

The ECCO Consortium: The impacts of Central- and Eastern-Pacific El Niño events on the Southern Ocean

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El Niño is known to have significant influence on the global ocean and weather patterns. Classical El Niño events are characterized by a maximum SST anomaly in the eastern-equatorial Pacific. Since the 1990s, there has been frequent occurrences of the so-called central-Pacific El Niño, where the maximum SST anomaly is located in the central equatorial Pacific. Classical El Niño events are known to influence the Southern Ocean dynamics, sea ice and heat flux through atmospheric teleconnections. In this study, we investigate the impacts of the ongoing change in El Niño characteristics on the Southern Ocean using multi-sensor satellite observations along with ECCO ocean state estimation products. We analyze Southern Ocean sea surface temperature, sea level, ocean bottom pressure anomalies, and changes in the circulation of the Southern Ocean (including the Antarctic Circumpolar Current) in general to characterize the differences of the state of the Southern Ocean during central- and eastern-Pacific El Niño events. The study also contrasts the influence of the Southern Annular Mode (SAM), the dominant mode of atmospheric variability over the Southern Ocean, to the effects of El Niño.