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STATEMENT OF PURPOSE:

The Monsoon Intraseasonal Oscillation (MISO) and Madden-Julian Oscillation (MJO) are regularly occurring processes characterized by large-scale deep convective rainfall events that initiate over the tropical Indian Ocean during northern summer (MISO) and northern winter (MJO) and propagate to India, Southeast Asia, the Maritime Continent, and Australia, strongly affecting the livelihoods of millions of people. This visualization presents the rainfall and surface wind patterns of the MJO and MISO based on composite analysis of many years of Outgoing Longwave Radiation (OLR) and surface wind data products from multiple NASA and NOAA satellite-based instruments. Additionally, the connection between the atmosphere and ocean during the development of the MJO and MISO is shown through changes in Sea Surface Temperature (SST), based on data from the NASA Tropical Rainfall Measuring Mission (TRMM). Colors are optimized using best practices for visual clarity. Potential impacts on the audience include a better understanding of critical processes that affect global weather and climate, as well as an appreciation of the variety of satellite data sets that are required to understand those processes. The Hyperwall is well-suited to this type of visualization because of the MISO/MJO's large scale and complex features, which are best viewed in a high-resolution format.

DESCRIPTION OF DATA SETS:

Surface (10m) winds: 0.25-degree, 6-hourly resolution Cross-Calibrated Multiplatform (CCMP) product, from NASA / Physical Oceanography Distributed Active Archive Center (PO.DAAC) [Atlas et al., 2011]. Sea Surface Temperature (SST): Version 7.1 of the Tropical Rainfall Measuring Mission (TRMM) Microwave Instrument (TMI) 3-day mean dataset (available on daily basis) on a 0.25-degree grid, from NASA / PO.DAAC [Wentz, 2015; Wentz et al., 2015]. Outgoing Longwave Radiation (OLR; proxy for rainfall): gridded one-degree daily mean satellite observed product, from NOAA / National Climatic Data Center (NCDC) [Lee, 2014]. Madden-Julian Oscillation (MJO) / MISO Index: Real-time Multivariate MJO Index (RMM), from the Australian Bureau of Meteorology [Wheeler and Hendon, 2004]. All data were post-processed, including removing the long-term trend and seasonal cycle, filtering to isolate power in the intraseasonal band, compositing to the eight MJO/MISO phases based on the RMM index, temporally interpolating, and spatially smoothing. All original data are available for academic use.