

## Climate simulations using an earth system model incorporating a high-resolution tropical ocean nesting model

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Climatic impacts of mesoscale eddies in the tropical oceans on the oceanic mean states, atmospheric circulation, ENSO, and other natural variabilities are investigated using an earth system model MRI-ESM1 where a high-resolution tropical ocean model is nested. Because of the realistic representation of tropical instability waves (TIWs), the simulated eddy heat flux improves not only tropical oceanic mean states but also spatial distributions of mean surface wind stress and precipitation in the nested version of MRI-ESM1. ENSO characteristics (amplitude, period, spatial pattern, teleconnection) are also modified through the changes of mean state. Interestingly, nonlinear eddy heat transports due to TIWs increase the ENSO skewness and improve the characteristics of ENSO nonlinearity.

Keywords: Tropical Instability Waves, ENSO, Earth System Model, High-resolution tropical ocean nesting model