

Resolution Dependence of Simulated NAO Teleconnections to Extremes

Contact: Salil Mahajan, E-mail: mahajans@ornl.gov

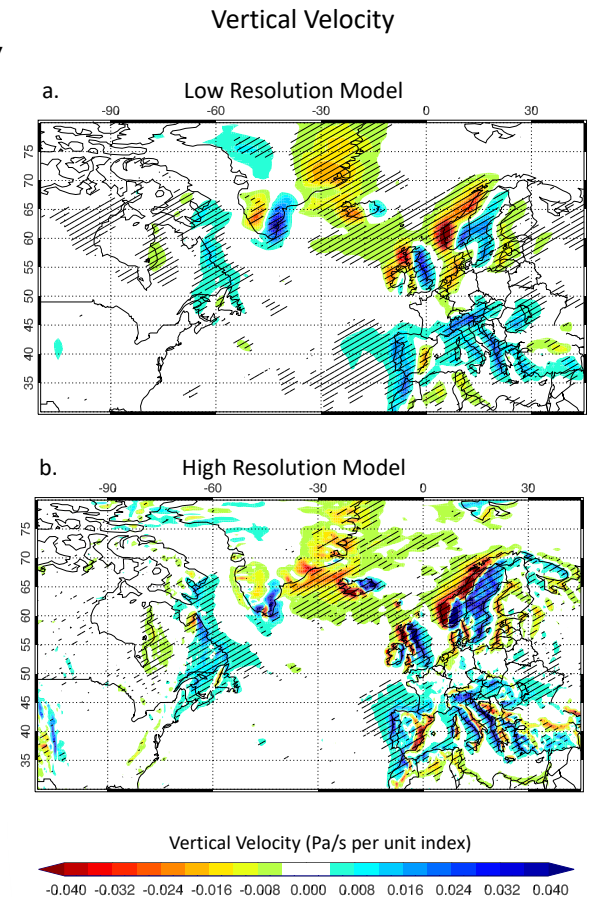
Funding: DOE Office of Science: E3SM Project

Objective: Evaluate and understand E3SM resolution impacts on the simulation of North Atlantic Oscillation (NAO) teleconnections to precipitation extremes.

New Science: Extreme value analysis reveals that high-resolution (0.25°) E3SMv0.3 better simulates the impact of NAO on precipitation extremes over parts of western Europe. NAO-dependent upward mass fluxes are stronger in the high-res model, intensifying precipitation. But, the high-res model simulates a weaker than observed impact of NAO on extra-tropical cyclone activity, underperforming the low-res model (1°).

Significance: Simulated NAO impacts on precipitation extremes are generally improved with an increase in E3SM resolution. However, NAO associated large scale drivers of these extremes are poorly reproduced. Alleviating these deficiencies could further improve teleconnections of large scale climate variability modes.

Citation - Mahajan, S., K. J. Evans, M. L. Branstetter and Q. Tang, 2018. Model Resolution-sensitivity of the Simulation of North Atlantic Oscillation Teleconnections to Precipitation Extremes, *Journal of Geophysical Research - Atmospheres* (available online), <https://doi.org/10.1029/2018JD028594>



Regression of vertical velocity at 850hpa against the NAO index. NAO associated upward mass fluxes are stronger in the high-resolution model resulting in intensification of precipitation.

