The Role of Ocean Eddies in Sub-Seasonal to Decadal Predictability and Prediction

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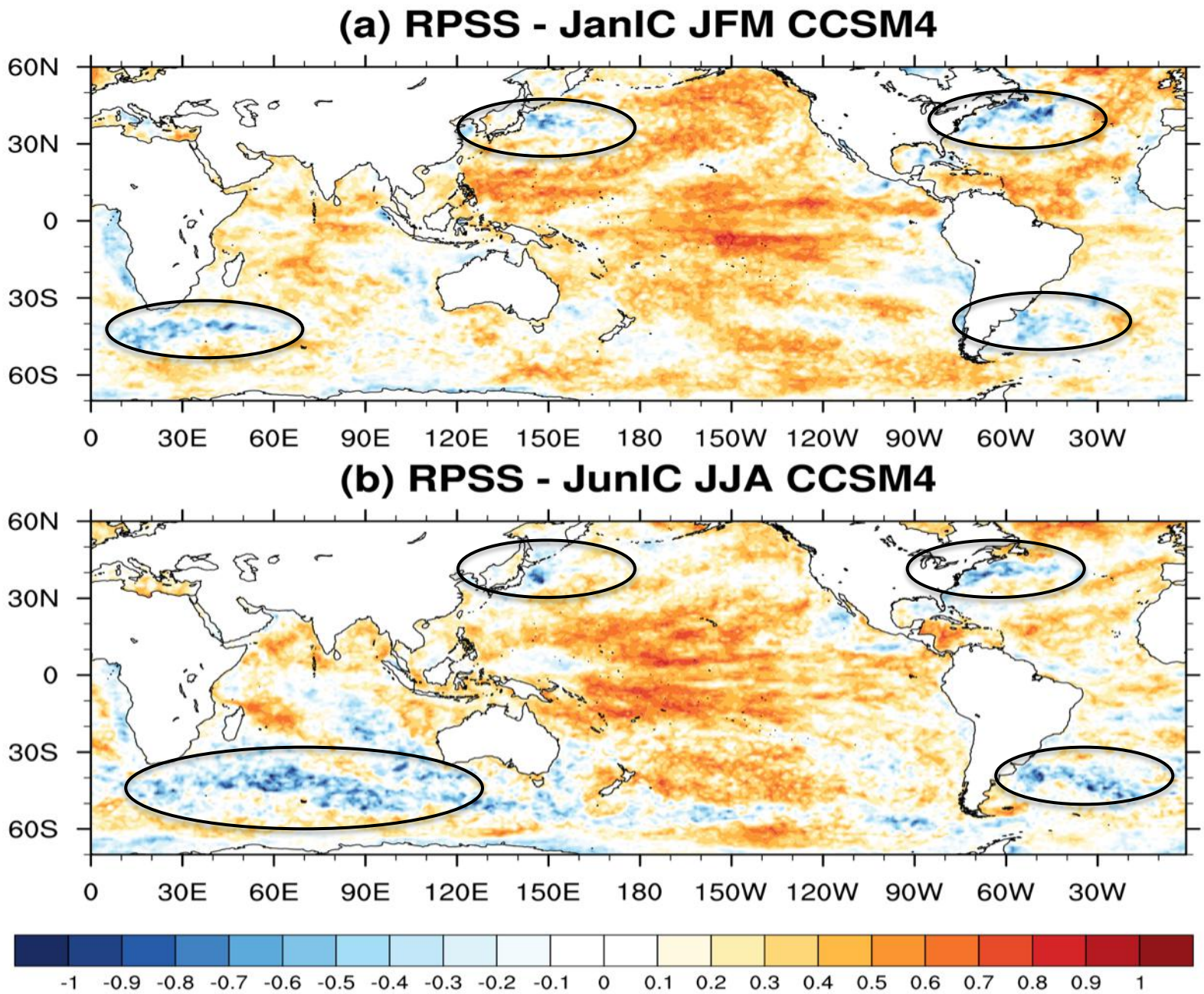
UNIVERSITY OF MIAMI
ROSENSTIEL SCHOOL of MARINE & ATMOSPHERIC SCIENCE

CIMAS

Seasonal Forecast



Ocean Eddy Resolving Coupled Predictability and Prediction

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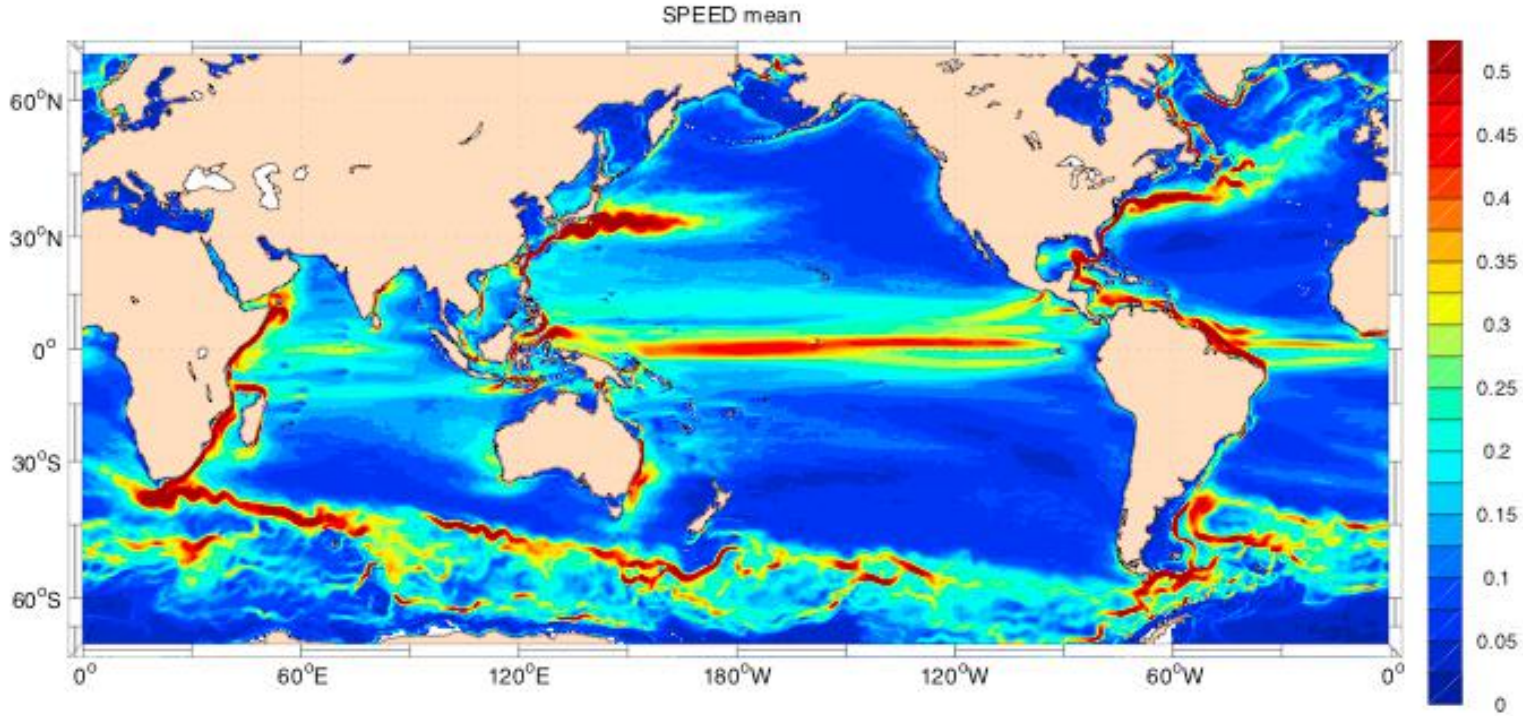
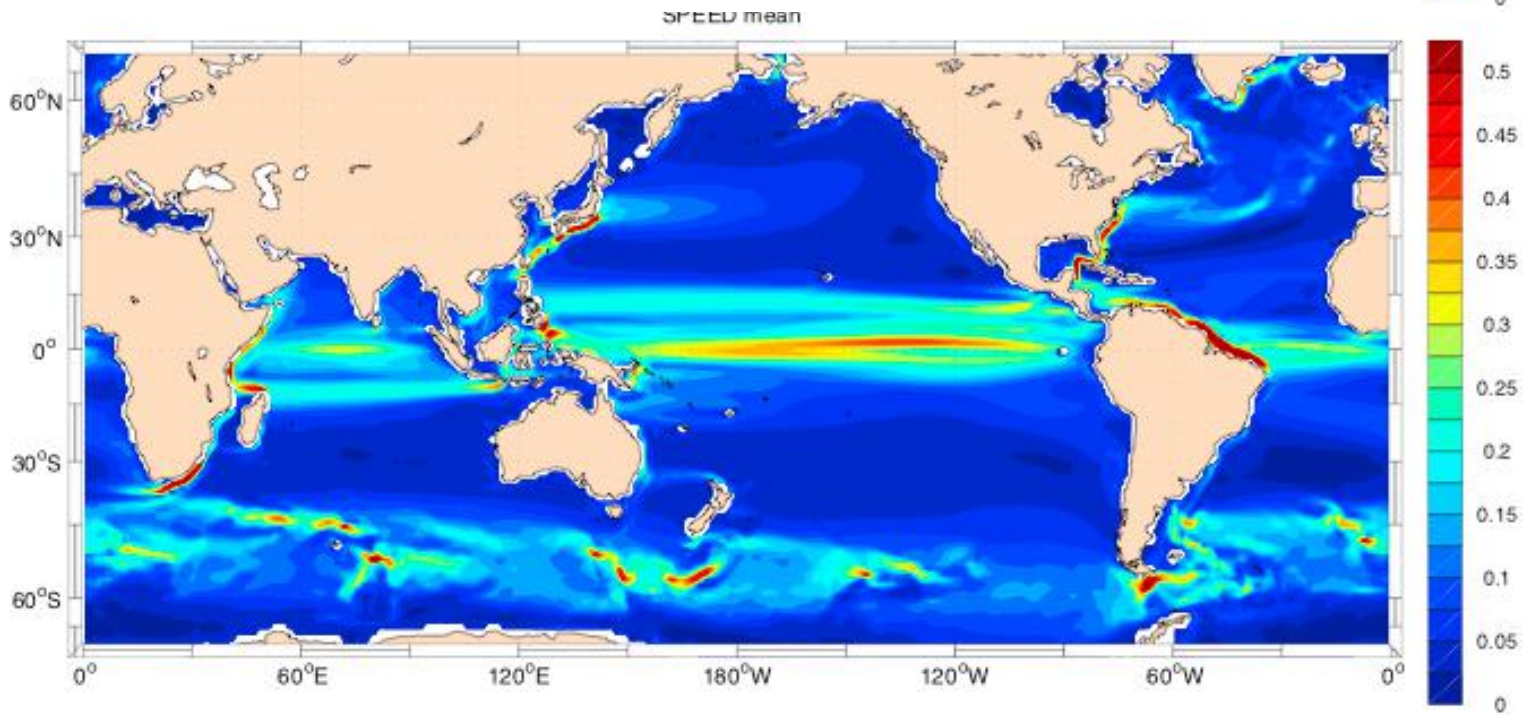
HRC


SPEED mean
60°N
30°N
0°
30°S
60°S
0°
60°E
120°E
180°W
120°W
60°W
0°
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0

LRC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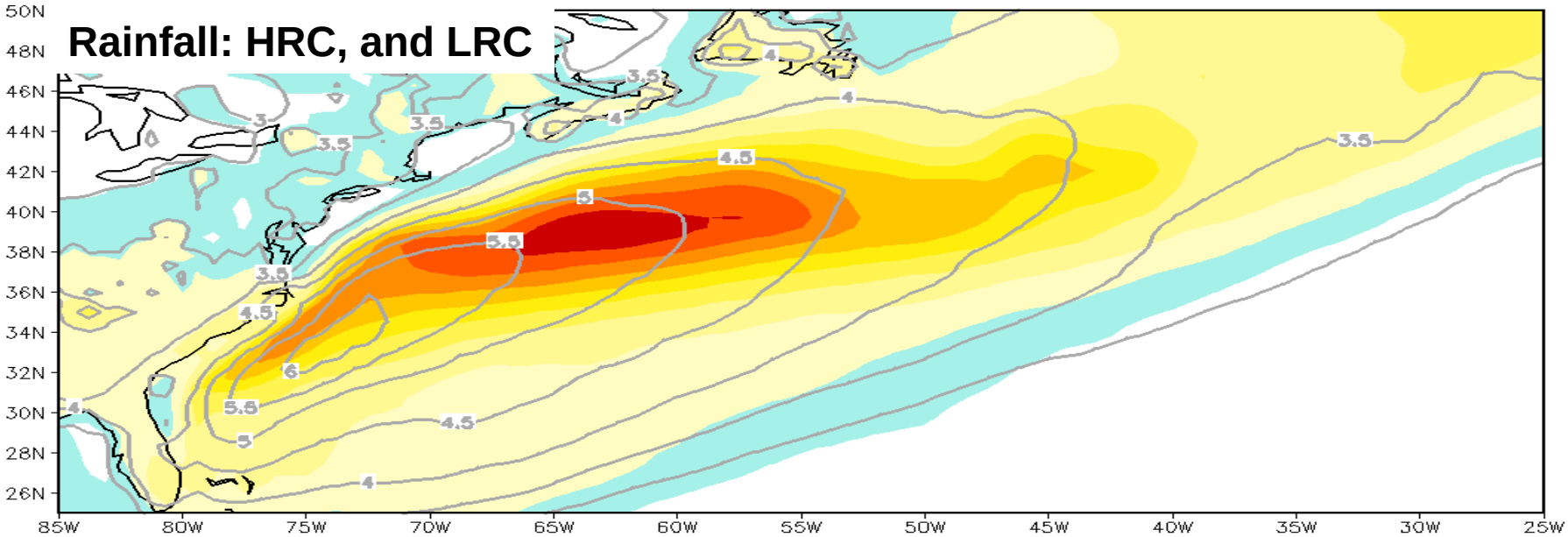
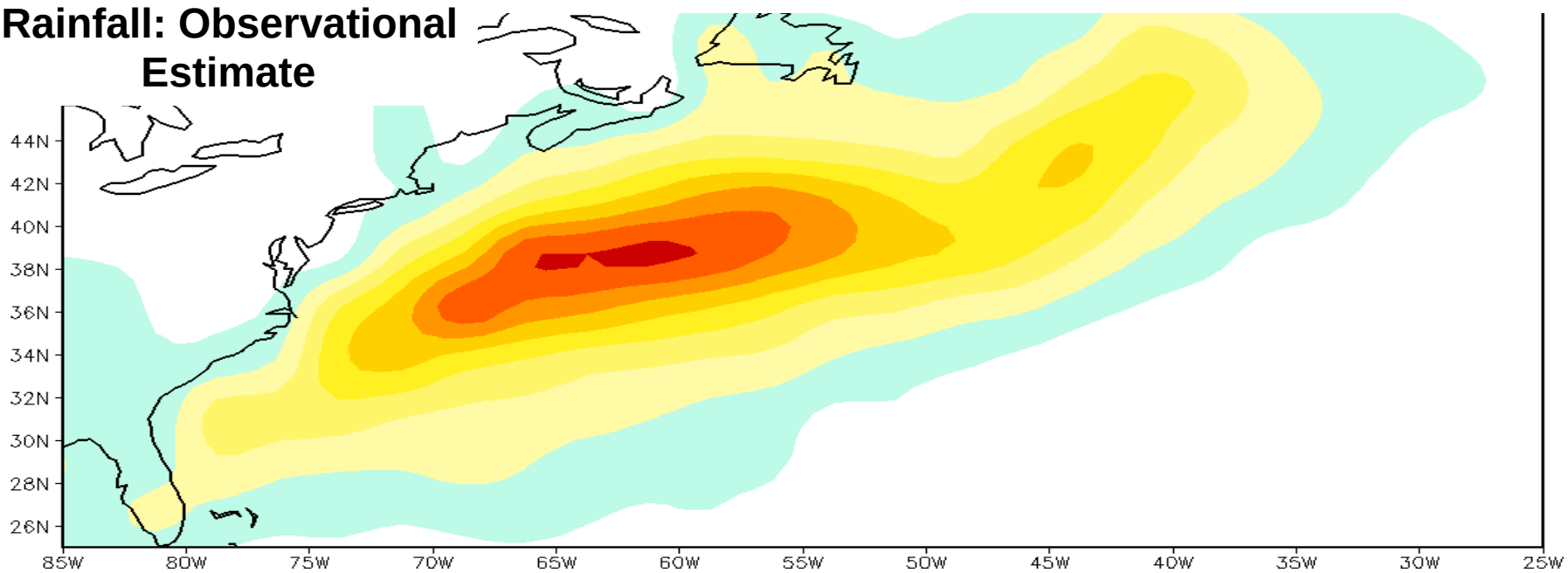
0°
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0

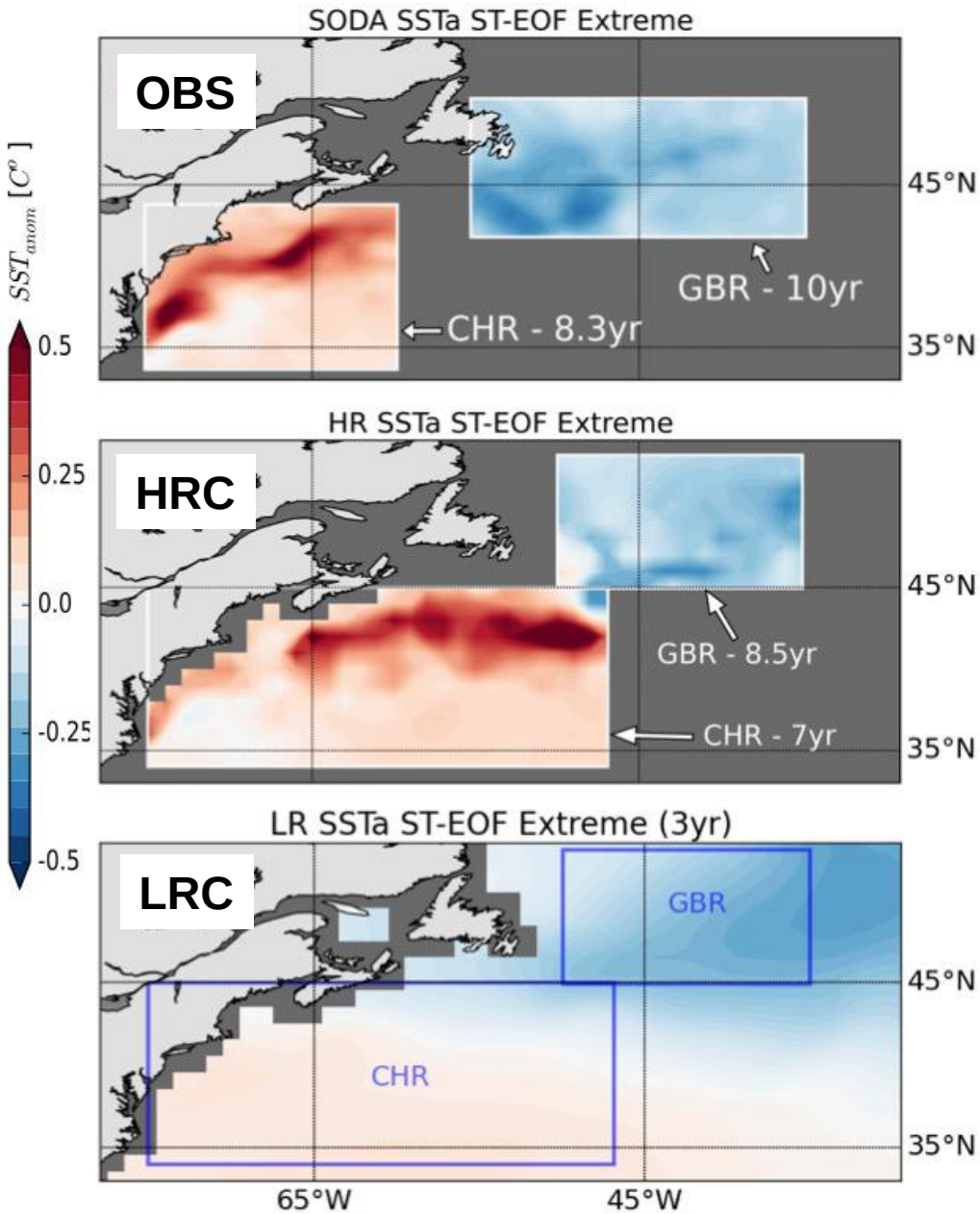
Rainfall: HRC, and LRC

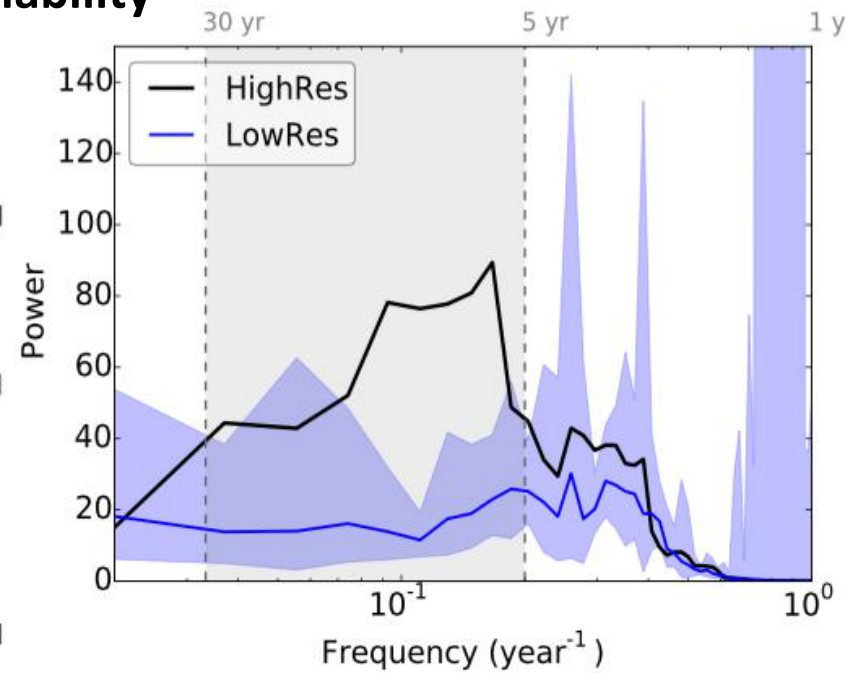


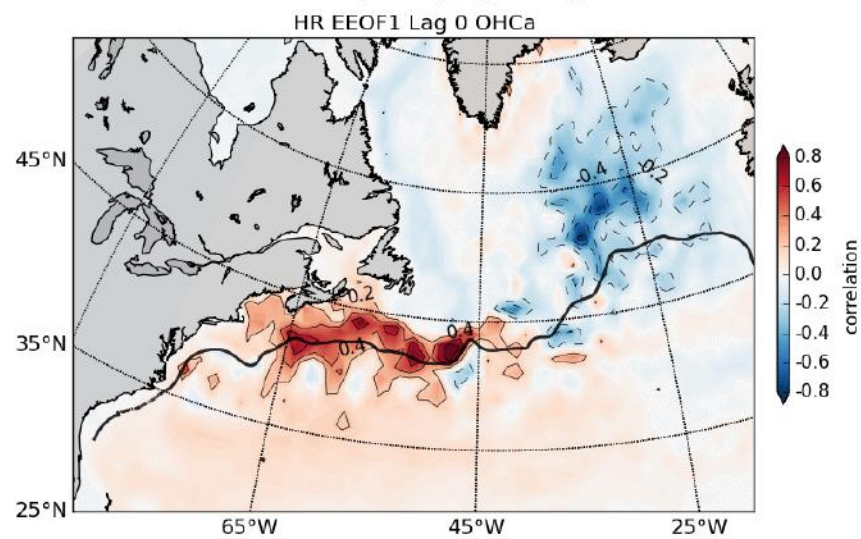
Rainfall: Observational Estimate



Natural Decadal Variability

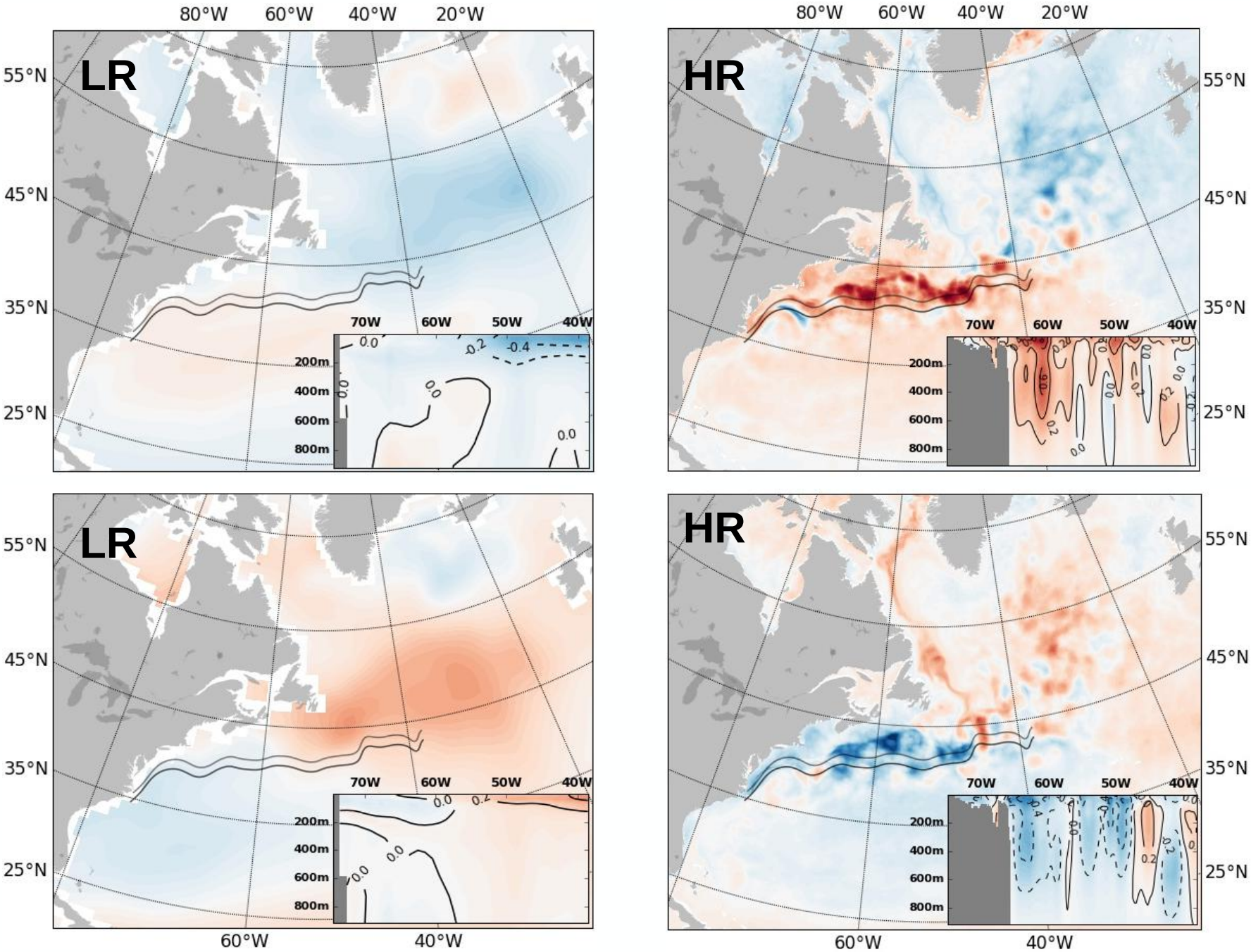




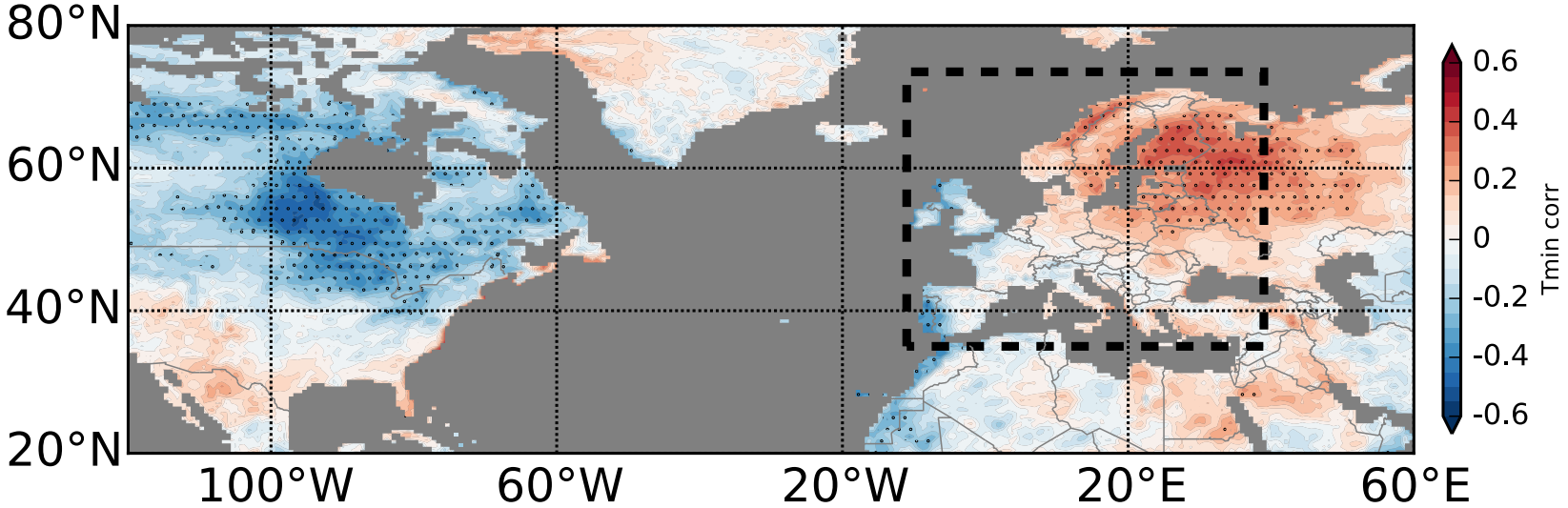


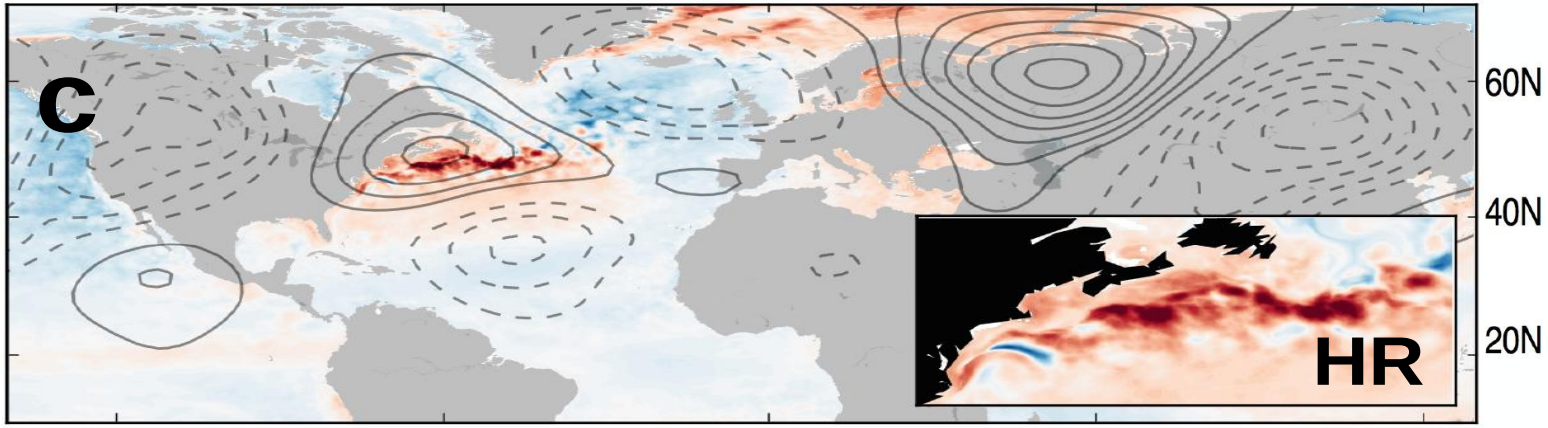
CMIP5 Class Resolution (1 Degree)

Ocean Eddy Resolving (0.1 Degree)

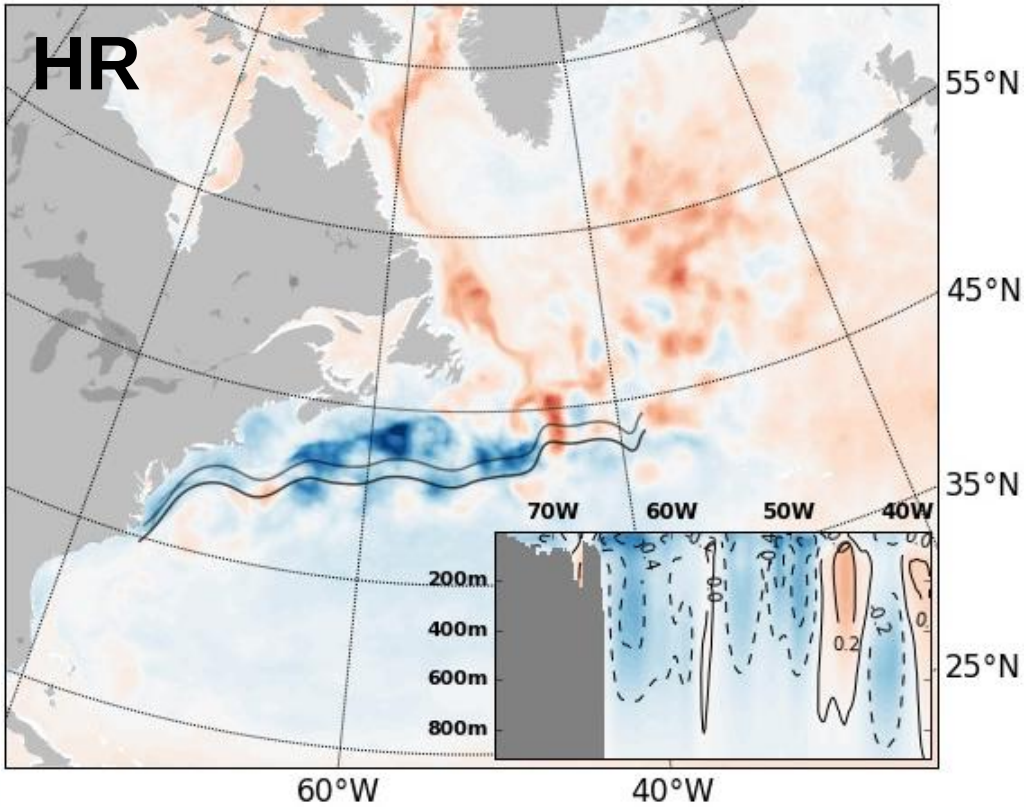


Correlation: T2m Daily Minimum Temperature Anomalies





Predictability T2m Min over EU (Cold Gulf Stream Case)



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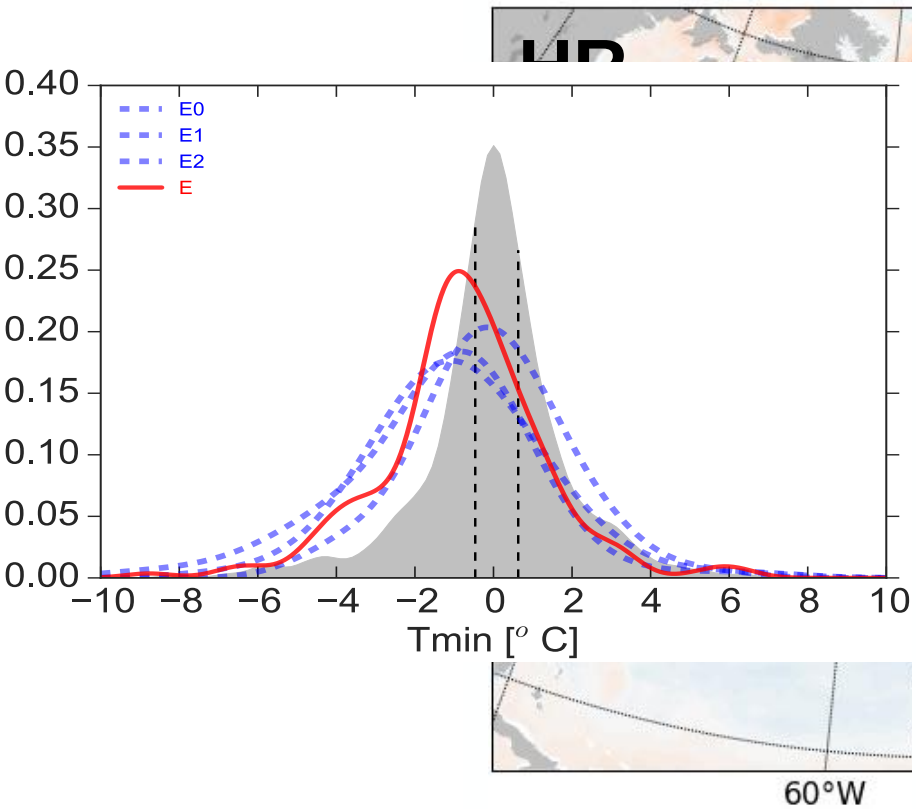

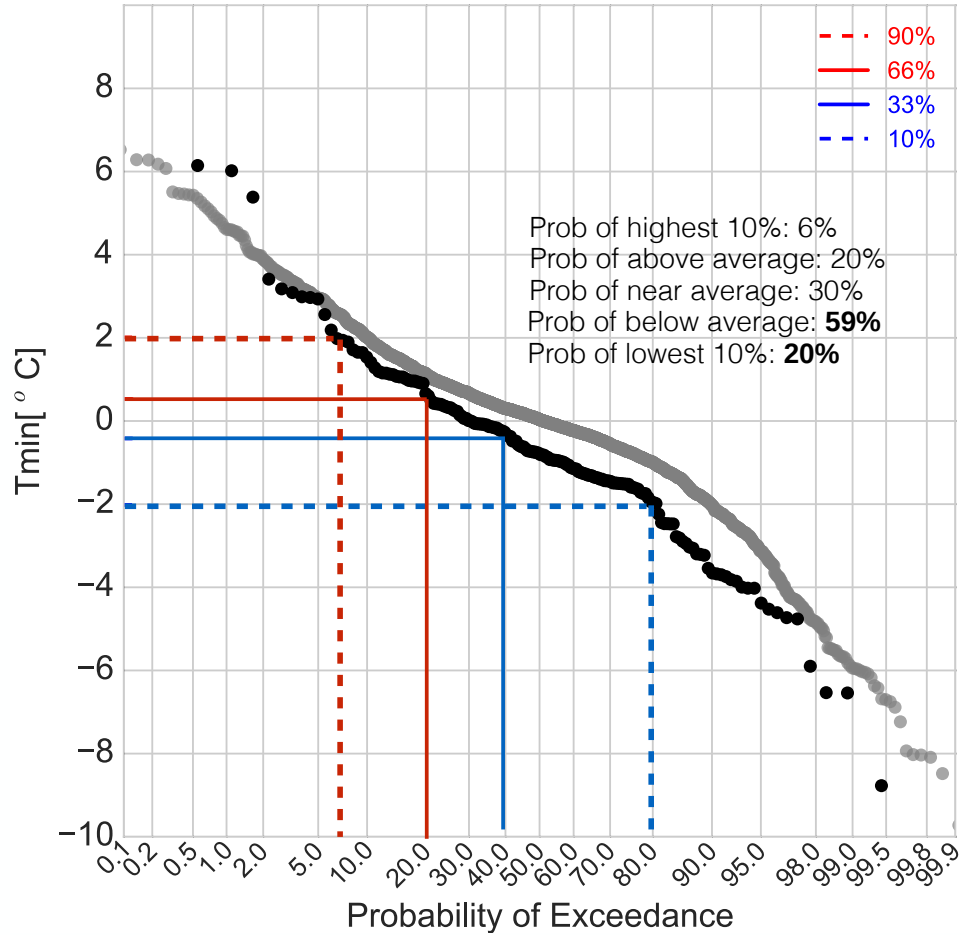

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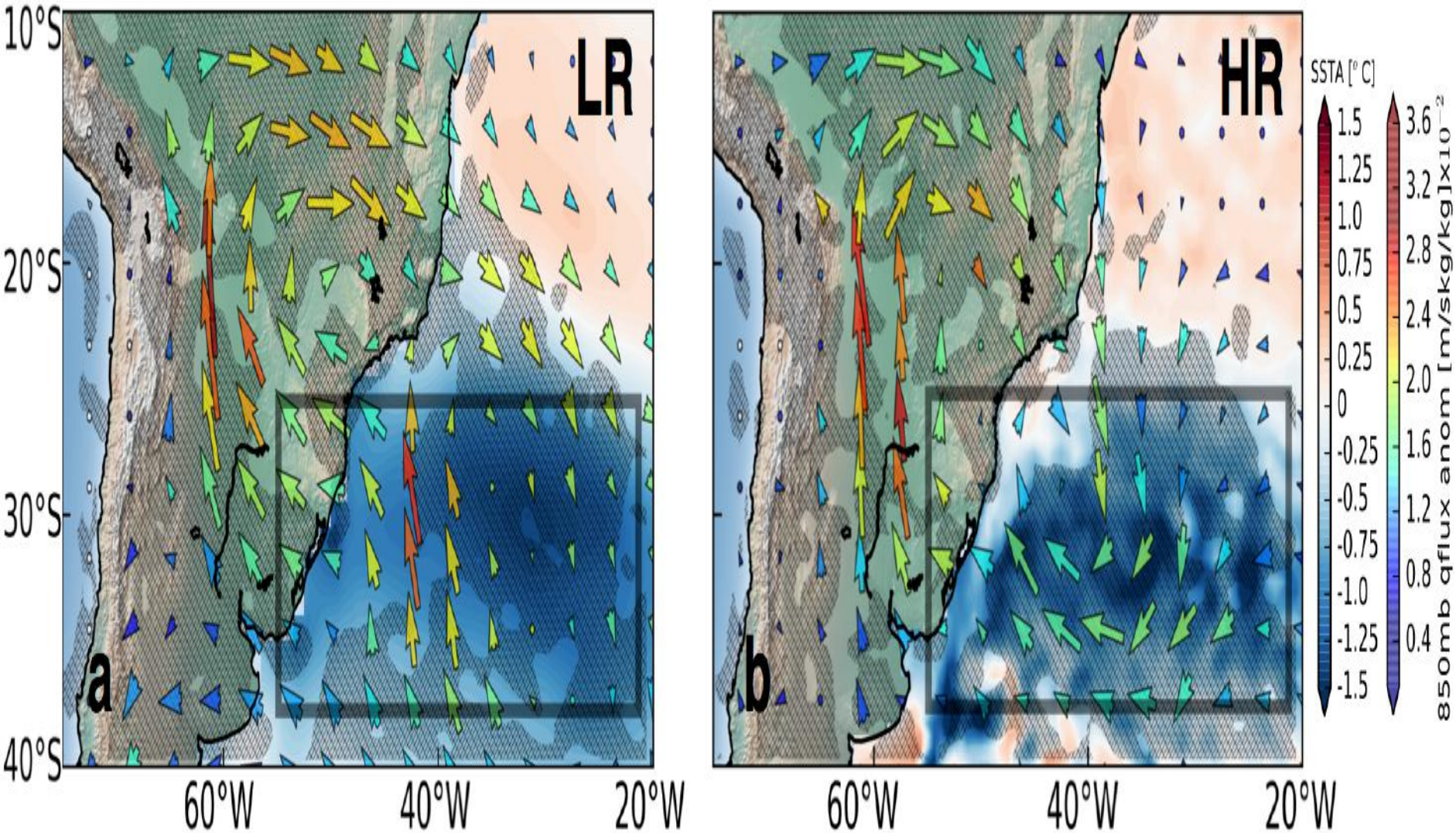
LR and HR Simulated COLD WSSA Events



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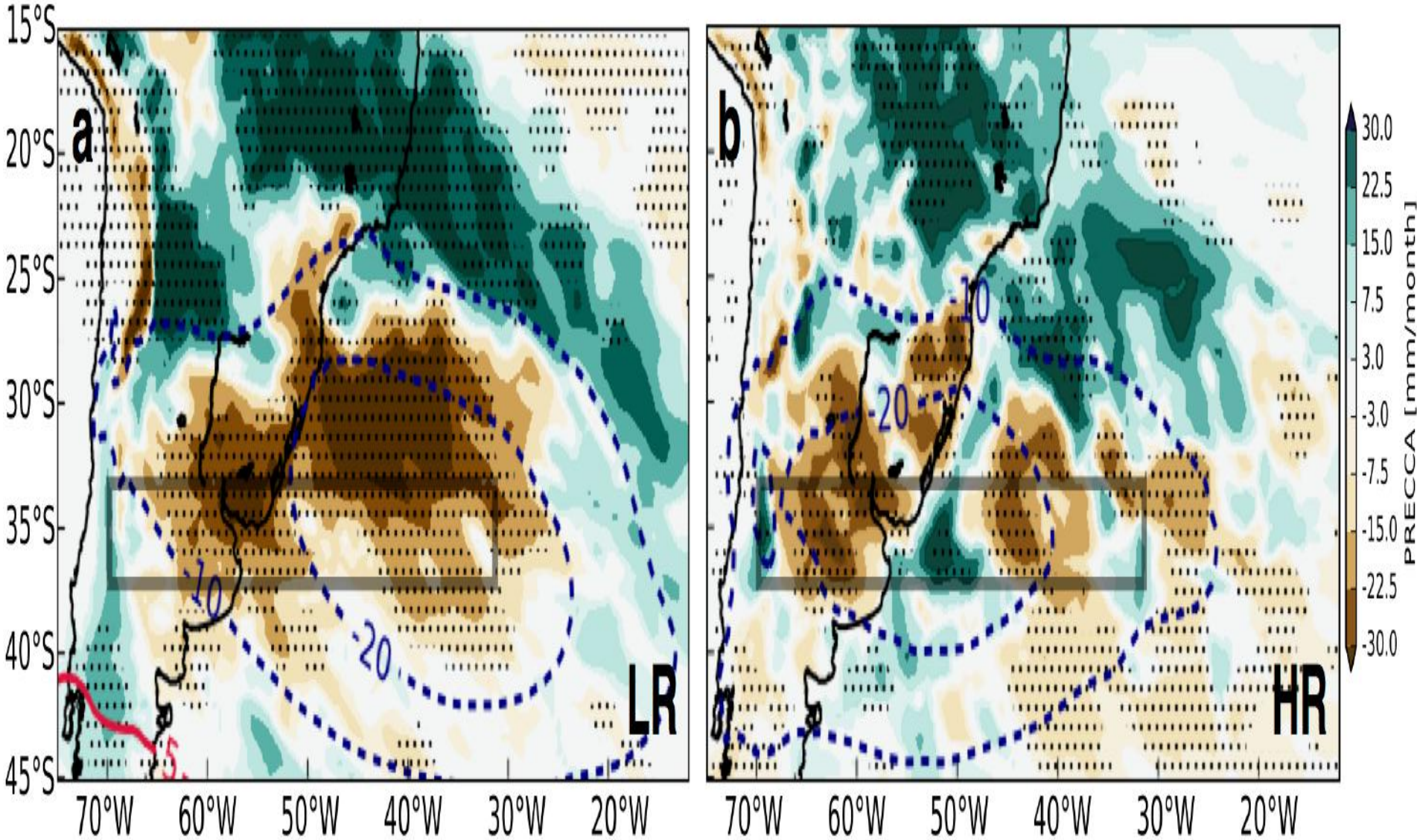

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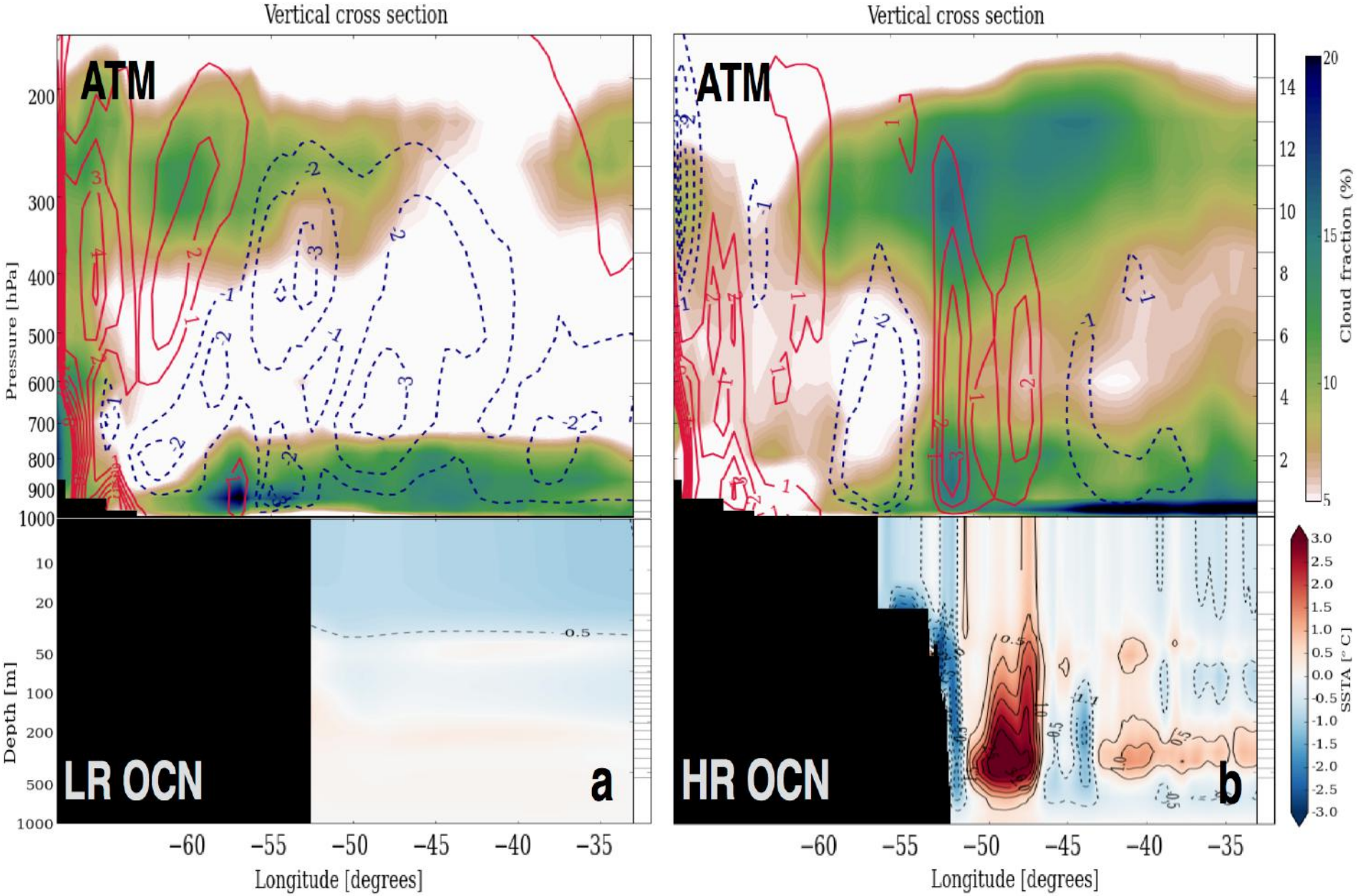
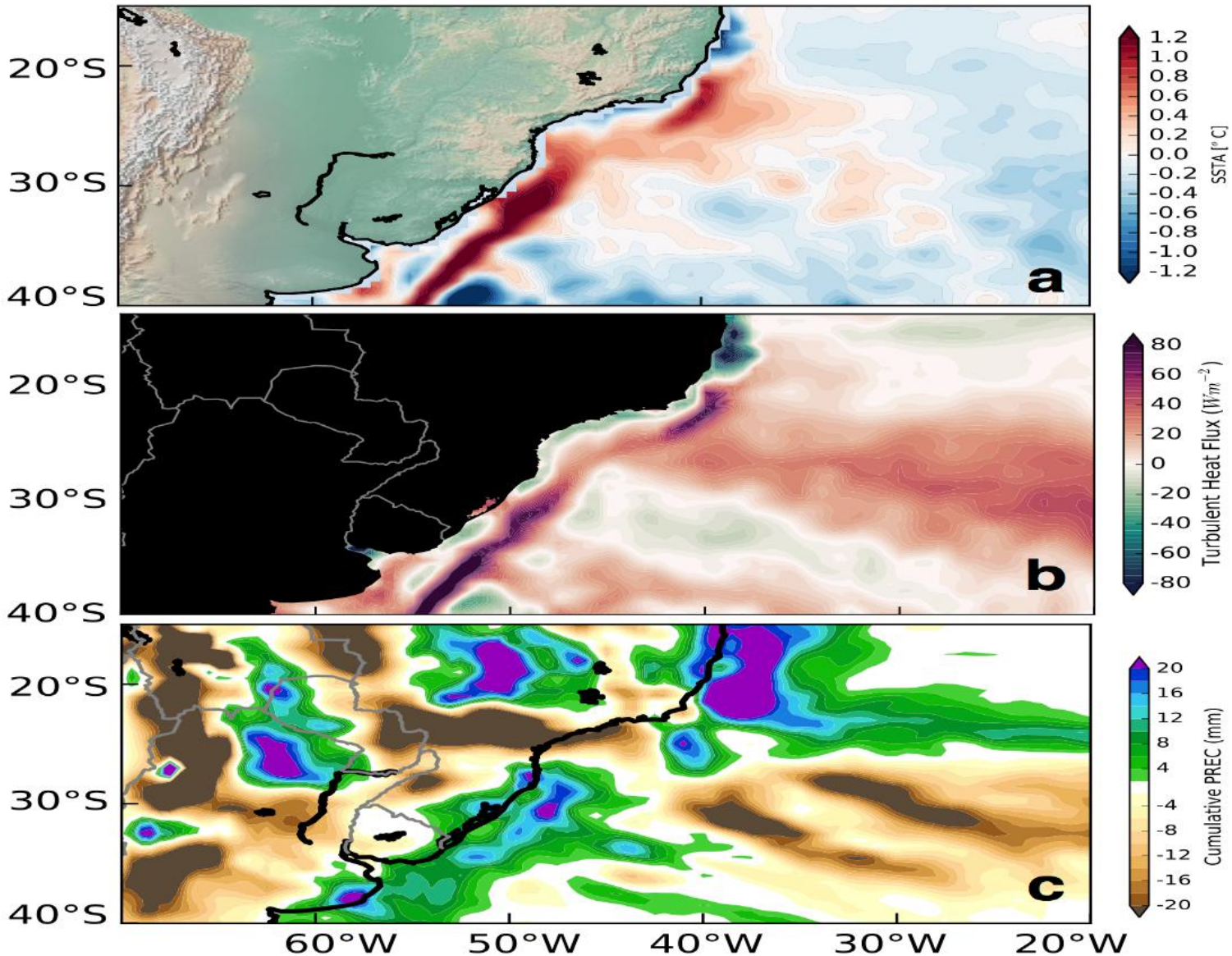


Composite HR-LR Retrospective Forecasts
Days 15-25



Ics: 1 Jan 1985, 99, 00

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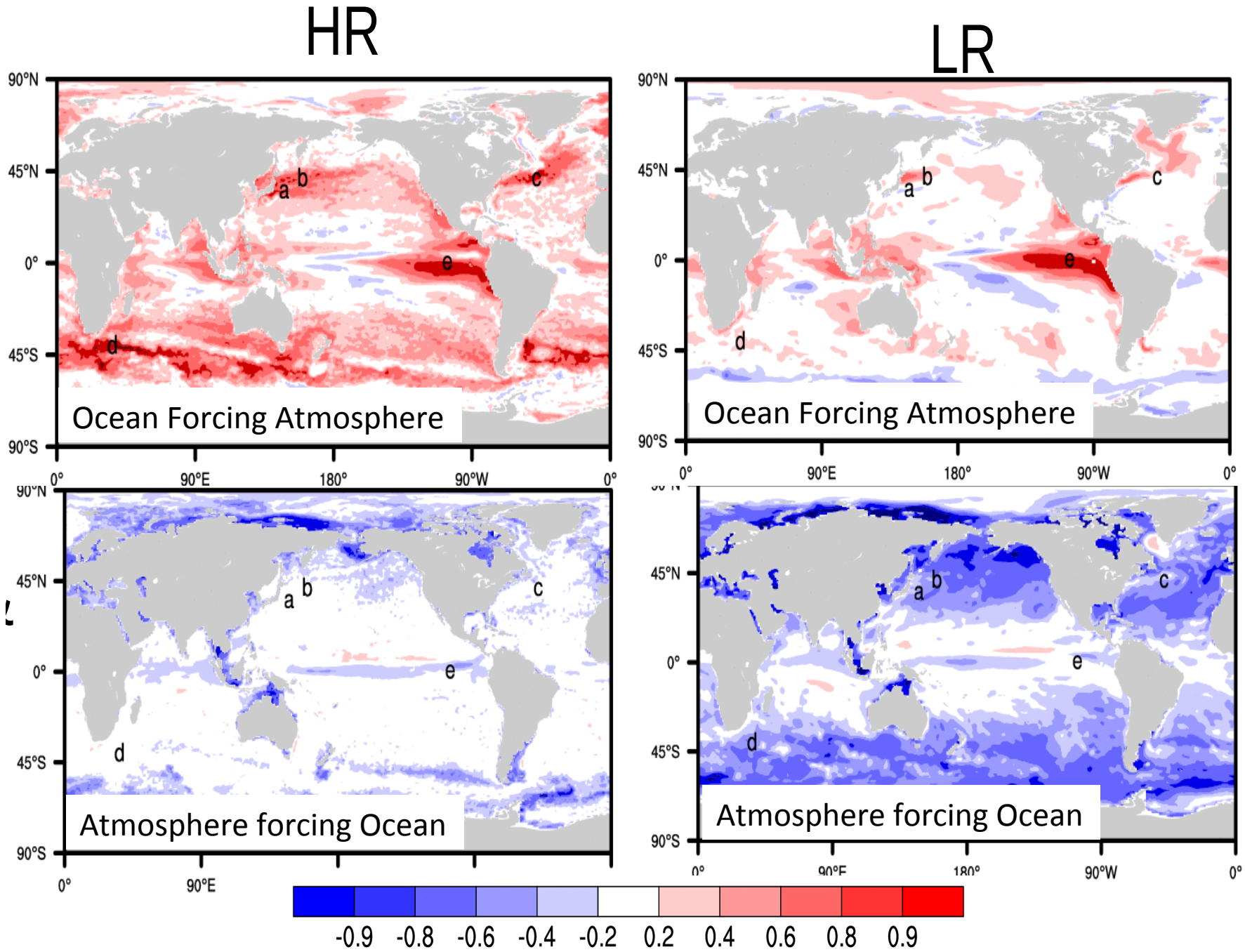
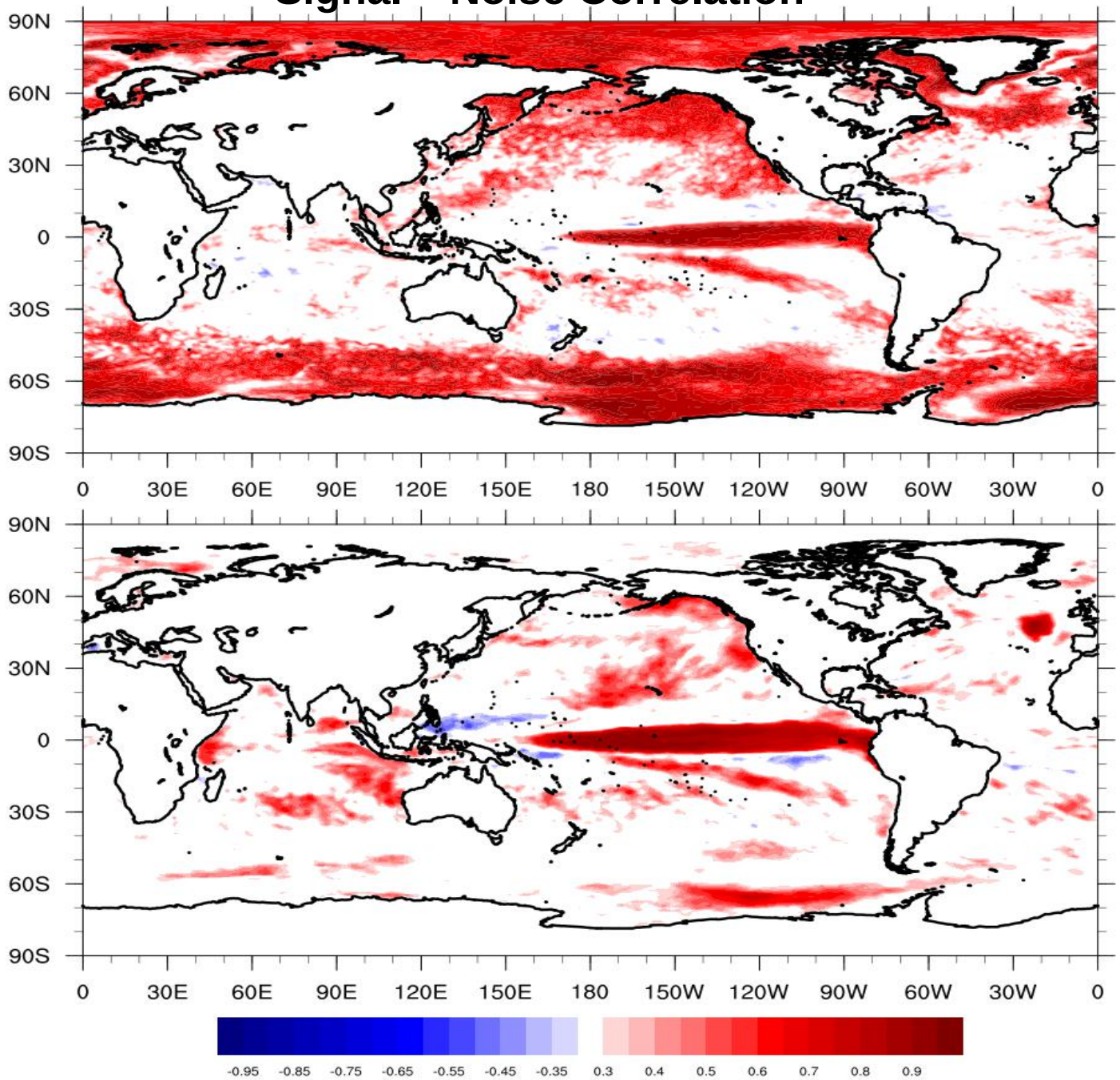

HR
LR
Ocean Forcing Atmosphere
Ocean Forcing Atmosphere
Atmosphere forcing Ocean
Atmosphere forcing Ocean
90°N
45°N
0°
45°S
90°S
0°
90°E
180°
90°W
0°
a
b
c
d
e
-0.9
-0.8
-0.6
-0.4
-0.2
0.2
0.4
0.6
0.8
0.9

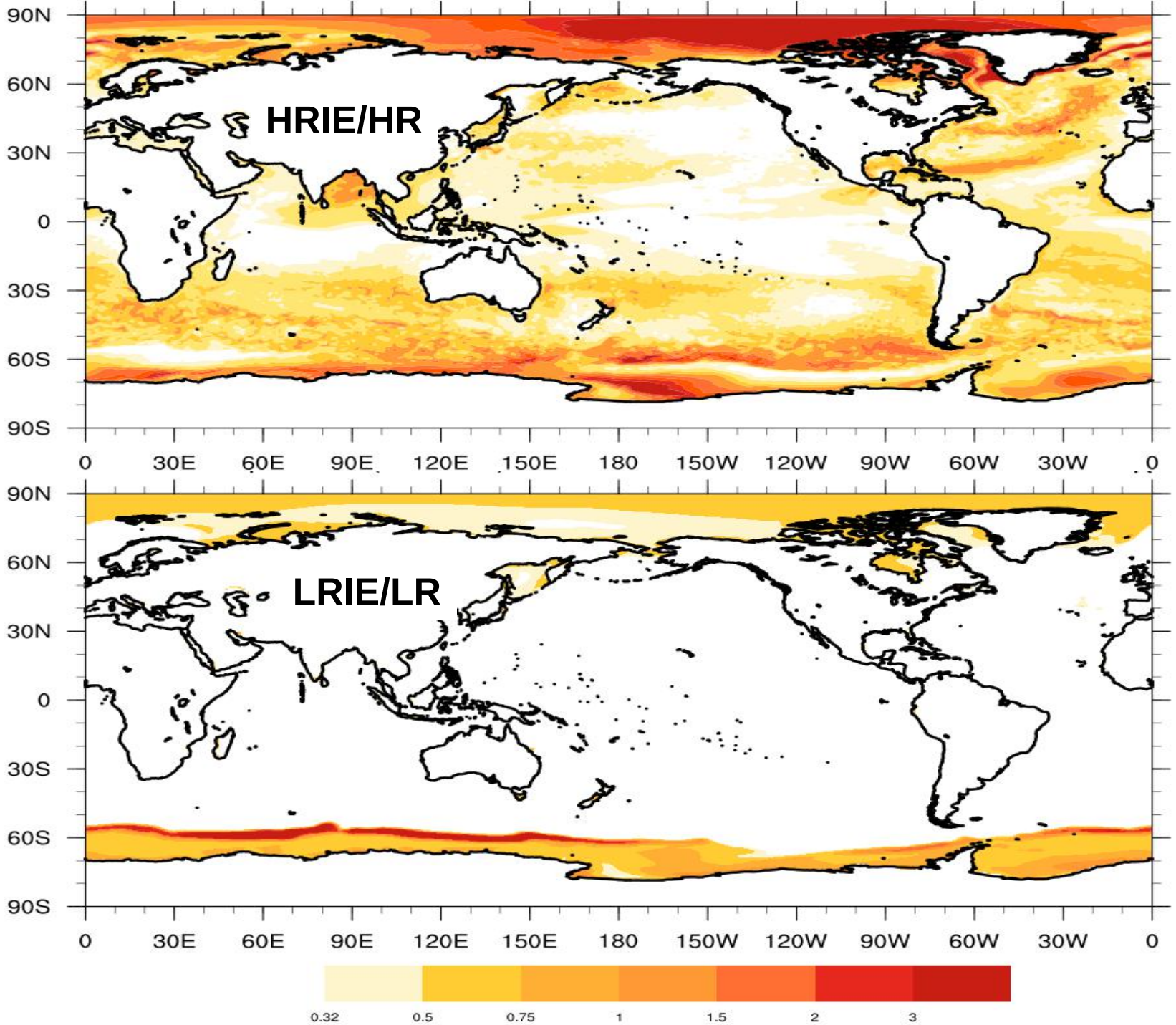
Signal – Noise Correlation

Noise = Precip Spread

Signal = SST



SST Variance Ratios



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