# Studying the MJO and tropical waves through data assimilation

Brian Mapes
RSMAS, University of Miami

The Madden-Julian oscillation is a robust, well-observed, and easily resolvable (large scale) phenomenon that global atmosphere models are notoriously poor at simulating. Analysis tendencies (ATs) in data assimilation can be interpreted essentially as model physics error fields. Systematic errors in precipitation melting and re-evaporation are easily spotted using time-averaged ATs. Of course, the same information is clear simply from mean state biases. Compositing ATs across the MJO indicates that, for the NASA GEOS-5 model (used in the new MERRA reanalysis, whose ATs are the basis of this work), the shallow-to-deep convection transition at the leading edge is an especially problematic area.