

**The Influence of Quasi-Biweekly Oscillation on Tropical Cyclone Track and Intensity  
within the Philippine Area of Responsibility**

**Analiza C. Clauren-Jorda**

Thesis Adviser: **Dr. Rafaela Jane P. Delfino**

Reader: **Dr. Gerry Bagtasa**

*Institute of Environmental Science and Meteorology, College of Science,  
University of the Philippines – Diliman*

**ABSTRACT**

Tropical cyclone (TC) activity over the western North Pacific (WNP) varies on intraseasonal timescales and is associated with variations in large-scale atmospheric conditions. One important mode of intraseasonal variability over the region is the Quasi-Biweekly Oscillation (QBWO), which has been associated with variations in TC tracks, landfall occurrence, and intensification. Previous studies have examined these relationships over the broader WNP and among TCs making landfall in the Philippines. However, the phase-dependent track and intensification characteristics of TCs entering the Philippine Area of Responsibility (PAR), including those that remain offshore, remain less understood. This study aims to investigate the track and intensification characteristics of TCs entering the PAR during May–October from 1980 to 2025 across the eight phases of the WNP-QBWO. The six-hourly Japan Meteorological Agency (JMA) best-track data from the International Best Track Archive for Climate Stewardship (IBTrACS) will be used to examine both TC track and intensification characteristics. Track characteristics will include the number and proportion of landfalling and non-landfalling TCs, daily landfall rate (DLR), and translation speed, while intensification characteristics will include 24-hour intensity change, probability of intensification, and occurrence of rapid intensification (RI). These characteristics will be assigned according to the WNP-QBWO phases using reference times specific to the analysis. Statistical tests and bootstrap resampling will be used to evaluate phase-dependent differences and estimate uncertainty. Daily ERA5 reanalysis data will also be used to examine the phase-dependent variations in large-scale atmospheric conditions, including low-level circulation, 500-hPa geopotential height, mid-tropospheric relative humidity (RH), and vertical wind shear (VWS), across the eight WNP-QBWO phases. The findings of this study are expected to improve

understanding of phase-dependent TC track and intensification characteristics within the PAR and enhance knowledge of subseasonal TC variability relevant to the Philippines.

Keywords: Quasi-Biweekly Oscillation, Tropical Cyclone, Philippine Area of Responsibility, Tracks, Translation Speed, Intensification