Teleconnections between the Southern Ocean Sea Ice Cover And the Southern Oscillation

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We have explored the teleconnections between the Southern Oscillation and the atmosphere, ice and ocean conditions south of 50 deg. These conditions are described by fields of sea level pressure (SLP), near surface air temperature (SAT), sea ice edge (SIE), sea ice motion (SIM) and sea surface temperature (SST). We characterize the relationships by examining: 1) the behavior of the above fields to extremes in the Southern Oscillation index (SOI); 2) the correlation of the above fields to the SOI; and; 3) the connections of these phenomena to the Antarctic Circumpolar Wave. In all cases, we find the correlation between the time series of SOI and the SLP, SAT, SIE, SIM, and SST fields to be especially significant in the Bellinghausen and Amundsen Seas. The positive phases of the SOI are associated with lower SLPS, lower SATs, and cooler SSTs around this area. The positive extremes of SOI show an anomalous low centered between the two seas resulting in different changes in the SIE due to differential forcing of the sea ice edge. This suggests that anomalies in the Southern Ocean are associated with SOI and that the resulting anomalies are propagated around the Antarctic Continent as part of the ACW.