

## ABSTRACT

*Influence of the Madden-Julian Oscillation on boreal winter extreme precipitation events in the Bicol region, Philippines*

Ryan T. Diocampo

The Madden-Julian Oscillation (MJO) is the dominant mode of intraseasonal variability in the tropics. It has been shown that the MJO modulates extreme precipitation events (EPE) in many parts of Southeast Asia during boreal winter and in Indonesia during its rainy season. In the Philippines, MJO has been shown to have an effect on seasonal rainfall in both Habagat and Amihan seasons. It is typically described by the Real-time Multivariate MJO index or RMM, which is an index based on the empirical orthogonal functions of daily anomalies of OLR and zonal winds. In this study, the influence of the MJO during boreal winter (NDJF) in Bicol region, Philippines will be investigated. Initially, gridded precipitation data (i.e. APHRODITE V1101, APHRODITE V1801, TRMM TMPA 3B42, and GPM IMERG Final Precipitation) will be assessed against PAGASA surface rainfall data to select which gridded data best represents extreme rainfall events. Then, rainfall probability distribution functions during all RMM Phases on the months of NDJF in the Bicol region will be analyzed. Precipitation at the 75<sup>th</sup> and 90<sup>th</sup> percentiles will be considered as wet and extremely wet, respectively. This study hypothesizes that there are statistically significant percentage changes in the likelihood of extreme rainfall due to the MJO for certain RMM Phases. A relationship between MJO and extreme rainfall in the Bicol region can help aid in medium-term or seasonal forecasting of extreme rainfall during the Amihan season.

**Keywords:** MJO, extreme precipitation, boreal winter, Philippines