

The relationship between natural climate modes of variability and Antarctic sea ice interannual variability/trends

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The relationship between climate modes and Antarctic sea ice is explored for interannual variability and trends. On the interannual time scale, El Niño Southern Oscillation (ENSO) and Southern Annular Mode (SAM) are important, but a large fraction of sea ice variance can also be explained by Rossby wave-like structures in the Drake Passage region. After regressing out the sea ice extent variability associated with ENSO, the observed positive sea ice trends in Ross Sea and Indian Ocean during the satellite era become statistically insignificant. Regressing out SAM makes the sea ice trend in the Indian Ocean insignificant. Thus, the positive trends in sea ice in the Ross Sea and the Indian Ocean sectors may be explained by the variability and decadal trends of known interannual climate modes.

Keywords: Antarctic sea ice, El Niño Southern Oscillation, Southern Annular Mode

