Dynamic downscaling of HadGEM2-ES over the Intra-Americas Sea and North American monsoon regions using the Advanced Research Weather Research and Forecasting (WRF-ARW) Regional Model

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HadGEM2-ES, the Hadley Centre global model for the 5th Assessment Report of the IPCC, is dynamically downscaled over the Intra-Americas Sea (IAS) and North American Monsoon (NAM) regions using the Advanced Research Weather Research and Forecasting (WRF-ARW) regional model. The WRF-ARW model is used to downscale 6-hourly HadGEM2-ES data at 1.25 degrees latitude and 1.875 degrees longitude horizontal resolution for the period 1950-2099 to 35-km grid resolution over the study region. Tropical storm track and tropical cyclone statistics are presented for both the historical and future time periods simulated. Historical and future climate precipitation variability and spatial patterns are also presented over a range of time scales for the region. Resulting data will be used by the authors in future studies to compile high-resolution case studies of select areas within the IAS/NAM region, with the intent of examining impacts of changes in the tropical storm track position on local forcing mechanisms of easterly waves and tropical storms and on the dominant patterns of NAM precipitation in the 21st century. We will additionally examine the impacts of 21st century land-cover change scenarios on localized precipitation patterns within the IAS.