Looking for the cause of the 1930s Dust Bowl: Sea surface temperature linkages

Bin Guan
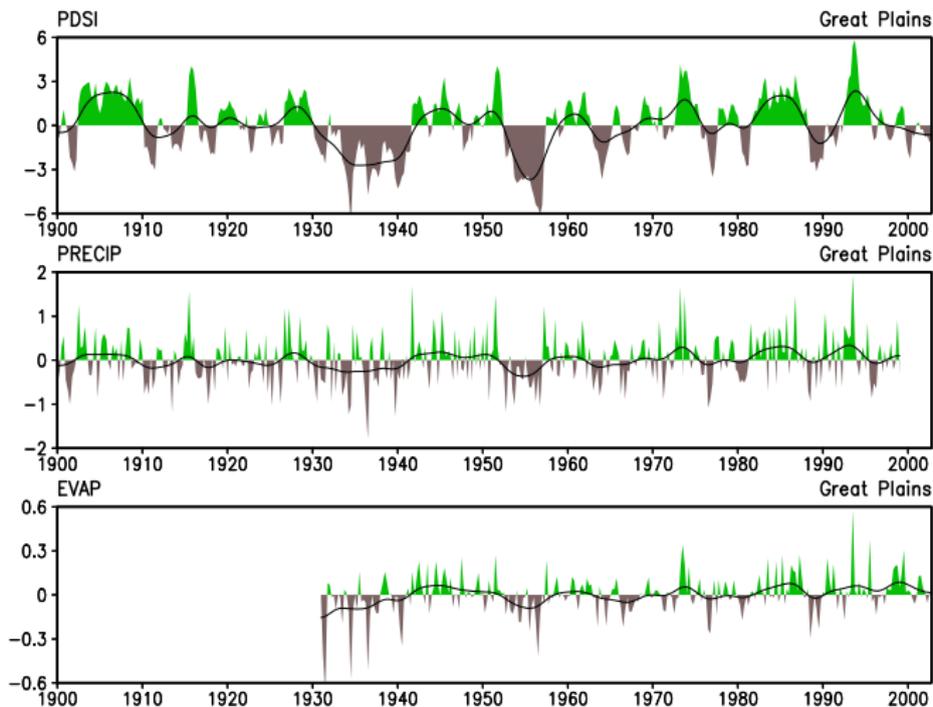
METO 658N Course Project
Department of Atmospheric & Oceanic Science
University of Maryland, College Park
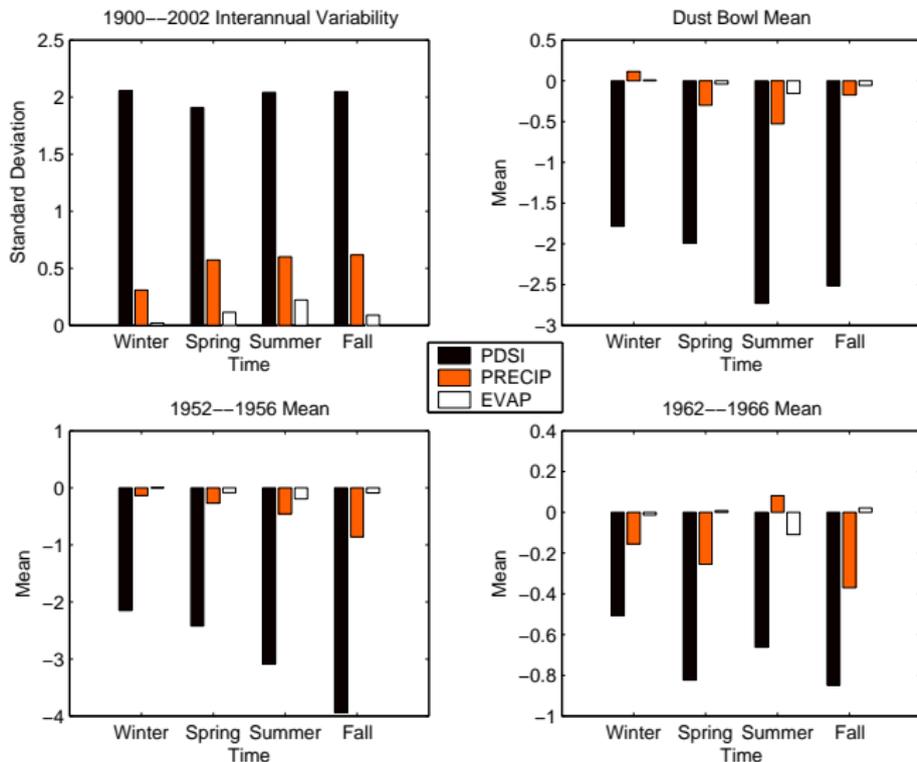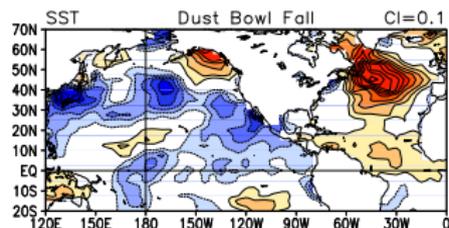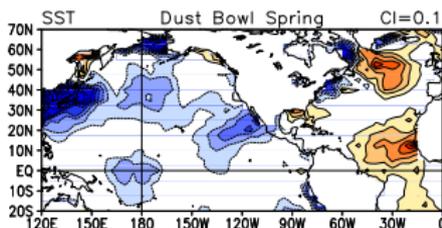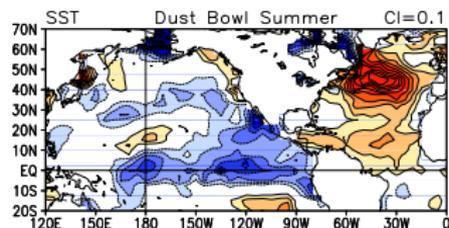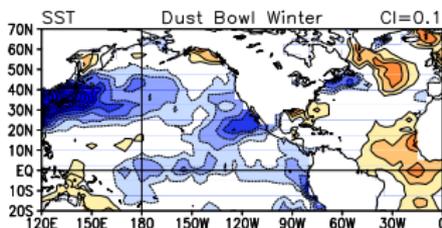
December 13, 2005
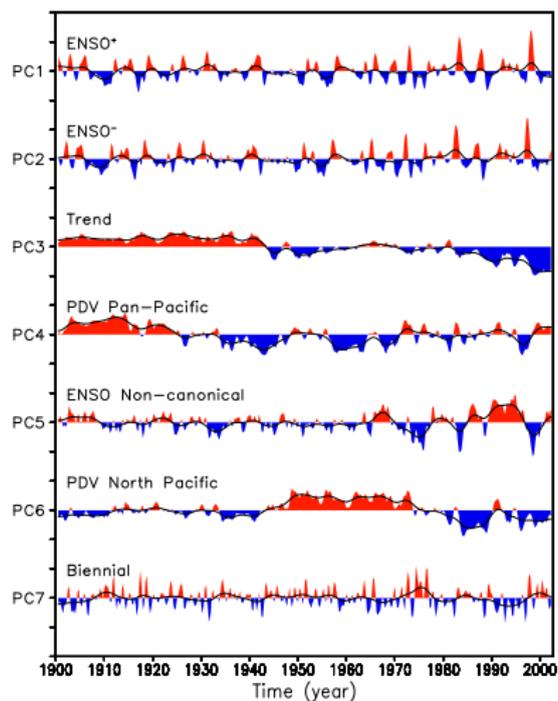
Outline

Great Plains Hydroclimate: Interannual Variability

Great Plains Hydroclimate: Seasonality

Dust Bowl SST

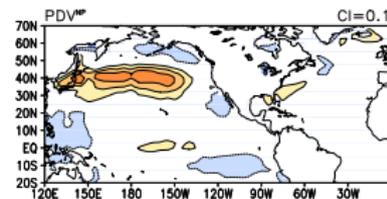# Pacific Low-frequency Variability: Principal Components (from REEOF)

Pacific Low-frequency Variability: Spatial Patterns
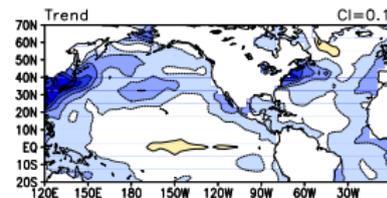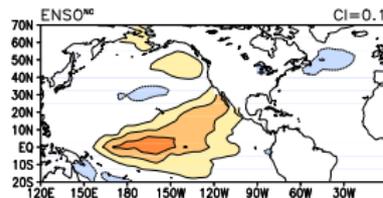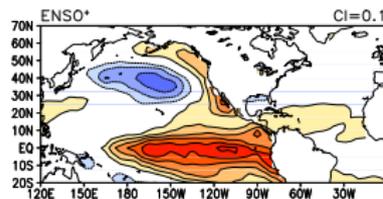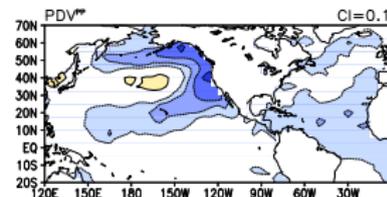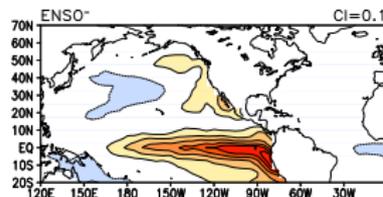
Regressed PDSI: 1900–1950 (Summer)
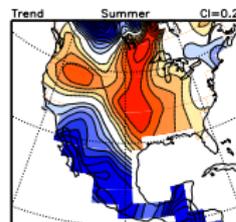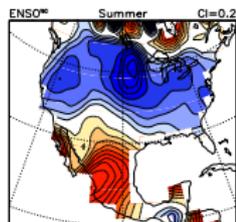
Observed vs. Reconstructed PDSI: 1932–1938 (Summer)

Antecedent SST signals

Summary

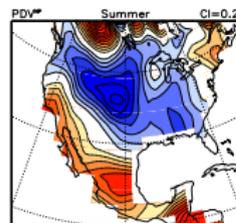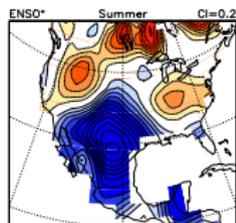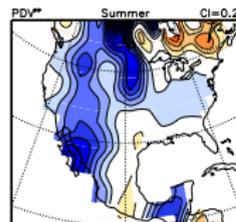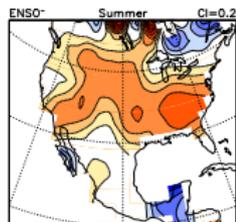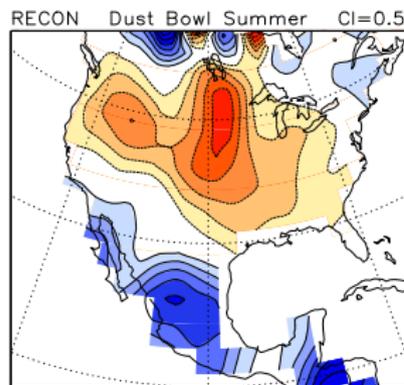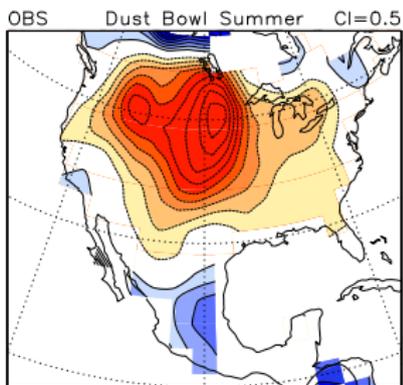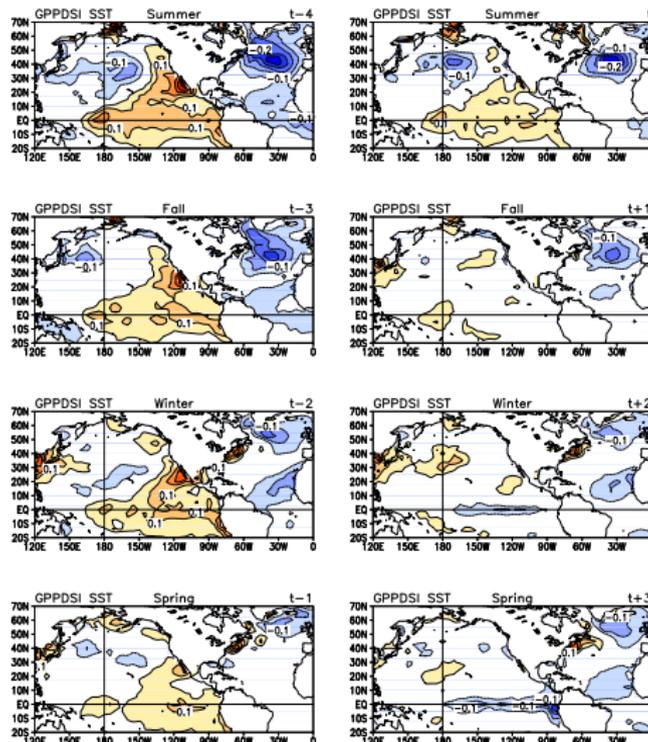- ENSO Non-canonical, PDV Pan-Pacific, PDV North Pacific and the trend mode are the four modes that have most significant linkages to the Dust Bowl drought. ENSO is of less importance compared to the above four modes.

- PDSI regression for ENSO Non-canonical mostly resembles the Dust Bowl observation.

- The Dust Bowl drought can in general be reproduced, with about one half of the full magnitudes, from the PDSI regressions associated with the leading six modes of the Pacific low-frequency SST variability.

- Antecedent SSTs associated with the Great Plains drought involve an ENSO-like pattern in the Pacific.