Improving Seasonal Predictions of Climate Variability and Water Availability at the Catchment Scale

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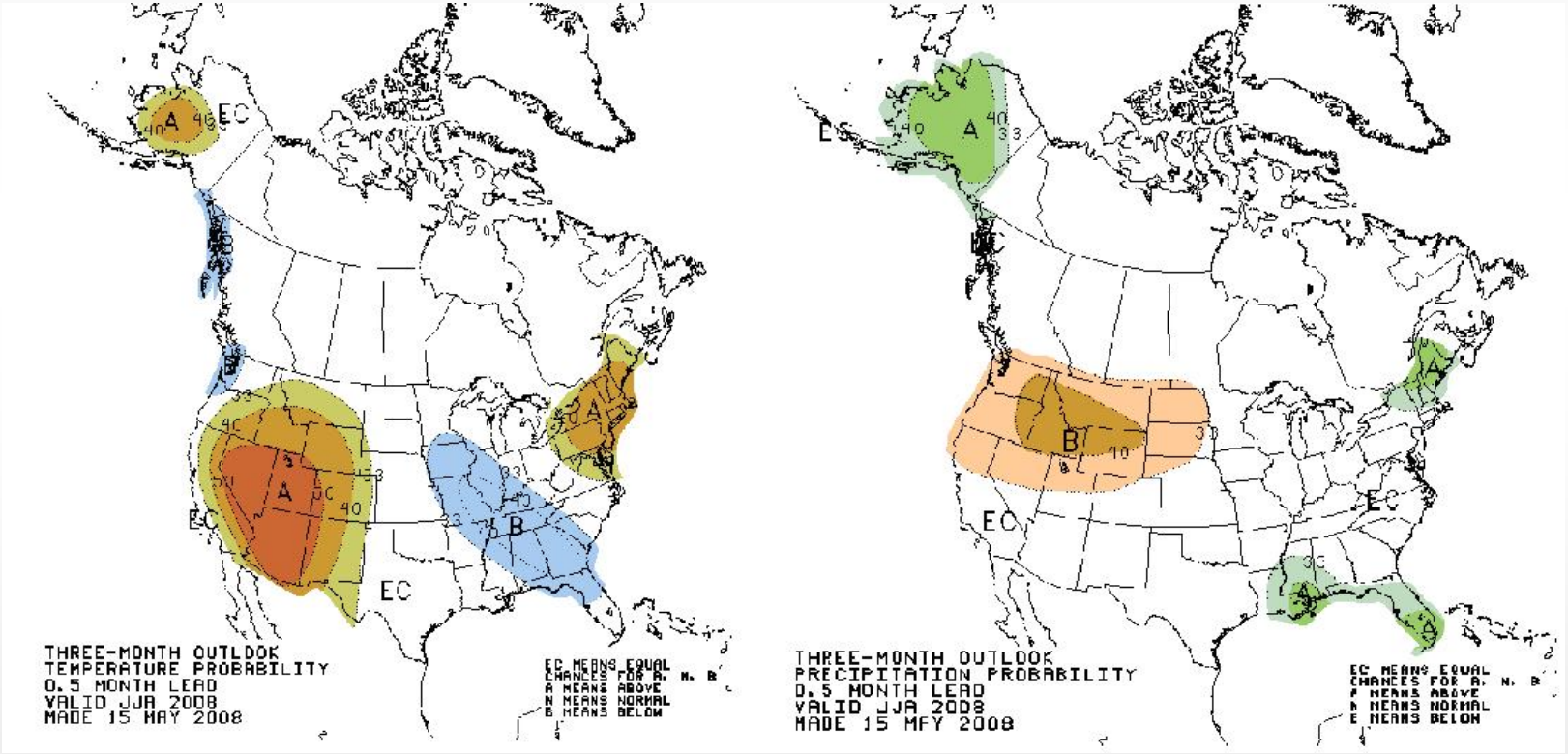
Current Practices

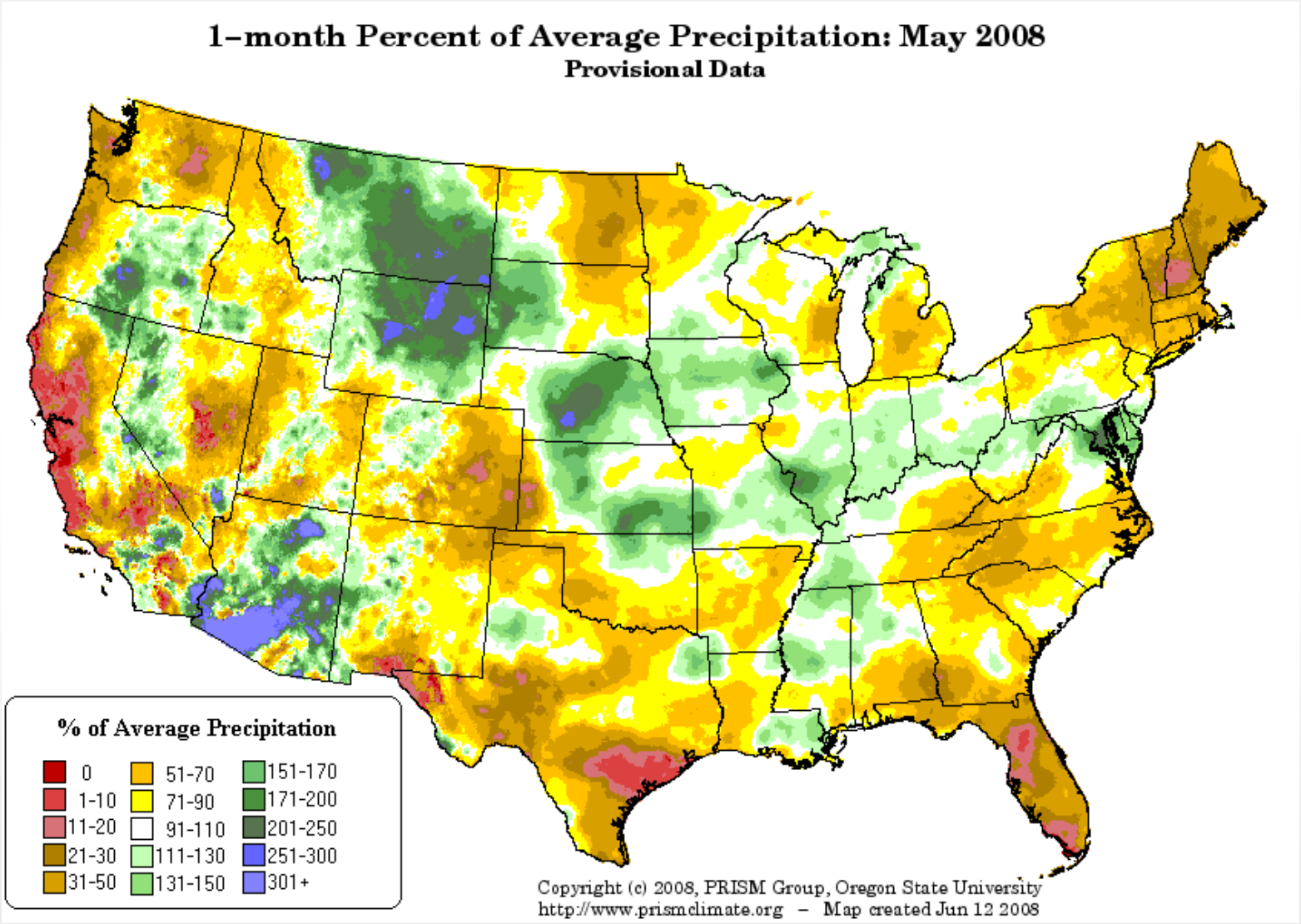
(Climate Prediction and River Forecast Centers)

ENSO, Climatic Trends, …



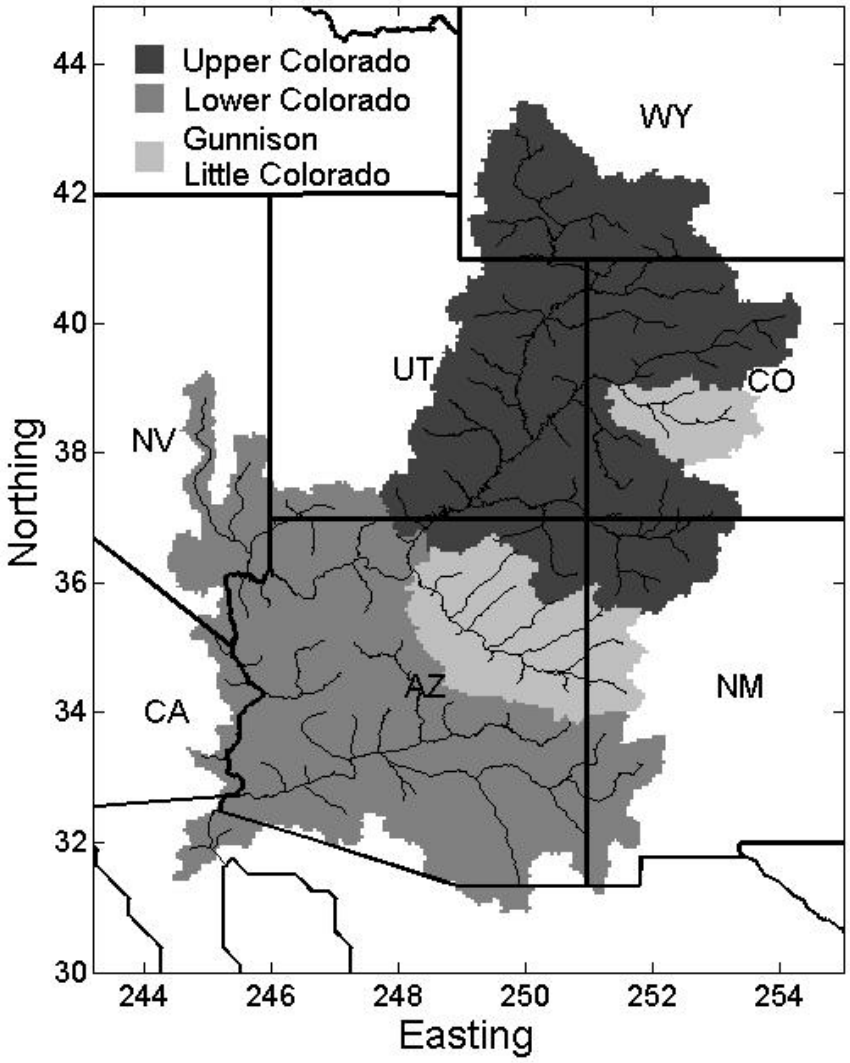
http://www.cbrfc.noaa.gov/climate/climoForecasts.cgi

Observed Precipitation Anomalies

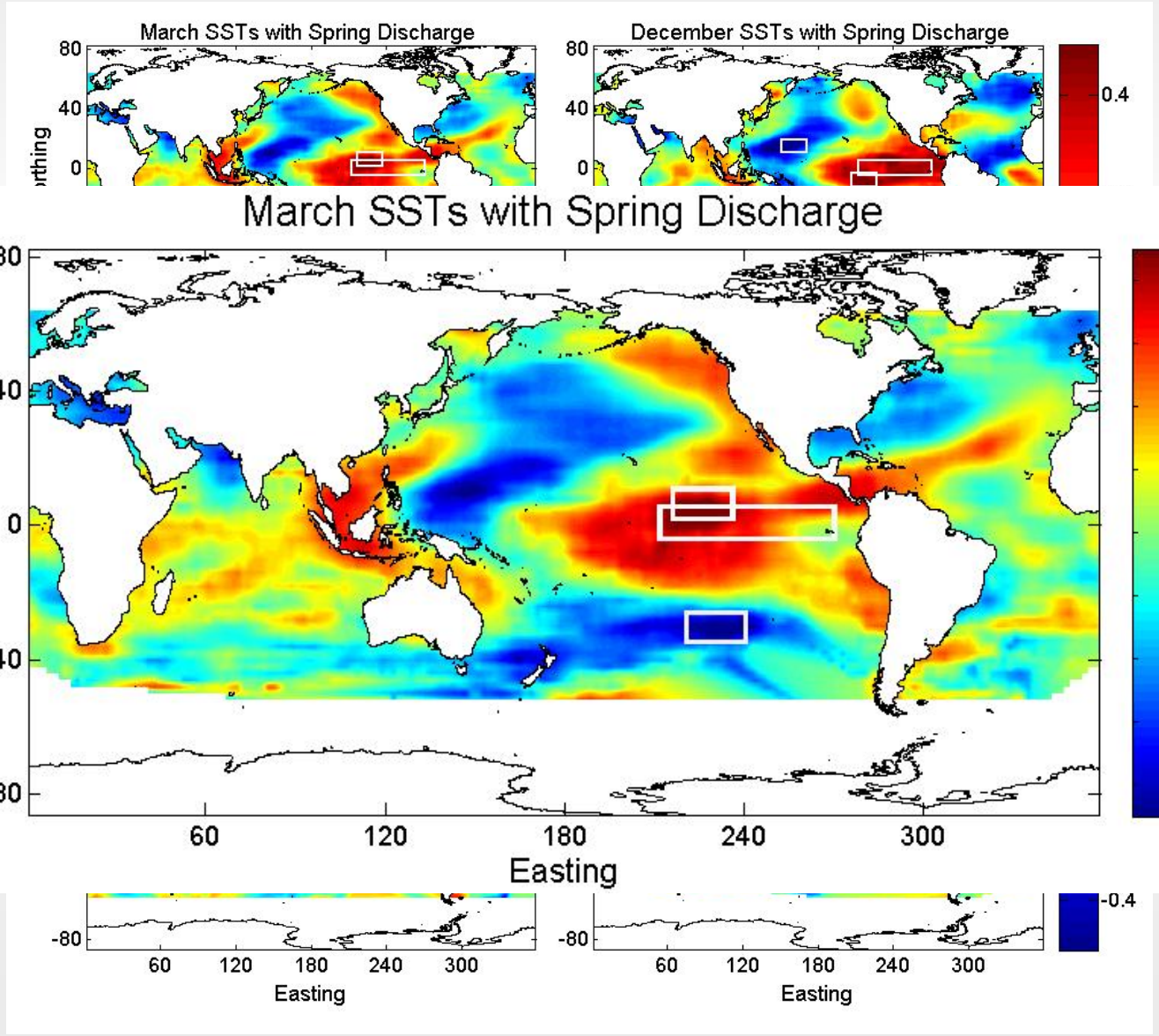


Basin-Specific Climate Prediction

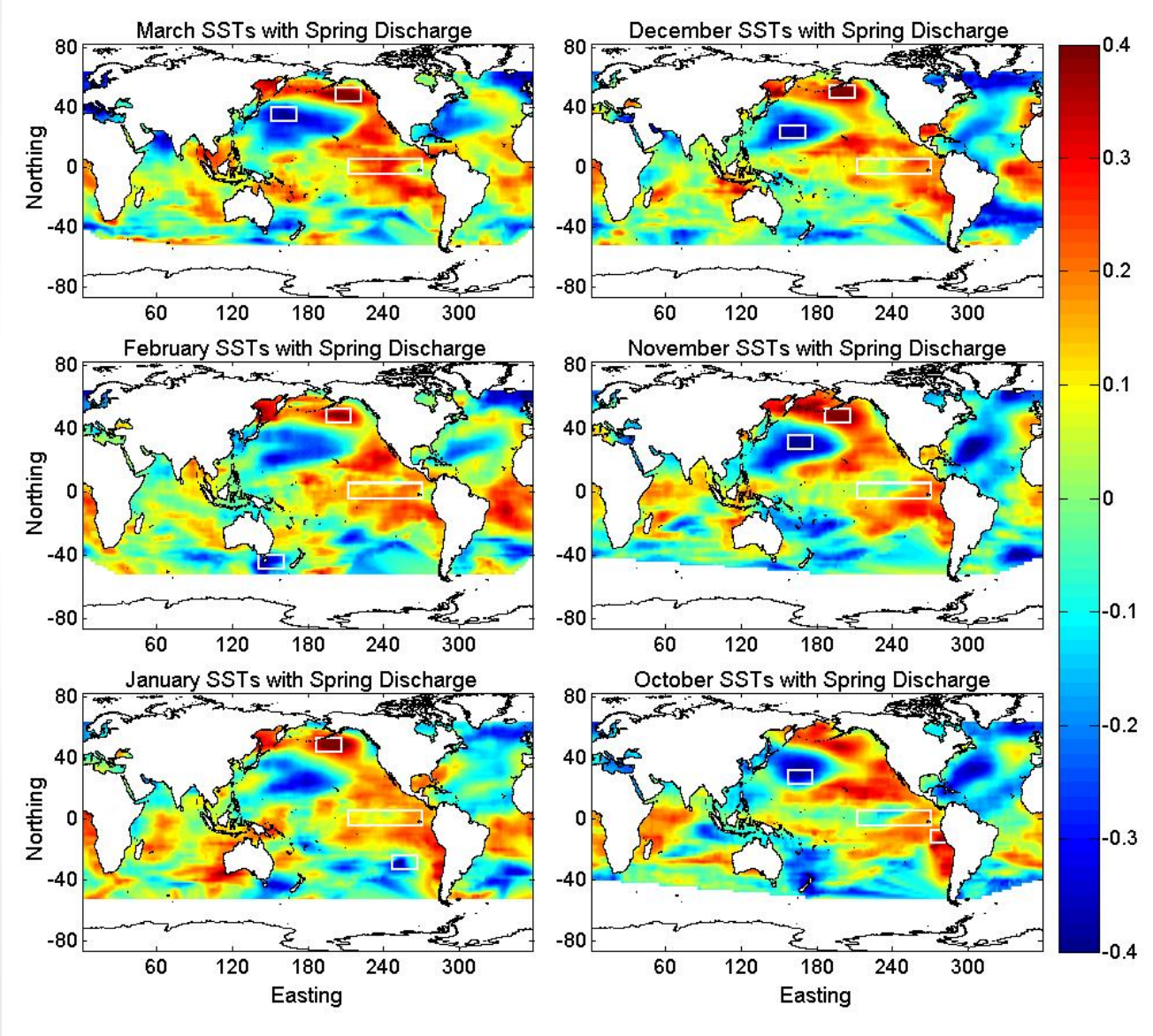
Develop predictors that are unique to a particular region's hydroclimate (precipitation, temperature and discharge).



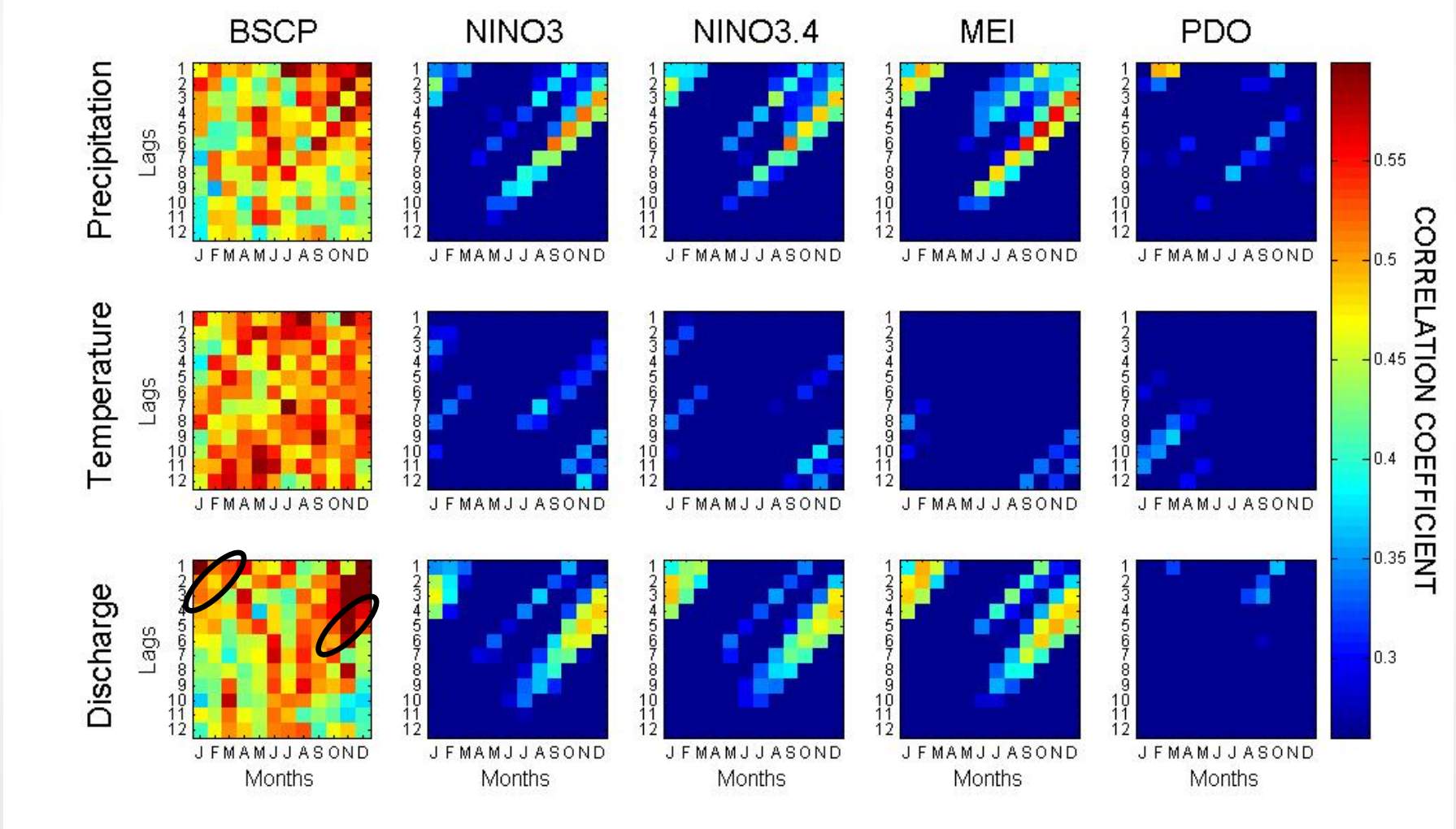
Most Correlated Oceanic Regions with the Little Colorado's Spring Discharge



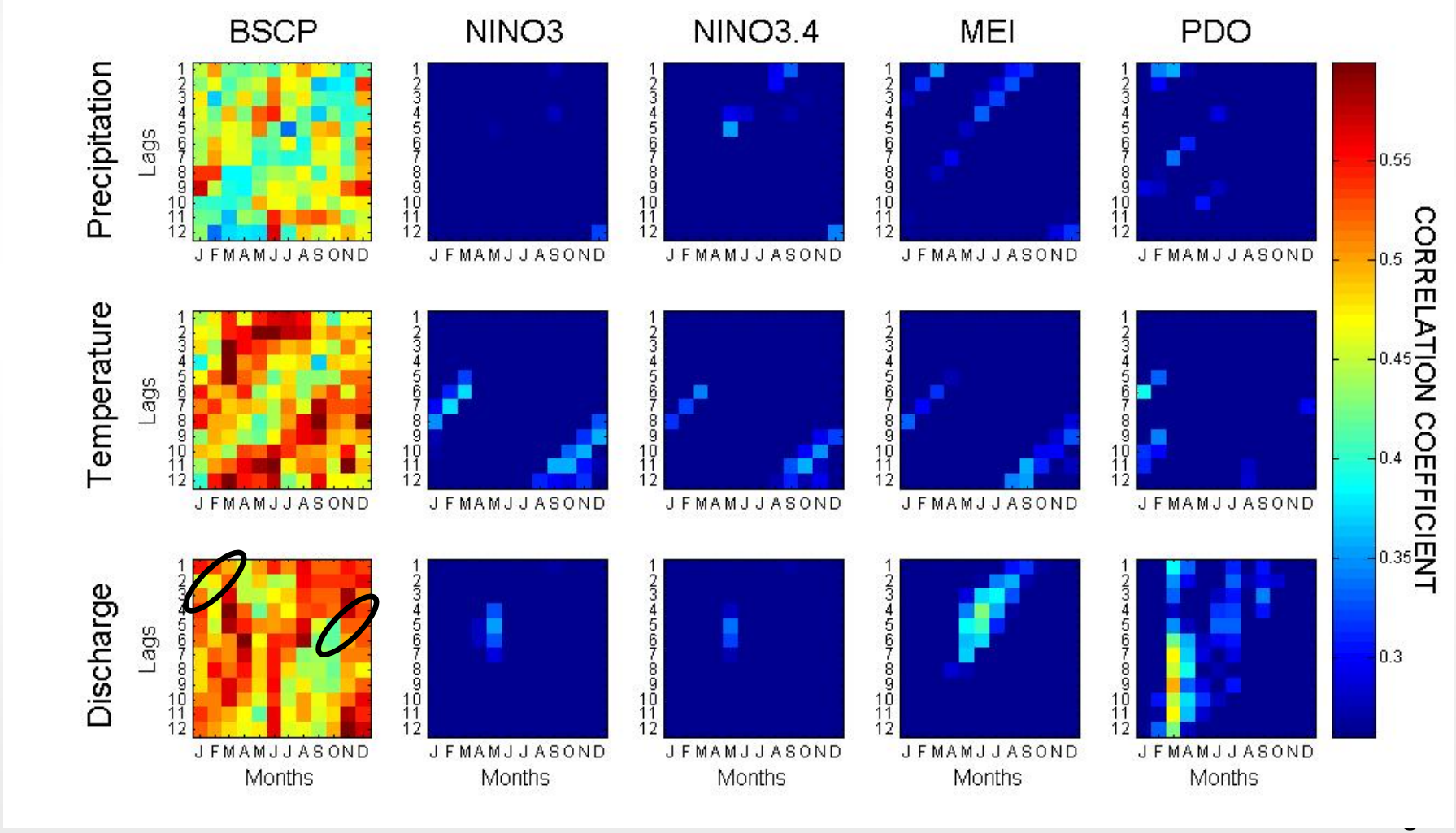
Most Correlated Oceanic Regions with the Gunnison's Spring Discharge



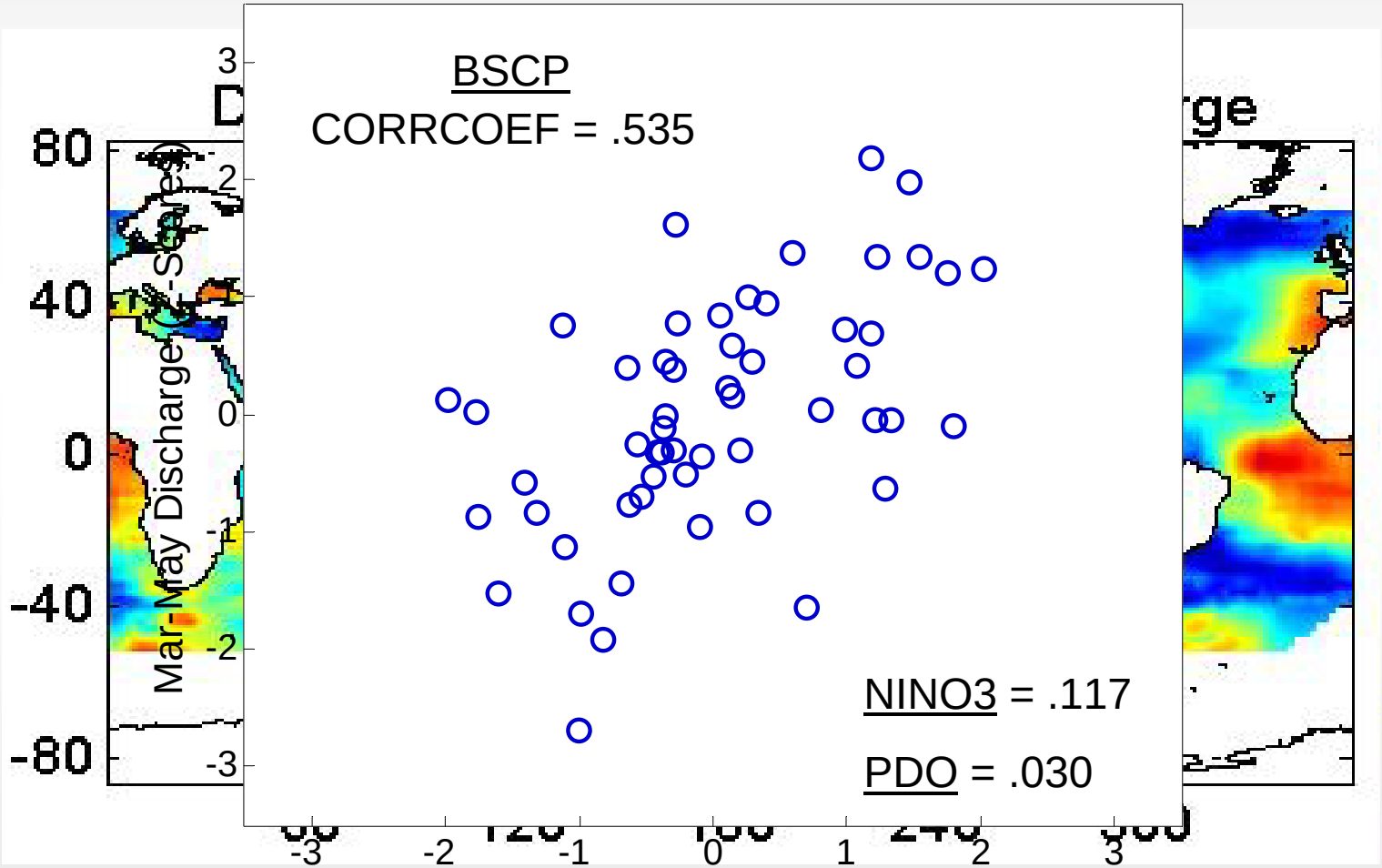
Little Colorado Correlation Coefficients



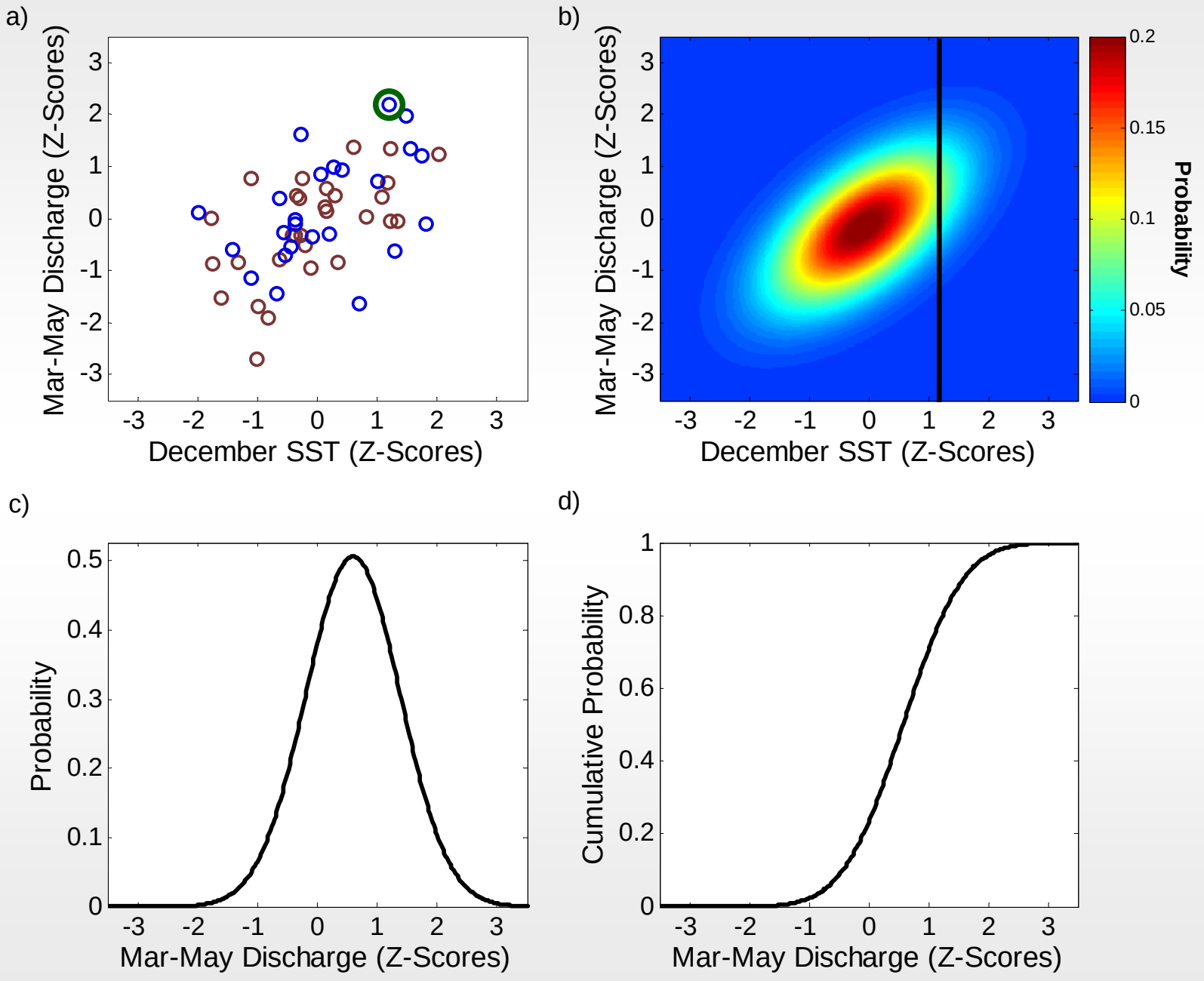
Gunnison Correlation Coefficients



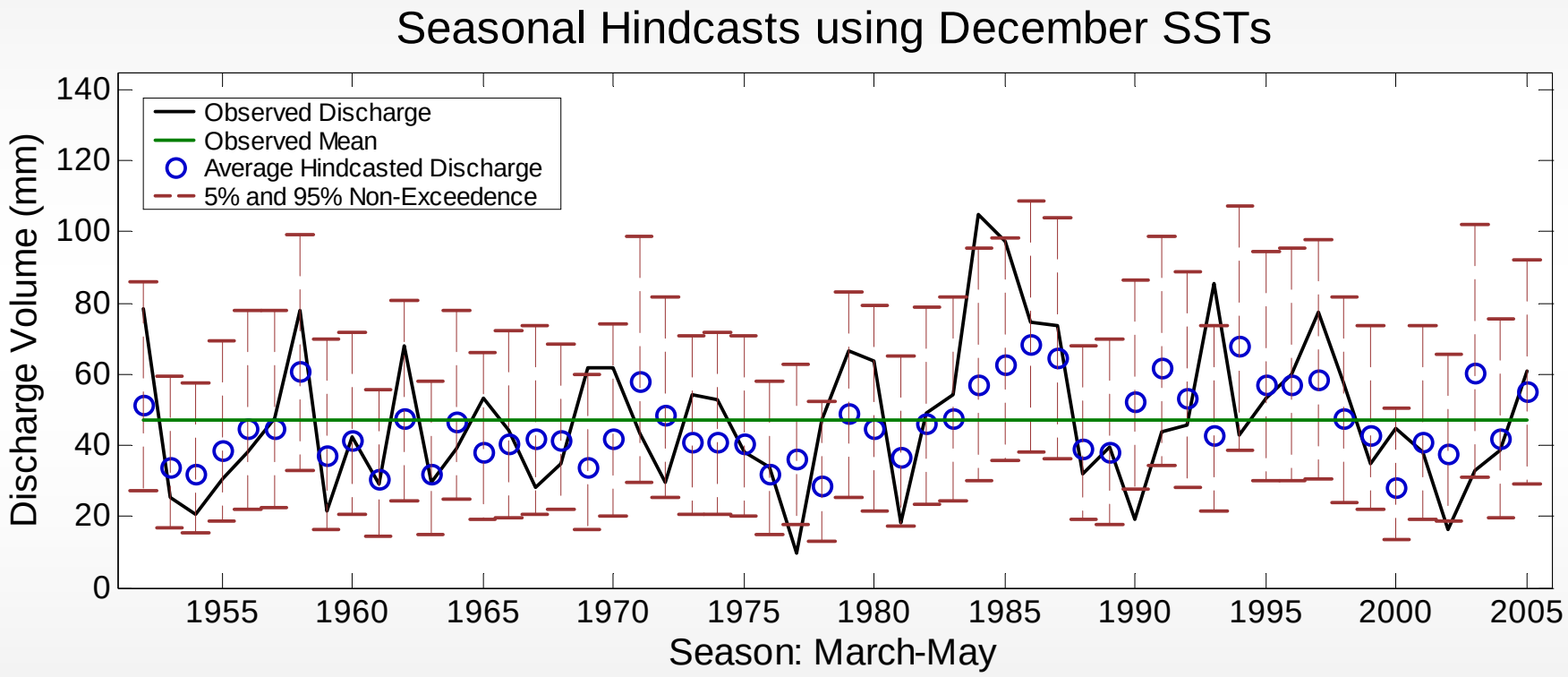
Establishing a Unique Predictor for Gunnison's Spring Discharge



Gaussian Mixture Model with Monte Carlo Simulations

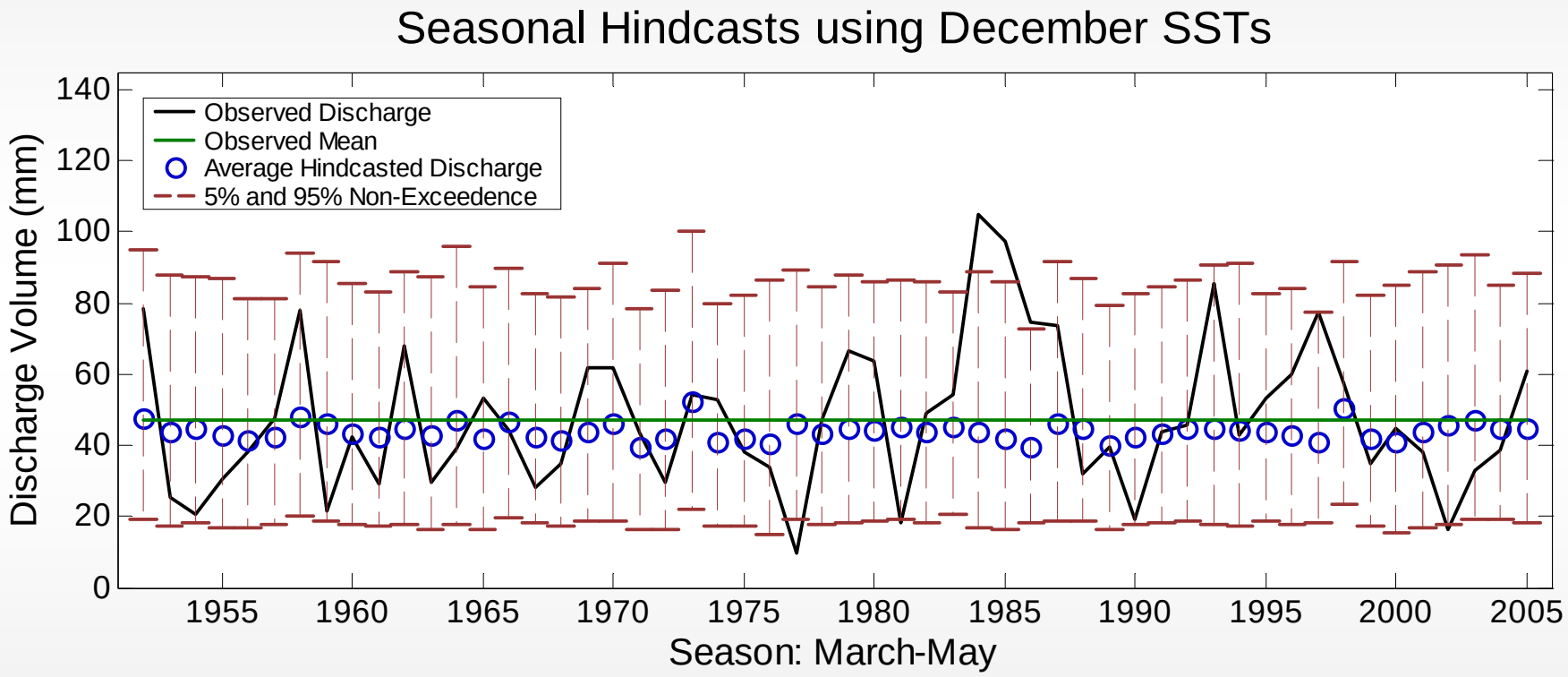


BSCP Discharge Hindcasts for the Gunnison



CORR:	.609
NSE:	.317

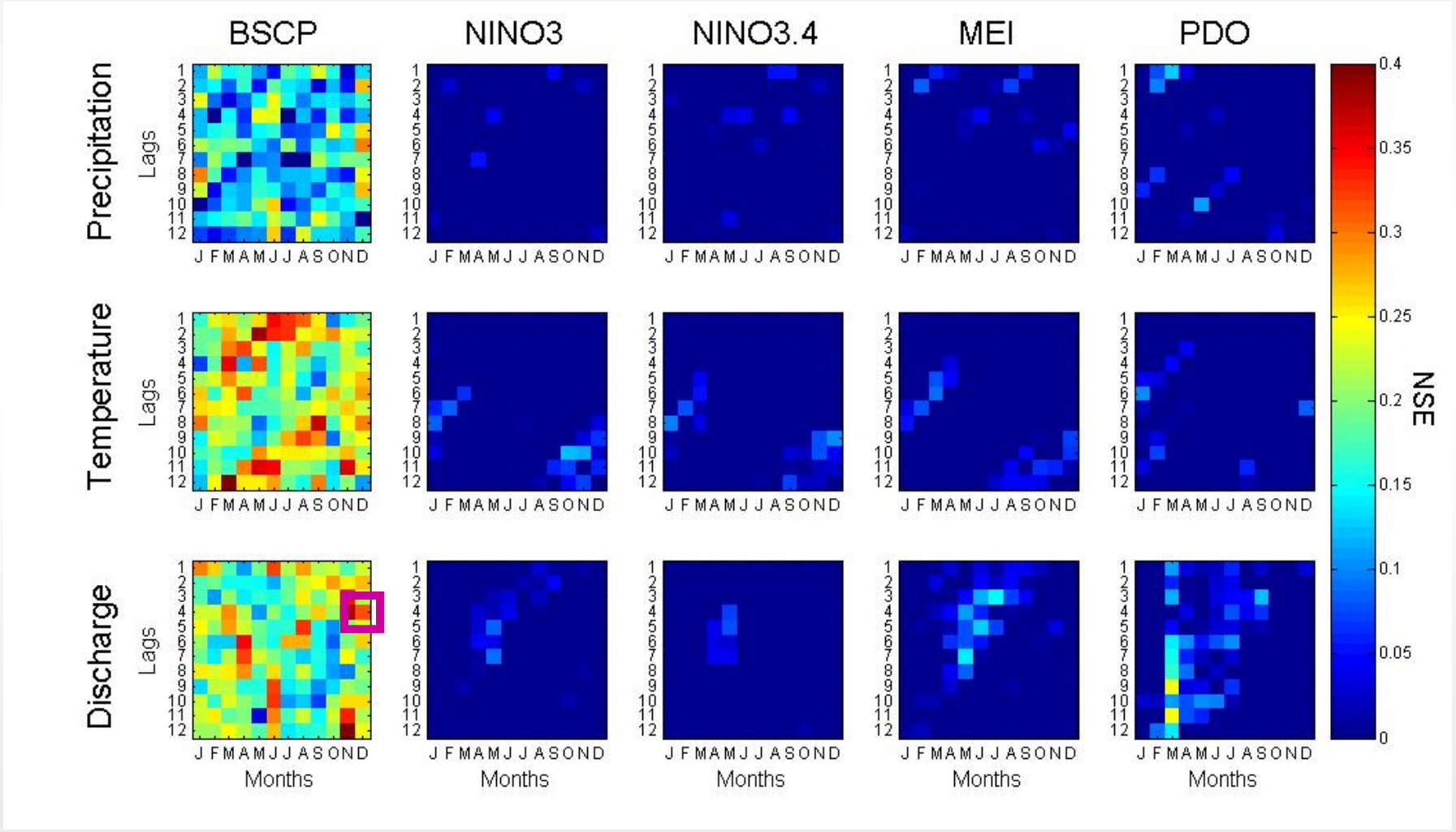
NINO3 Discharge Hindcasts for the Gunnison



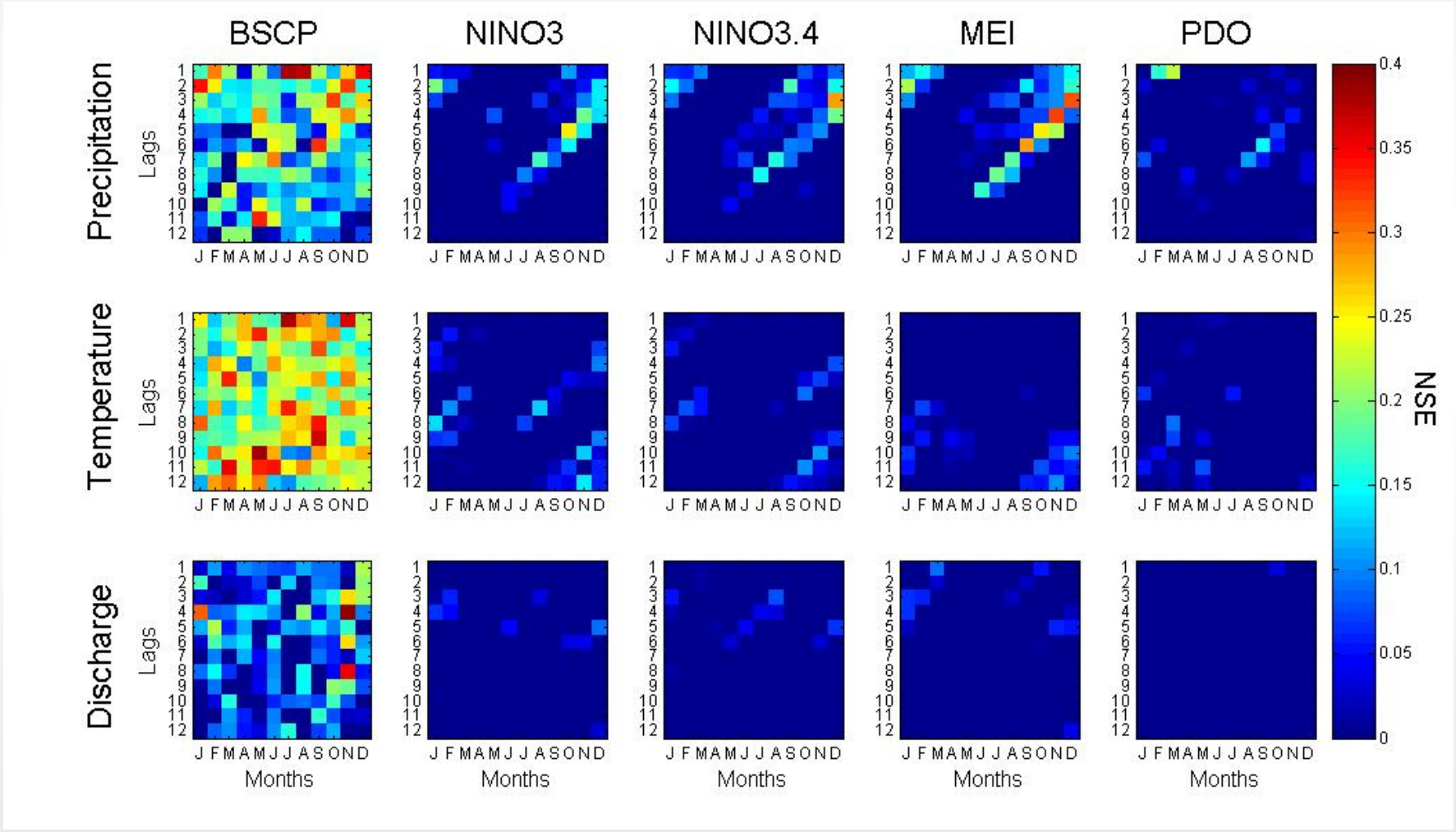
NINO3	
CORR:	.014
NSE:	-.045

BSCP	
CORR:	.609
NSE:	.317

NSE for the Gunnison

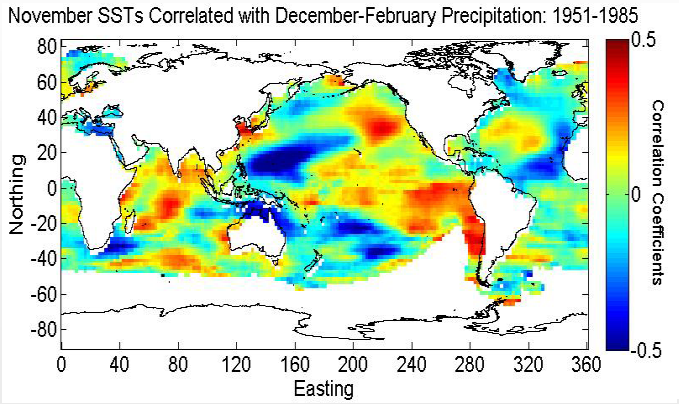


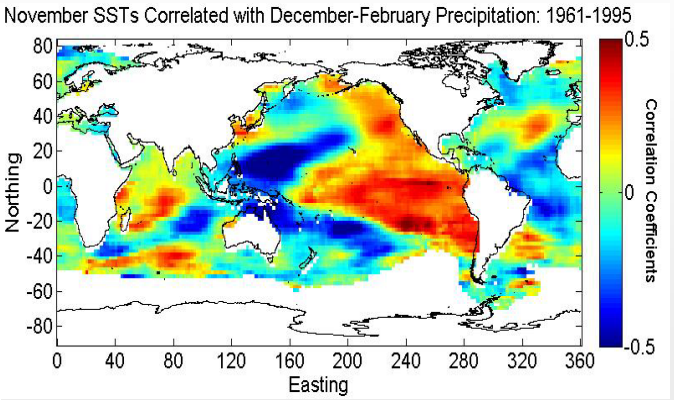
NSE for the Little Colorado



Current and Future Work

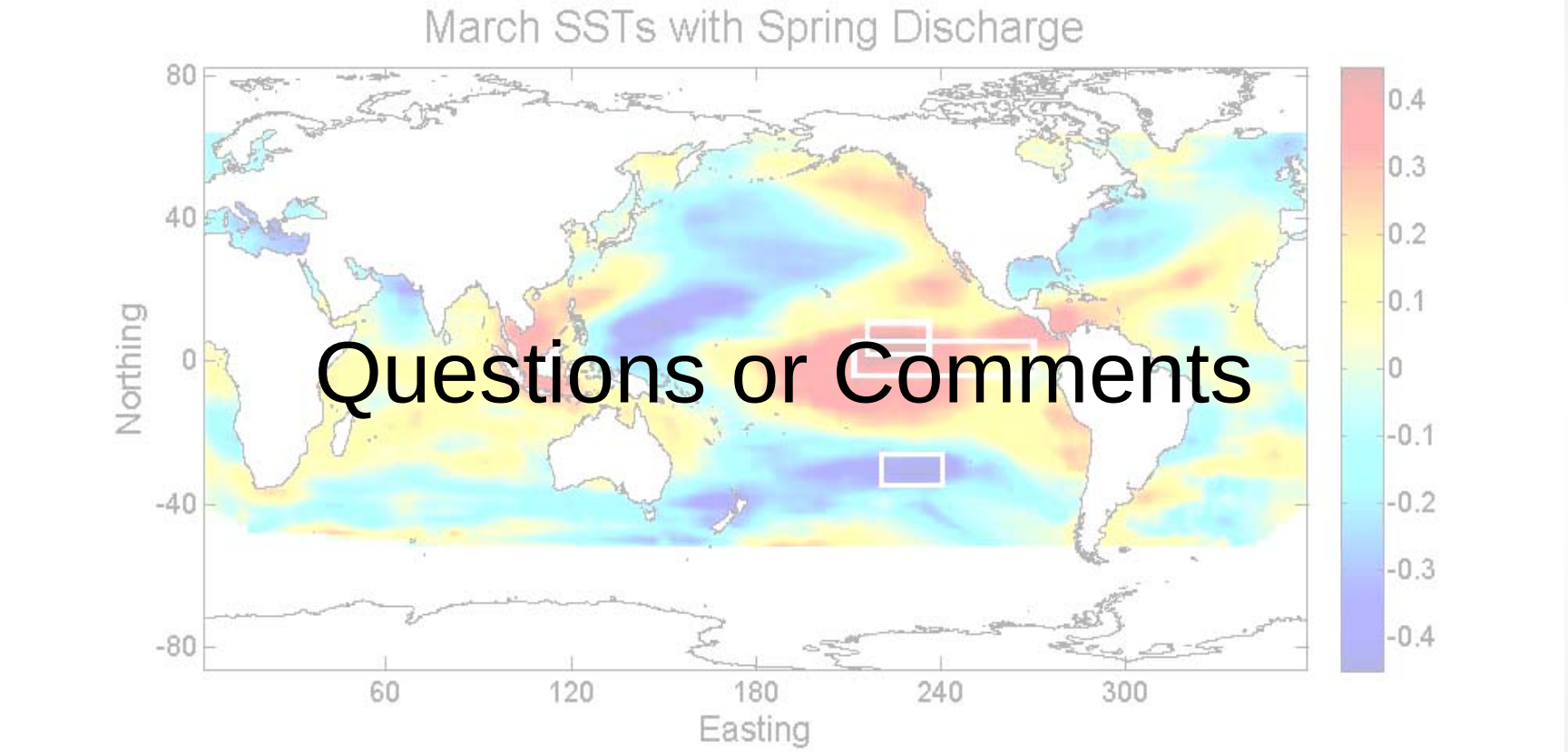
- Test methodology across the western U.S.
- Use more oceanic variables
- Improve steamflow predictions by incorporating antecedent basin conditions
- Must account for non-stationarity to help improve forecasts





Conclusions

- BSCP has shown substantial improvement over the standard climate indices for conditioning hydroclimatic hindcasts
  - Establish stronger statistical relationships to build better predictors
- Performing better predictions at the sub-basin scale helps provide water managers with a more detailed and accurate map of water availability



Questions or Comments