The Atmospheric Control Knobs of WAIS Climate

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Recent studies have demonstrated a significant warming extending from the Antarctic Peninsula into West Antarctica over the last 50 years. While the state of the Southern Ocean and local cryosphere play an important role, the large-scale atmospheric controls on this warming are quite complex. The region is influenced by hemispheric wide pressure and wind variations manifested in the Southern Annular Mode (SAM). Further, remote influences from the tropics, often related to the El Niño ï Southern Oscillation, are another important player in WAIS climate. However, multiple factors must be in place in order for WAIS to be influenced from the tropics, including the position of anomalous sea surface temperatures (and hence, resultant convection) in the tropics, and the atmospheric circulation pattern determined by the phase of the SAM. Both ENSO and the SAM influence a semi-permanent pressure center, the Amundsen-Bellingshausen Seas low, whose interannual and intraseasonal variations are not well known. While there are noted changes in the ABSL over the last 30 years, it is apparent that a driving mechanism in WAIS climate variations stems not only from this climatological low pressure, but also from strong influences in the underlying synoptic-scale activity.

The presentation will conclude with highlights from the last 3 years of the ôState of the Climateô reports published in the *Bulletin of the American Meteorological Society*. These yearly climate snapshots frame the changes in WAIS climate within the broader picture of ongoing Antarctic climate change and variability.