

Changing Influences on the Climate of West Antarctica and the Antarctic Peninsula during Austral Spring

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Recent studies have demonstrated a marked warming of West Antarctica over the last 50 years that is maximized during austral spring. The warming trend is consistent with changes in sea ice concentrations / extent in the nearby Amundsen-Bellingshausen Seas, and also is likely tied to changes in tropical forcing. Other influences on this warming trend are examined in this presentation, with a particular focus on temporal changes in potential mechanisms. It will be demonstrated that in austral spring a) the Amundsen-Bellingshausen Seas Low (ABSL) is becoming stronger over the last 30 years; b) cyclones in the Ross Sea are becoming stronger in the last 30 years, consistent with the sea ice changes and warming in West Antarctica; c) the El Niño – Southern Oscillation influence on both the ABSL and the climate of West Antarctica and the Antarctic Peninsula is strongly related to the magnitude and sign of the Southern Annular Mode (SAM); d) and the 1988 La Niña / negative SAM event had a profound and unique impact on the regional climate, notably different than typical La Niña events. The results suggest that understanding the austral spring changes in the West Antarctic and the Antarctic Peninsula climate is complex, and many factors and their temporal changes must be considered.