

CHAMP Update

May 3, 2019

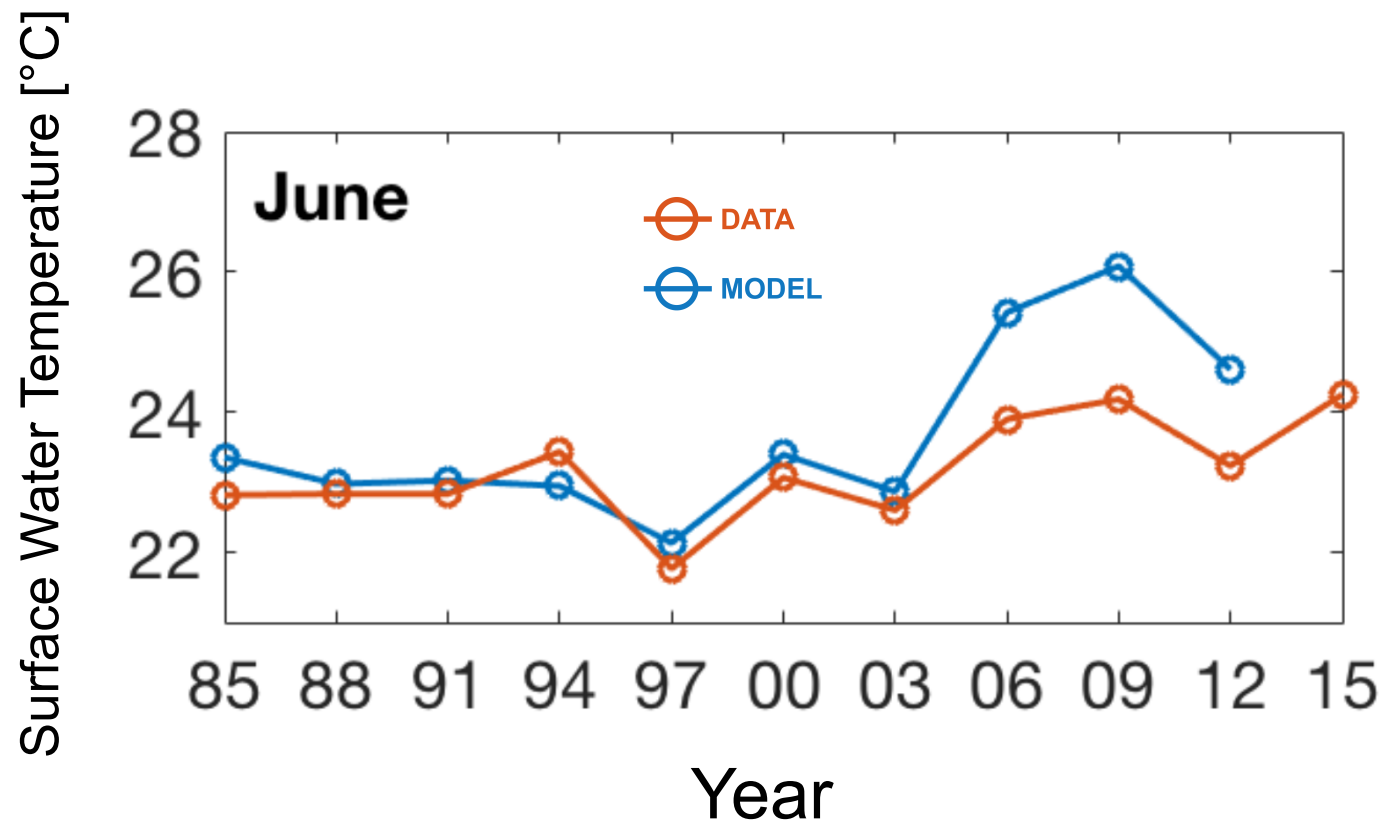
**Change in historical atmospheric forcing
(1980-2018) from NARR to ERA5**

Marjy Friedrichs

Kyle Hinson

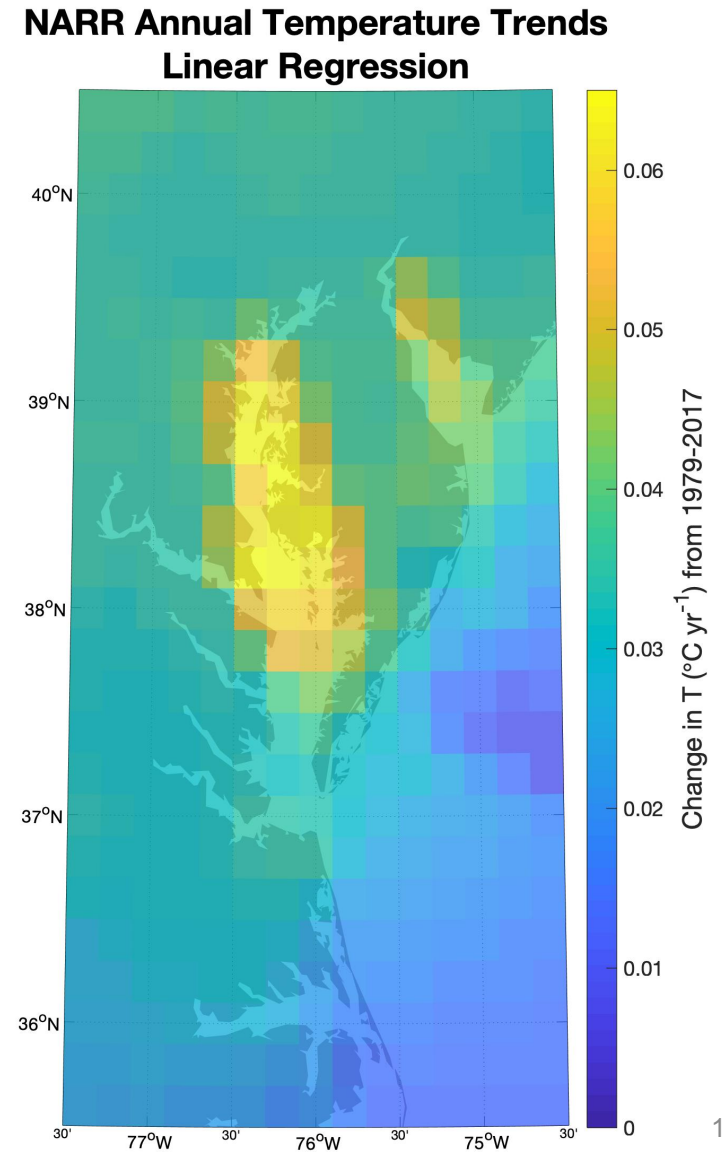
Pierre St-Laurent

Why is ChesROMS overestimating increased water temperatures in recent years?

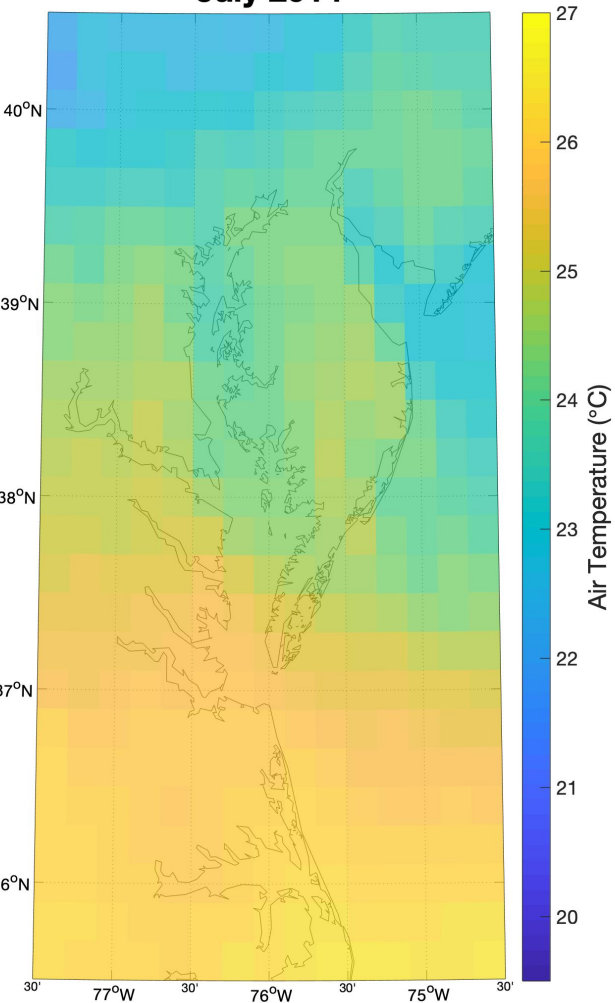


Air Temperature Analysis

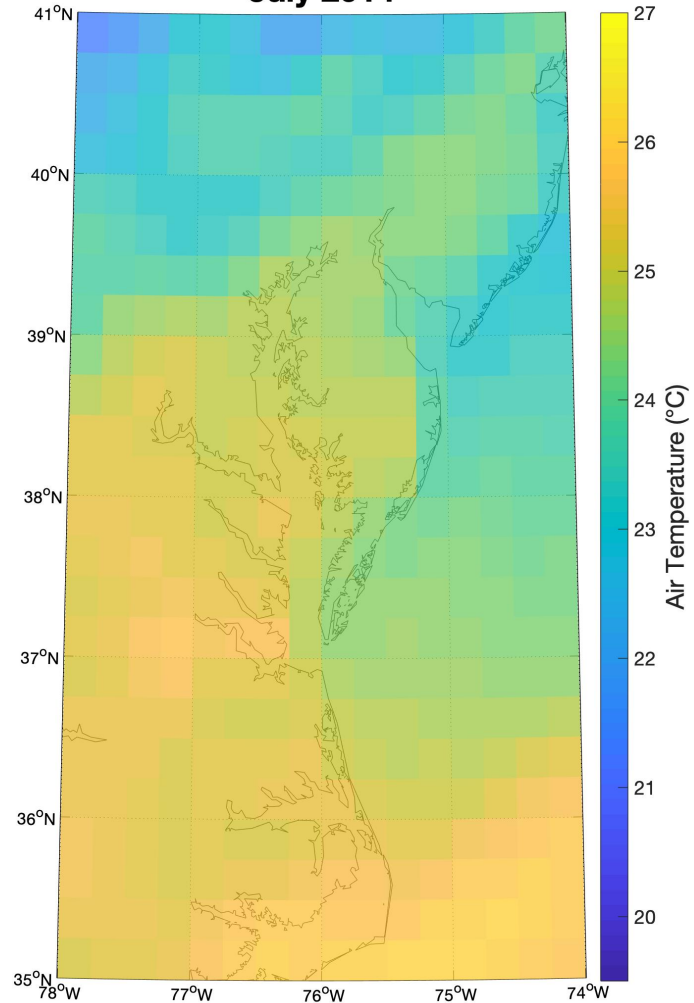
- North American Regional Reanalysis (NARR) provides air temperature data for ChesROMS
- Performed linear regression over every cell to study air temperature trends
- Anomalous warming patch ($> 2\text{ }^{\circ}\text{C}$ over 40 years) over middle and upper Chesapeake Bay



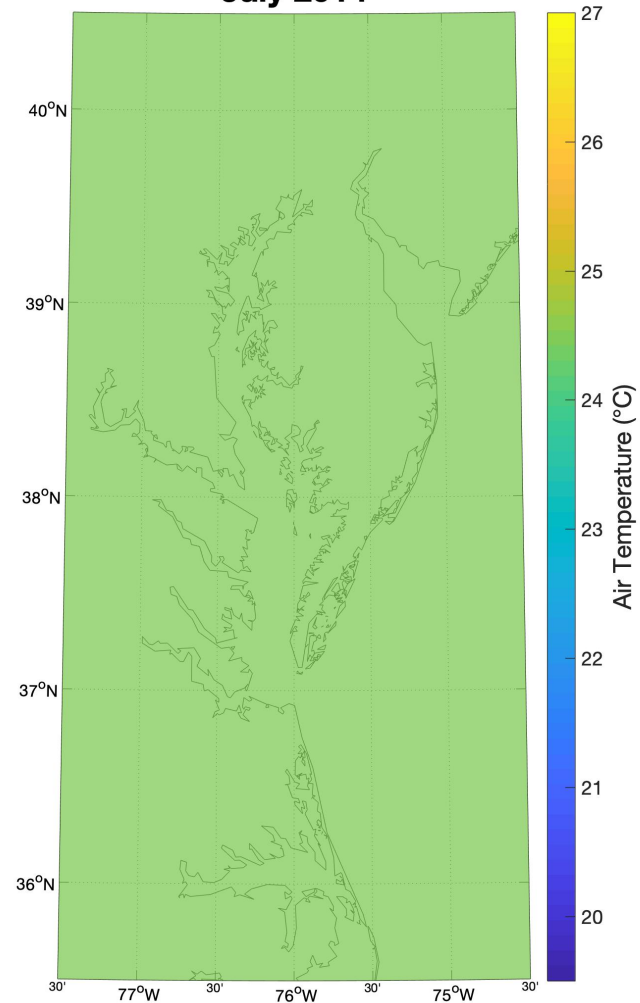
**NARR Air Temperatures
July 2014**



**ERA5 Air Temperatures
July 2014**

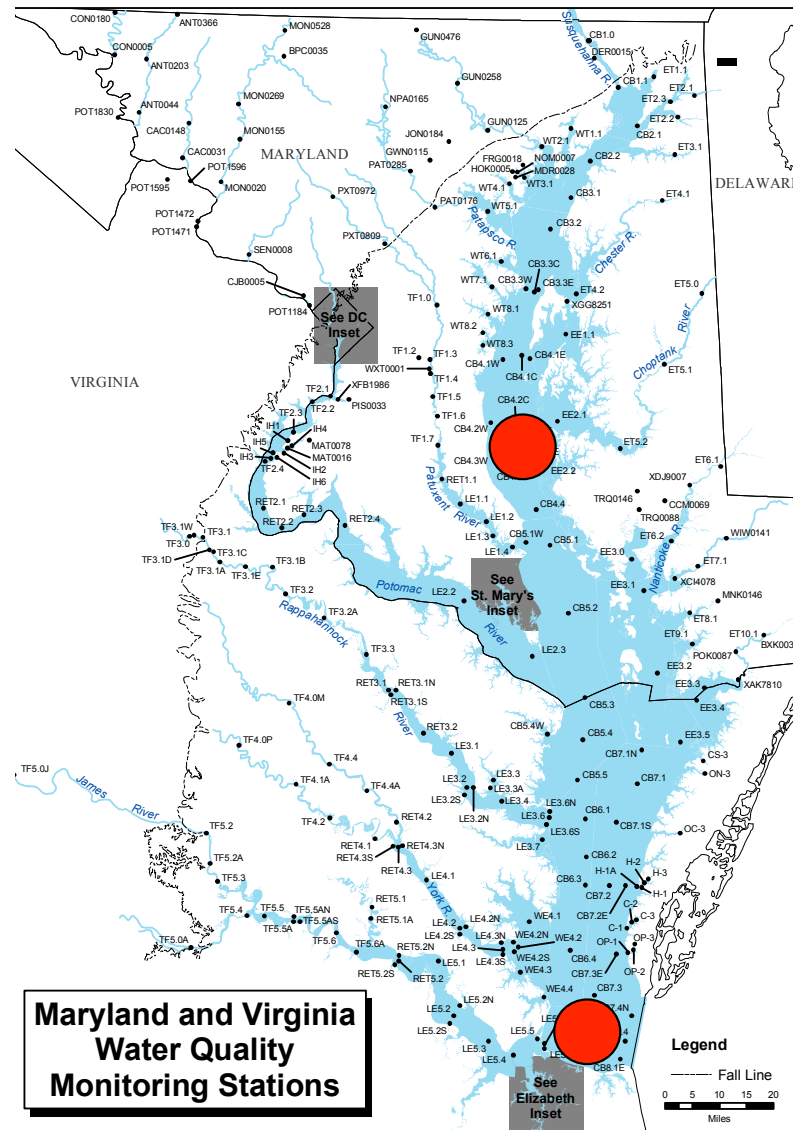


**CBP Air Temperatures
July 2014**

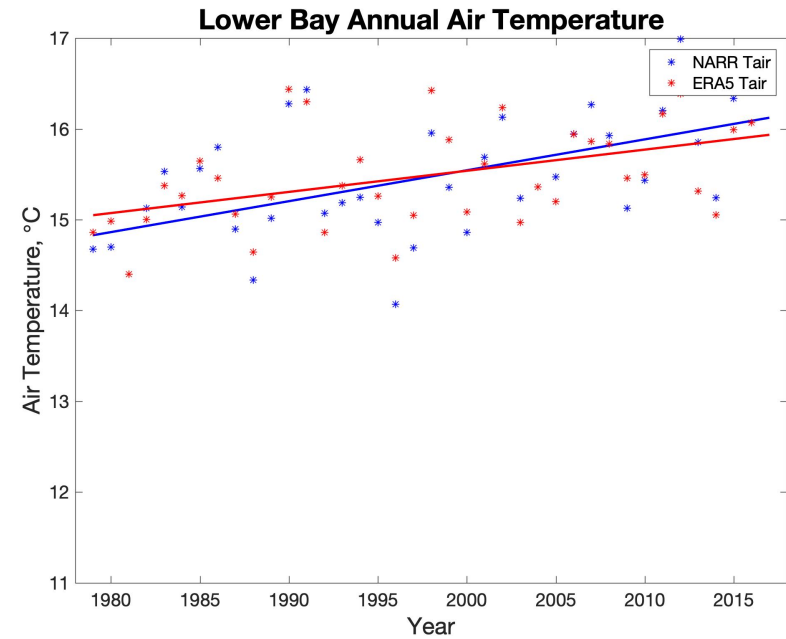
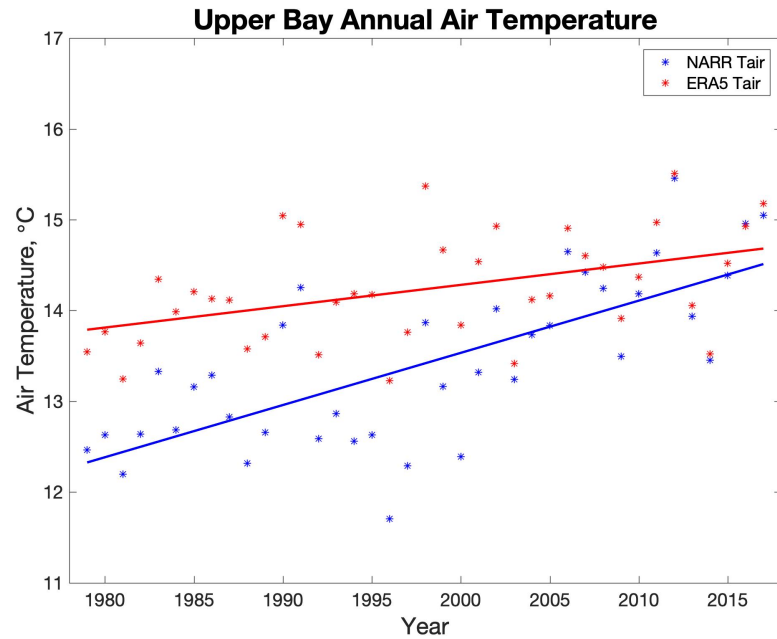


Upper Bay: CB4.3C

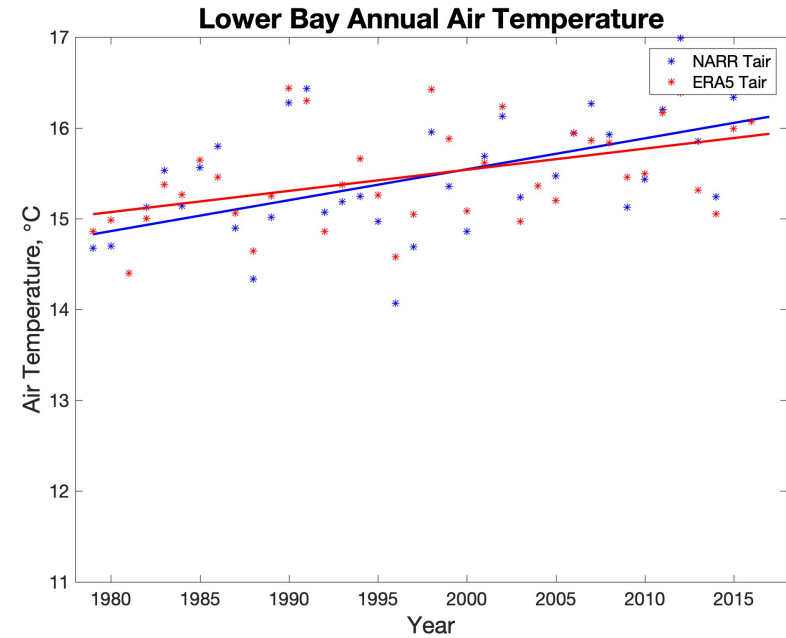
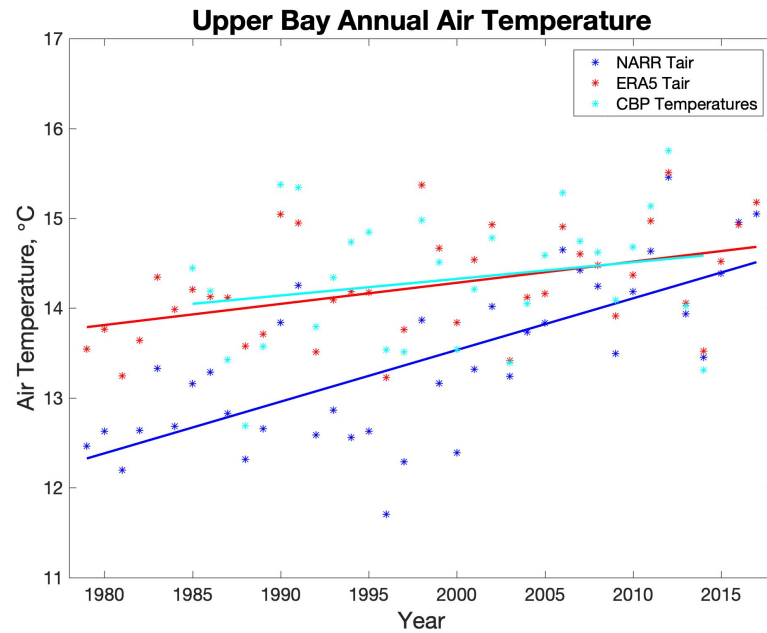
Lower Bay: CB8.1



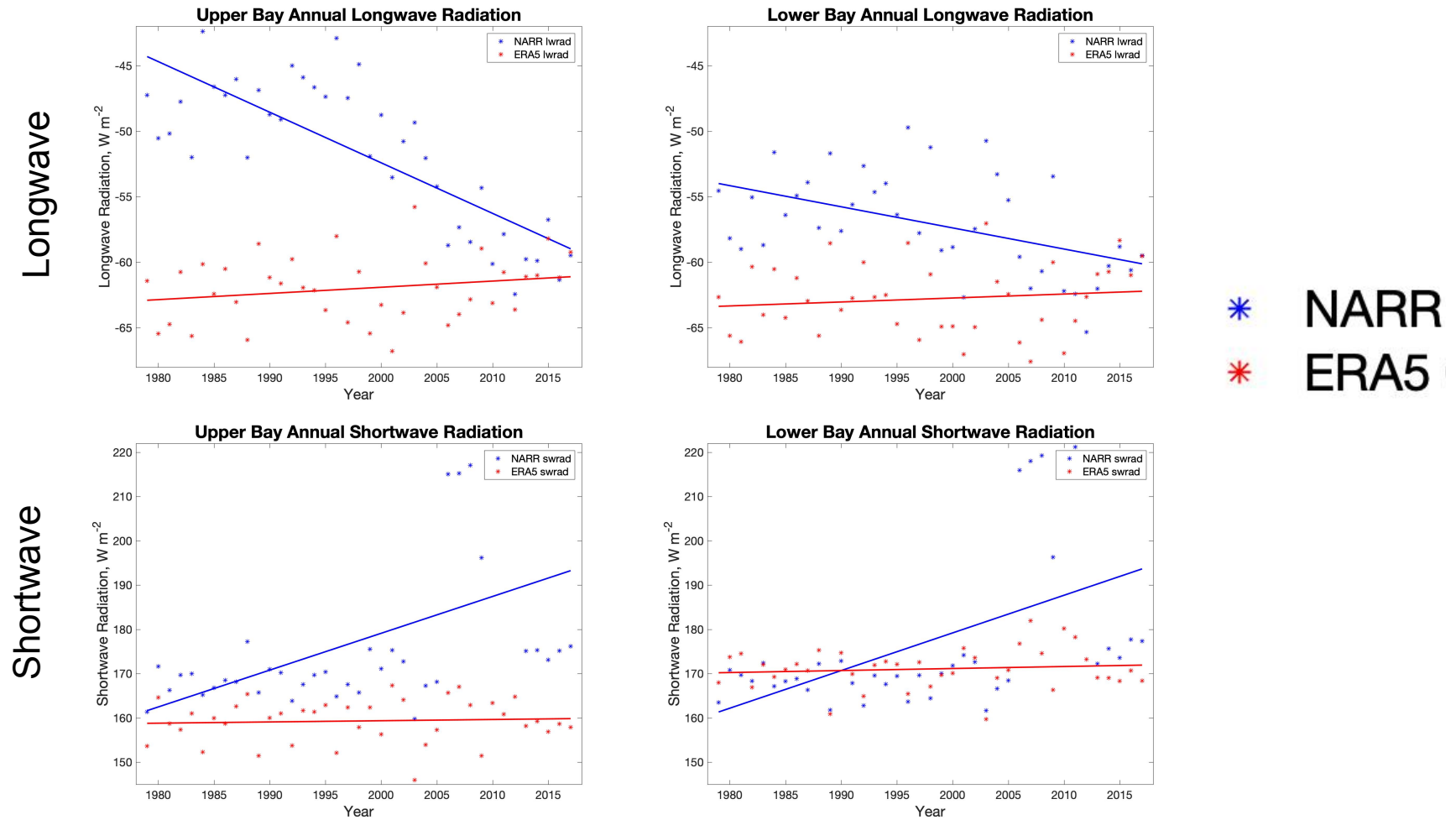
NARR vs. ERA5 Air Temperature Comparison

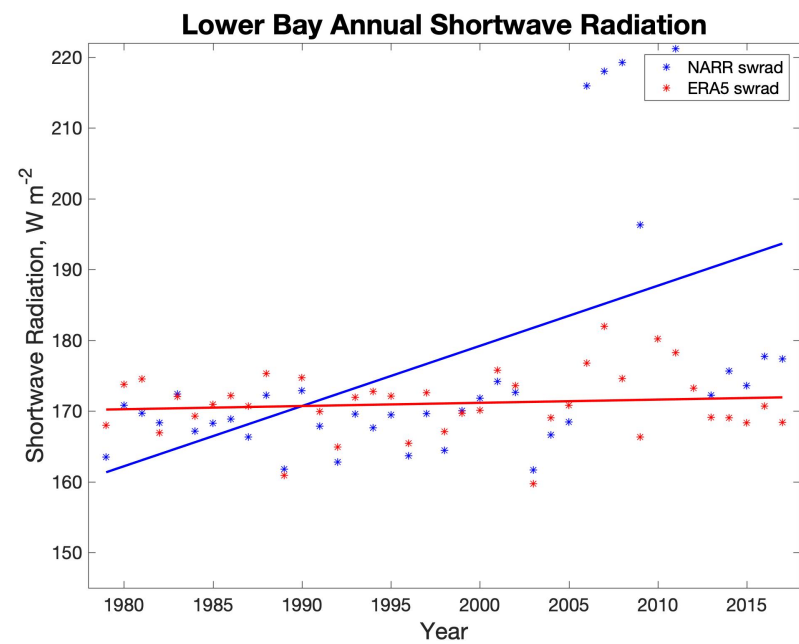
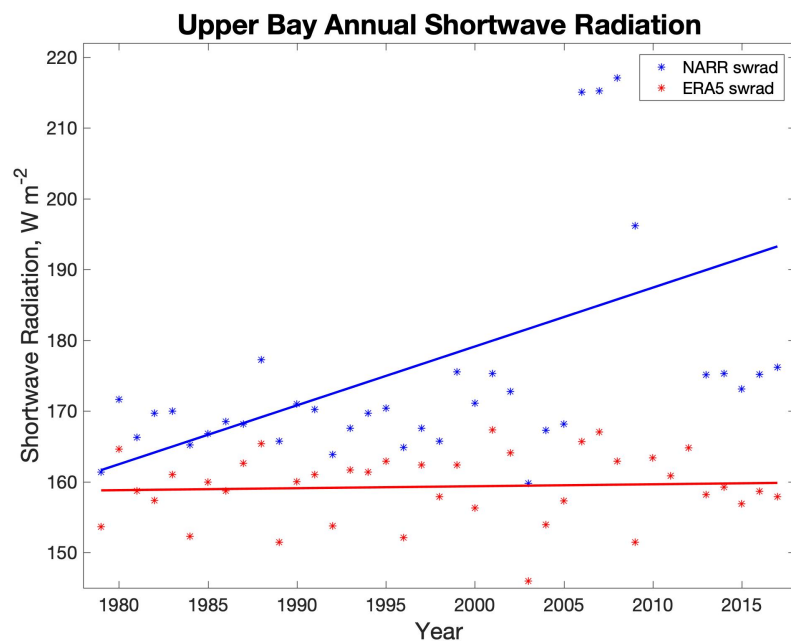


NARR vs. ERA5 Air Temperature Comparison



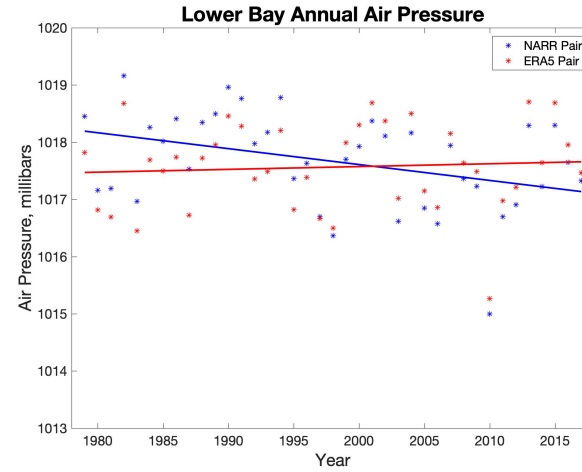
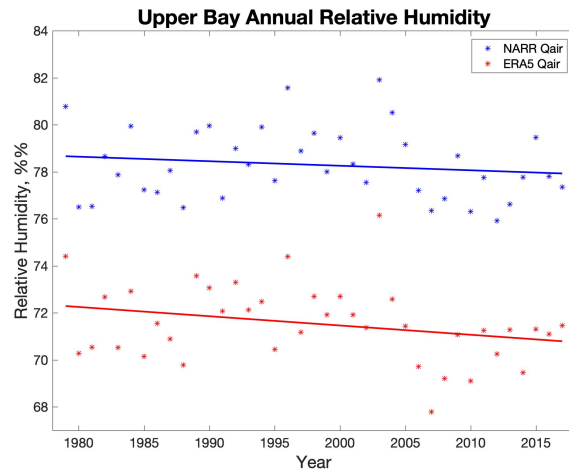
NARR vs. ERA5 LW and SW Radiation Comparison





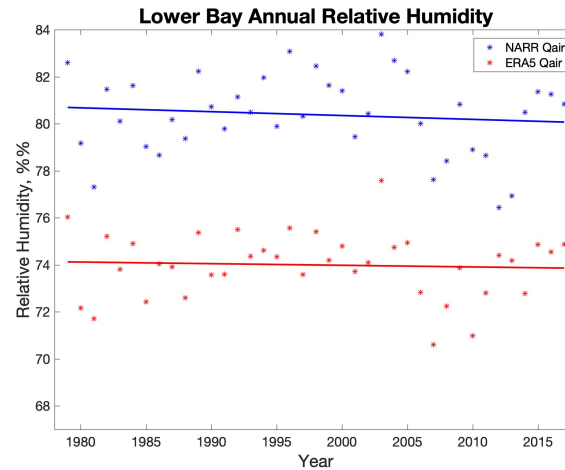
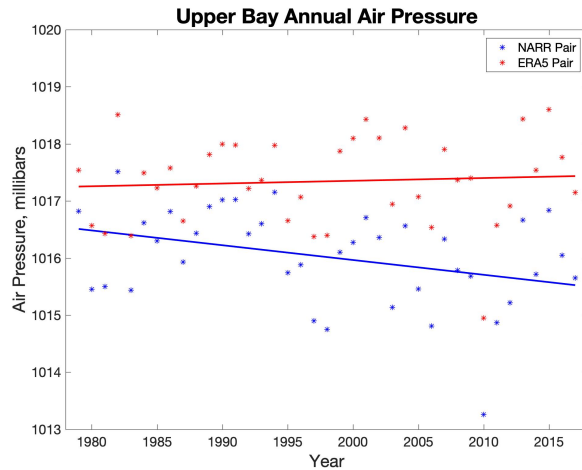
NARR vs. ERA5 Humidity and Air Pressure Comparison

Humidity



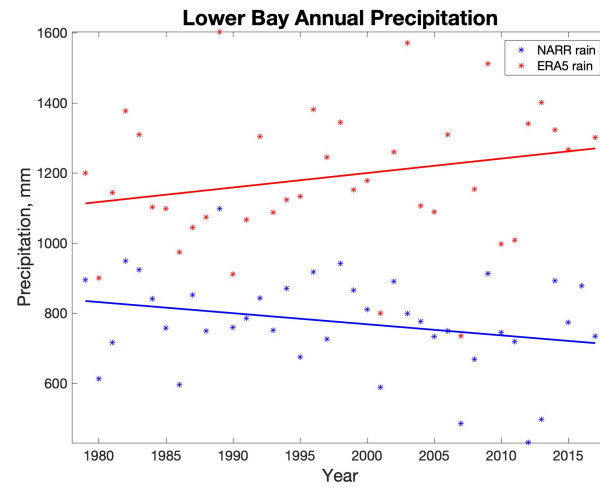
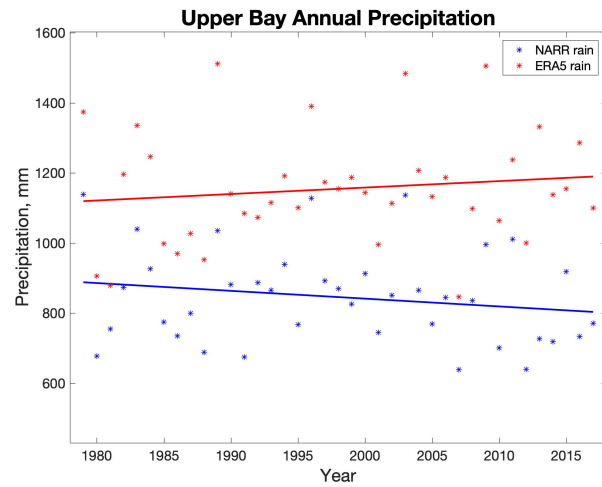
* NARR
* ERA5

Air Pressure

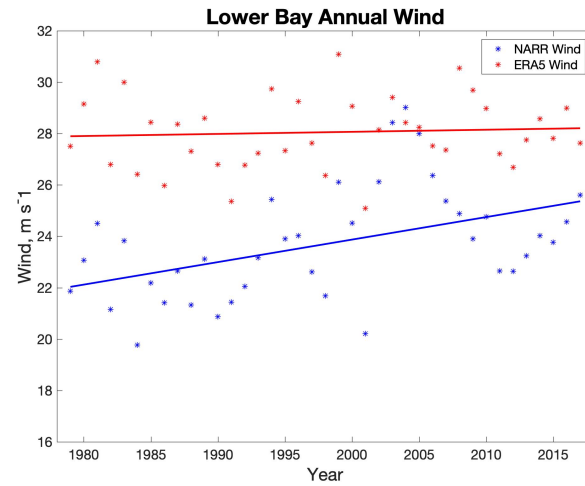
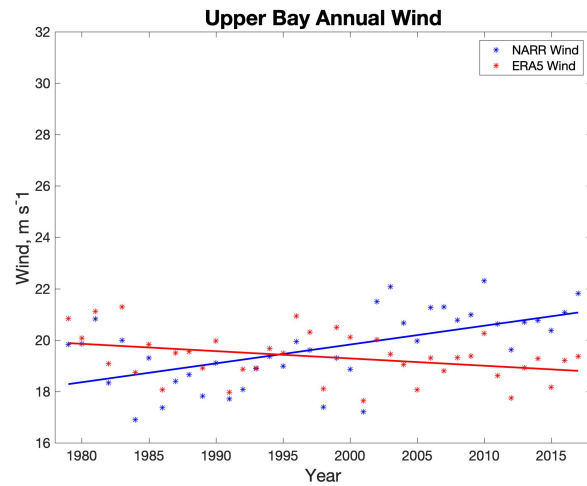


NARR vs. ERA5 Precip and Wind Comparison

Precipitation



Wind



* NARR
* ERA5