Composite Analysis of the Effects of El Nino Southern Oscillation events on Antarctica

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**INTRODUCTION**

Substantial evidence exists for teleconnections associated with El Nino Southern Oscillation (ENSO) events throughout Antarctica and the Southern Ocean. These phenomena have been primarily viewed through the lens of comparing the opposite phases, El Nino and La Nina, of ENSO. This methodology has provided substantial understanding of regions where both phases have opposing effects. More recently, analysis of the phases separately has become viable through comparison with non-event, or neutral state conditions. Of interest are regions where only one phase has an effect, both phases have a similar impact, and significant regions which have gone undiscussed in prior literature. Areas of specific interest generally associated with ENSO are the Amundsen Bellingshausen Sea, West Antarctica, and the Antarctic Peninsula.

This work explores the differences throughout the atmosphere between the El Nino and La Nina phases with specific emphasis on La Nina as represented in the European Centre for Medium Range Weather Forecasts Reanalysis Interim (ERA-Interim) from 1979-2014. Generally the regions of impact shift East (West) around the ABS region with El Nino (La Nina). The focus is on regions affected outside of the Pacific areas that show some unexpected interactions particularly throughout the East Antarctic. These signals consist primarily of significant cooling during Austral Winter La Nina events. Cold anomalies in this region are generally associated with the Southern Annular Mode (SAM), or through interactions between SAM and ENSO..

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These signals remain significant despite one method of removing the SAM signal

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