

The Arctic and Antarctic Oscillations and their relationship to
20th Century warming: investigations with a global coupled model

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A major recent achievement of state of the art coupled climate models is their reproduction of the observed profile of 20th Century global surface temperature. Those models forced with the observed time series of both natural and anthropogenic forcings get the best fit with reality. But do they get the warming for the correct reasons? Observed NH warming over the past 50 years has been linked to changes in the atmospheric circulation (eg. the Arctic Oscillation). However, most model simulations of the 20th Century show very weak changes or trends in the AO and their pattern of warming is significantly different than observed. In the Southern Hemisphere, trends in atmospheric circulation (eg. the Antarctic Oscillation) have also been well documented with links to both ozone losses and greenhouse gas increases. Ensembles of climate simulations with various combinations of natural (solar, volcanic) and anthropogenic (greenhouse gas, ozone, sulfate aerosol) forcings are investigated to attempt to isolate the relationship between recent warming and atmospheric circulation.