

Ningaloo Nino simulated in the CMIP5 models

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Ningaloo Nino (Nina) is a recently identified climate mode characterized by anomalously warm (cool) sea surface temperature (SST) off the west coast of Australia and has strong impacts on precipitation over Western Australia and marine lives in the coastal area. Using outputs from 12 coupled general circulation models (CGCMs), which participate in the Coupled Model Intercomparison Project, phase 5 (CMIP5), ability of the models in simulating Ningaloo Nino/Nina is evaluated and causes of their differences are examined. Although many models can successfully simulate the spatial pattern and seasonality of Ningaloo Nino/Nina realistically, its amplitude varies among the models. This inter-model difference is mainly explained by varying strength of remote influences from El Nino/Southern Oscillation via oceanic wave propagation and atmospheric teleconnection. Differences in the strength of local air-sea interaction called the coastal Bjerknes feedback also contribute to the inter-model difference. This study may provide new insight into understanding processes that determine the strength of Ningaloo Nino/Nina.

Keywords: Ningaloo Nino, Coupled general circulation model, Southern Indian Ocean, El Nino/Southern Oscillation, Coastal Bjerknes feedback