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**Bradford S Barrett\*** (bbarrett@usna.edu), Oceanography Department, 572C Holloway Road, Annapolis, MD 21402. *Data assimilation challenges: predicting weather and climate on intraseasonal time scales.*

The Madden-Julian Oscillation (MJO) is the leading mode of atmospheric variability on intraseasonal time scales. The MJO has been shown to impact a wide array of climate phenomena across many spatial and temporal scales: the Indian-Australasian monsoon, El Niño, and circulation on the planetary scale to global precipitation, severe convective storm and tropical cyclone activity on the synoptic and mesoscales. Full comprehension and predictability of these phenomena is difficult without realistic representation of the MJO. Global climate models (GCMs) routinely struggle to represent the MJO. Recent work suggests much of the challenge in representing the MJO in GCMs stems from two sources: limitations in physical parameterizations of sub-grid scale processes, and poor data assimilation, particularly of tropical convective heating rates. A seamless data assimilation suite is likely to be the best way forward to improve weather and climate models. In this study, current data assimilation techniques for MJO prediction are presented and critiqued. Additionally, MJO's role in the climate system is explored in context of its predictability and representation in data assimilation schemes. (Received December 19, 2014)