

**RISK ASSESSMENT OF THE SELECTED TROPICAL CYCLONE
SEVERE WINDS IN BULACAN, PHILIPPINES**

JAYMEE LHYN M. CORONEL

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LIST OF ACRONYMS

DRT	Doña Remedios Trinidad
GEV	Generalized Extreme Value
IPHR	Ideal Person-to-House Ratio
IRPU	Ideal Real Property Unit
JMA	Japan Meteorological Agency
MMWS	Municipal Mean Wind Speed
PAGASA	Philippine Atmospheric, Geophysical, Astronomical Services Administration
PDRRMO	Provincial Disaster Risk Reduction and Management Office
PFAR	Population-to-Residential-Floor-Area Ratio
PHR	Person-to-House Ratio
RP	Return Period
RPU	Real Property Unit
STS	Severe Tropical Storm
STY	Super Typhoon
TC	Tropical Cyclone
TCRM	Tropical Cyclone Risk Model
TCSW	Tropical Cyclone Severe Wind
TY	Typhoon
UNDRR	United Nations Office for Disaster Risk Reduction
UNDRR-GAR	United Nations Office for Disaster Risk Reduction – Global Assessment Report
UNISDR	United Nations International Strategy for Disaster Reduction
UPD-ICE	University of the Philippines, Diliman – Institute of Civil Engineering

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ABSTRACT

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Adviser: ADRIAN CHUMMAC, M.Sc.
Co-Adviser: ANDREA CANLAS

The geographical feature of Bulacan (uplands, low-lying, and coastal areas) belongs to the identified factors prone to the impact of severe winds. However, no study has been conducted focusing on the risk of the province to Tropical Cyclone Severe Winds (TCWS). In this study, *Typhoon Ulysses*, *Severe Tropical Storm Paeng*, and *Super Typhoon Karding*, the three (3) severely wind-damaging tropical cyclone (TCs) events that made landfall in the vicinity of Bulacan from 1998-2022 are selected using the Systematic Observational Method and analyzed in determining the risk of each city/municipality of the province with respect to the exposure and vulnerability of the population and the residential real property units (RPUs) or the houses.

The peaking wind gust of the selected TC events on their entire TC duration are produced by the Tropical Cyclone Risk Model (TCRM) and by using the zonal statistics, the municipal mean wind speeds (MMWSs) are produced. The vulnerability analysis is done by utilizing the vulnerability ratio of each building type, adapted from UP-ICE, to certain wind intensity by which the vulnerable houses are quantified with the associated number of vulnerable populations inhabiting the affected houses. Standardization of data

is done by obtaining the weighted values of the variables to be easily processed. In the assessment of risk, the variables hazard, vulnerability, and exposure were used and employed in the conventional risk equation: $R = H \times V$. The hazard and vulnerability scales of Wang, et al. (2021) are utilized to effectively qualify the risk of the TCSW to Bulacan.

Keywords: Risk Assessment, Tropical Cyclone Severe Winds, Hazard, Exposure, Vulnerability.

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