

Polar climate response to tropical SST trends from 1980-2012 in a fully coupled climate model

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Correlations between tropical SST and certain aspects of polar climate variability are common in observational records. Modeling studies have shown plausible tropical-polar connections through atmospheric teleconnections. However, the response of sea ice and the polar oceans to these teleconnections is less clear. Here we discuss the results of prescribing tropical SST trends from 1980-2012 in an ensemble of 20th-century simulations of the CESM1. We compare integrations with these imposed trends to a new thirty-member CESM1 ensemble of 20th-century simulations with freely varying tropical SST. Although none of the thirty ensemble members has cooling in the eastern equatorial Pacific to the extent as has been observed, members with the least warming (or most cooling) in that region exhibit variability in the polar climates much like the runs with imposed trends.