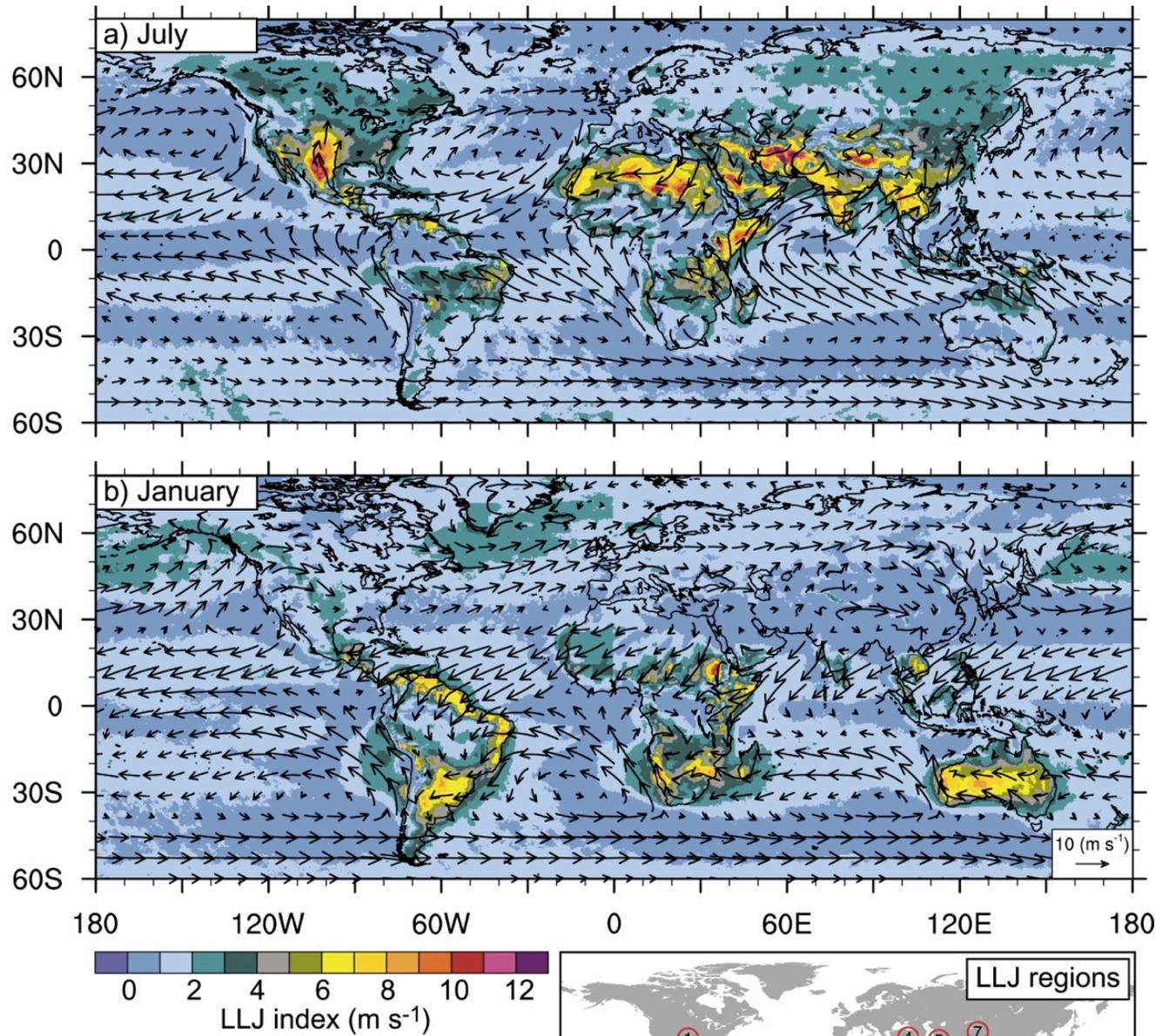


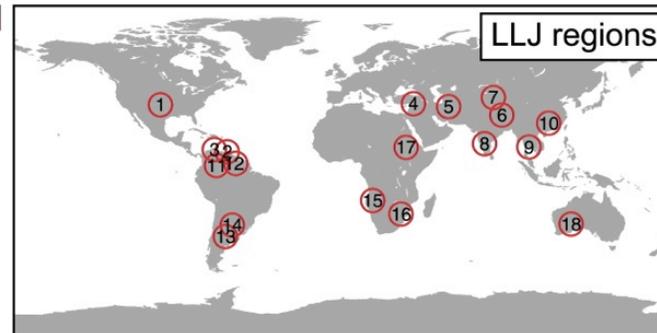
Climatic Role of North American Low-Level Jets on Severe Weather Variability

Scott Weaver
Emily Riddle

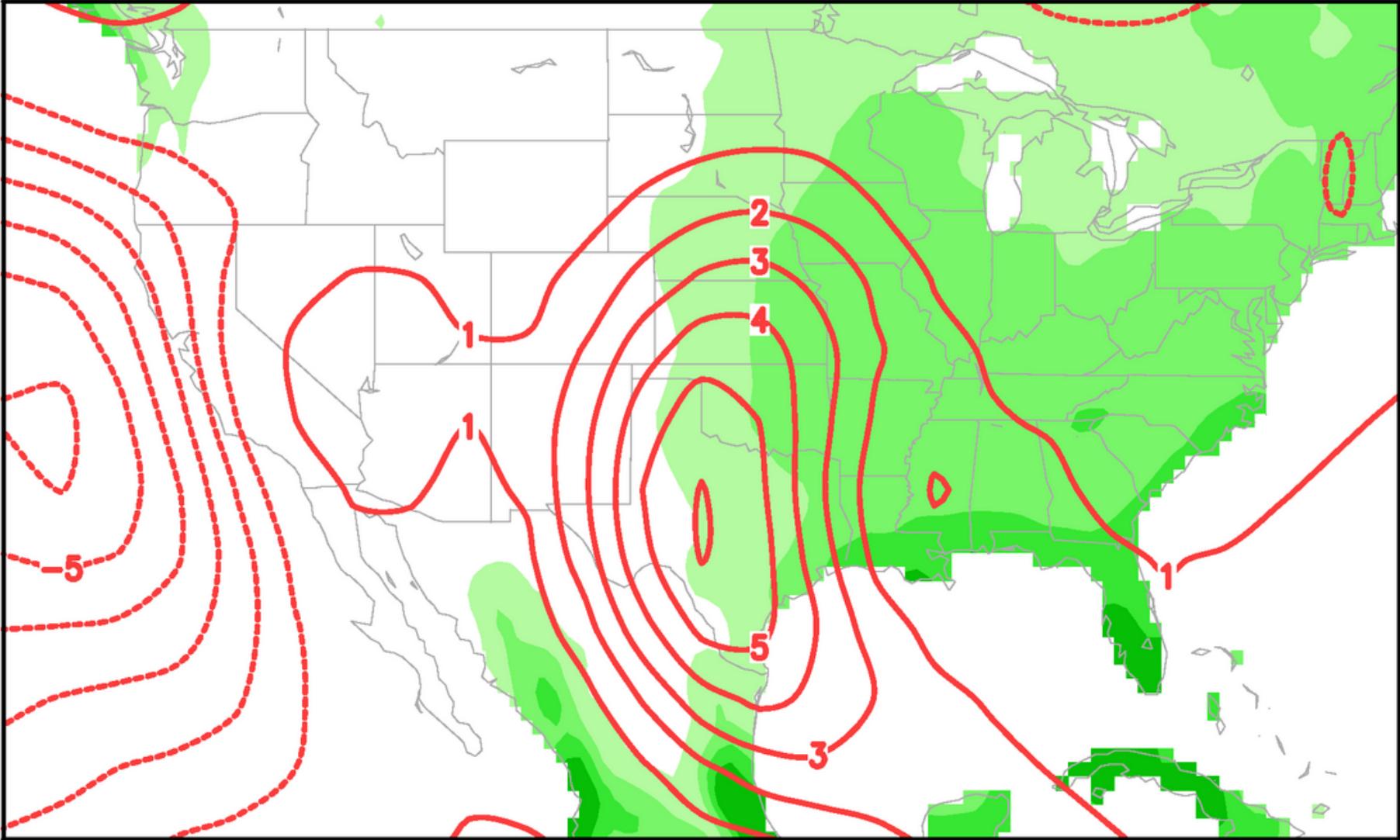
NOAA Climate Prediction Center



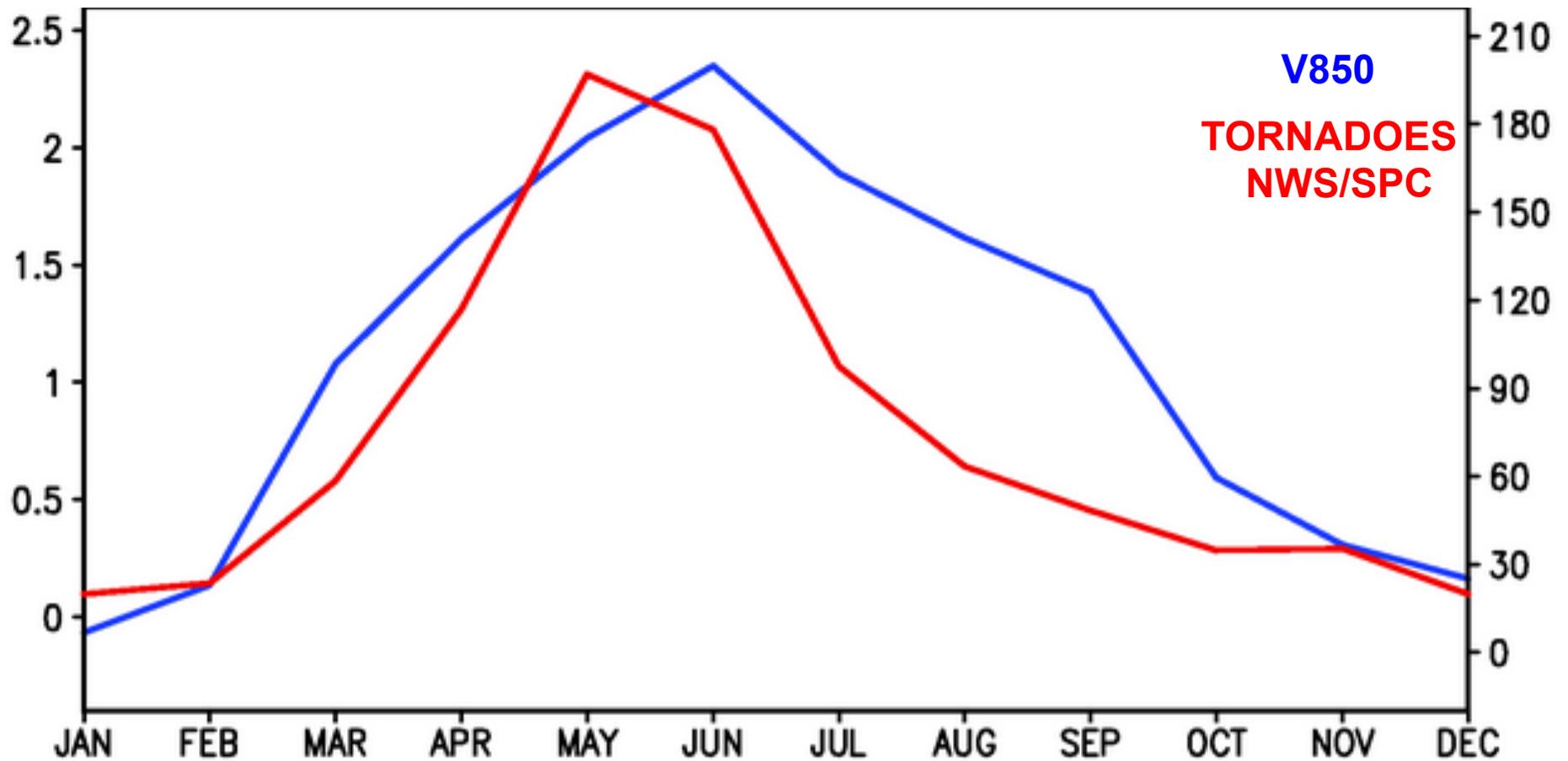
Monaghan et al. 2010



V850 & Precip Climatology



Climatology and Seasonal Cycle 1950-2010

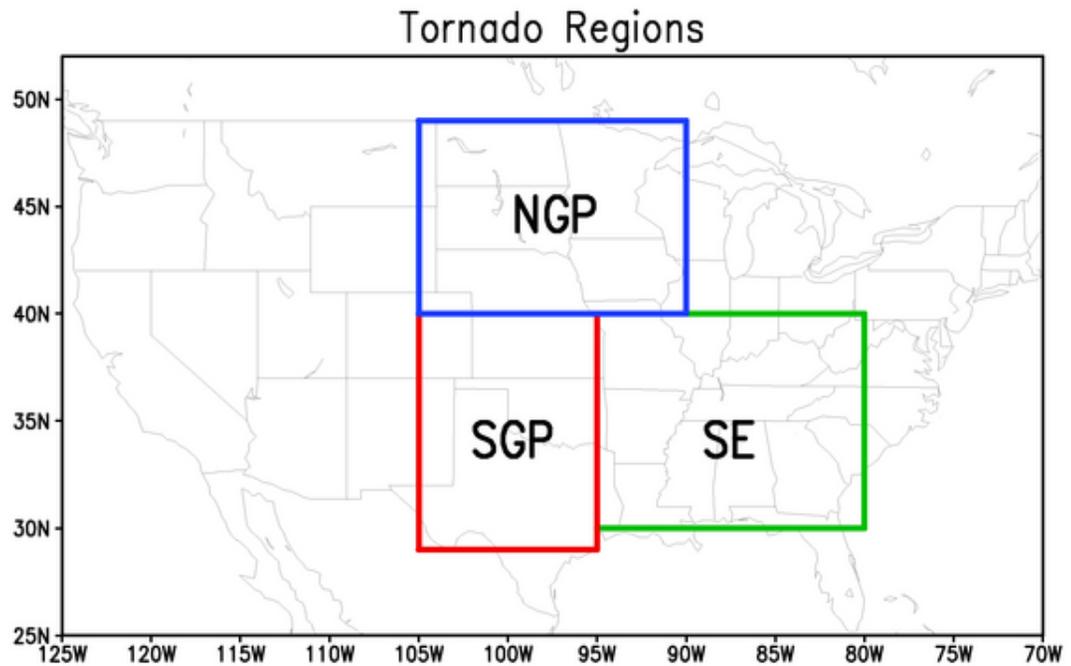


Tornado Regions

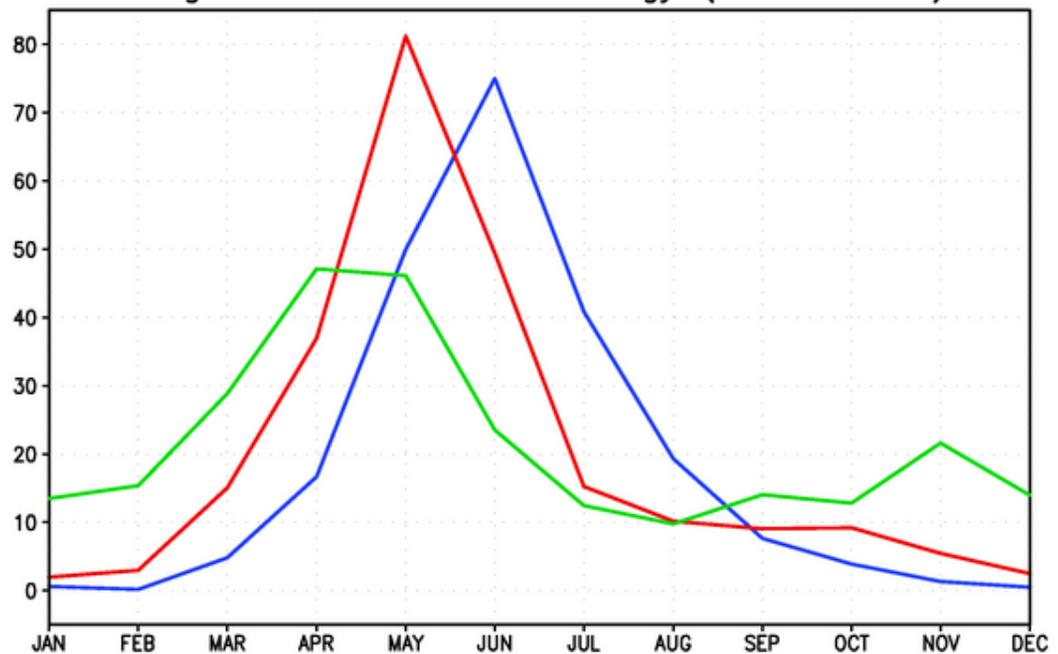
NGP: 40-49N 105-90W

SGP: 29-40N 105-95W

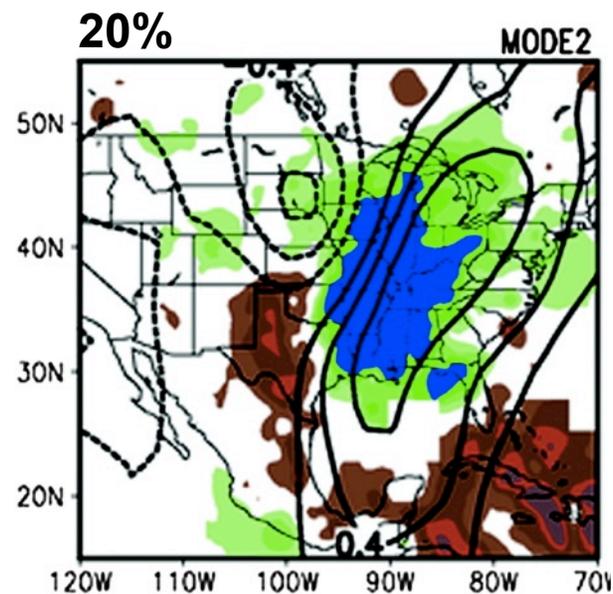
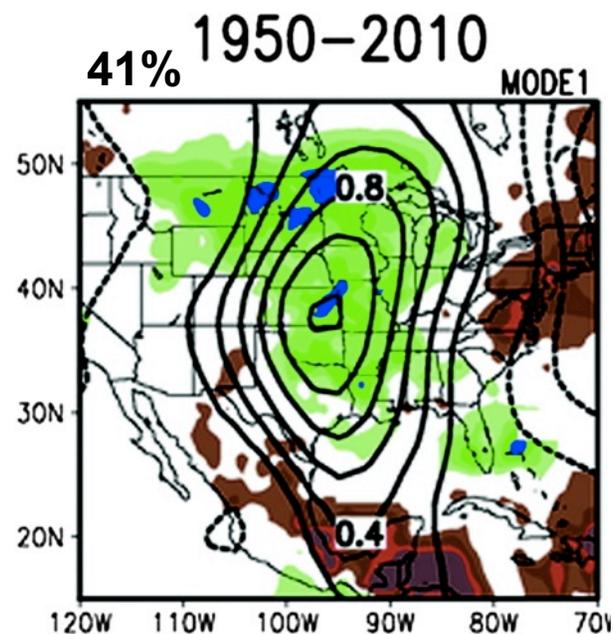
SE: 30-40N 95-80W



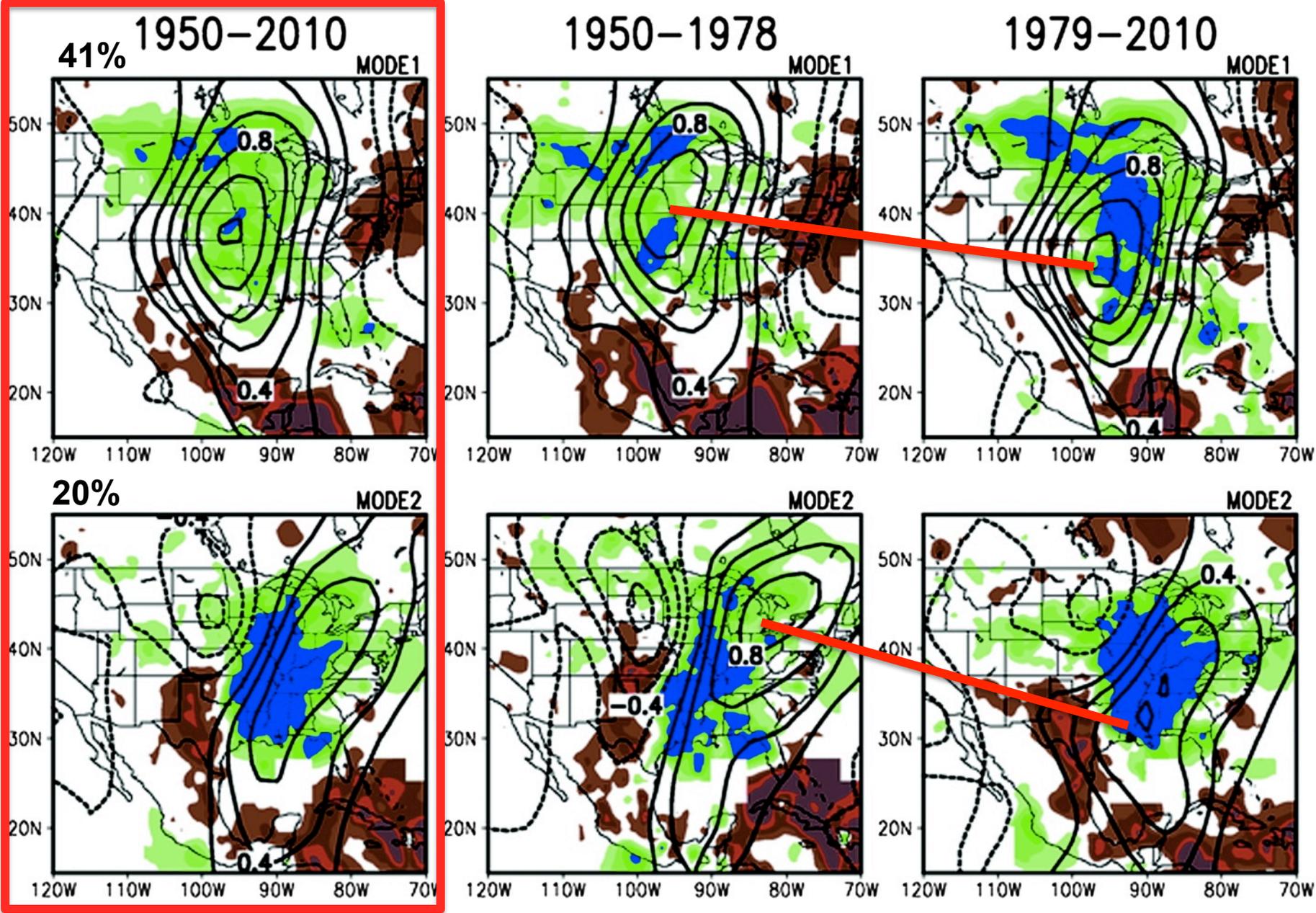
Regional Tornado Climatology (1950–2010)



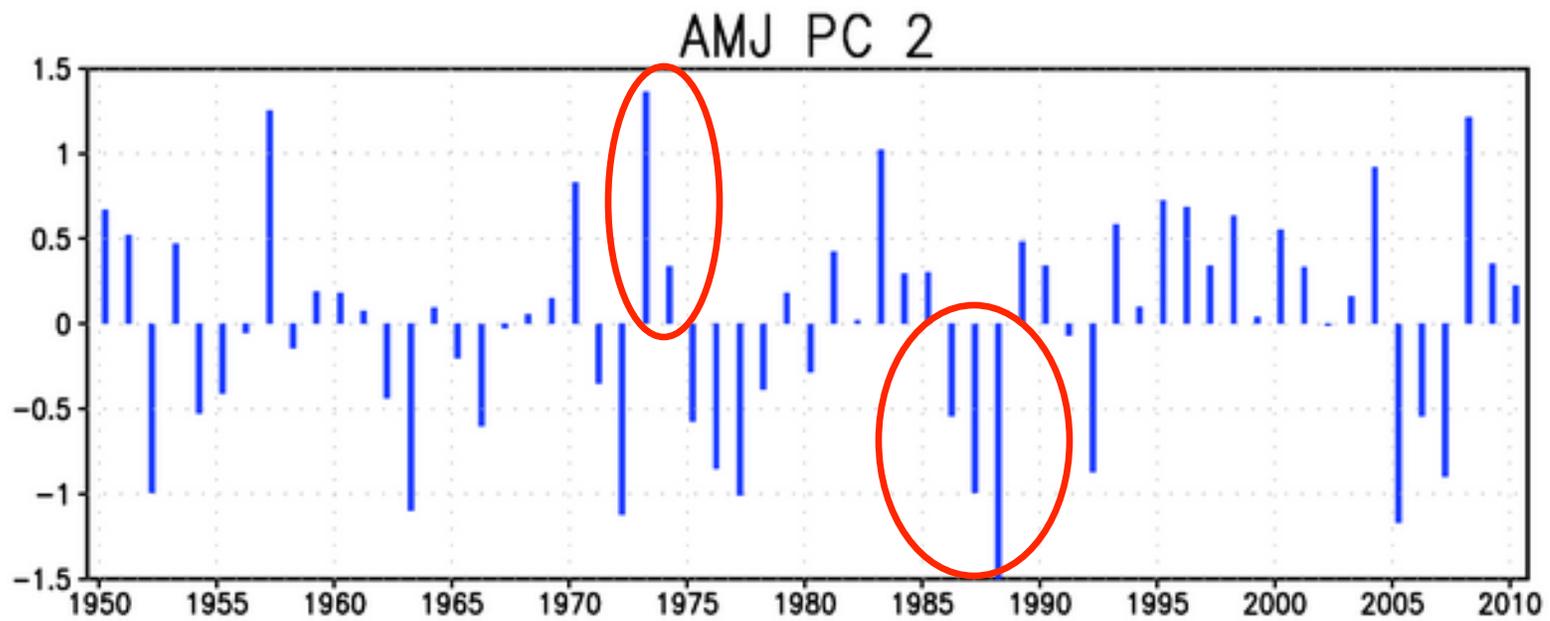
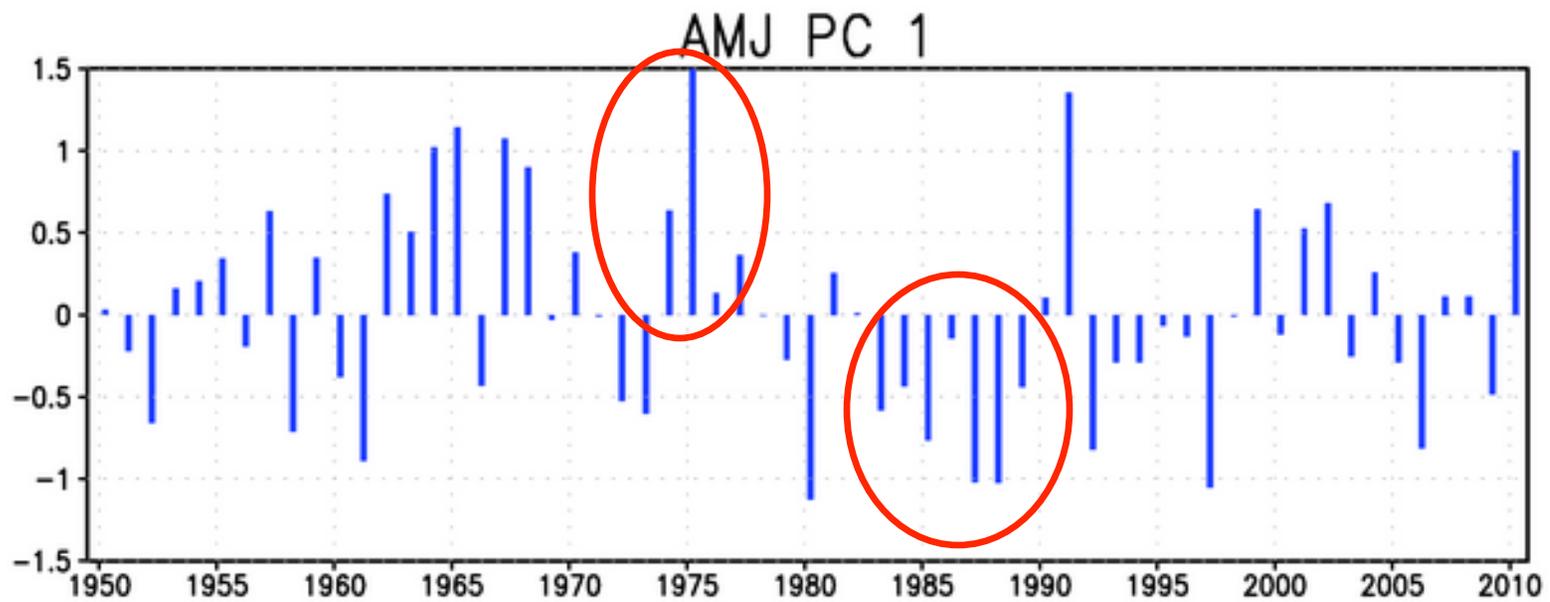
NALLJ Variability Modes & Precipitation



NALLJ Variability Modes & Precipitation

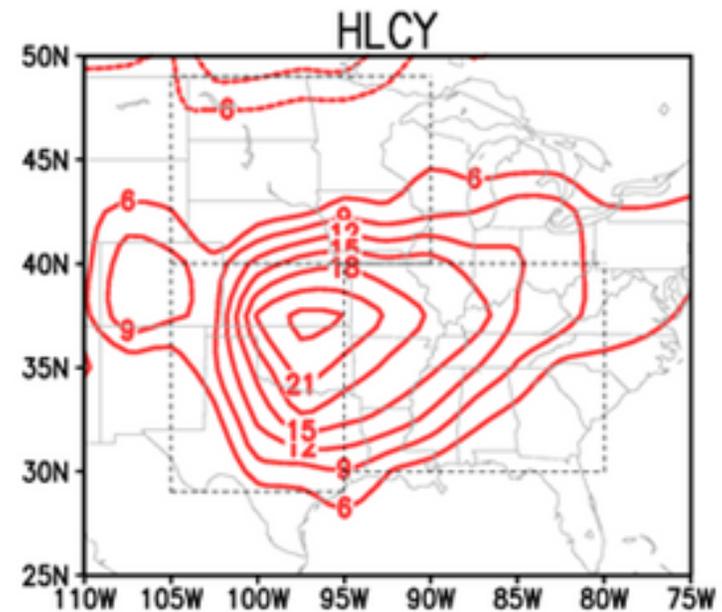
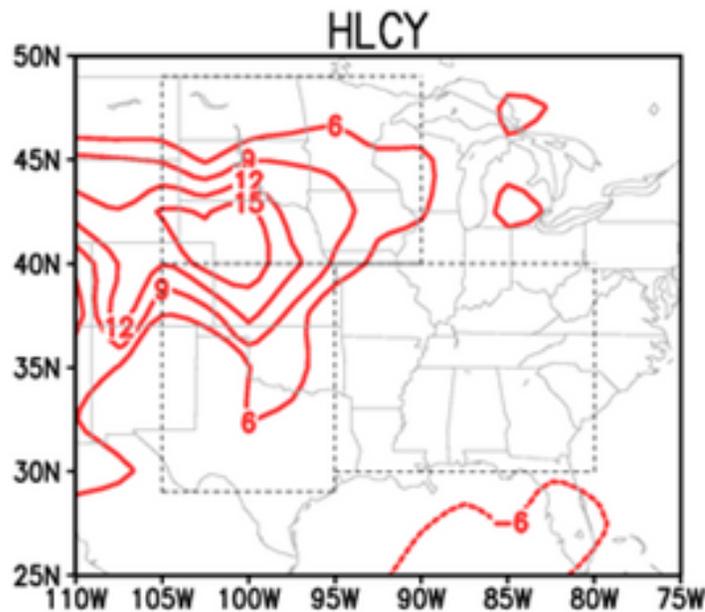
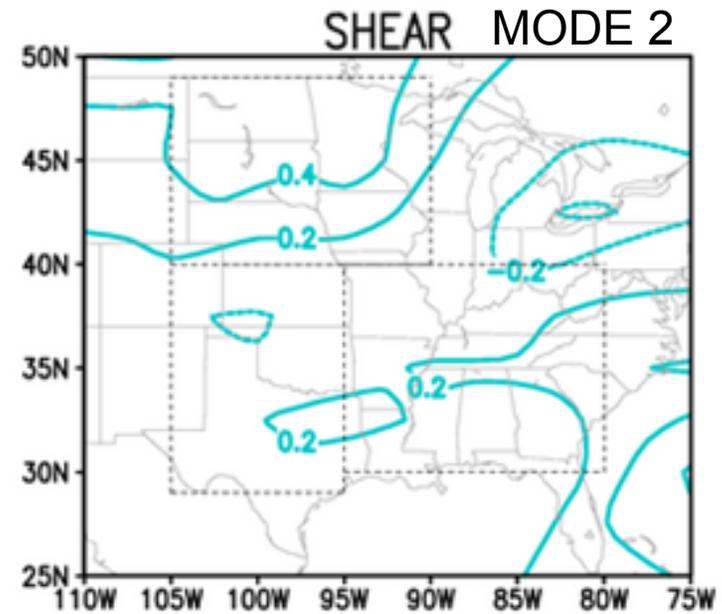
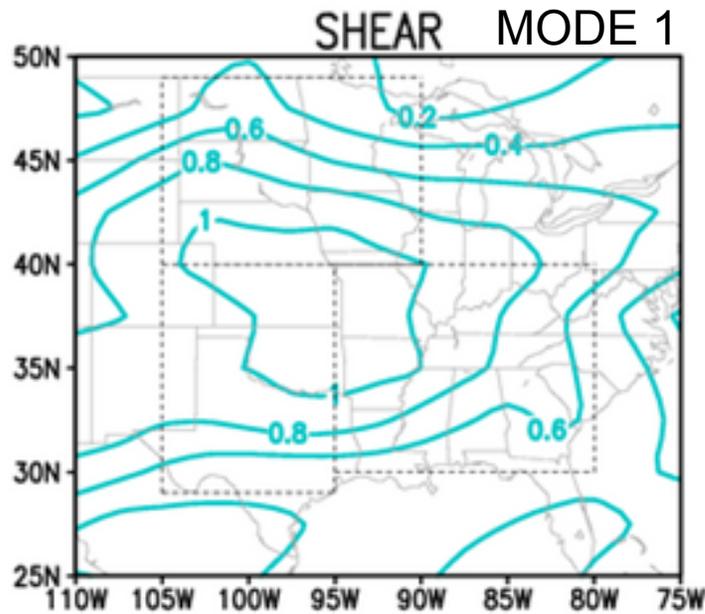


NALLJ PC Time Series

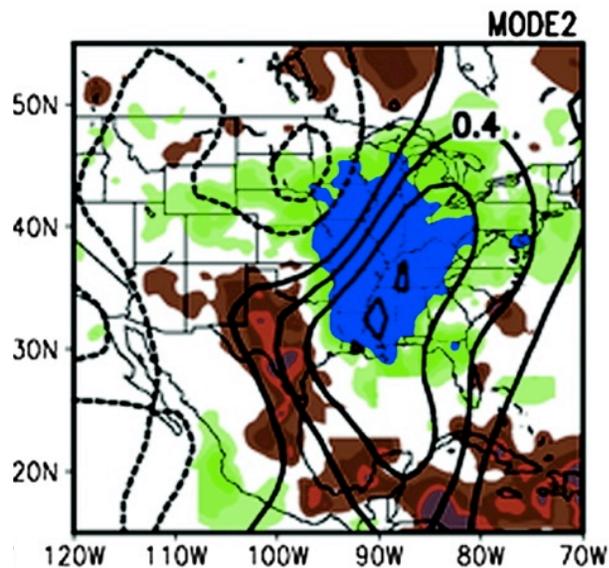
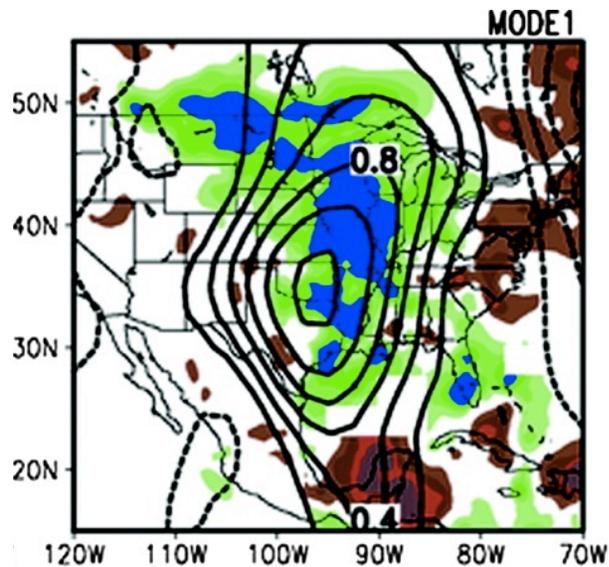


NALLJ PC Regressions to CFSR Tornadic Parameters

1979-2010

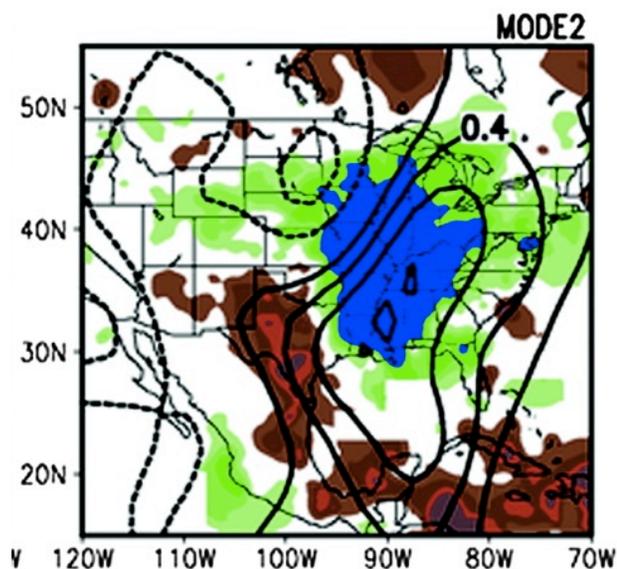
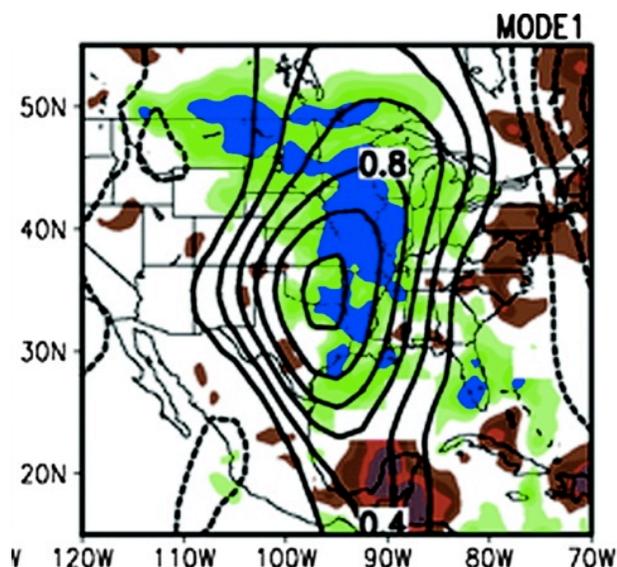


NALLJ PC & Tornado Timeseries Correlations



	PC 1	PC 2
SE 50-10	-0.02	0.50
50-78	0.06	0.53
79-10	0.03	0.47
NP 50-10	0.35	0.24
50-78	↓ 0.65	0.05
79-10	0.49	0.28
SP 50-10	0.30	0.24
50-78	↑ 0.31	0.13
79-10	0.57	0.25

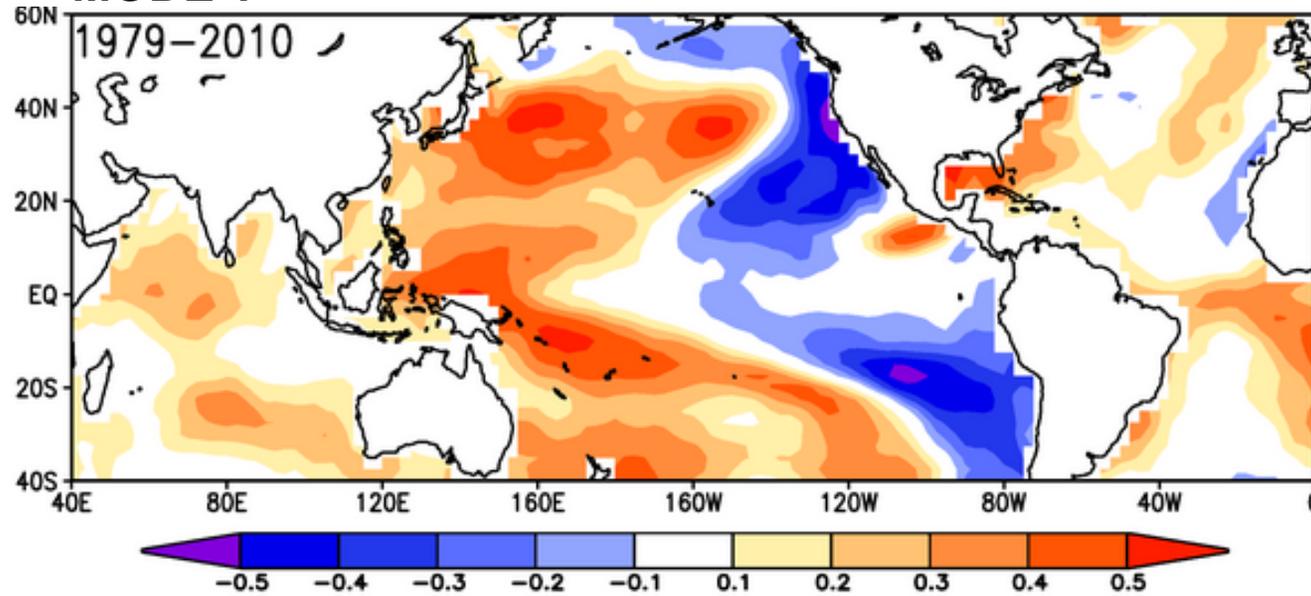
Combined Influence of NALLJ Modes 1 & 2



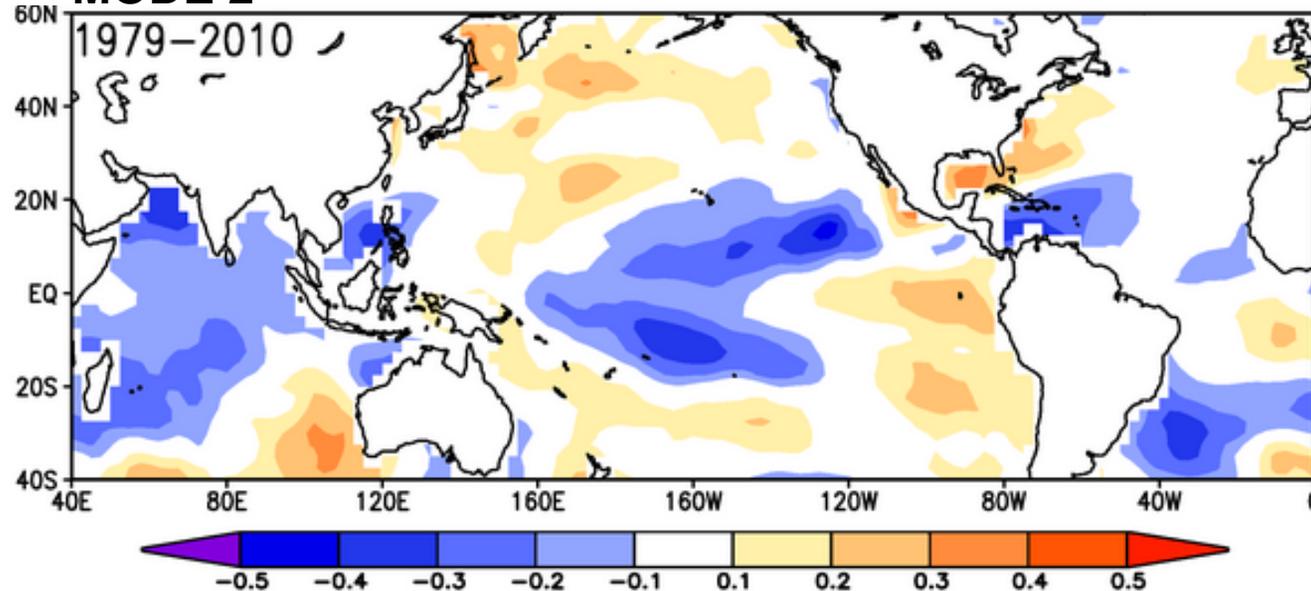
Seasons where both PC1 & PC2 are both Positive (Negative) and Tornado anomaly is also Positive (Negative)	PC1/PC2 Both Positive	PC1/PC2 Both Negative
At least one Region	14/18 + 78%	13/13 - 100%
All Regions	4/18 + 22%	9/13 - 69%

AMJ NALLJ PC SST Correlations

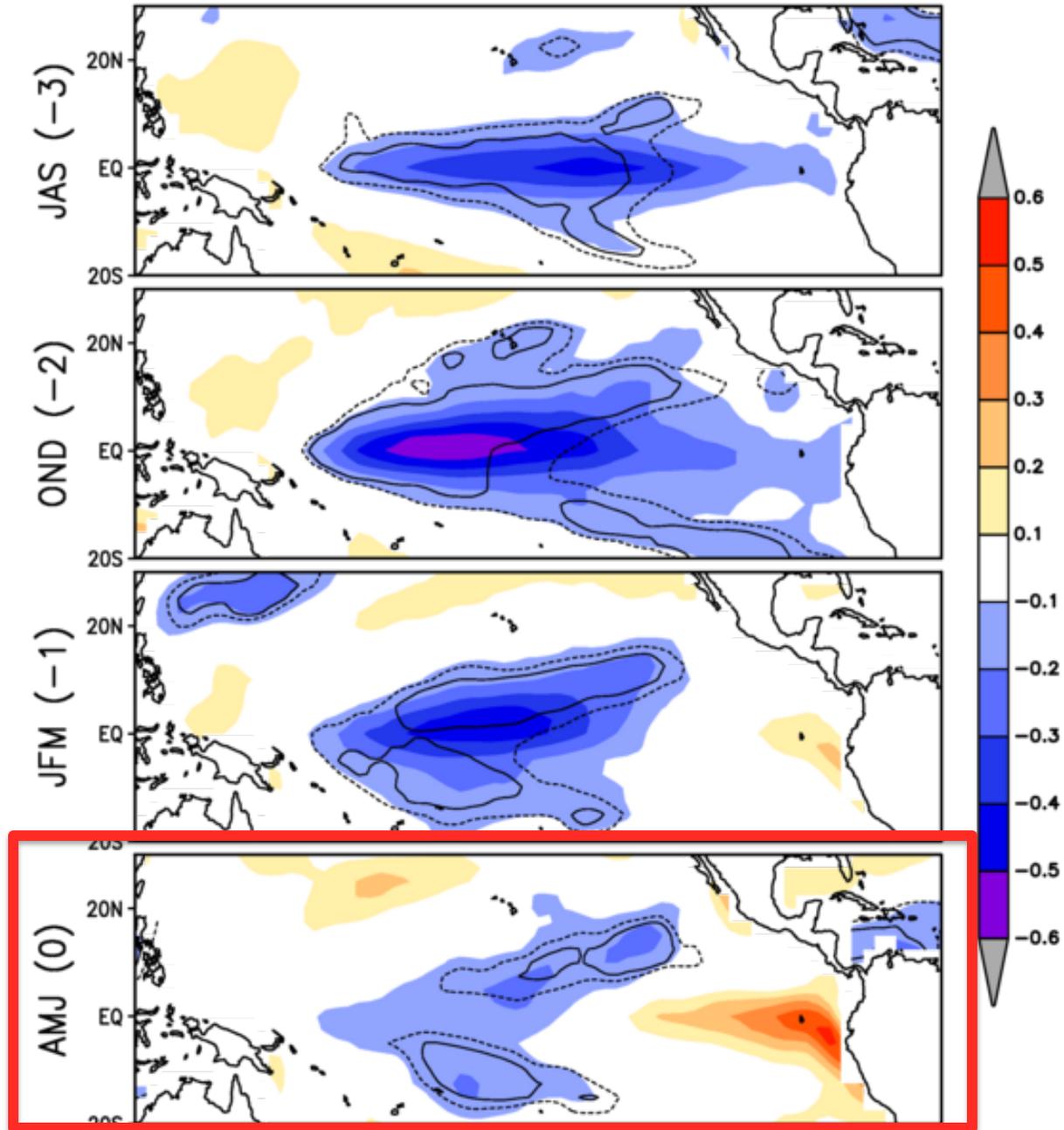
MODE 1



MODE 2

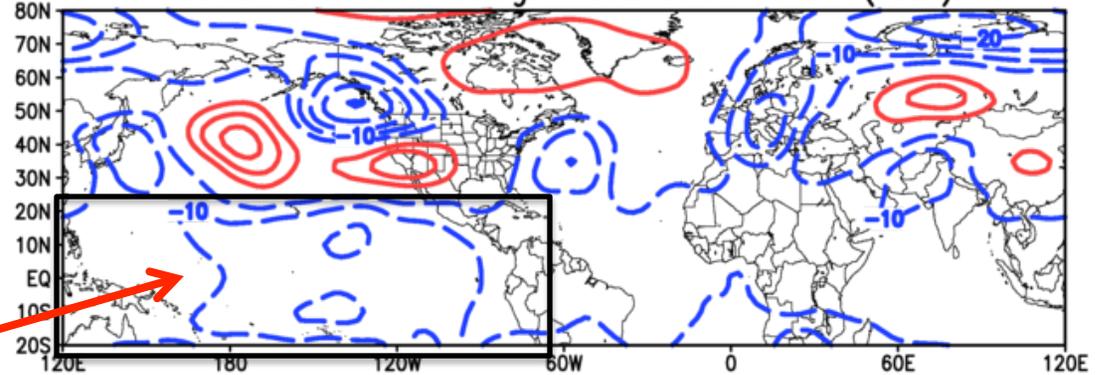


AMJ NALLJ PC 2 SST Lag Regressions

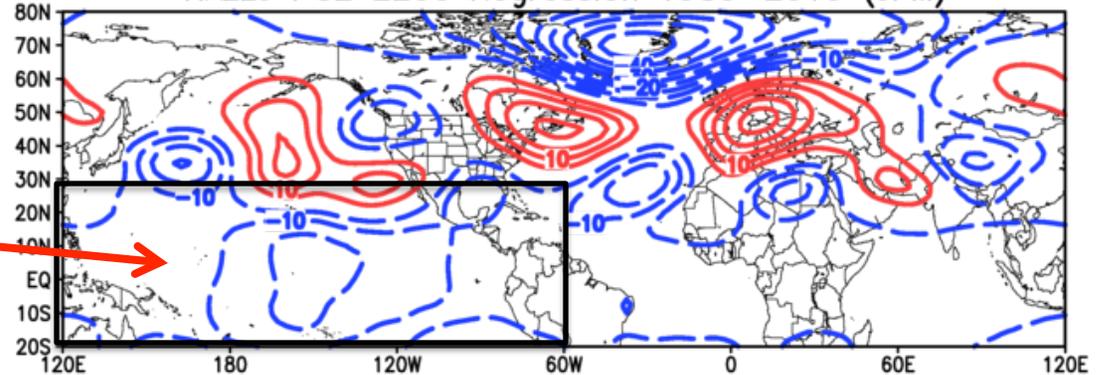


AMJ NALLJ PC 2 Z200 Lag Regressions

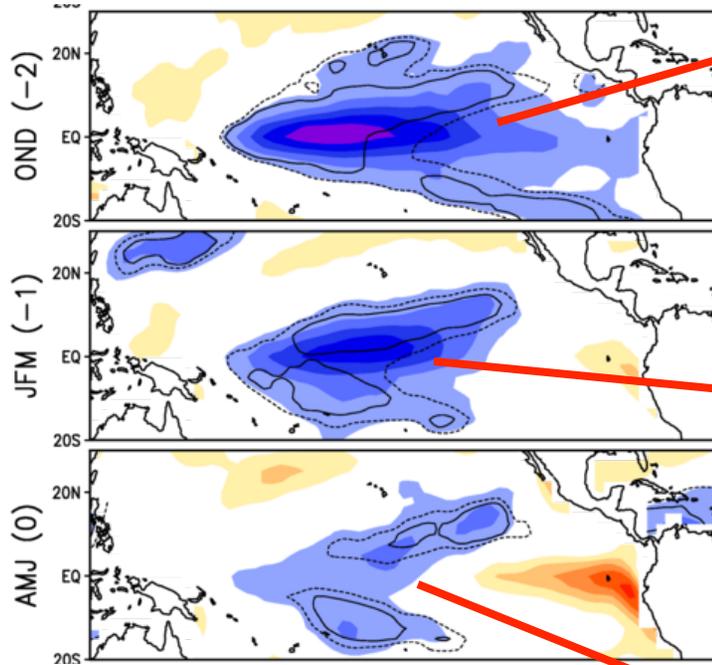
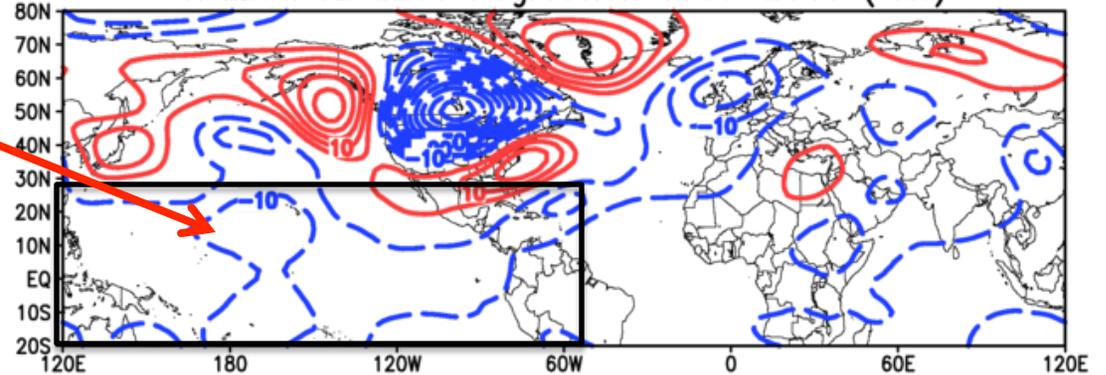
NALLJ PC2 Z200 Regression 1980–2010 (OND)



NALLJ PC2 Z200 Regression 1980–2010 (JFM)

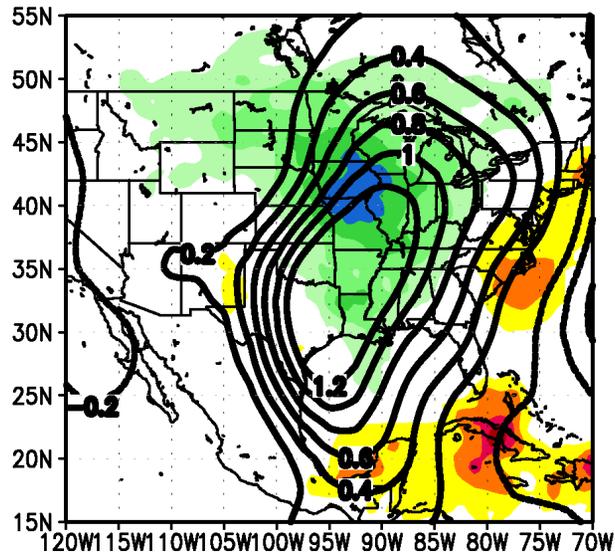


NALLJ PC2 Z200 Regression 1980–2010 (AMJ)

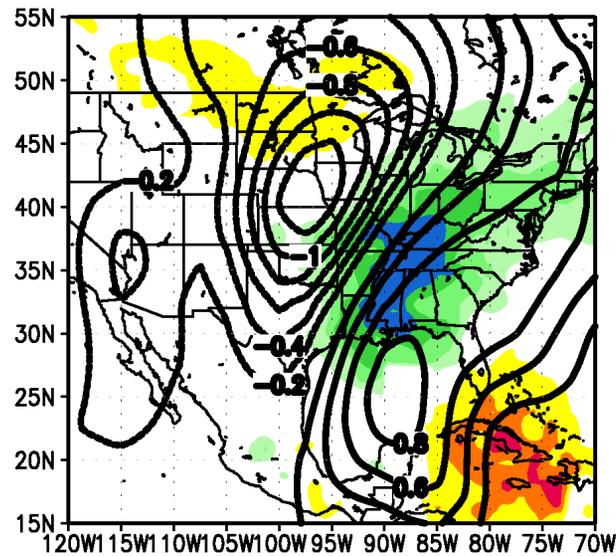


EOF's 1 & 2 of AMJ NALLJ Contours (V850 winds), Shading (PCP)

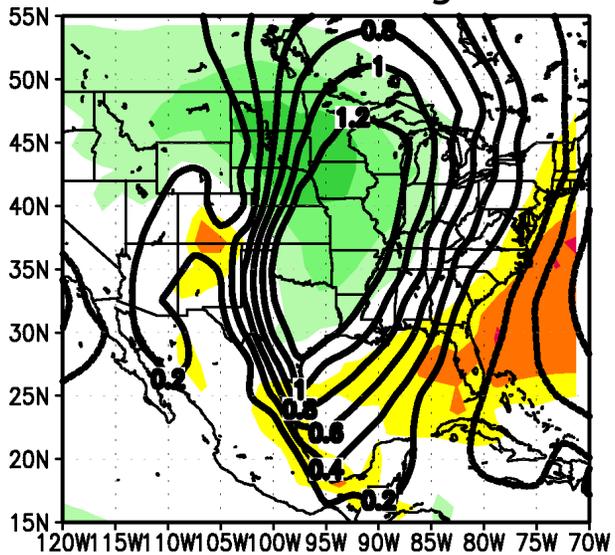
CFSR Mode 1



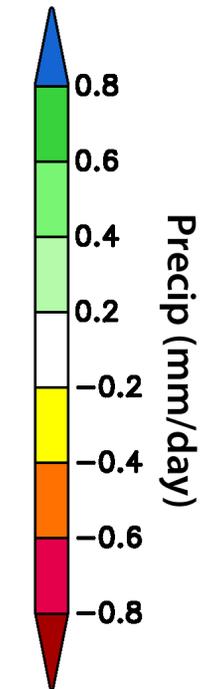
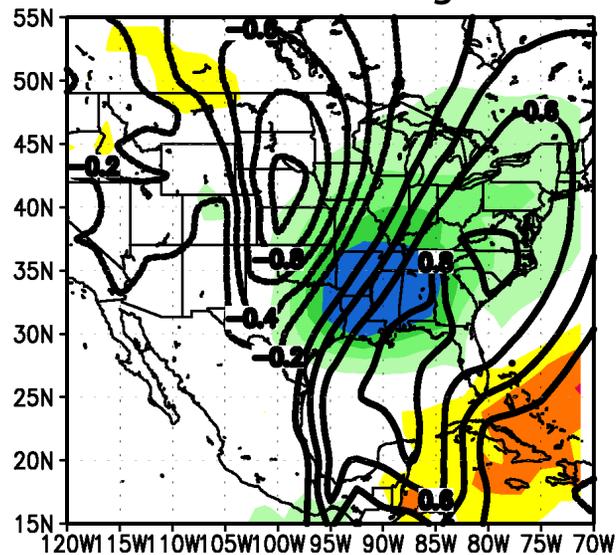
CFSR Mode 2



CFSv2 Mode 1 172 Ens. Average

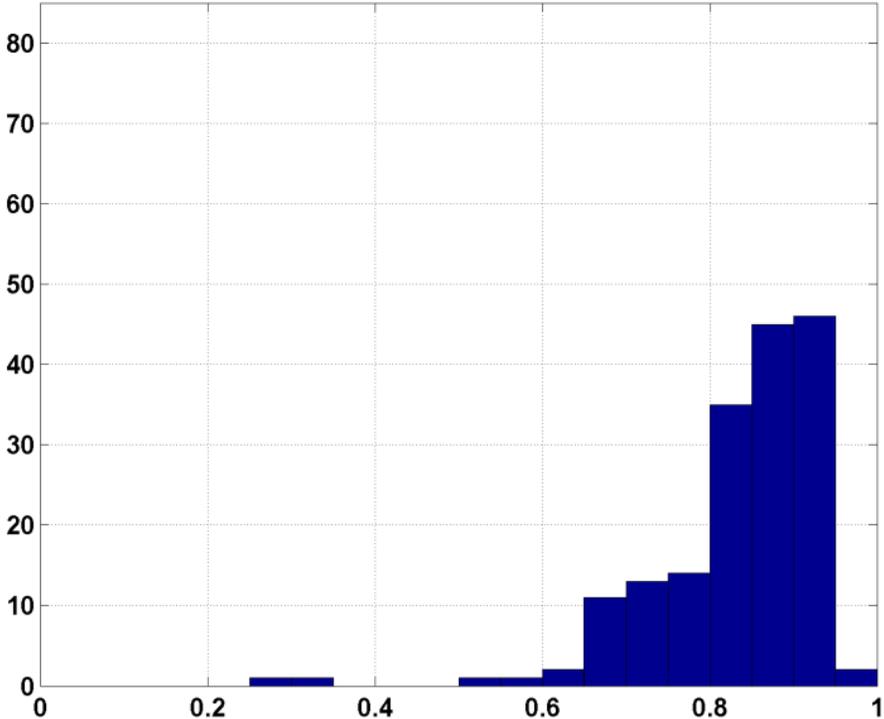


CFSv2 Mode 2 172 Ens. Average

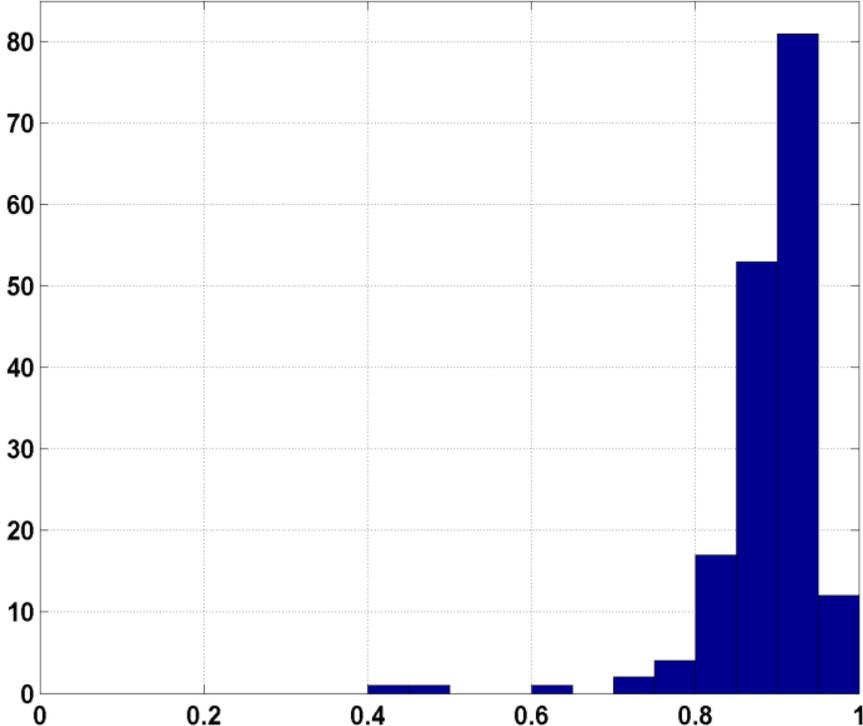


Pattern Correlations Between CFSv2 (172 runs) Loading Patterns and CFSR

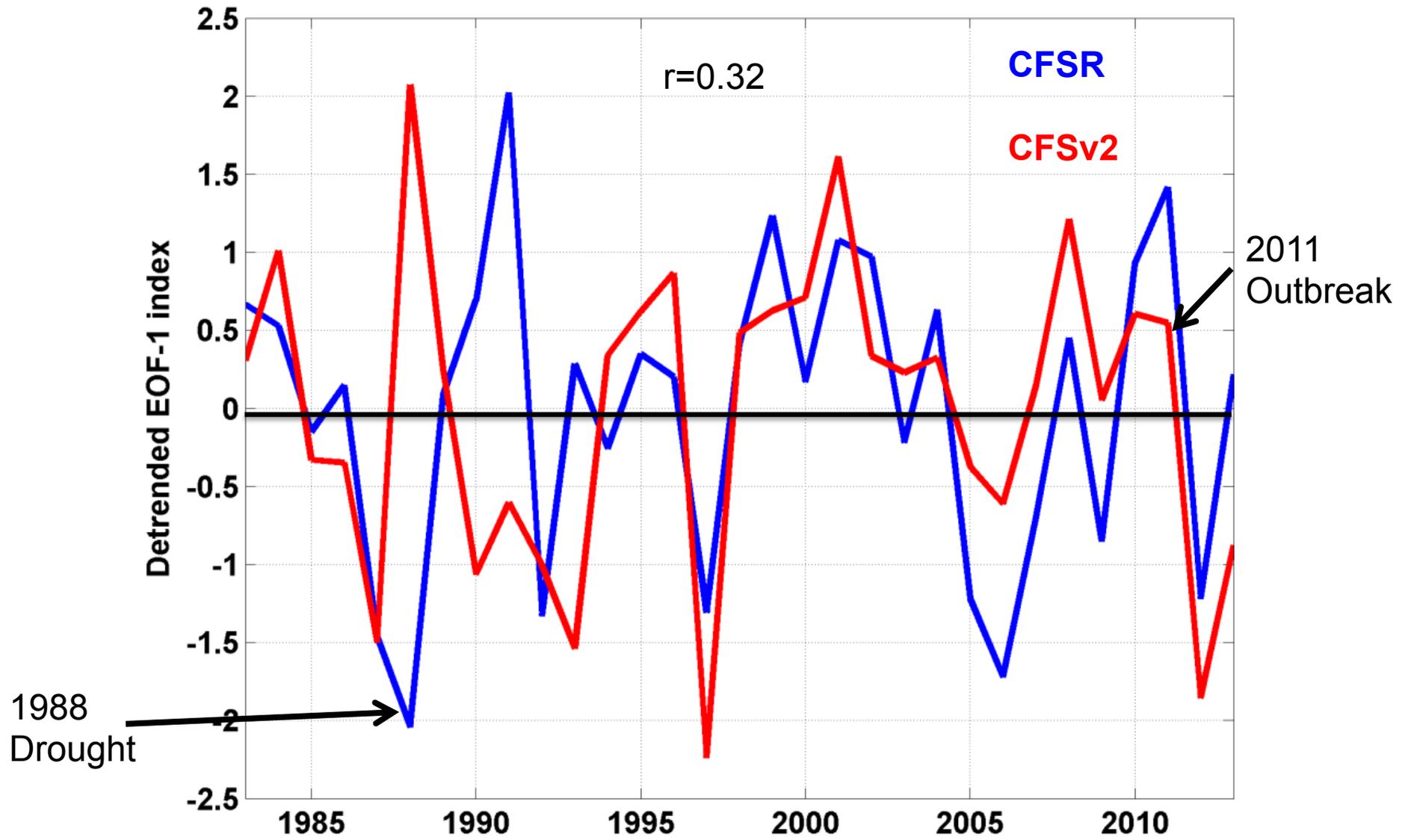
EOF-1



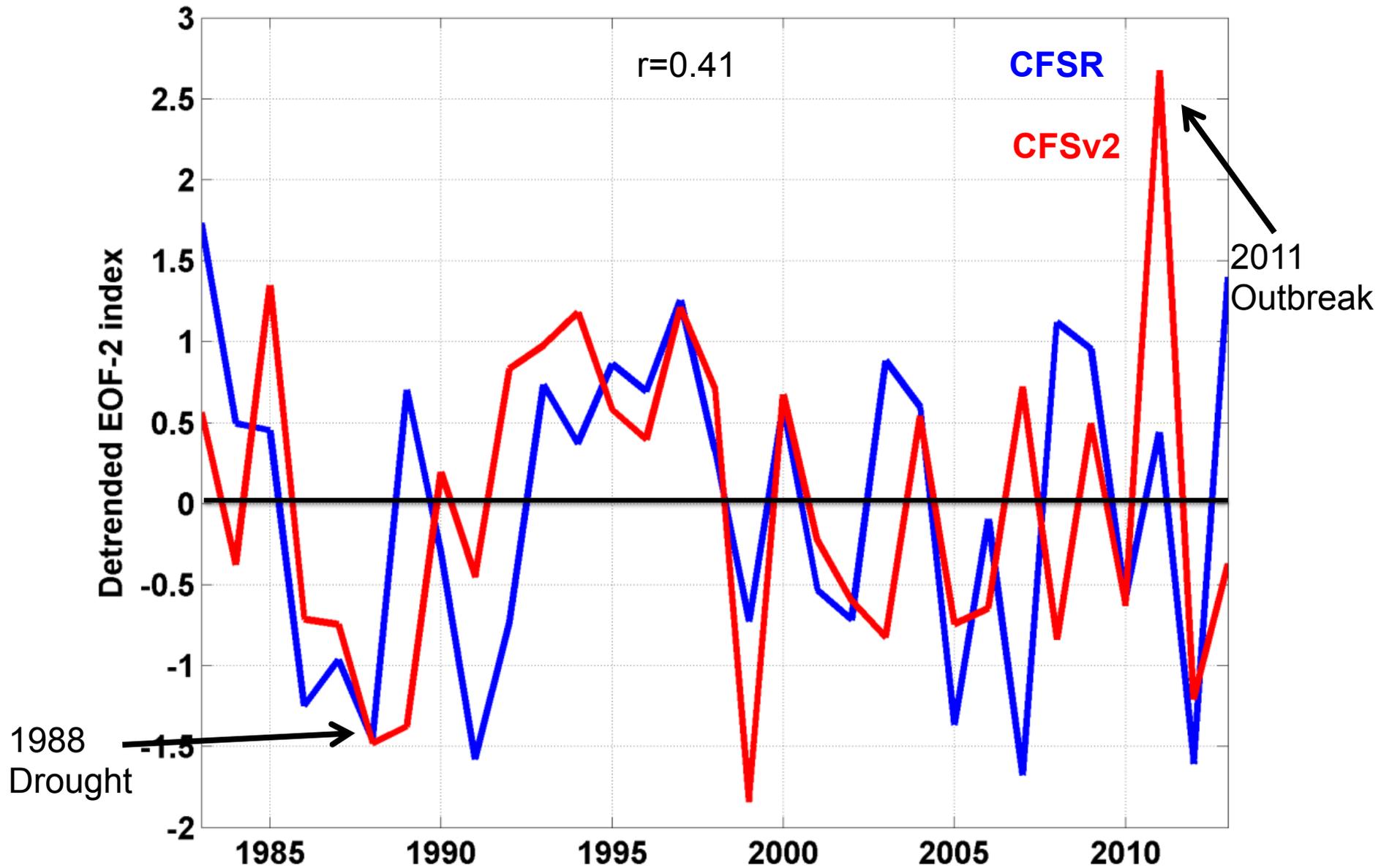
EOF-2



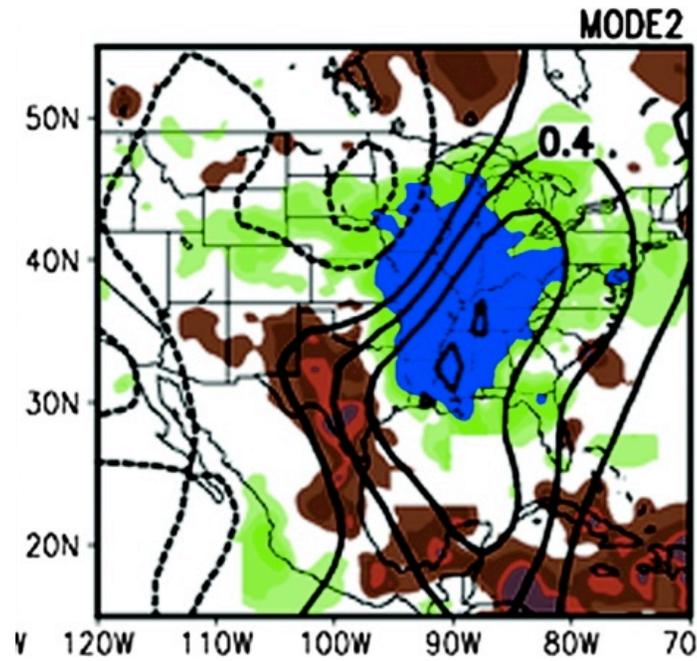
CFSv2 0-month lead 20-member forecast of AMJ NALLJ Mode 1



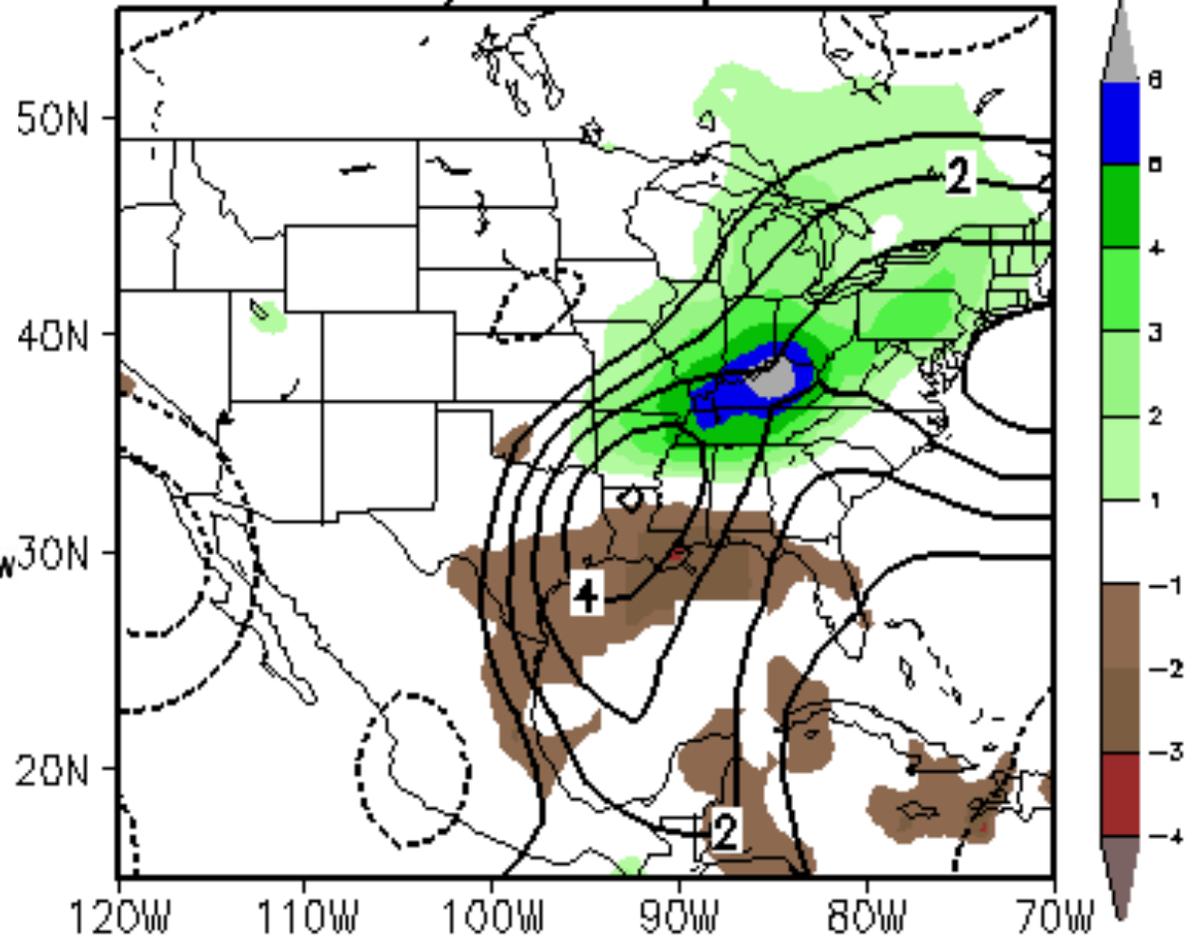
CFSv2 0-month lead 20-member forecast of AMJ NALLJ Mode 2



April 2011



V850 & Precipitation Anomalies



Thank You

Backup Slides

$$\begin{aligned} \text{RWS} &= -\nabla \cdot (\mathbf{v}_\chi \zeta) \\ &= -(\mathbf{v}_\chi \cdot \nabla \zeta) - (\zeta \nabla \cdot \mathbf{v}_\chi) \end{aligned}$$

Notable divergent outflows in west central and east Pacific coincident with subtropical RWS

Suggests potential for tropically induced circulation influence on GPLLJ variations

Height correlations further suggest tropical links

