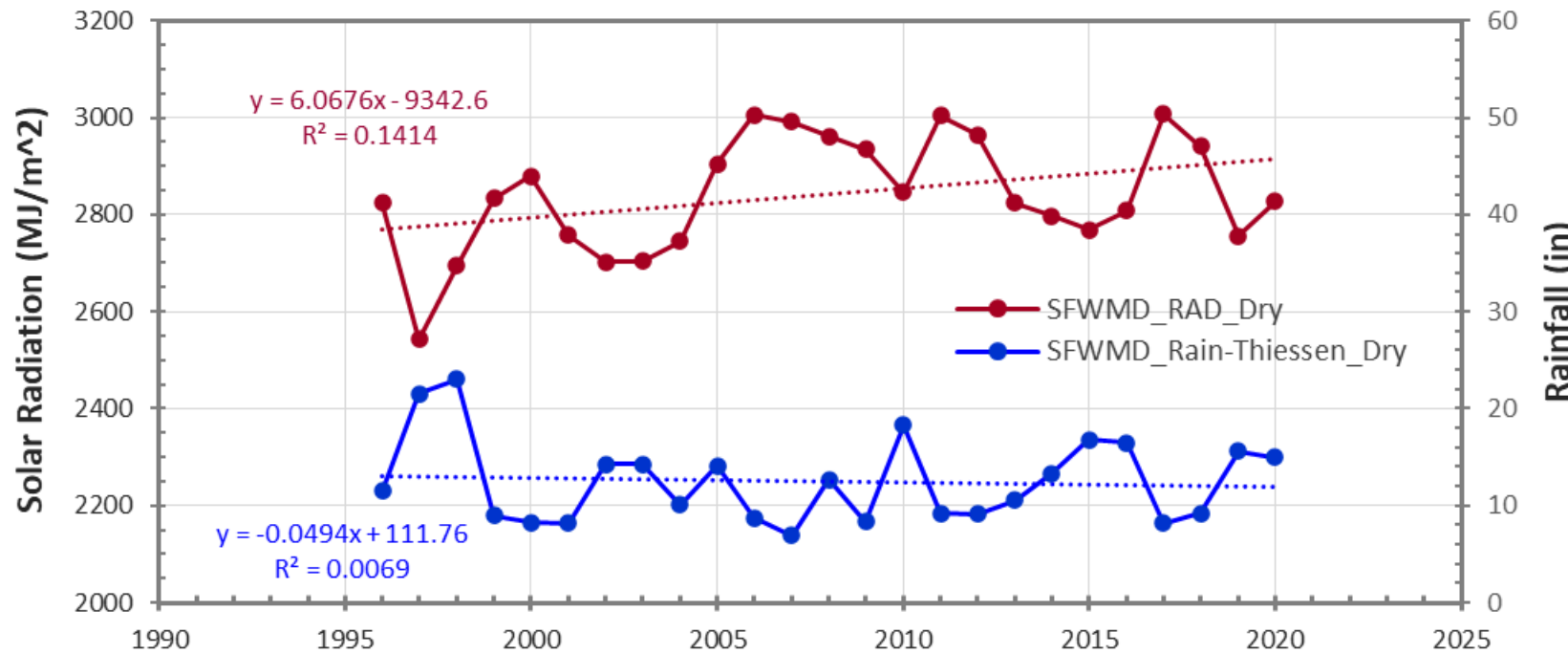
Hurricane, Tropical Storm, or Cold Front Contribute Disproportional or Excessive Rainfall over a Short Period of Time.



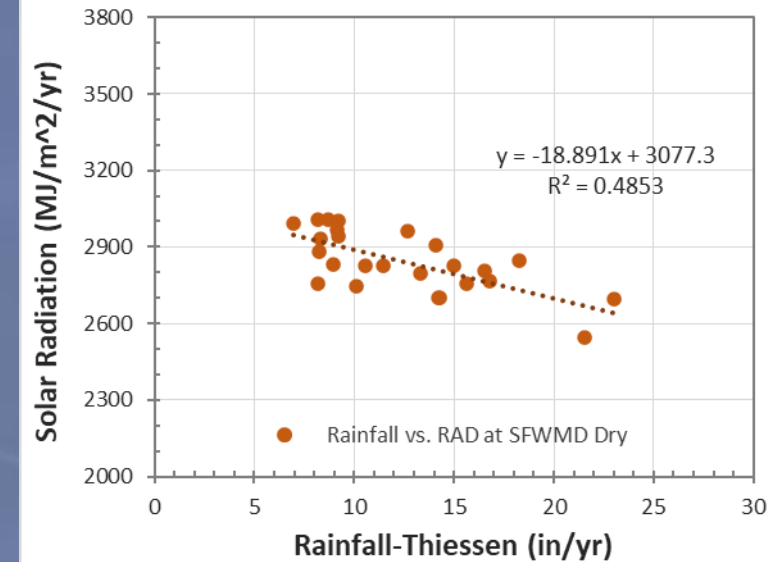
# Correlation to Rainfall (Dry Season)



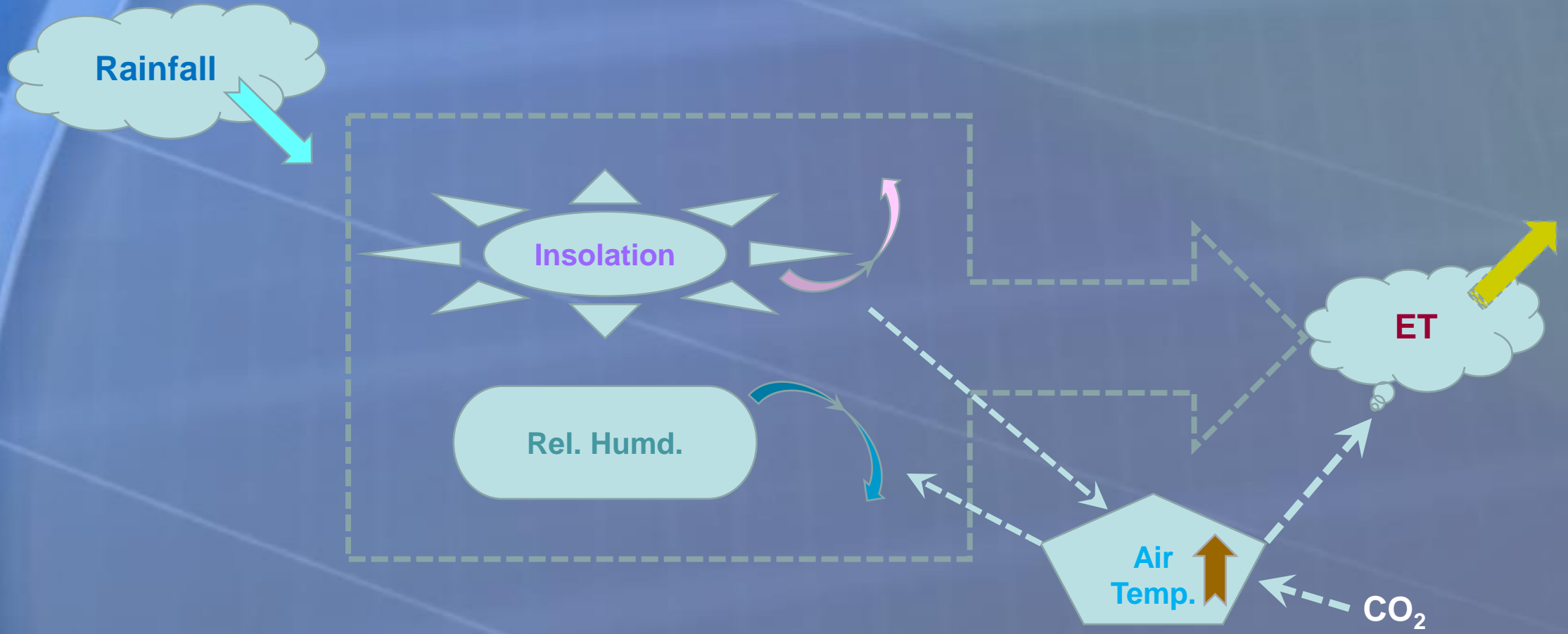
### Trends of Solar Radiation & Rainfall (Dry SZN)



### Rainfall vs. RAD (Dry SZN)



# Links / Hypothesis



## Summary & Conclusions

# Upward Trend (↑ ET)

# Rate of Change: + 0.1 in/yr

# Driving Variables: Solar RAD (↑), Air Temp (↑), Rel Humd (↓)

# Climate Cycle: AMO (Atlantic Multidecadal Oscillation)

# Q&A



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