

Analysis of Ability of HighResMIP Models to Simulate ENSO-TC Relationship

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El Niño Southern Oscillation (ENSO) modulates tropical cyclone (TC) activity in different regions as ENSO causes changes in vertical wind shear, humidity, and subtropical highs, all of which impact tropical cyclone activity. This project examines how well the High Resolution Model Intercomparison Project (HighResMIP) models are able to reproduce the observed ENSO-TC relationship. This project used historical observational data from NOAA (for ENSO) and International Best Track Archive for Climate Stewardship (IBTrACS; for TCs) to compare with the HighResMIP models. The main diagnostic used was the track density difference between El Niño and La Niña events to determine the ability of each model to reproduce the track density pattern that appears in observations. In addition, the ability of the model to simulate approximately the right frequency of ENSO events, as compared to the historic observational data, was investigated. Several of the models were unable to model the ENSO-TC relationship in the North Atlantic and North-East Pacific basin, which have well-observed relationships. Ongoing work is being done to quantify the differences between models, increase the number of models considered, as well as expanding the model analysis to other TC characteristics, such as frequency, duration, and intensity.