Antarctic sea ice variability and the West Antarctic ice sheet

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Antarctica's remoteness, the difficulty of conducting research there and the paucity of observations, are some reasons why the Antarctic climate and sea ice variability are not as well understood as in the Arctic. However, research has shown that the climate of Antarctica including its sea ice is dictated by numerous influences with origins ranging from the Tropics to local atmosphere/surface interactions. Over the period of record indications are that much of Antarctica is warming, led by the Antarctic Peninsula. Regional changes in atmospheric circulation, sea surface temperatures and sea ice may explain this warming. Overall, sea ice extent is increasing, contrary to climate model predictions for the 21st century, and this increase has strong regional and seasonal signatures. Sea ice variability is strongly influenced by ENSO, the Southern Hemisphere Annular Mode (SAM) and by zonal wave three (ZW3) among other large scale atmospheric circulation mechanisms. Using observations and global climate models, the Antarctic climate and sea ice variability are examined with respect to the atmospheric and modes that influence them. Potential influences on the West Antarctic ice sheet are discussed.