

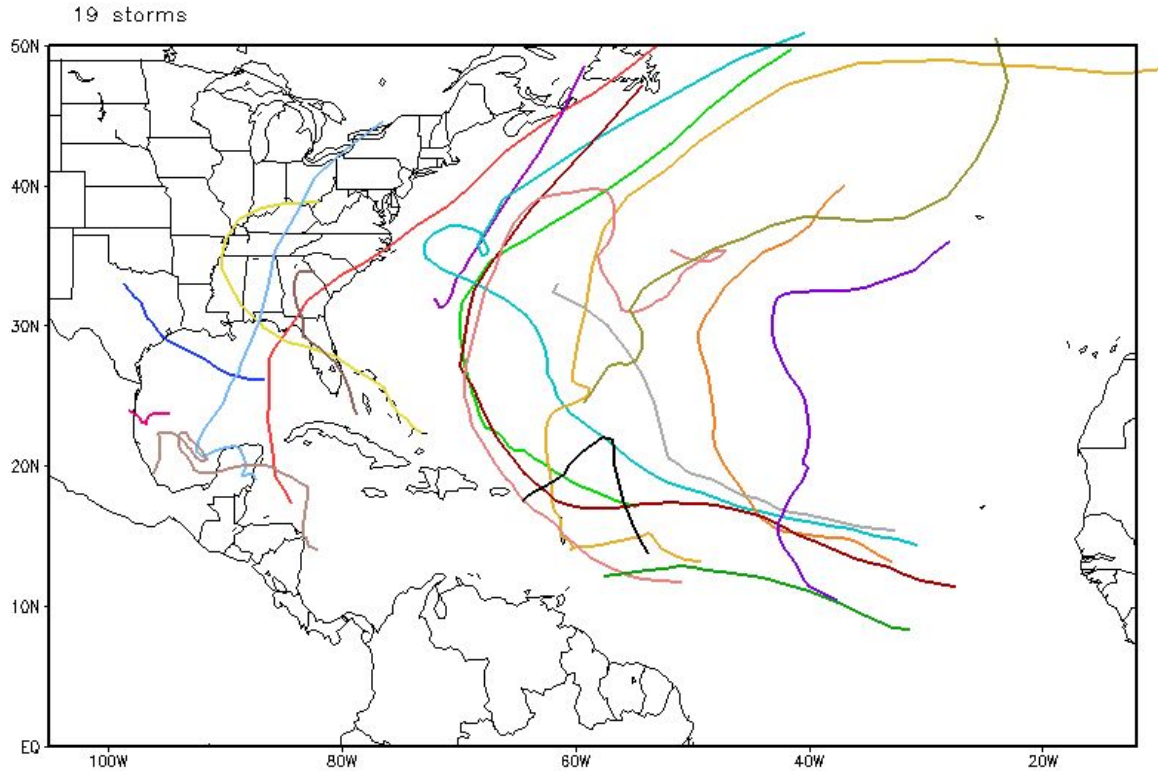
# **CORe TC Analysis and Comparison to CFSR 1950-2020**

Lindsey Long

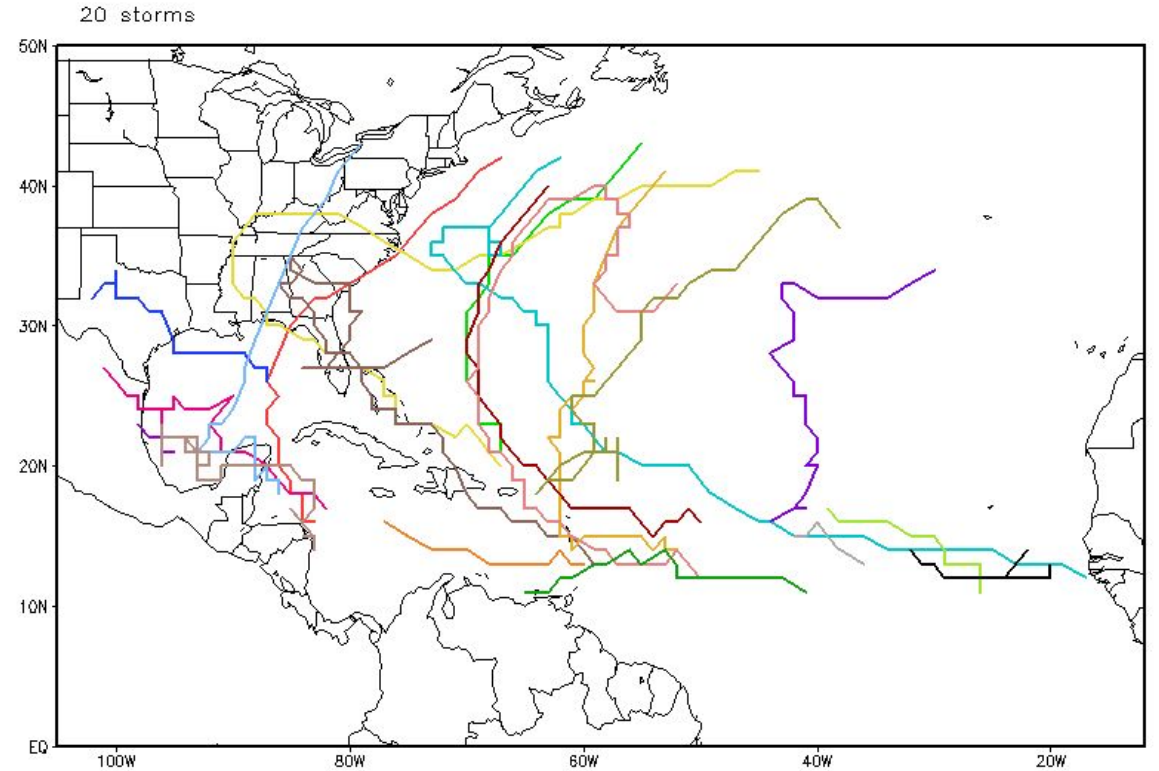
9/12/2022

# Observed Track Vs CORe – 1995 Example

Tropical Cyclone Storm Tracks  
Obs, Year=1995



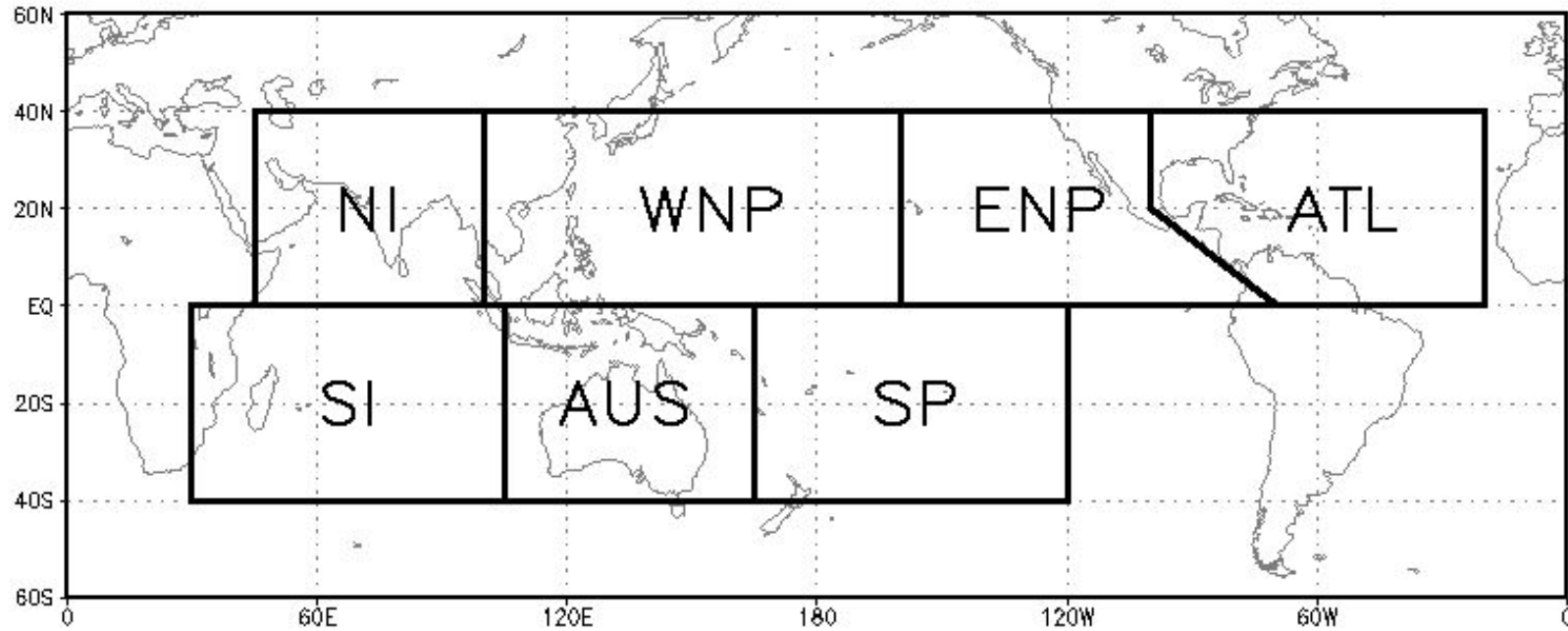
Tropical Cyclone Storm Tracks  
CORe, Year=1995



- Most tracks are easily compared.
- A few observed were missed (Black, Orange)
- A few short-lived erroneous storms in the CORe (near Africa)

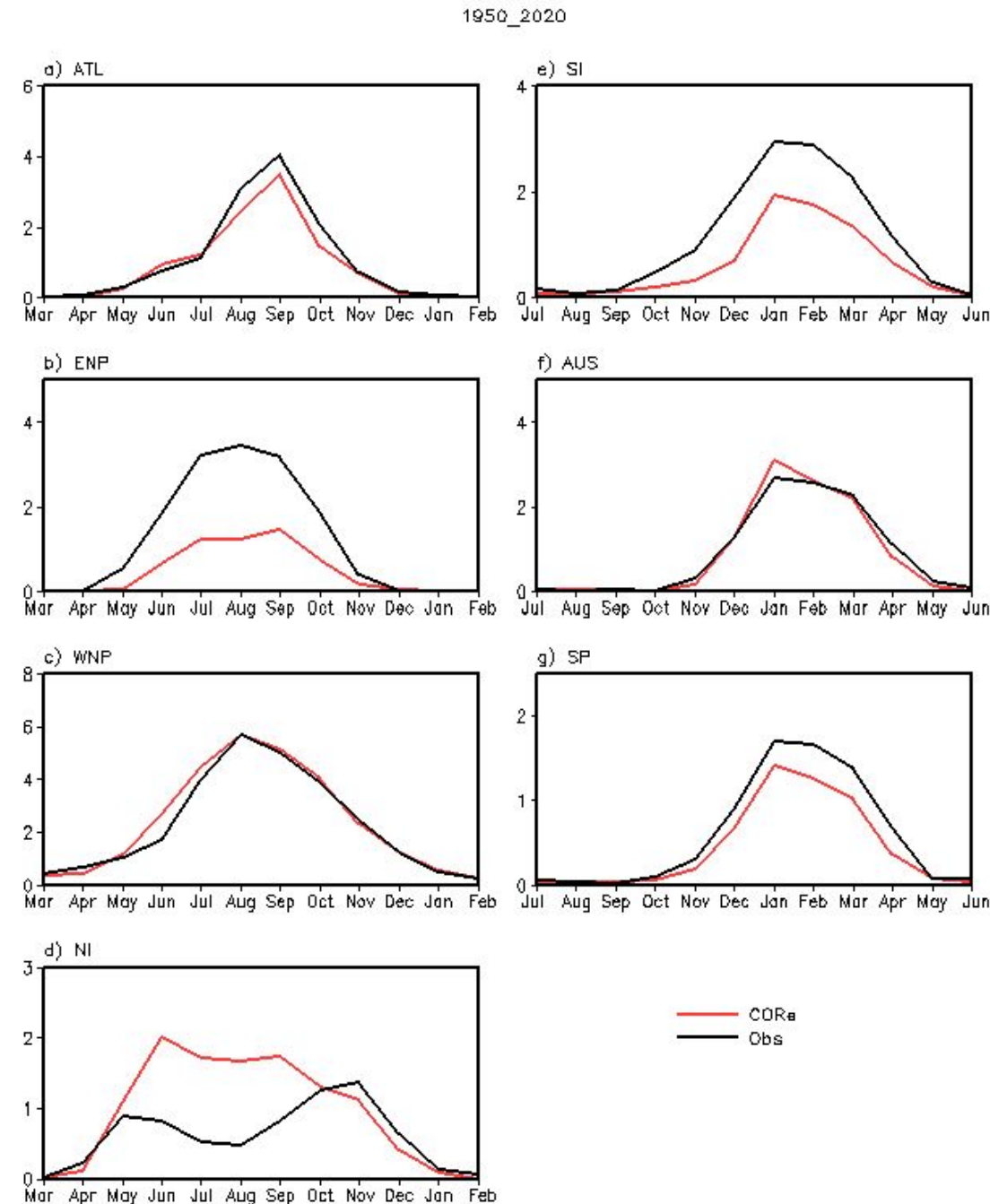
# Basin Delineations

- Basin areas and abbreviations used throughout the rest of the presentation:



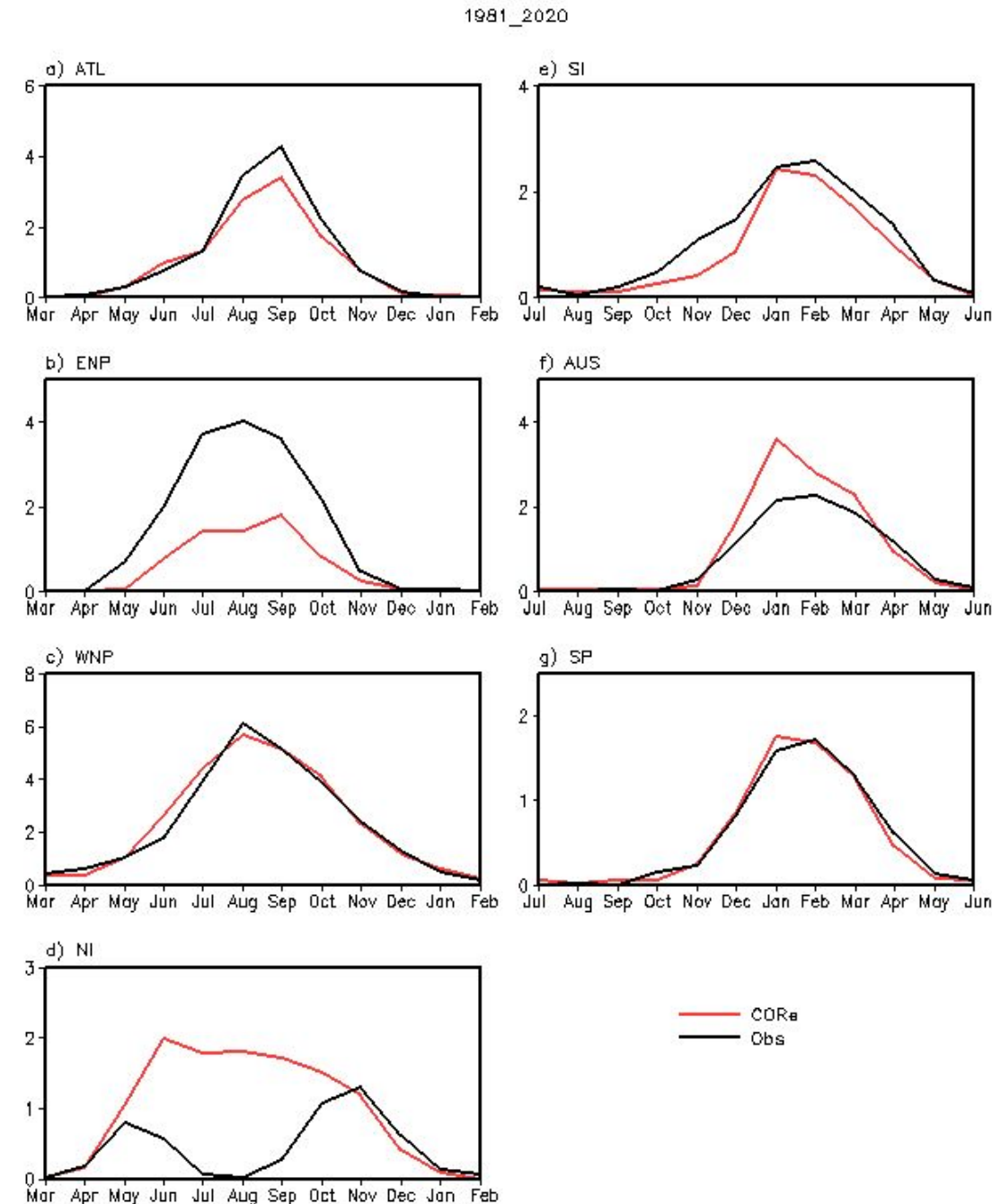
# Seasonal Cycle

- CORE does well in most basins but underestimates the number of storms in the ENP.
- Overestimate of NI storms during Jun-Sept is a known issue with the tracker. Monsoonal lows tend to get picked up and counted as TCs. This shouldn't be considered an issue with CORE.



# Seasonal Cycle

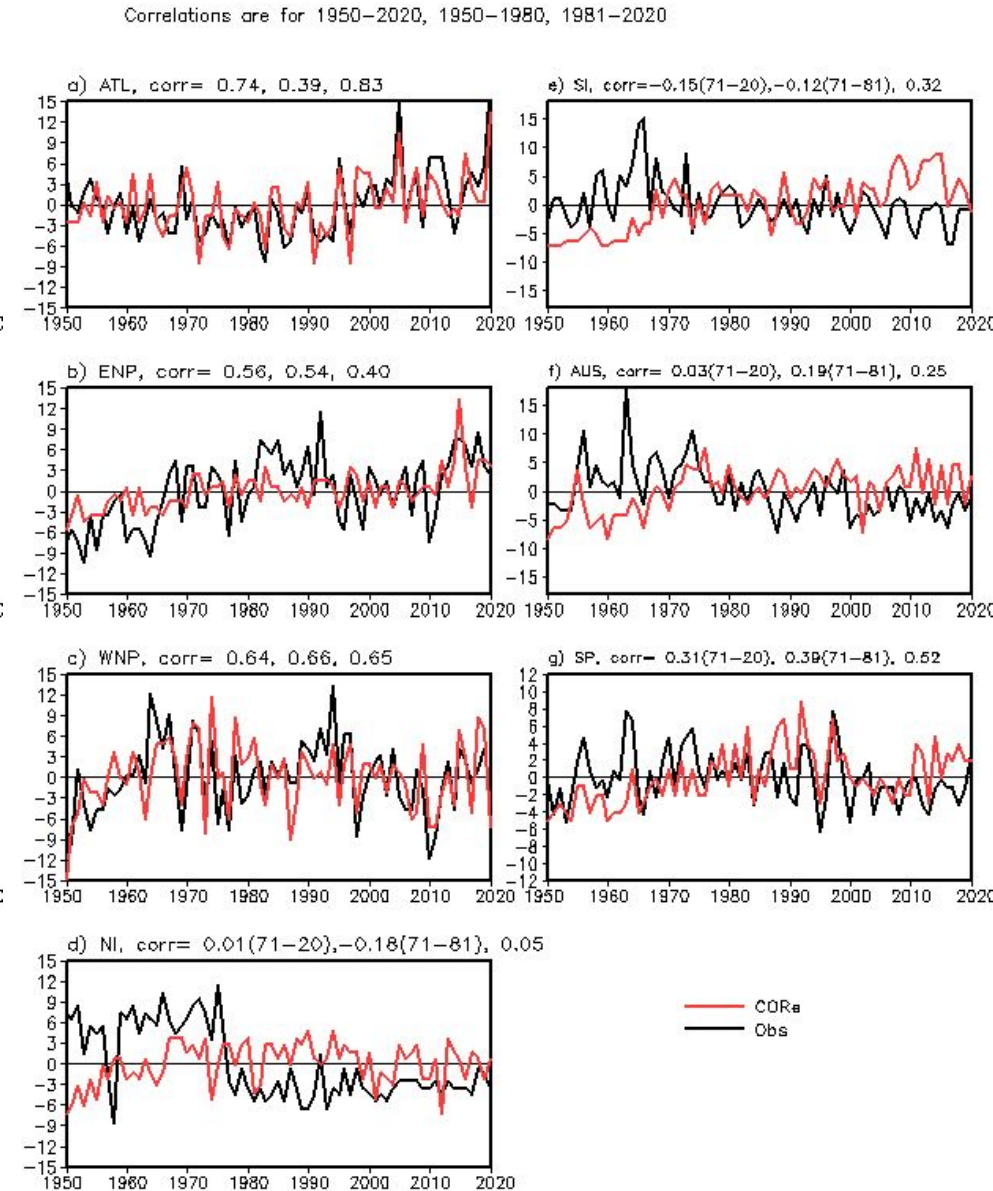
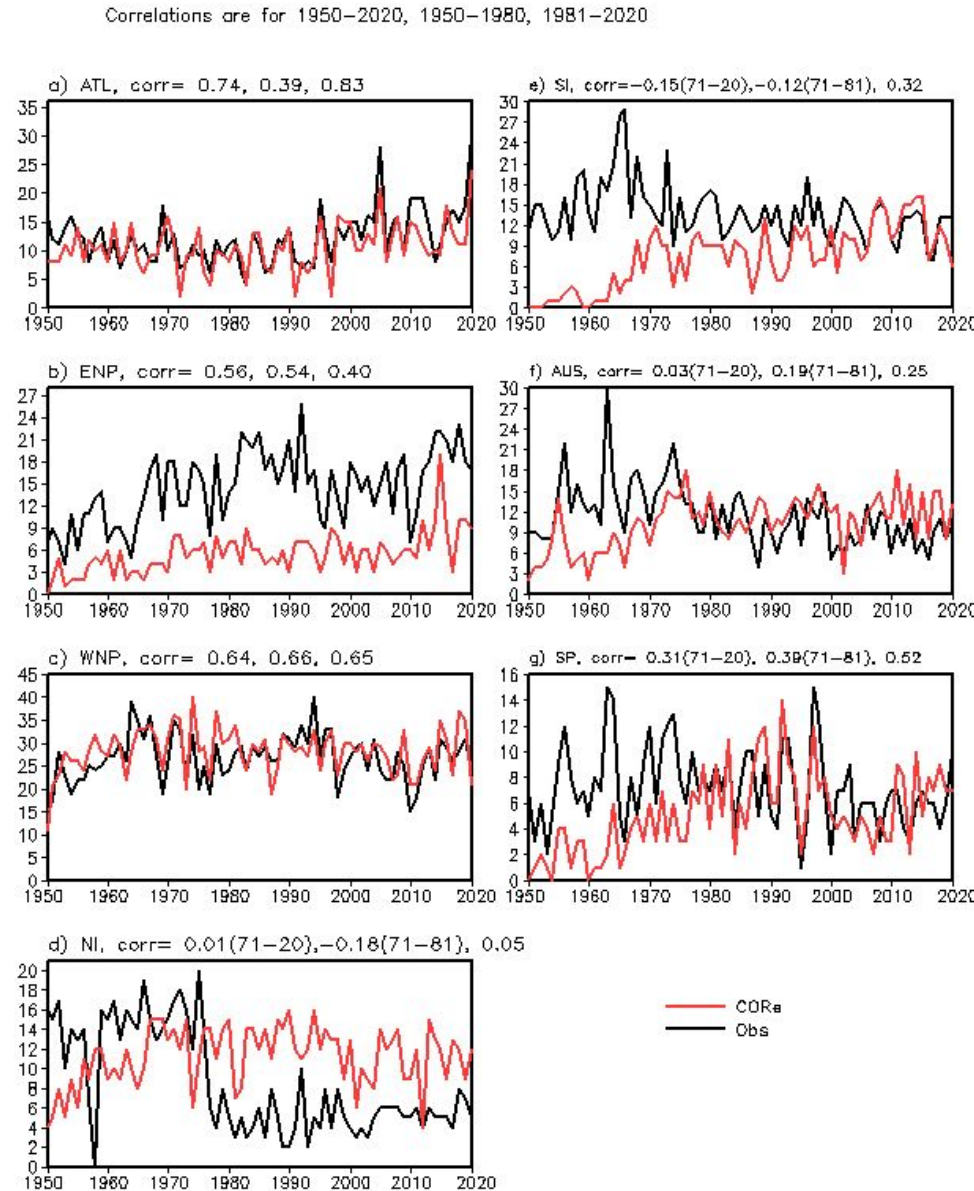
- Using the base period of 1981-2020, provides more accurate observations
  - Best track data in the NI and SH is not as accurate before 1981. Between 1971-1981, not all storm data contains wind speed, and there is no wind data before 1971.
- Results are similar to the full period of 1950-2020.
- SP and SI improve while AUS becomes overcounted.





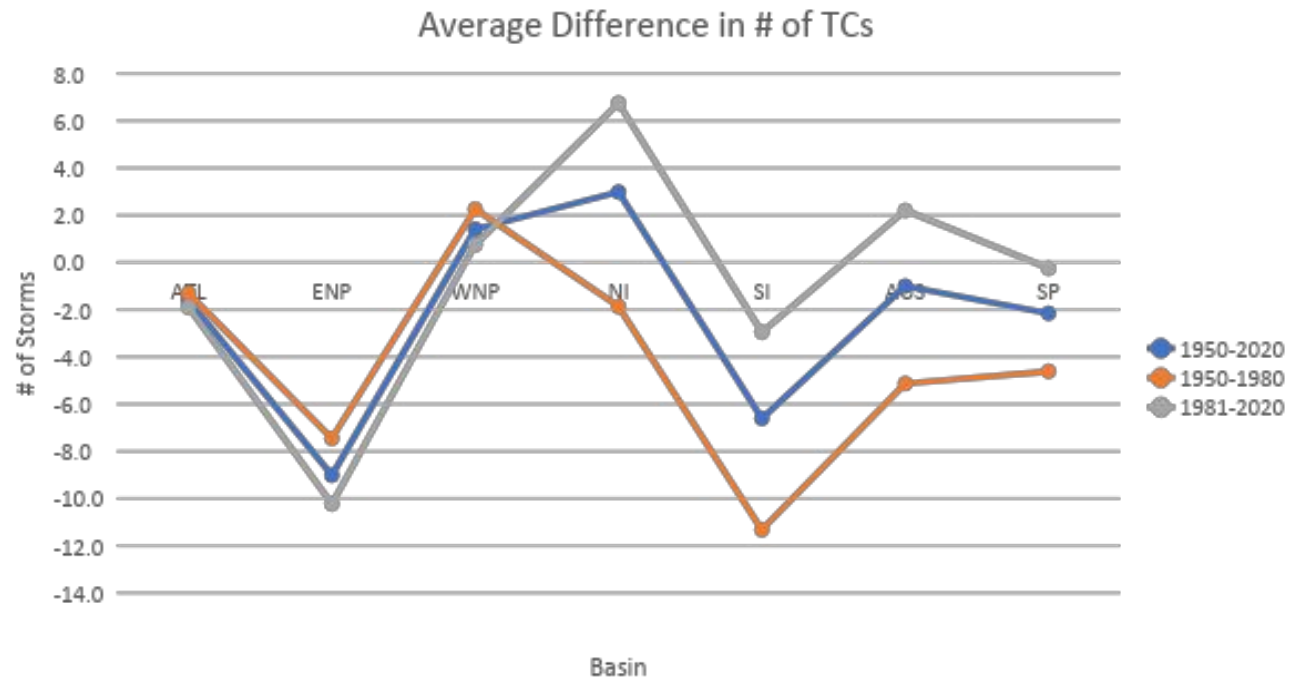
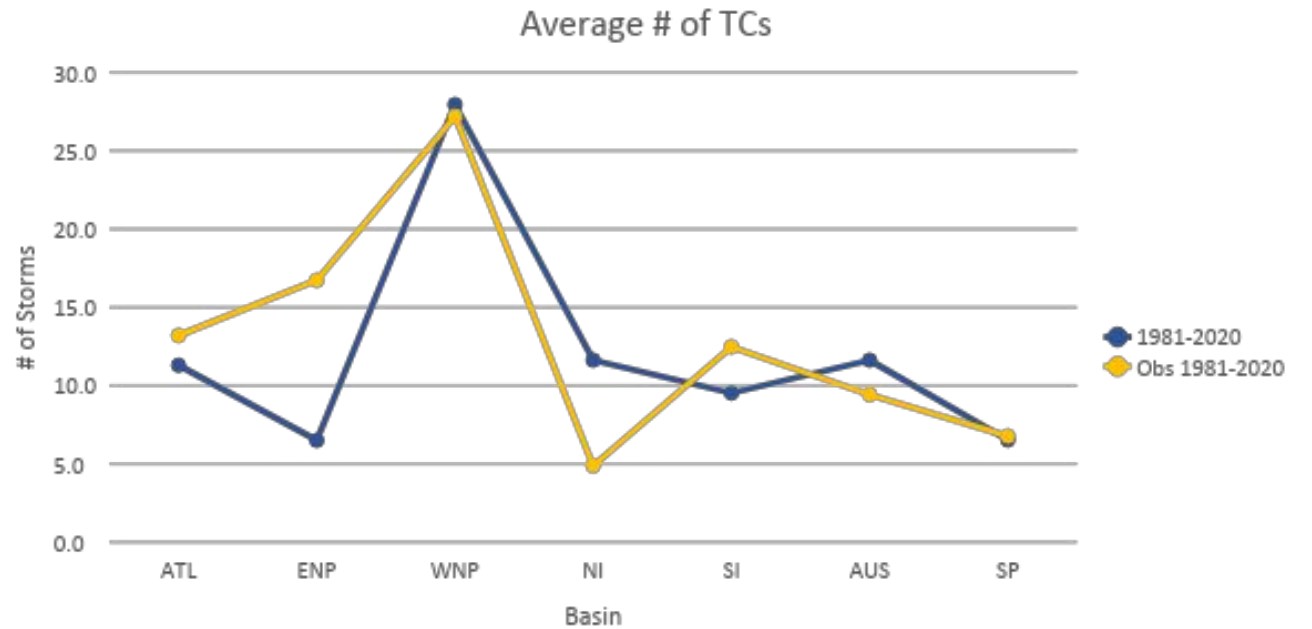
# Interannual Variability – TC Strength

- Left shows the total counts. Right shows the anomalies.
- The totals illustrate the low storm count in the ENP. The anomaly correlations aren't bad (0.56 for the full period), so the interannual variability is there. The wind speeds are just too low to reach the 34 kt TC threshold.
- Atlantic and W. Pacific have the highest ACs.
- Because the NI and SH obs before ~1981 do not contain wind speeds, any storm in the best-track before 1981 is counted as a TC. Overcounting is definitely occurring, so not included in AC calculations.



# Average Storm Counts

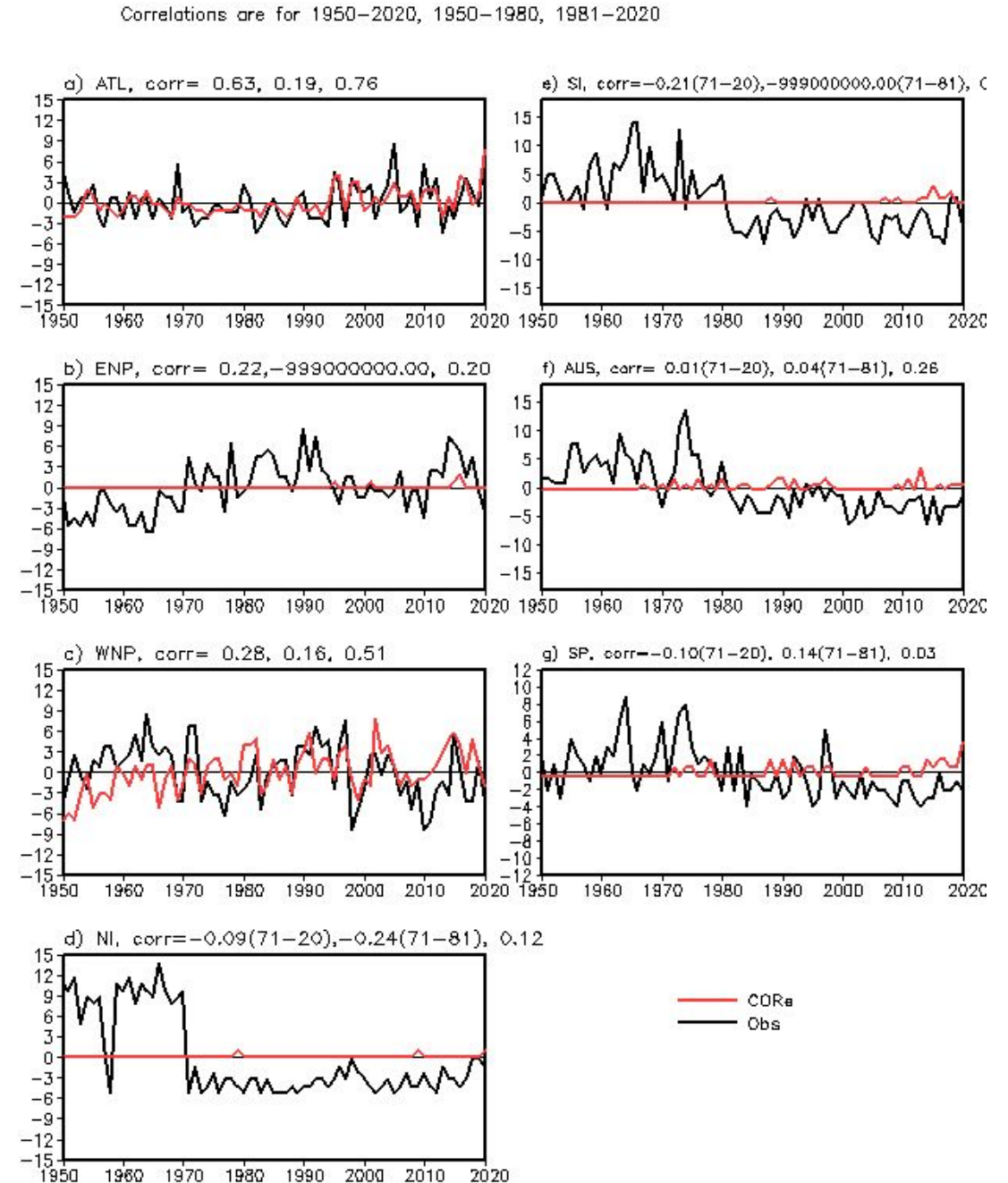
- ATL, WNP, and all 3 SH basins have close average counts to observations in the past 40 years.
- NI is over-simulated, probably due to tracking errors discussed earlier.
- ENP is lacking on average 10 storms a year.
- Average Differences (bottom): The discrepancy in observed best track for the NI and SH can be seen in the change in count differences when using data before 1981.



# Interannual Variability

## – HU Strength

- Continuing issues with wind speed
- For some reason, ATL and WNP seem to be immune, while the other basins have few to any storms reaching 64 kts.
- Some wind strength may have been averaged out when making the CORe ensemble, but the inconsistency between basins seems suspect.



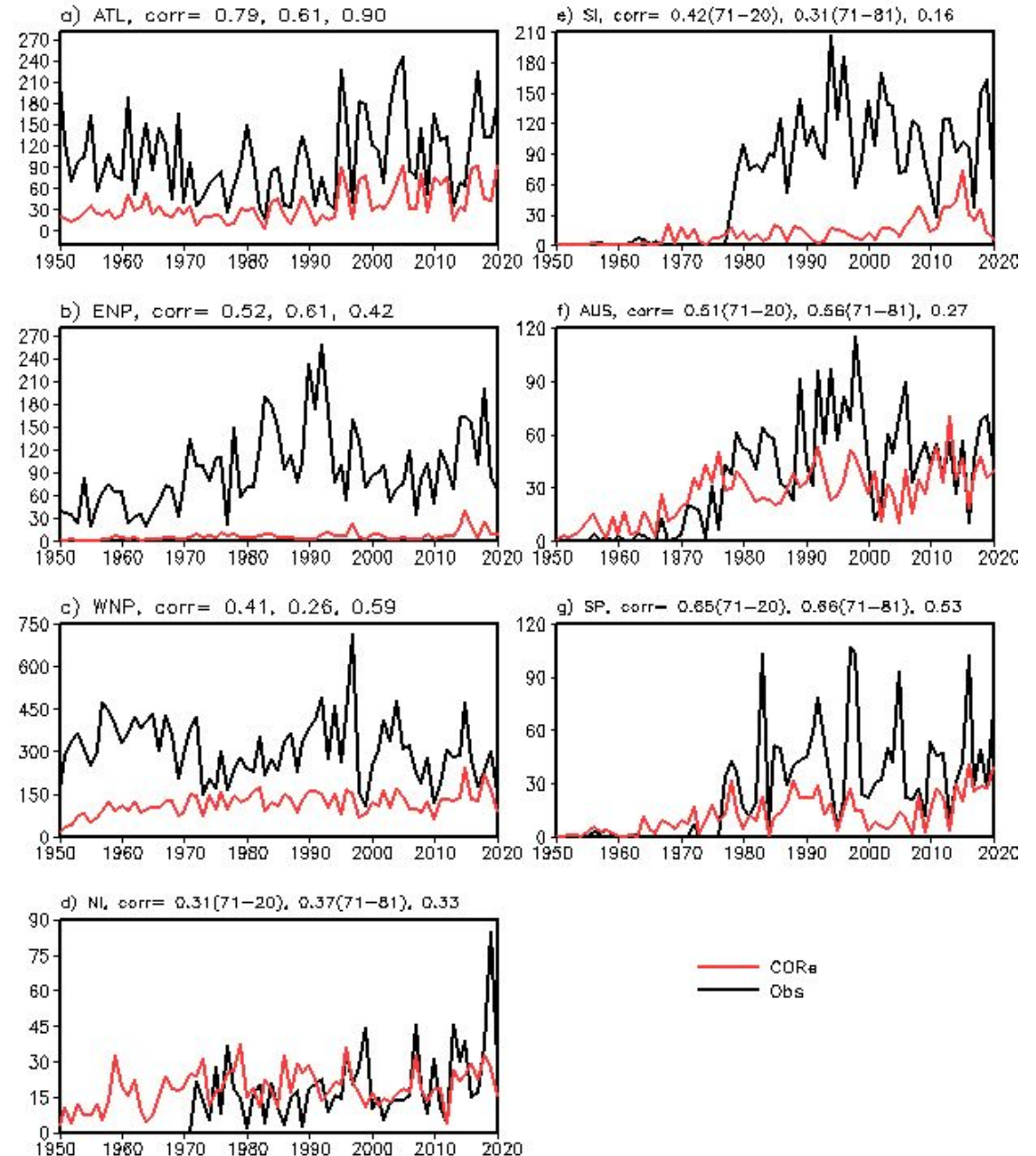


# Interannual Variability

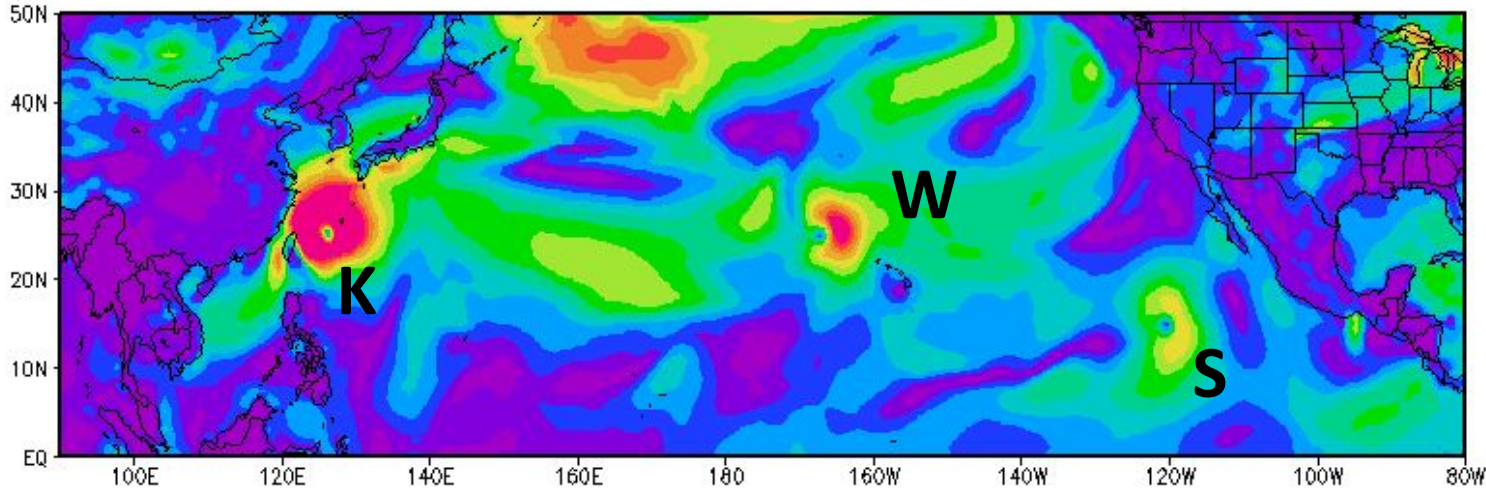
## – ACE Index

- ACE Index measures strength and length of TCs
- Weaker in all basins than observed but, again, interannual variability present.

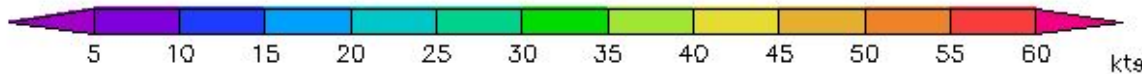
Correlations are for 1950–2020, 1950–1980, 1981–2020



# Wind Comparison by Basin - 10/4/2018, 12Z



CORE 10m Winds



Three storms coexist at this time:  
Sergio, 120 kts (CORE = 36kts)  
Kong-Rey, 65 kts (CORE = 75kts)  
Walaka, 100 kts (CORE = 52kts)

Why are the Eastern Pacific winds so much weaker?

CORE Vorticity (850mb)

