

The Role of Resolved Ocean Eddies in Decadal Predictability

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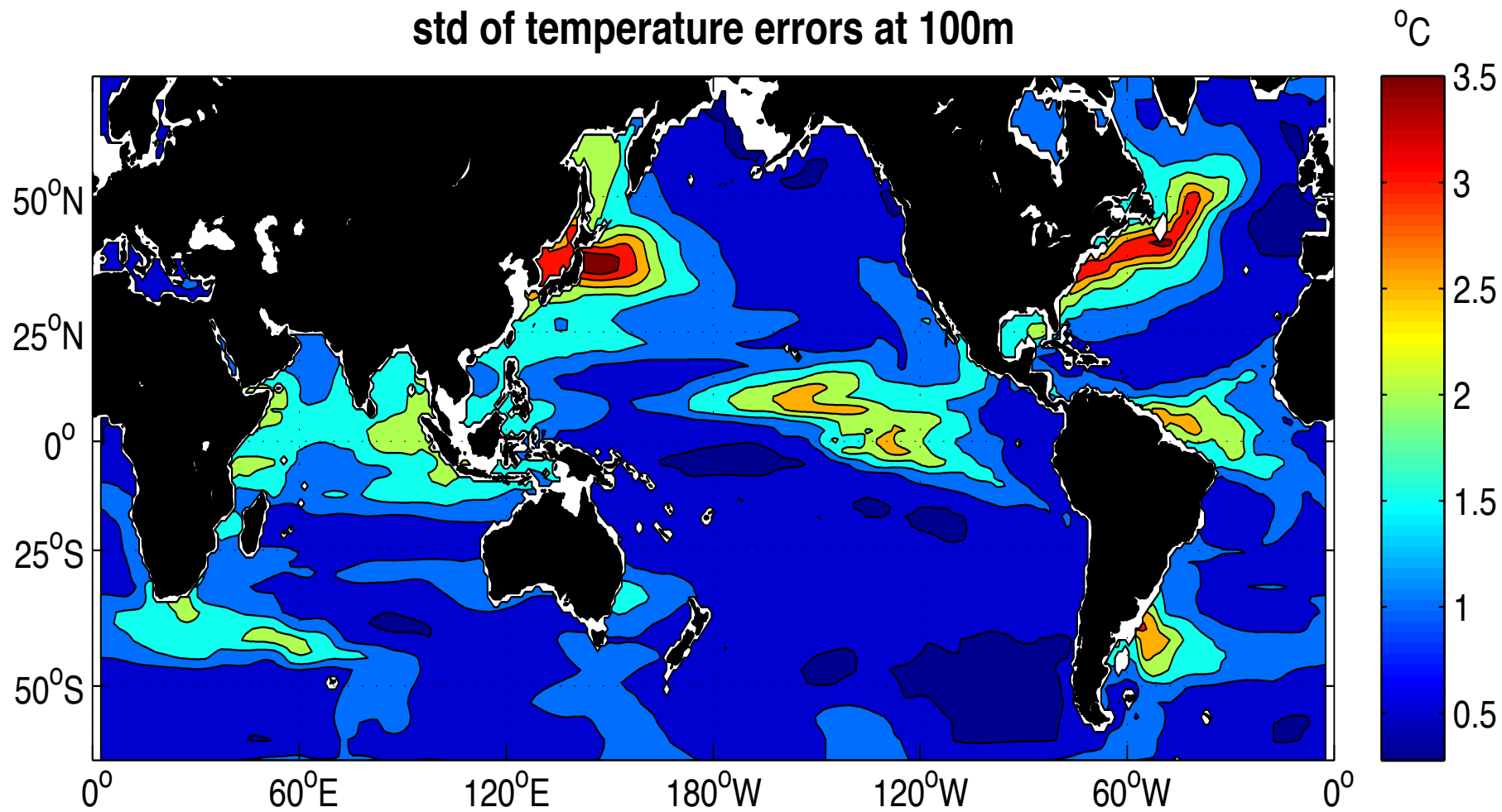


Ocean Eddy Resolving Coupled Predictability

- **Motivation – Seasonal Prediction**
- **Changes in Variability – Air-Sea Feedbacks**
- **Decadal North Atlantic Variability/Predictability**
- **Atmos-Ocean Eddy Interactions**

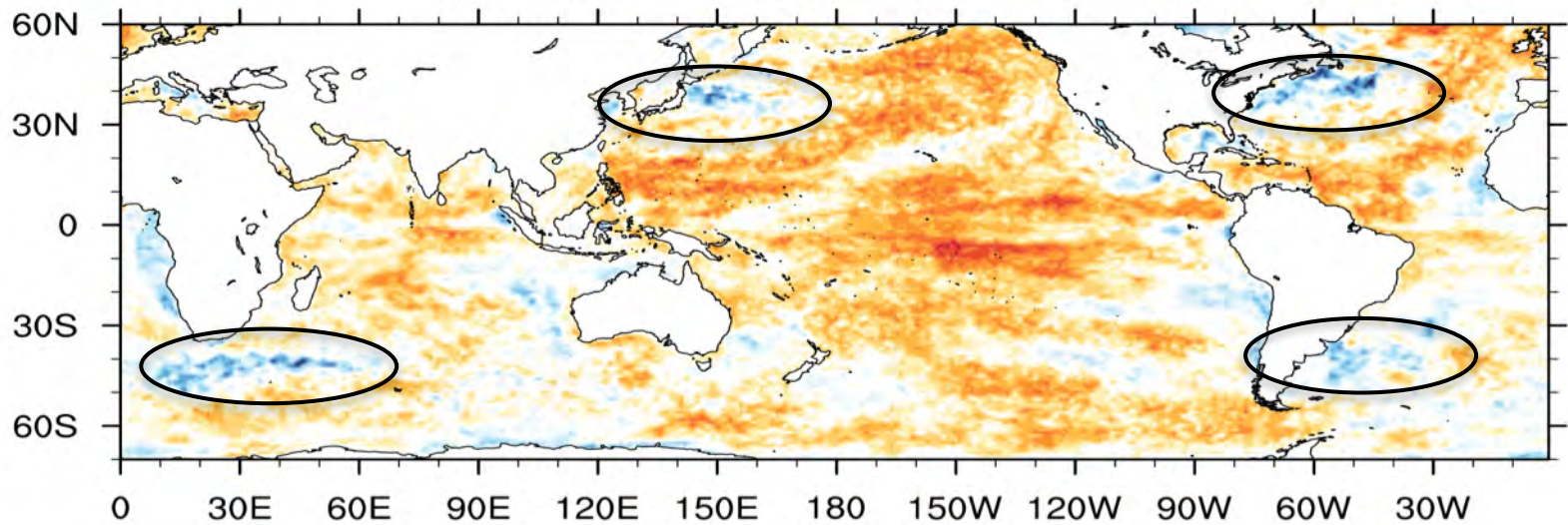
DART LRC Representativeness Errors

std of temperature errors at 100m

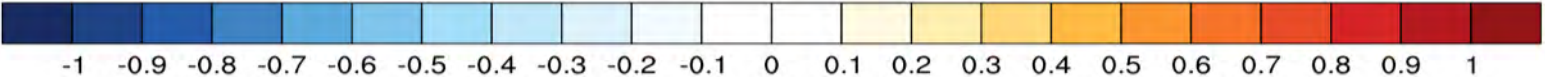
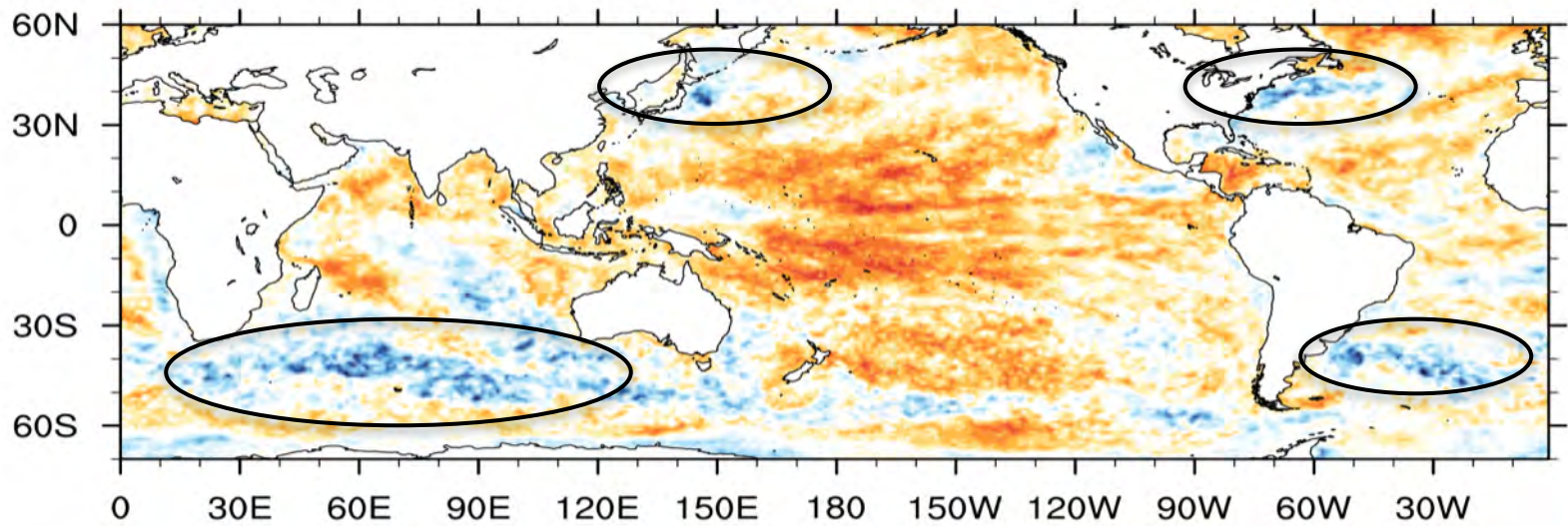


Seasonal Forecast

(a) RPSS - JanIC JFM CCSM4



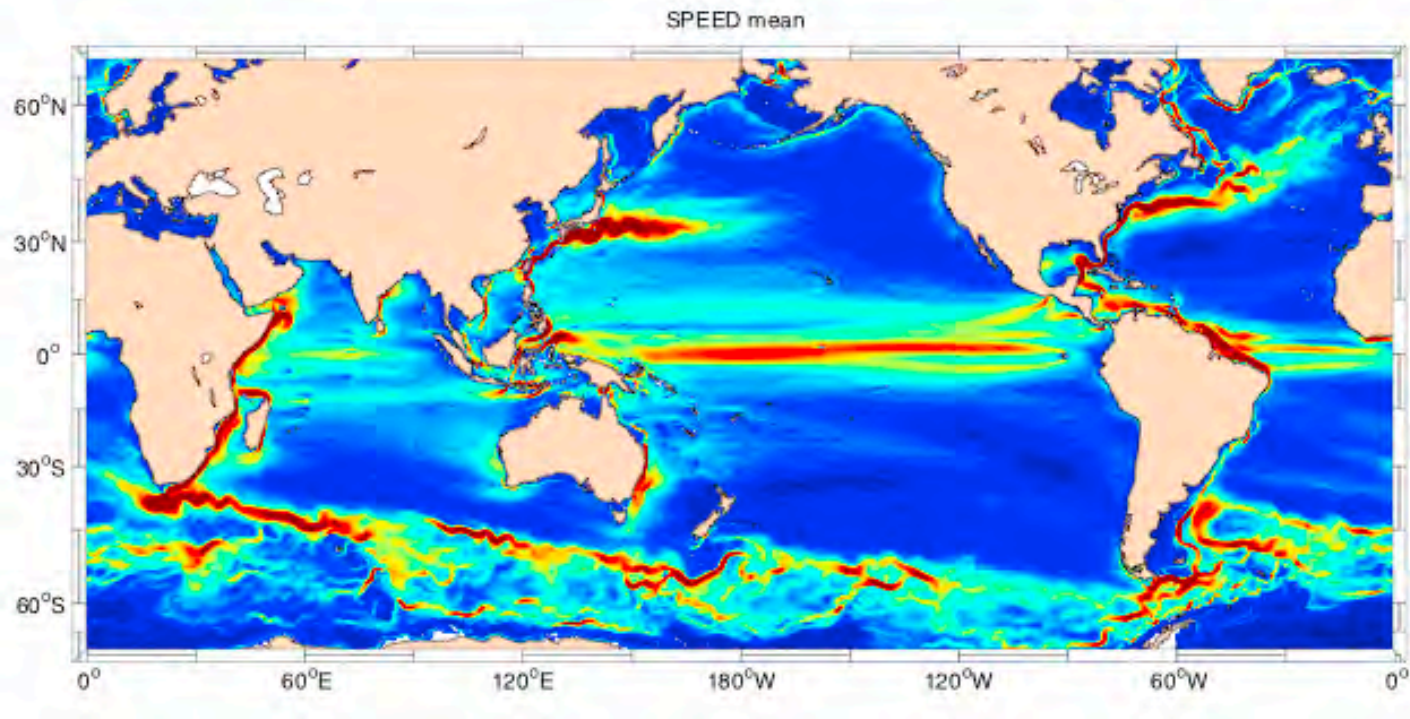
(b) RPSS - JunIC JJA CCSM4



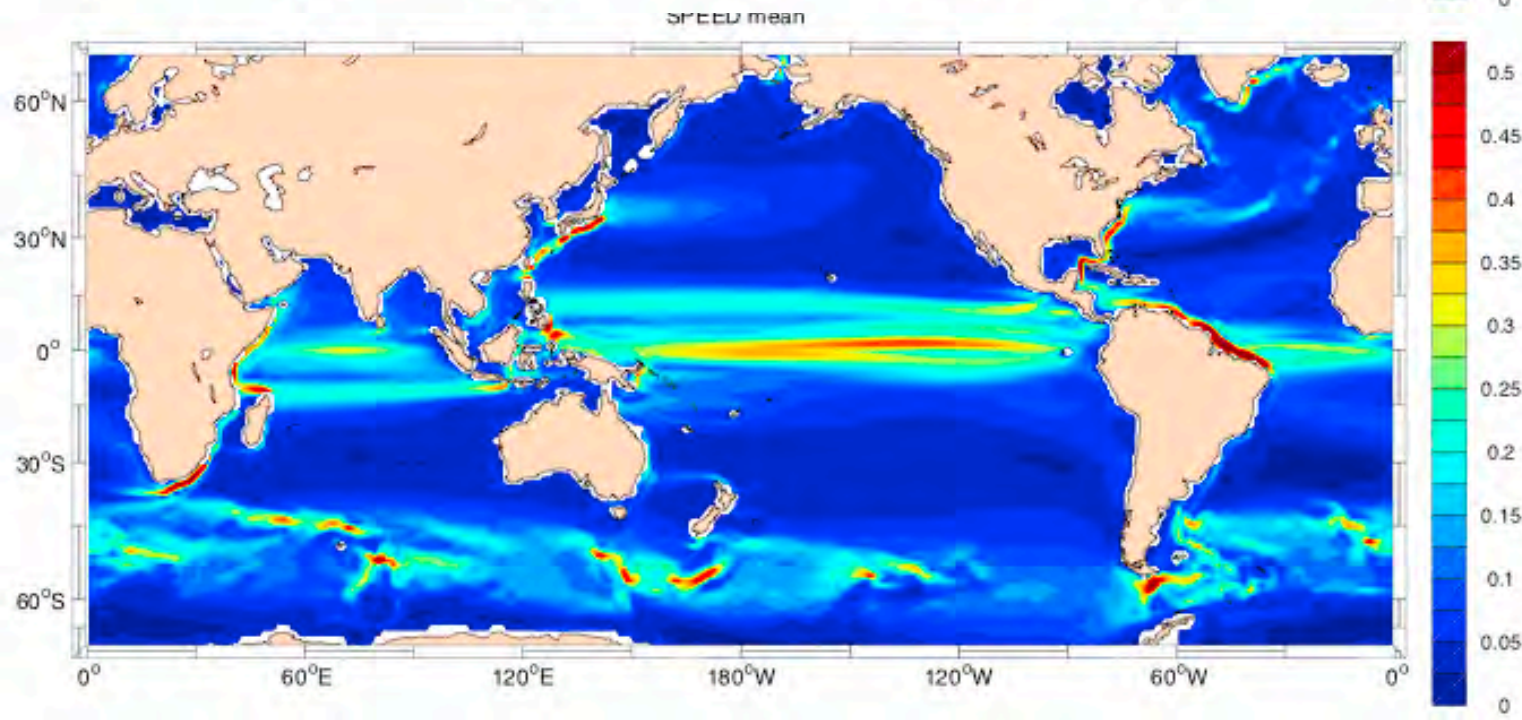
Ocean Eddy Resolving Coupled Predictability

- **CESM**
 - Atmosphere: 0.5x0.5
 - Ocean: 0.1x0.1 [HRC] vs. 1x1 [LRC]
- **Resolved Eddy Impact**
 - Changes in Variability – Air-Sea Feedbacks
 - Decadal North Atlantic Variability/Predictability
 - Atmos-Ocean Eddy Interactions

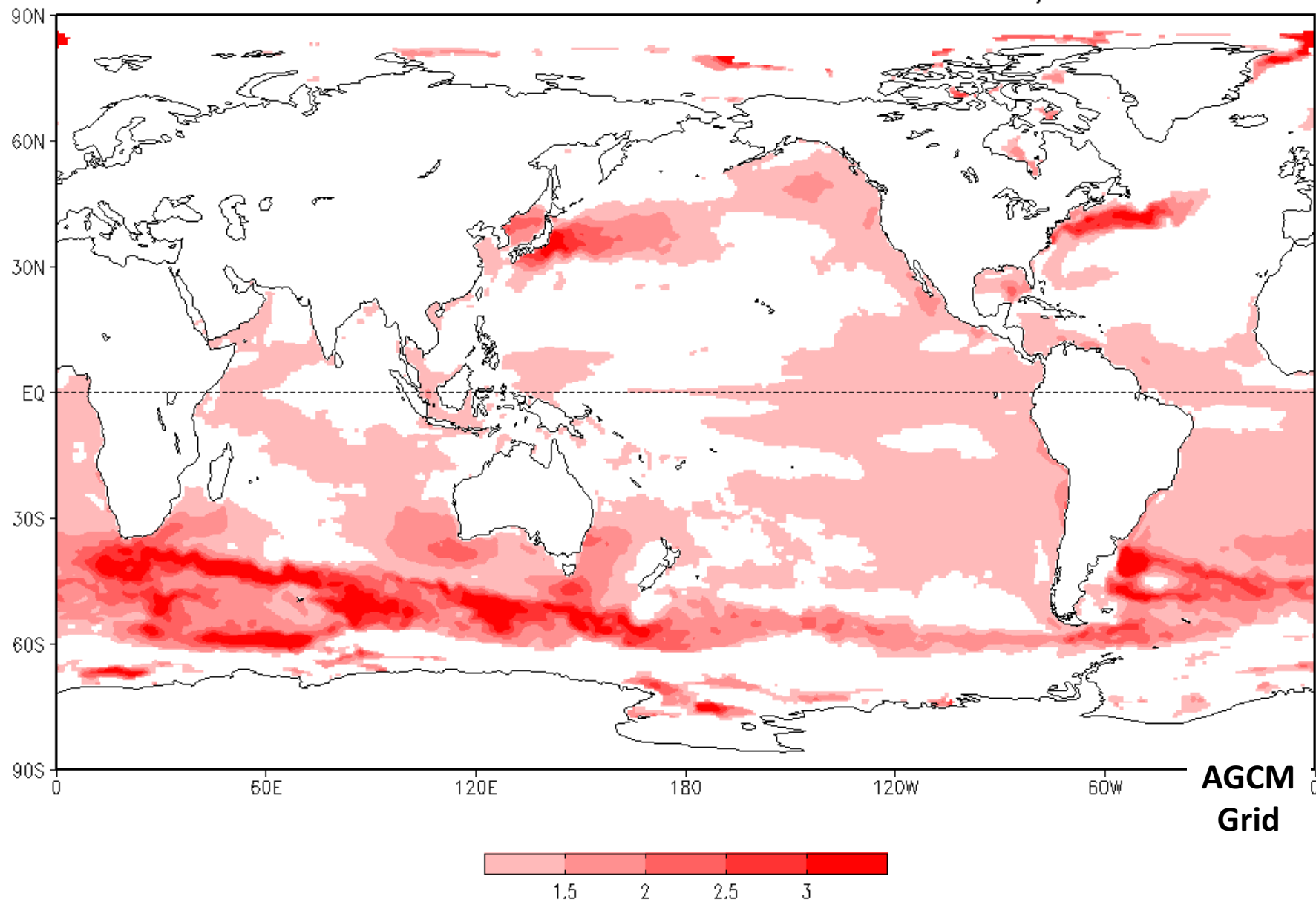
HRC



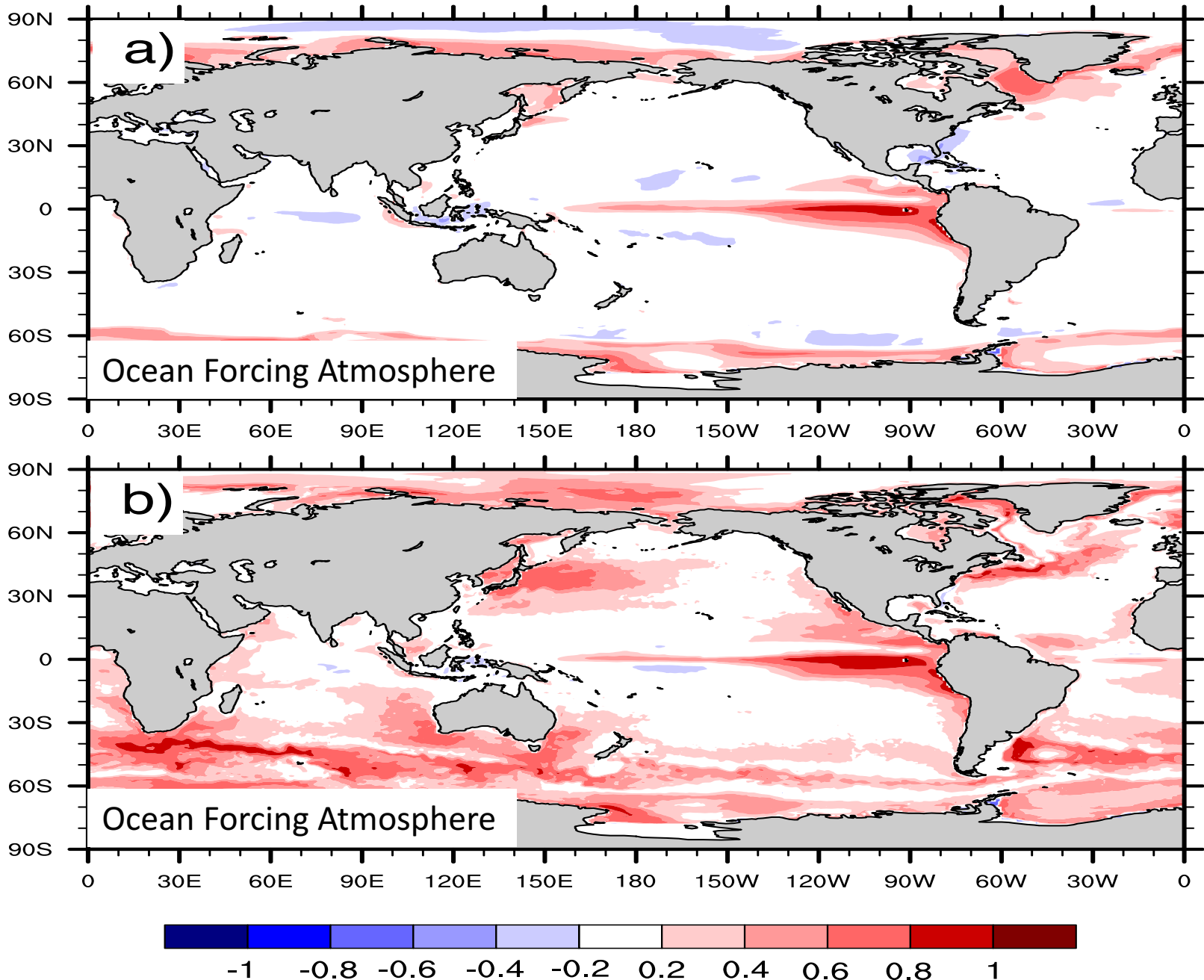
LRC



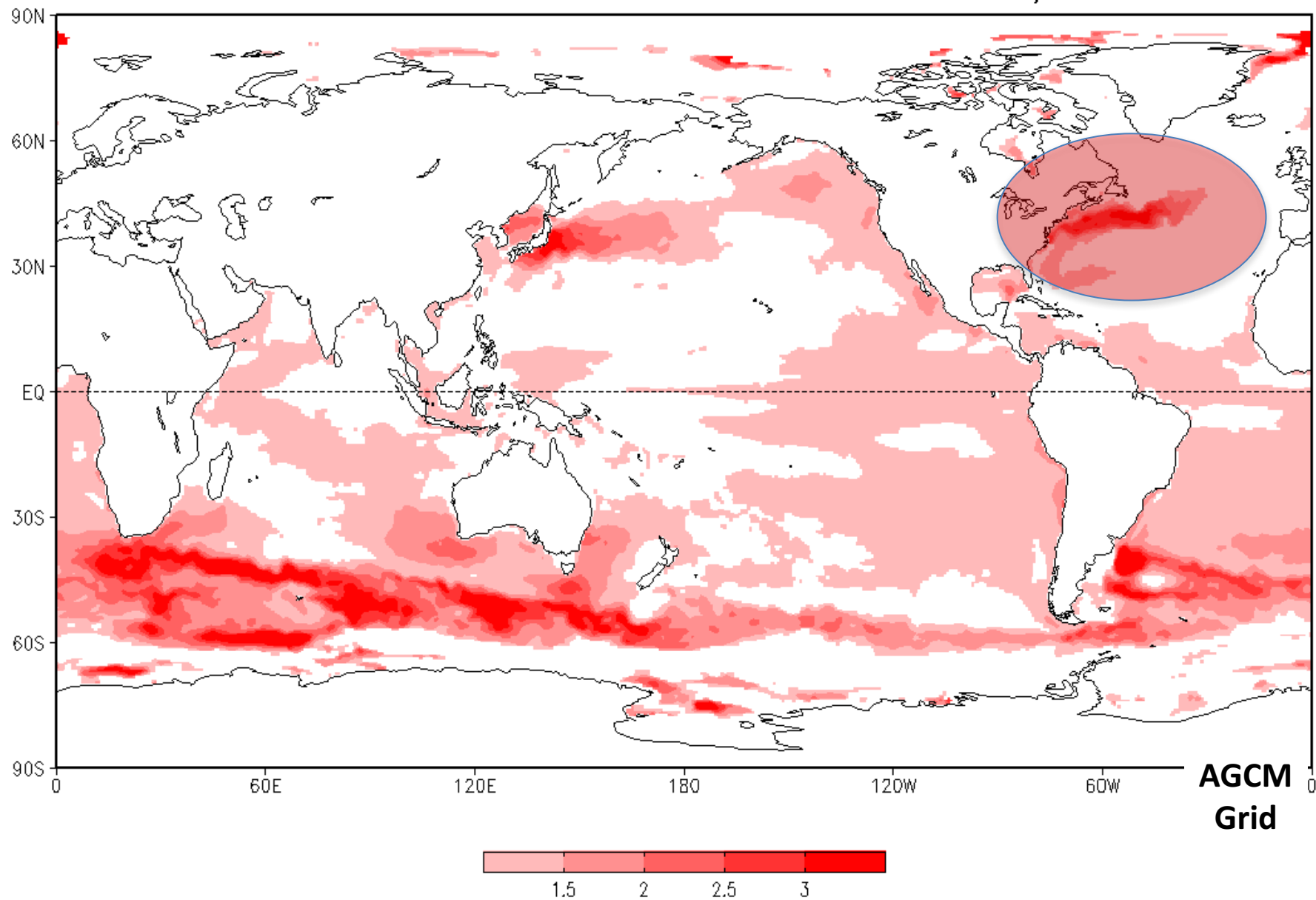
SST Standard Deviation Ratio HRC06/LRC



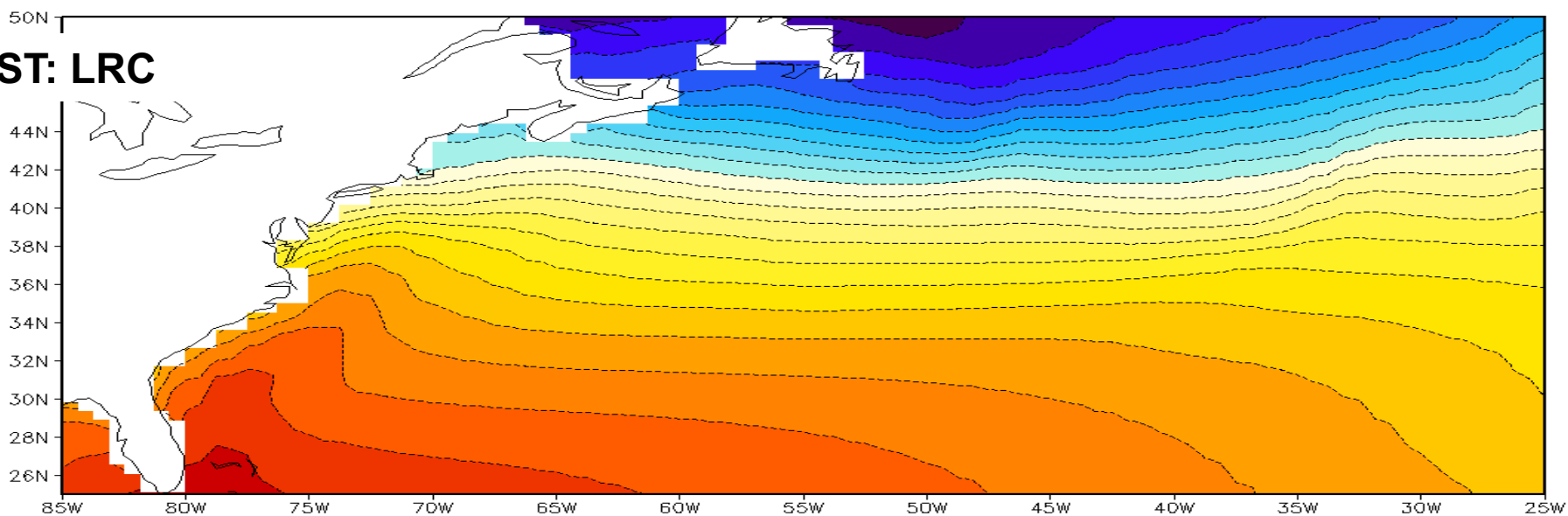
Local SSTA- Turbulent Heat Flux Correlation



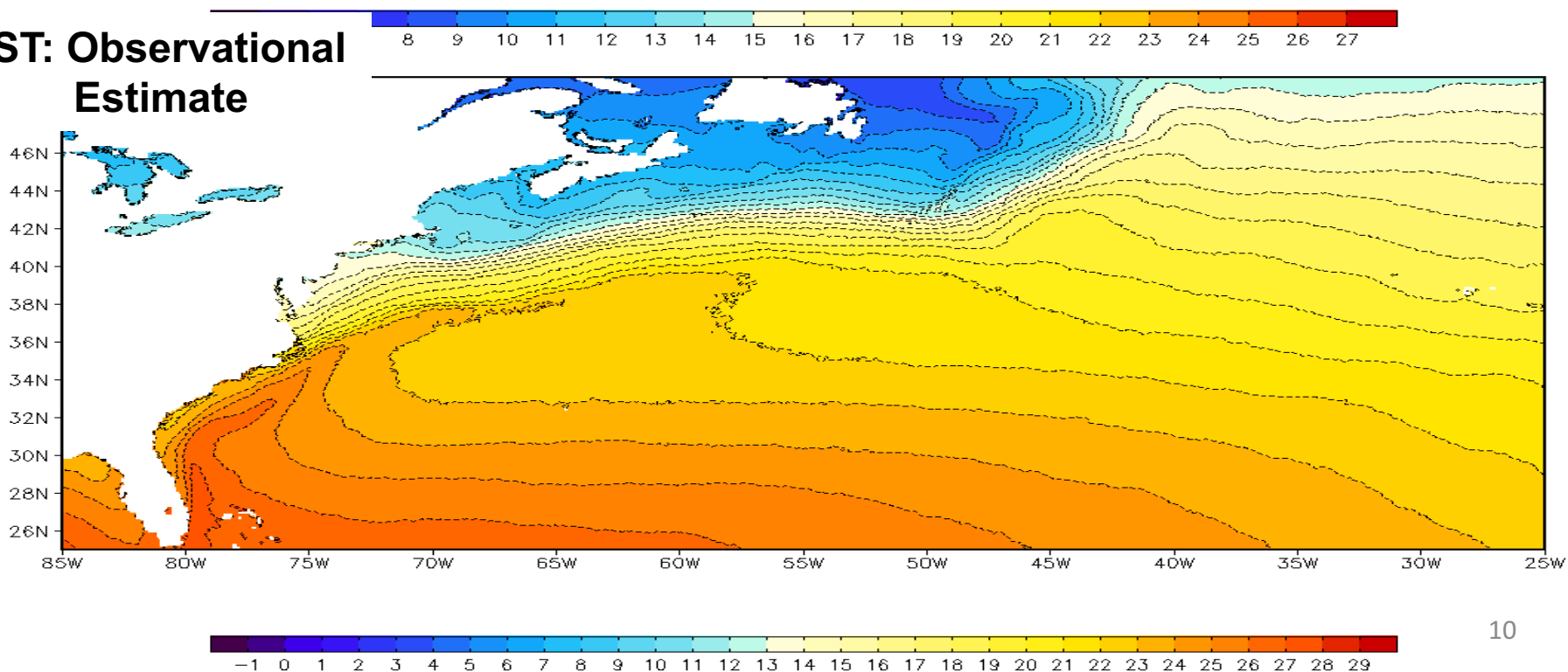
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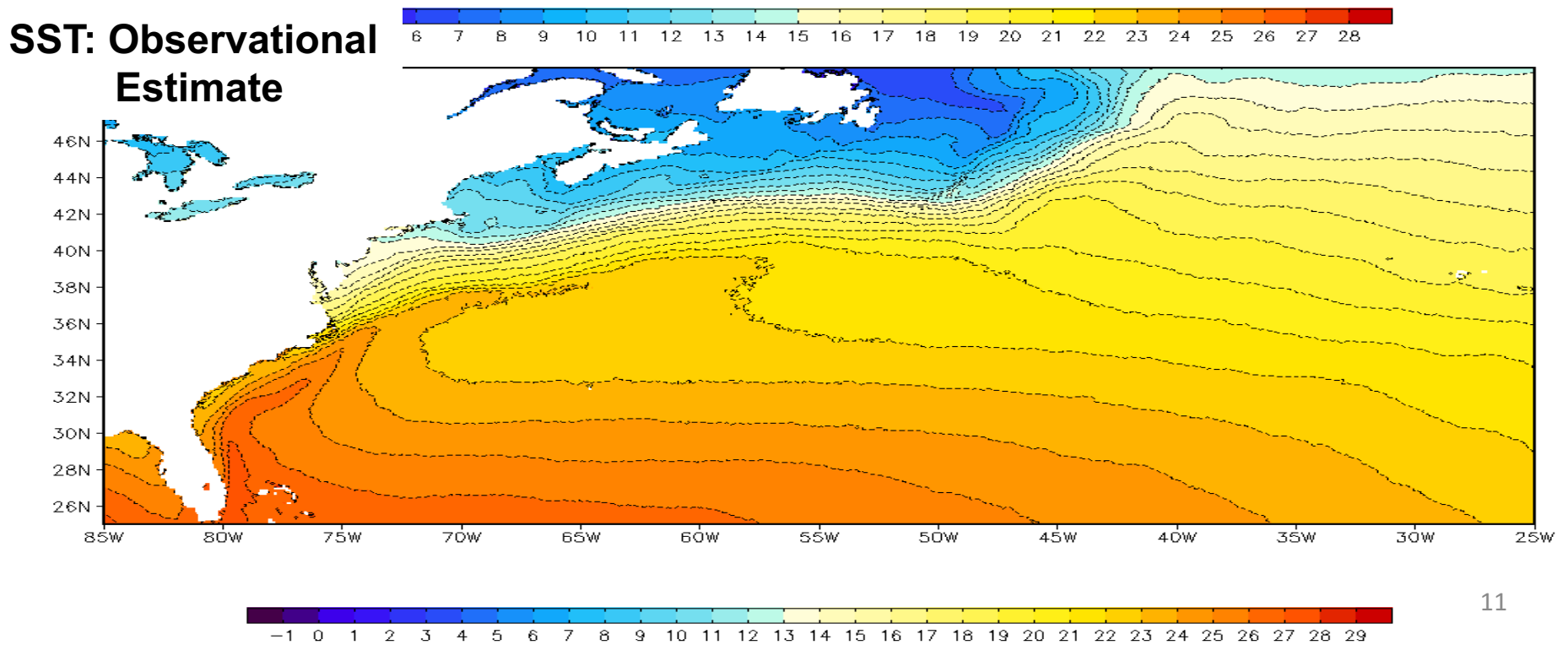
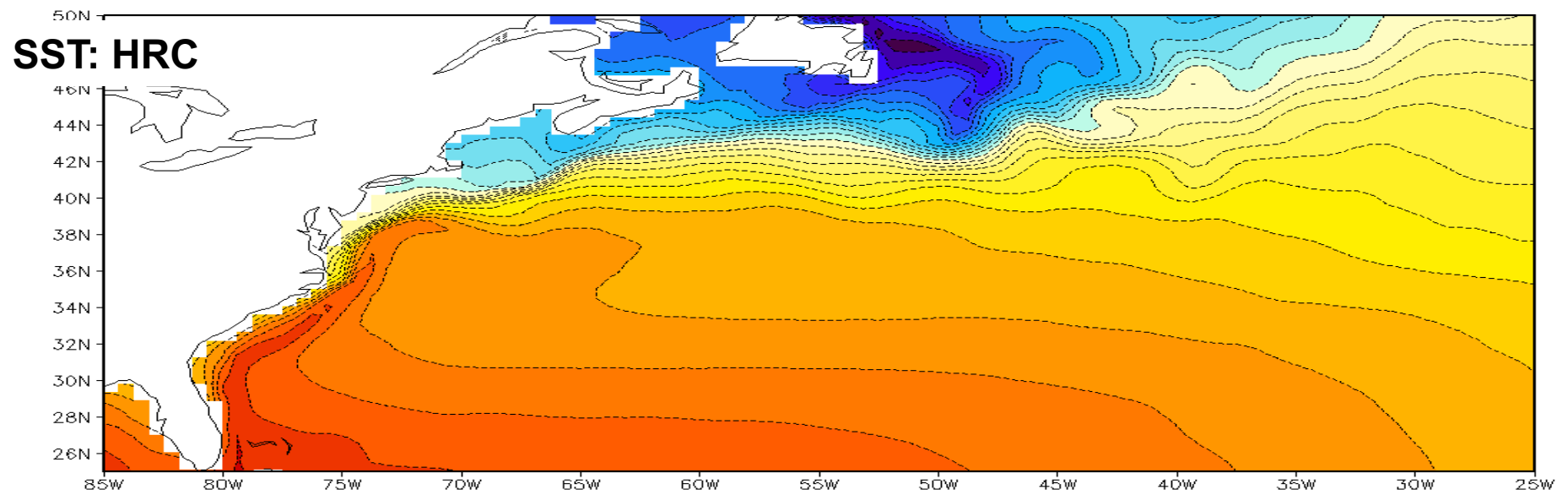


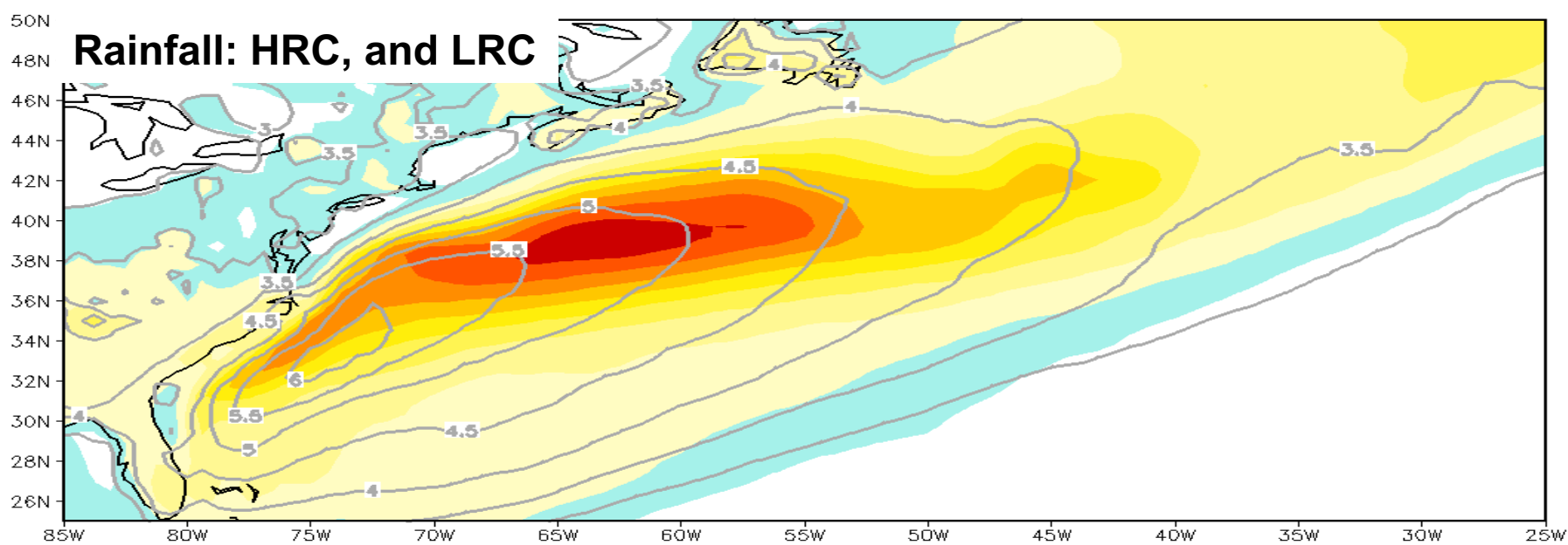
SST: LRC



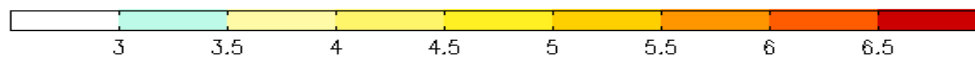
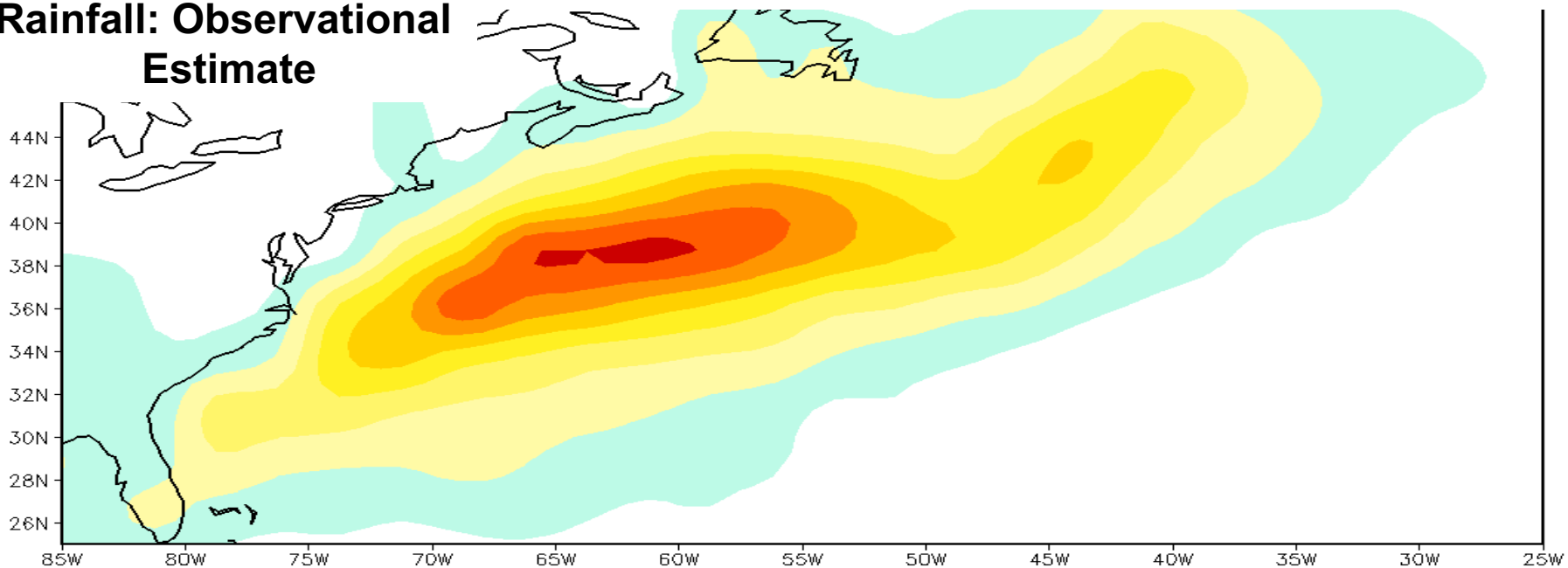
SST: Observational Estimate



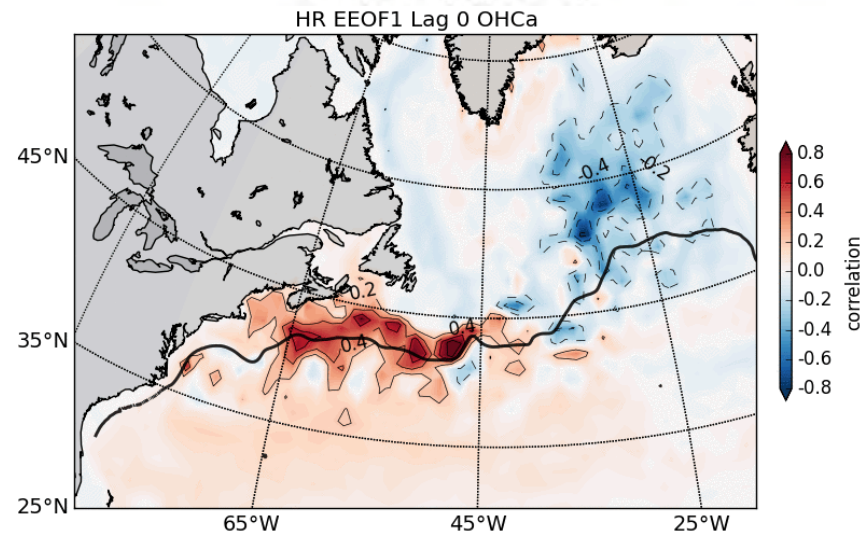
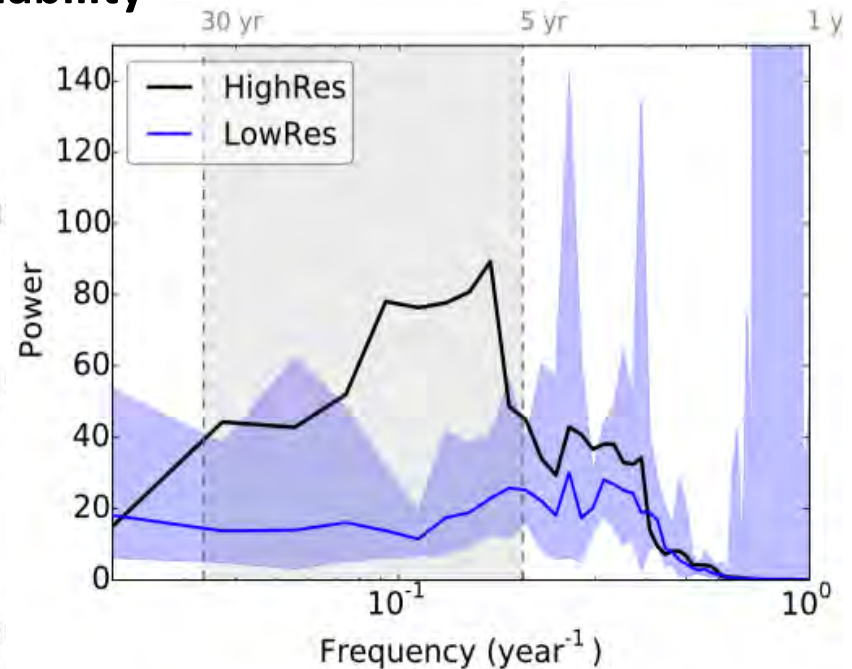
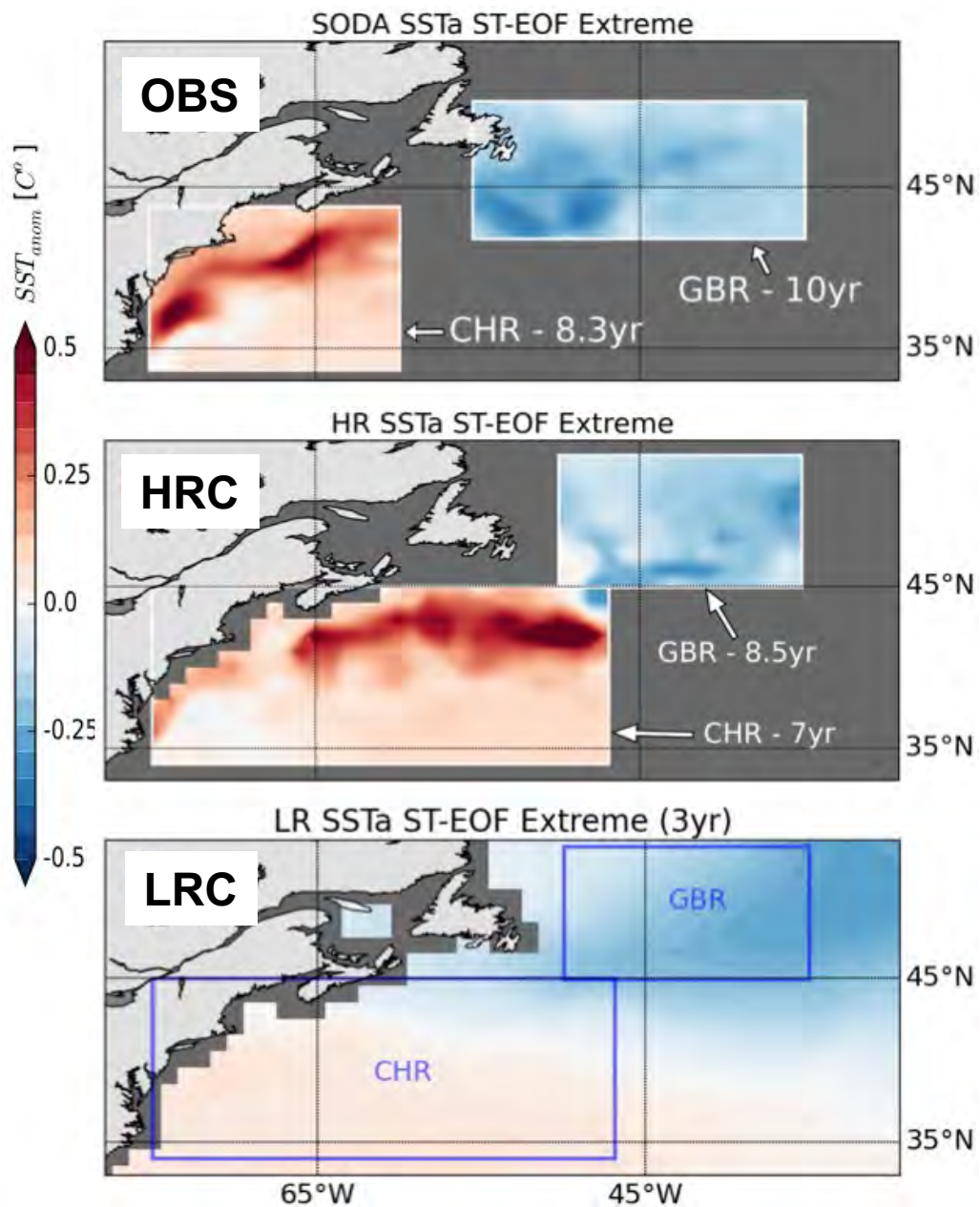




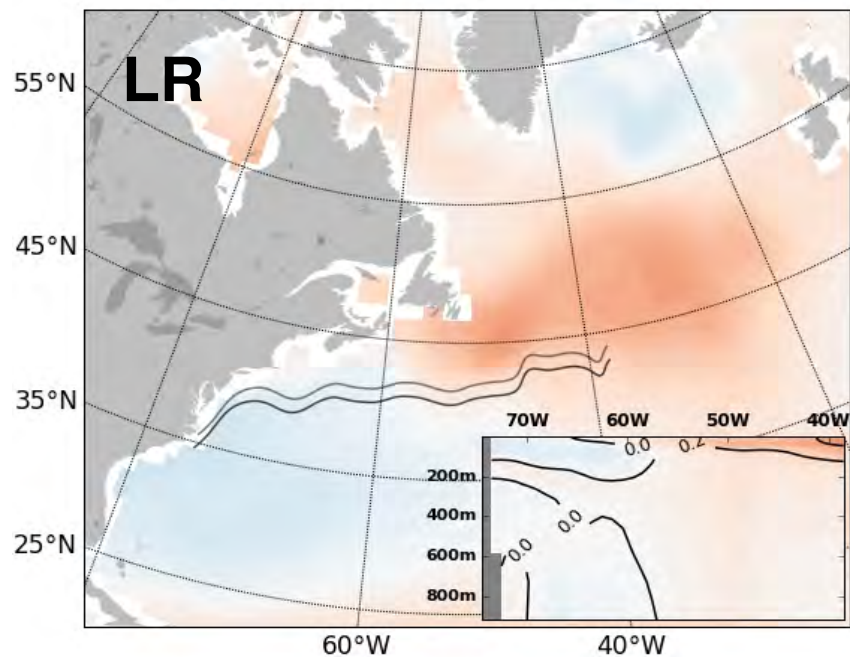
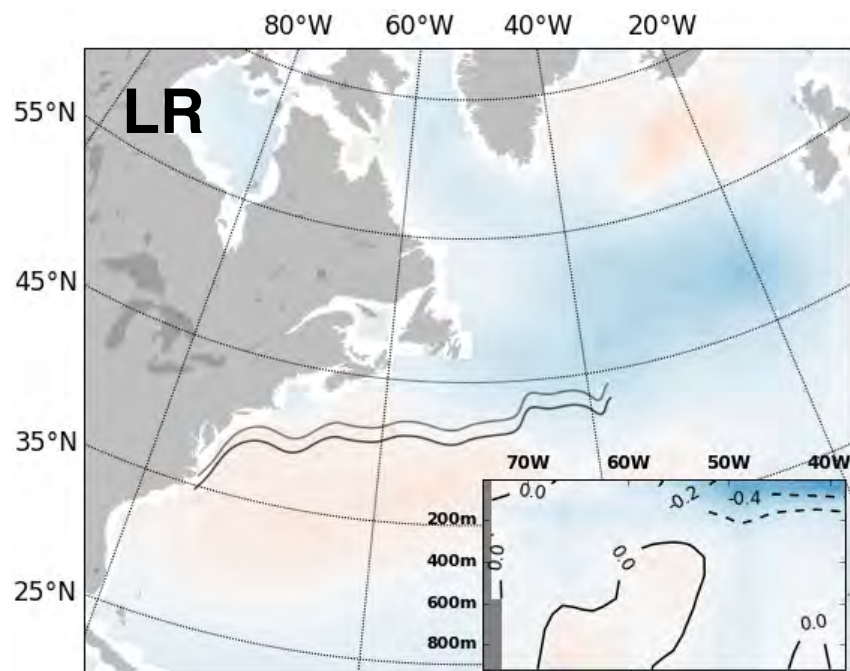
Rainfall: Observational Estimate



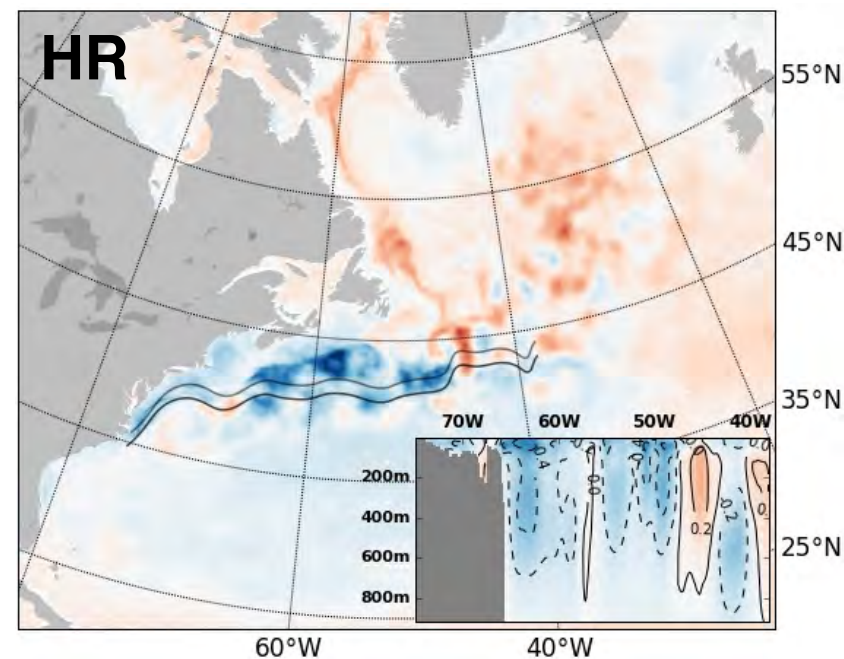
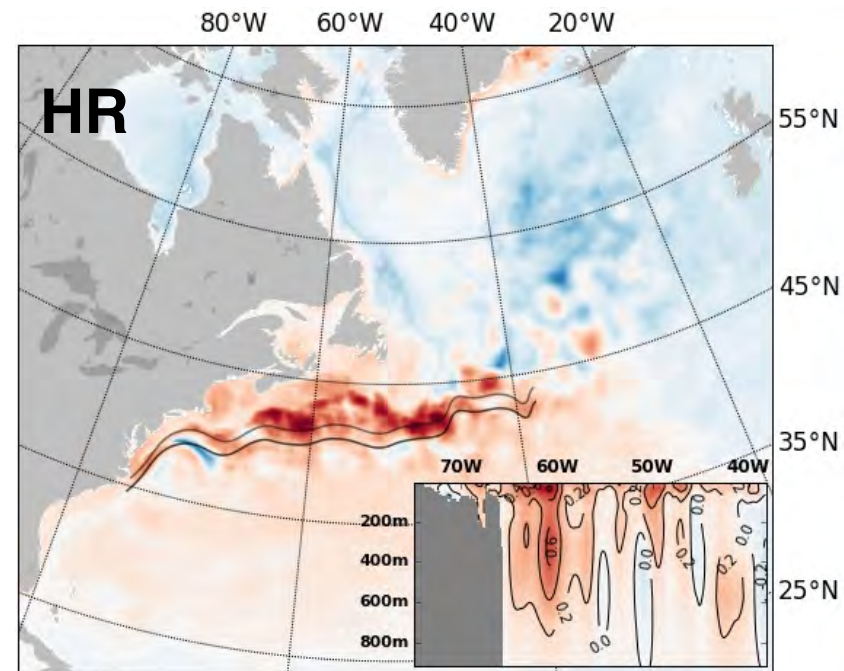
Natural Decadal Variability



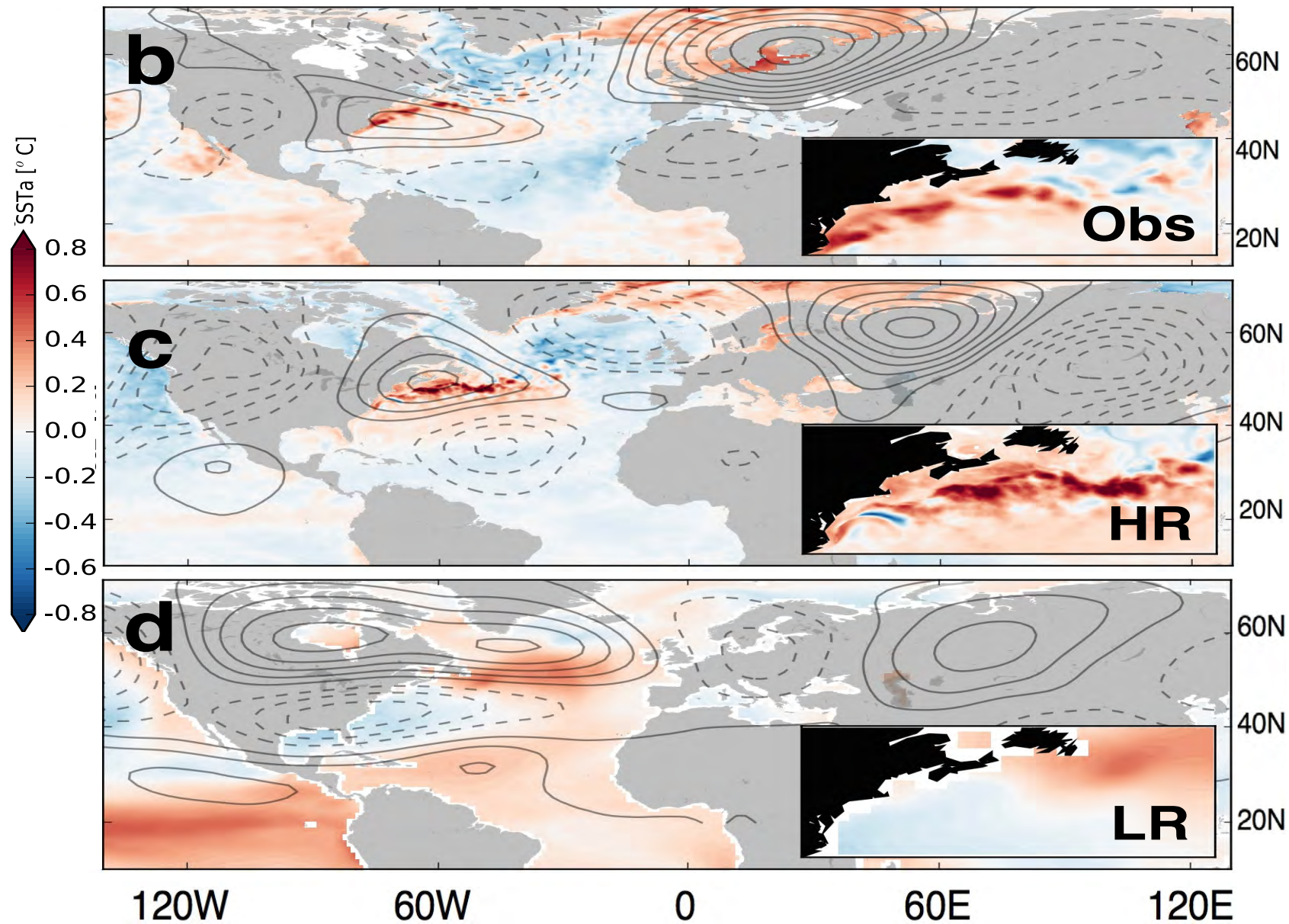
CMIP5 Class Resolution (1 Degree)



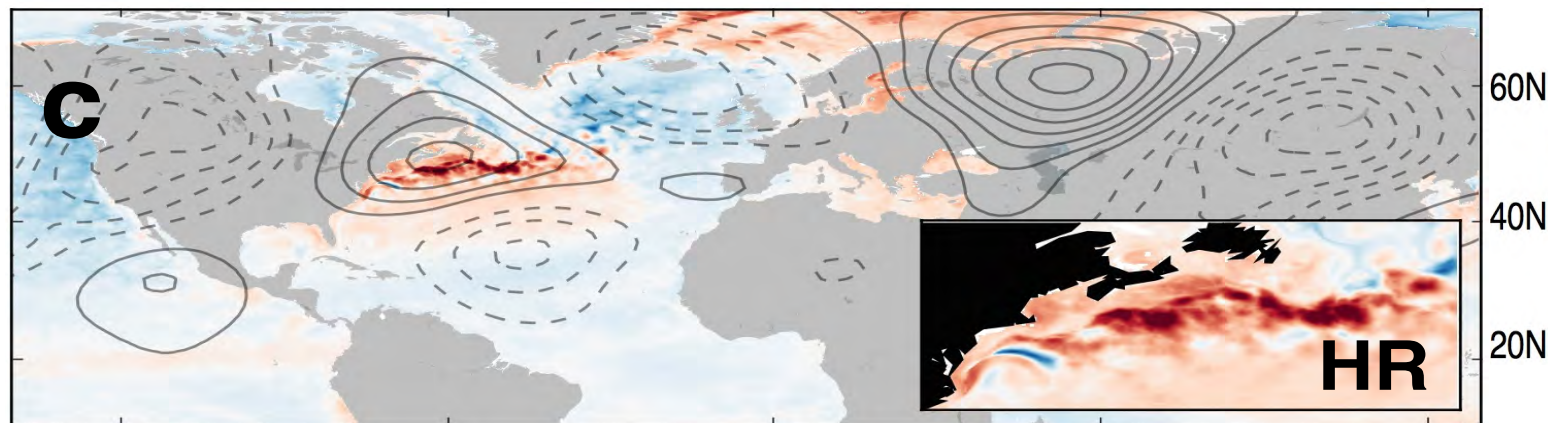
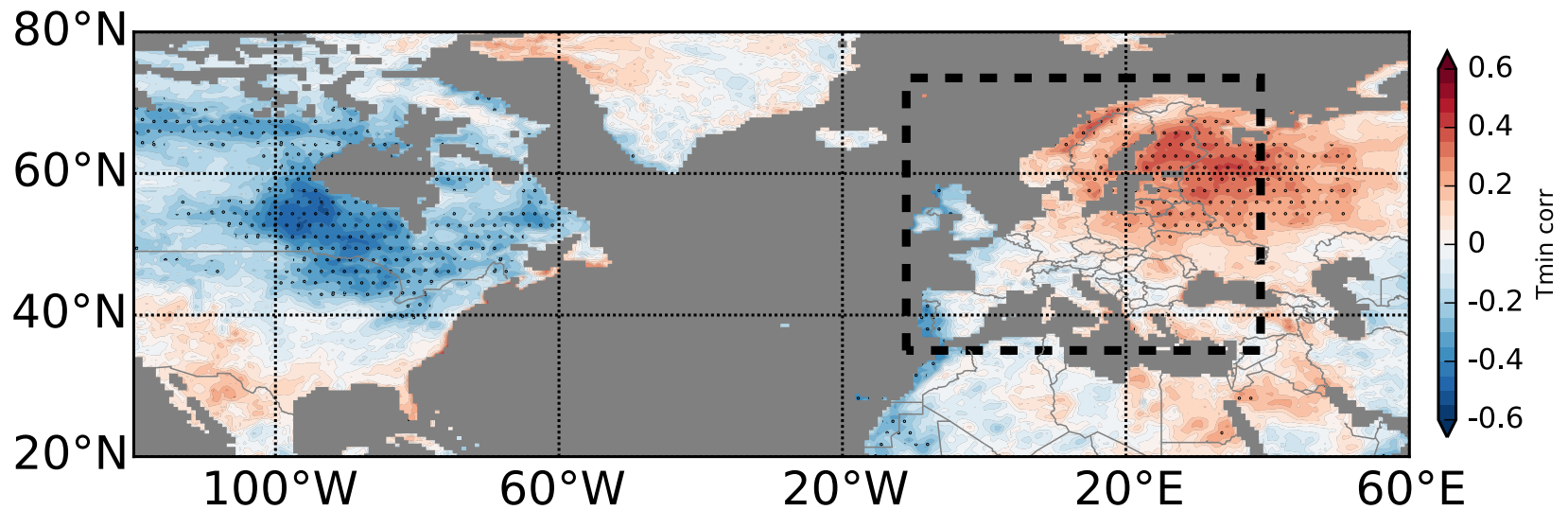
Ocean Eddy Resolving (0.1 Degree)



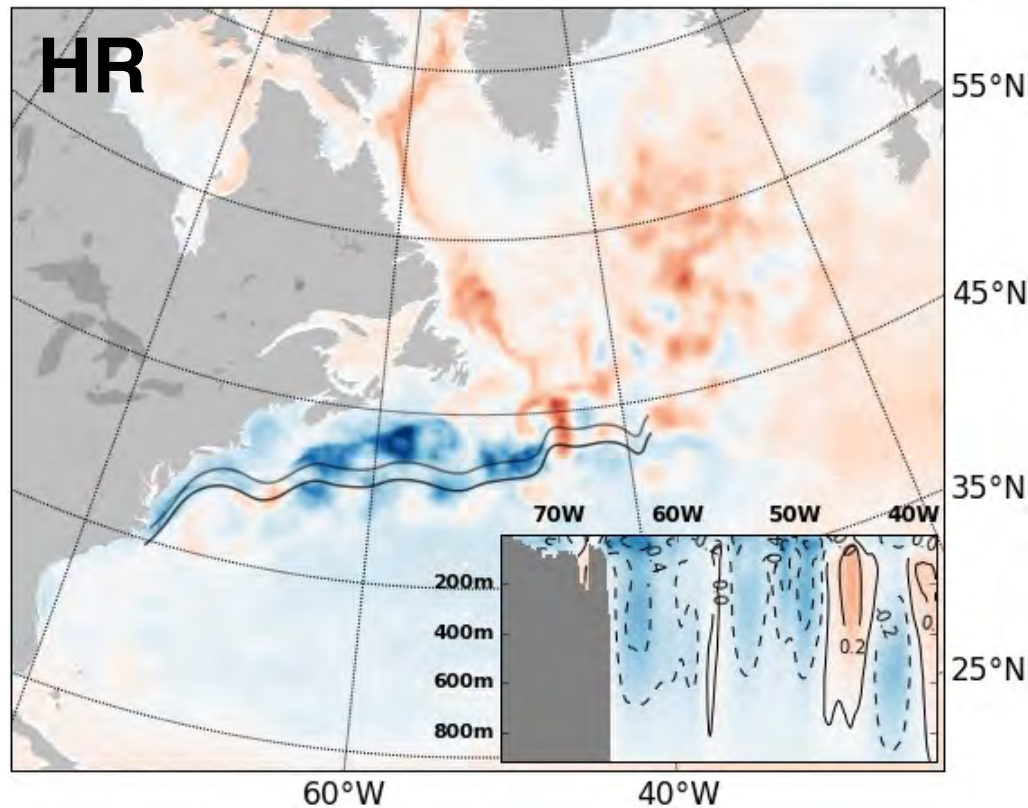
SST and 200 mb Geopotential Anomalies



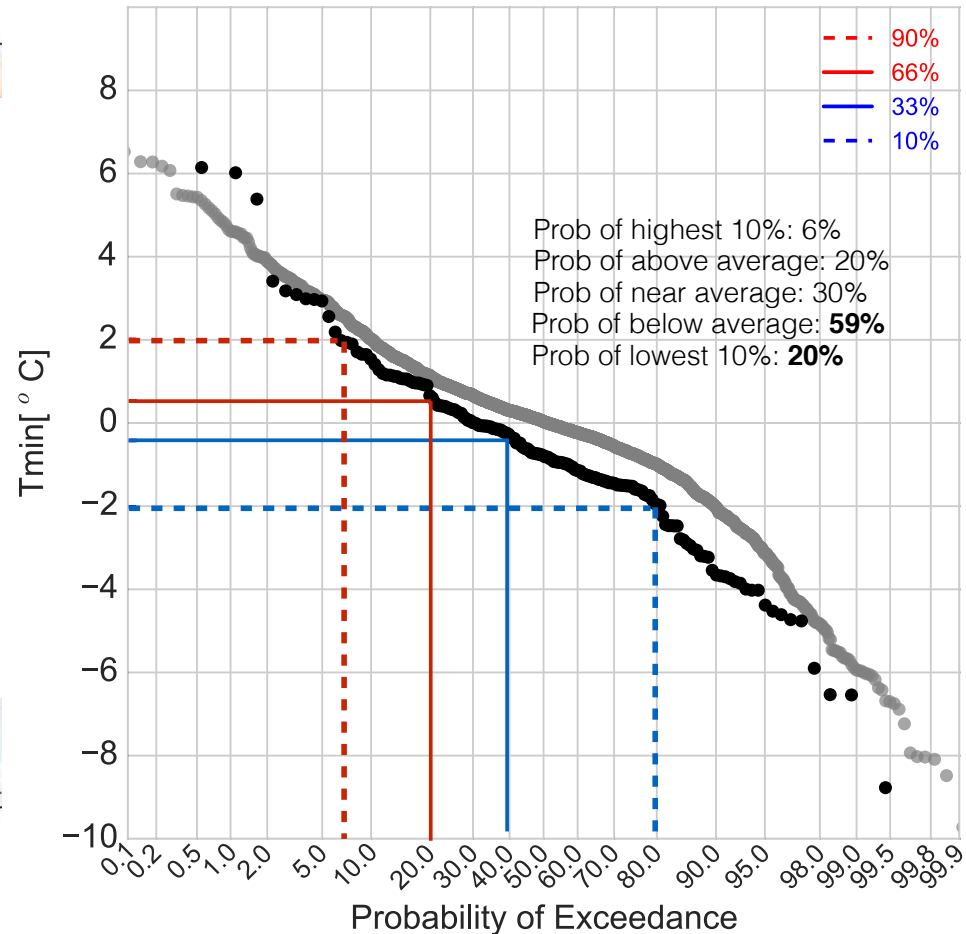
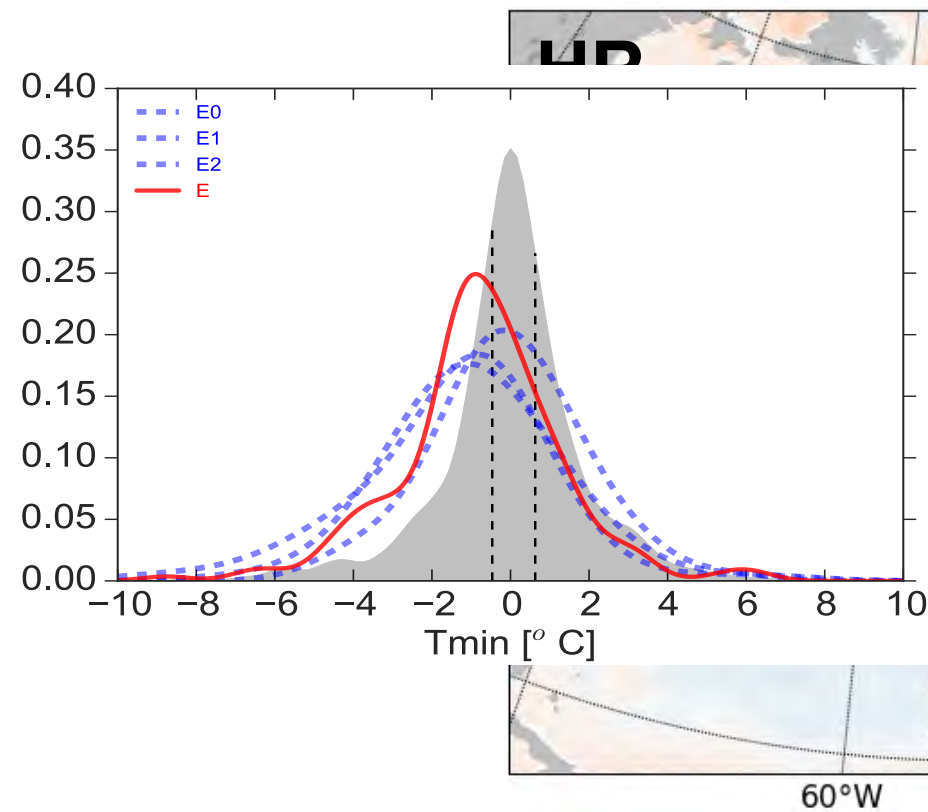
Correlation: T2m Daily Minimum Temperature Anomalies



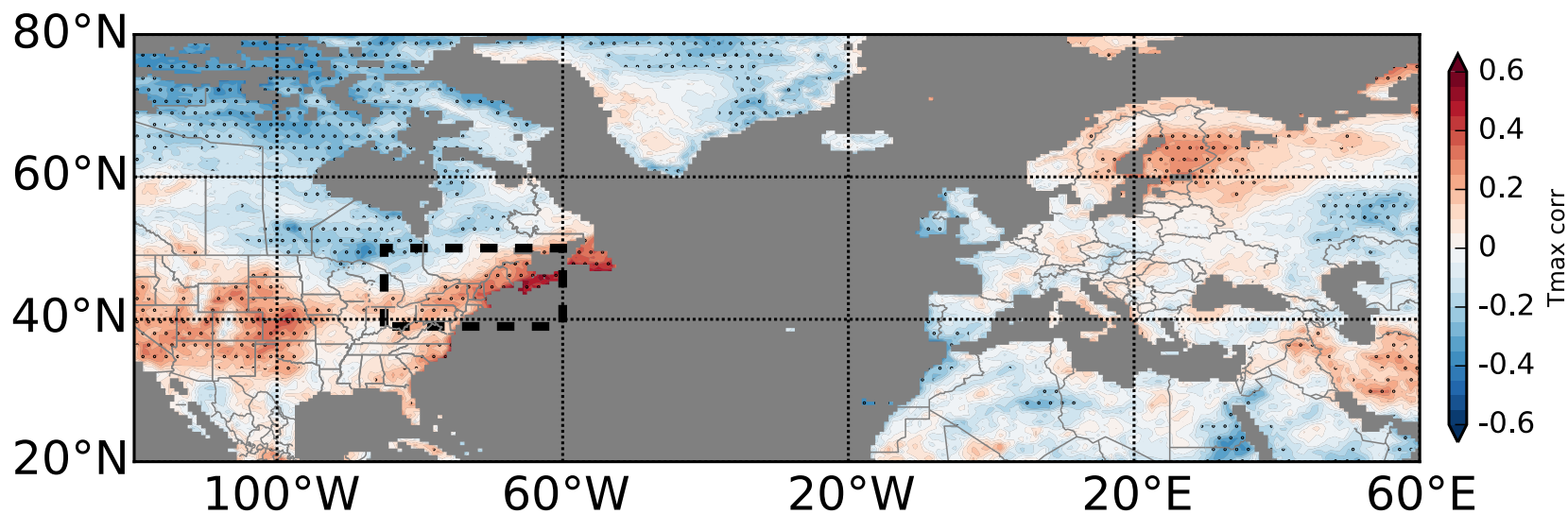
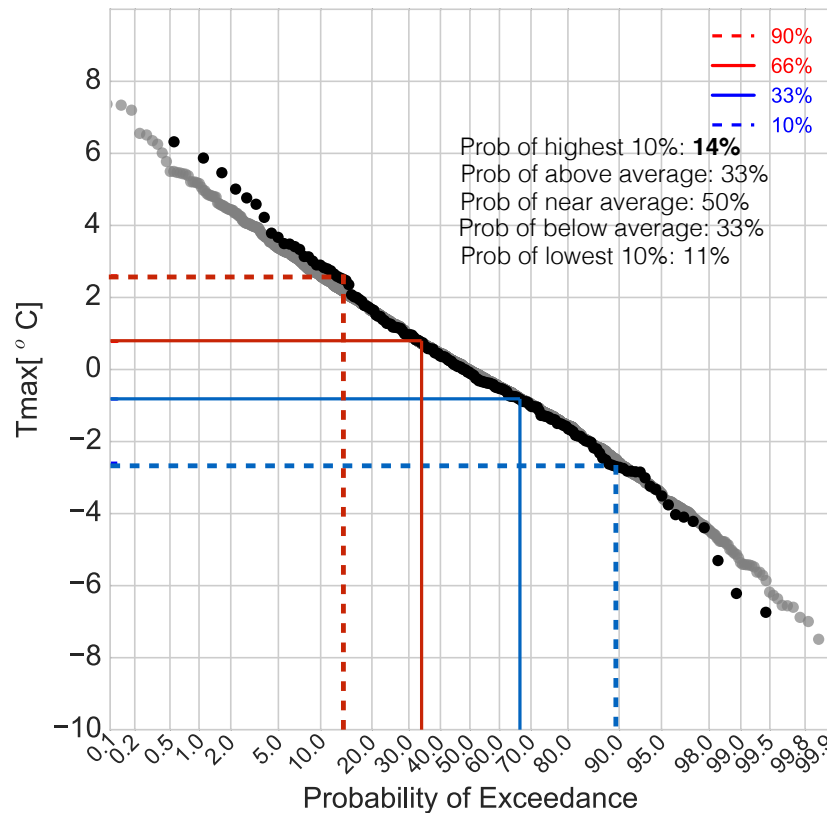
Predictability T2m Min (Cold Gulf Stream Case)



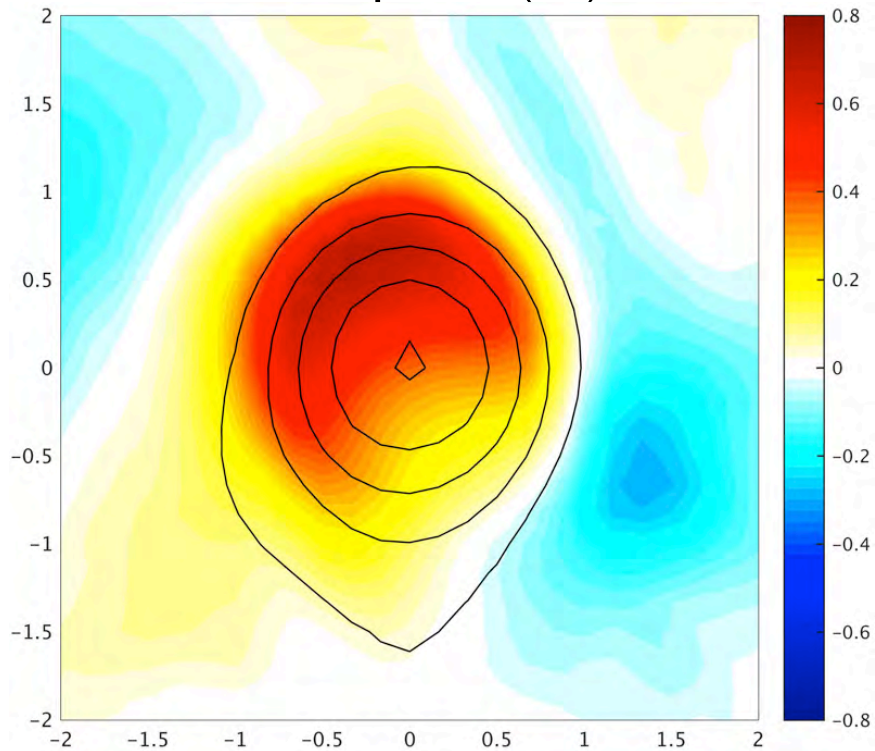
Predictability T2m Min (Cold Gulf Stream Case)



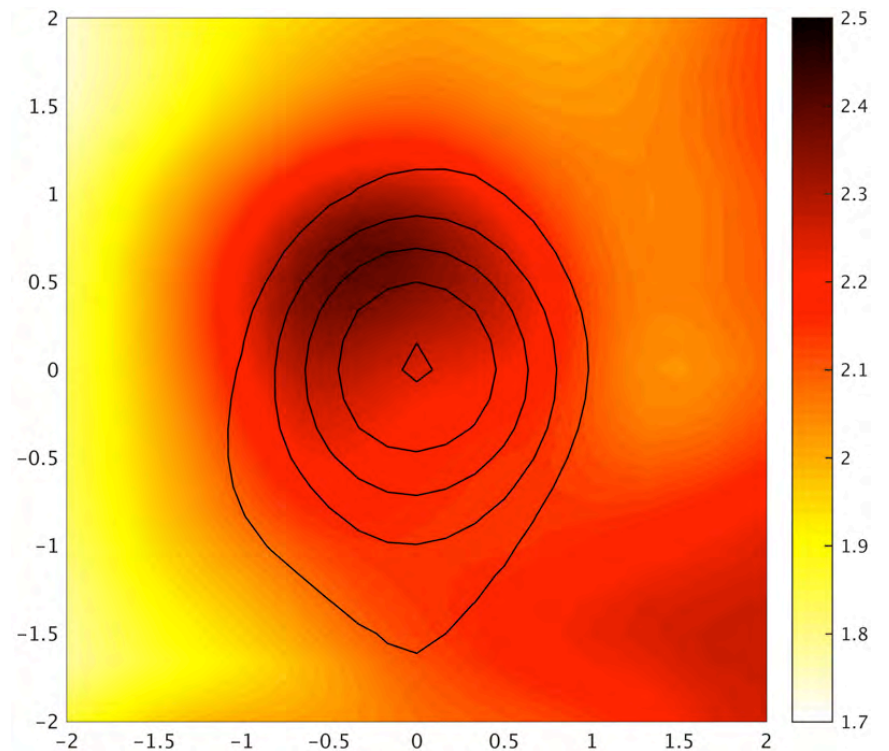
Predictability T2m Max (Warm Gulf Stream Case)



SSTA composite ($^{\circ}\text{C}$)



Full convective precipitation
composite (mm/day)



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