P.O. SEMINAR

TUESDAY, MARCH 29

3:00 p.m. CLARK 507

"Observations of Large-Scale Ocean-Atmosphere Interaction in the Extratropical Southern Hemisphere"

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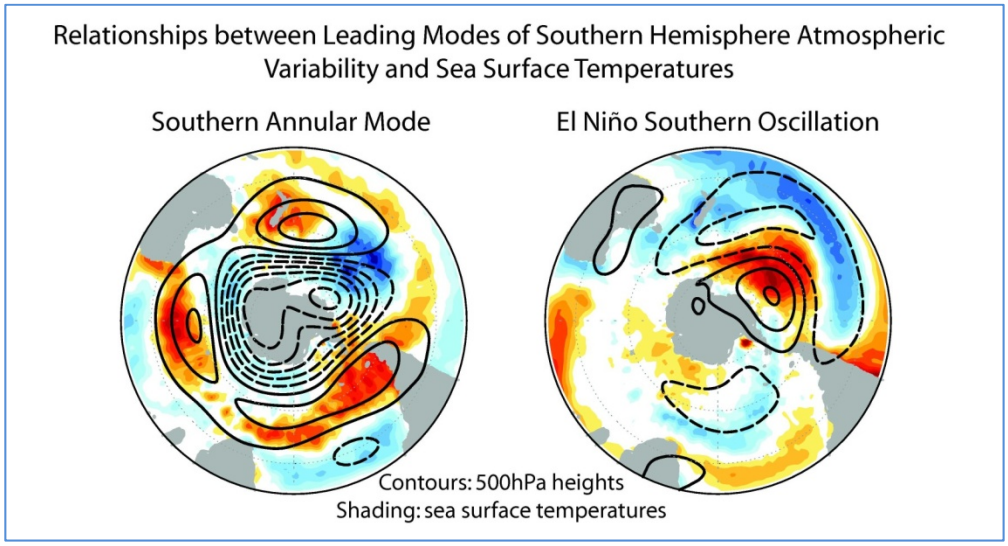

Abstract: There is a growing body of evidence to suggest that the Southern Hemisphere (SH) oceans play a crucial role in the global climate system, but there remains a large gap in our understanding of how the SH oceans are influenced by the large-scale modes of atmospheric variability. In this seminar, a detailed examination of ocean–atmosphere interaction in the SH is provided, focusing on the observed relationships between variability in SH extratropical sea surface temperature (SST) anomalies, the Southern Annular Mode (SAM), and the El Niño–Southern Oscillation (ENSO).

The observed spatial and temporal relationships between the SAM and SH SST anomalies are presented to examine the roles of surface turbulent (latent + sensible) heat fluxes and horizontal Ekman transport in generating SAM-related SST anomalies for the austral warm and cold seasons. An interpretation of the seasonal variations in the persistence of SST anomalies associated with the SAM is then discussed within the framework of a simple stochastic paradigm. This analysis is also extended to explicitly compare and contrast the mechanisms that control the persistence of extratropical SST anomalies associated with the annular modes in both hemispheres.

The mechanisms that govern the ENSO teleconnections to SH mixed layer oceans are also examined using several observational and reanalysis products, focusing on the relative contributions of radiative, turbulent and Ekman heat fluxes to SST variability. Each ENSO-related flux component is compared between the ERA-40, NCEP-2 and OAFlux/ISCCP products to determine where the most robust features of the ENSO teleconnections are observed and also where the largest discrepancies exist. The total air-sea heat and Ekman flux fields are then compared to the tendency in SST anomalies to demonstrate that a large fraction of the ENSO-related SST signal can be captured by radiative, turbulent and Ekman heat fluxes.