Anjela A. Ilagan
Student, MS Meteorology
IESM, UP Diliman

Adviser: Olivia C. Cabrera, Ph.D.

Reader: Bernard Alan B. Racoma, Ph.D.

Working Title: Meteorological Drivers of Storm Surge Events in the Ilocos Region

ABSTRACT

Compared to other areas in the western Philippines, the Ilocos Region is more frequently hit by tropical cyclones (TC). Its location on the northwestern coast of the country, high coastal population, and presence of several low-elevation coastal zones (LECZ) make it more vulnerable and at risk of experiencing significant impact due to TC-induced coastal hazards such as storm surges. Despite having been documented in the past, storm surge events in the region are yet to be thoroughly investigated. In this study, storm surge events in the Ilocos Region from 2008 to 2022 will be identified using data from Currimao and San Fernando tide gauge stations. The storm surge heights will be calculated as the residual between the observed sea level height and predicted astronomical tides when there are TCs with a maximum sustained wind (MSW) of at least 34 knots that have passed within a 500-km radius from any of the tide stations. Meteorological factors that drove these events will be examined using regression analysis with a 95% confidence interval. Specifically, linear and exponential fits will be used to describe the relationship between storm surge height and TC intensity, size, track, and forward speed from the Joint Typhoon Warning Center (JTWC), as well as the wind speed, wind direction, and atmospheric pressure measured at the synoptic stations located in Laoag, Sinait, and Dagupan. The residual standard error (RSE) will also be calculated for each fit such that a lower value corresponds to a better fit. Lastly, empirical thresholds resulting in different surge heights will be determined and summarized in a table to facilitate use.