

The Madden–Julian Oscillation (MJO) is the most prominent form of tropical intraseasonal variability in the climate system. The MJO is known to interact with a panoply of climate phenomena across different spatial and temporal scales. Global warming is expected to lead to a large change in atmospheric water vapor content and to impact all components of the climate system, especially the hydrological cycle including an intensification of the precipitation extremes. Observations suggest that warming in the tropical Indian and Pacific Oceans in recent decades may have contributed to increased trends in the annual number of MJO events.

We estimate how the MJO will change in a transient global warming climate using the NCAR CCSM4 model. A 100 year model run with the 20th century forcing is compared to a 100- year model run with the most extreme 21st century forcing projections as prescribed by the Representative Concentration Pathways of 8.5 W/m<sup>2</sup>. Results suggest a significant increase in intraseasonal variability in the precipitation in the Tropics with global warming. The warmer climate shows an increase in number of days with higher amplitude MJOs, higher number of active MJO days in the Indian and West Pacific Ocean, and enhanced propagation of the composite MJO into the central and Eastern Pacific ocean. Consistent signals in anomalous surface latent heat flux, perturbations of zonal wind, increase in lower level versus upper level specific humidity are compared and analyzed in the different climates to study mechanisms that explain the observed modification in the MJO initiation and activity as seen in CCSM4.