

A STUDY ON INDICATORS/INDICES OF TROPICAL CYCLONE VARIABILITY/CHANGE IN THE PHILIPPINE VICINITY (1948-1997)

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This is a study of the variability/changes of tropical cyclone activity in the Philippine Area of Responsibility (PAR) from 1948 to 1997. This attempt is to search for and develop potential indicator/indices useful for socioeconomic benefits and for detecting possible changes or signals attributable to enhanced global warming due to human interventions. An examination of various aspects of tropical cyclone activity in the PAR was carried out such as seasonal and inter-annual variability, tropical cyclone extreme indices and some modalities of tropical cyclone activity and associated rainfall distribution during El Niño events.

Interesting is revealed in the seasonal variability. For example, long periods (12-13 years and 15-16 years) of above (below) average tropical cyclone activity during summer monsoon (April-September) are associated with below (above) average cyclone occurrences during winter monsoon (October-March). The alternating periods of seasonal tropical cyclone peak activities could be part of their natural variability as affected by the equatorial Pacific and southern Indian Oceans. The speculation that trends in frequency changes of these extreme events could be attributed to enhanced global warming is still quite uncertain.

Occurrences of the typhoon category (maximum wind ≥ 117 kph, including extreme events of ≥ 150 kph) were also examined. The intensity of typhoon extremes is consistent with the Typhoon Damage Scale developed for assessing damages to agriculture and housing in Philippines. The Typhoon Extreme Index (TEI) was below average during the 20-year period from 1948-1967. The next 20-year period (1968-1987) was dominated by above-average TEI. This period coincides with below-average typhoon activity but about 82% of the typhoons were of extreme intensity. A bias may exist in assessing maximum wind speed from minimum sea level pressure used since the early seventies. However, after 1987 a decrease trend in the number of typhoon extremes suggests that these changes may be due to natural variability. The time series projects that the 10-year period starting 1997 may also be characterized with below-average TEI in the PAR.

An examination on tropical cyclone variability and associated rainfall patterns during the last 11 El Niño events was undertaken. During these events, the number of tropical cyclone occurrences are dominantly below-average. The peak of tropical cyclone response to El Niño occurs during winter (October-March) and tapers down during the summer monsoon of the following year. Drought events due to persistently below-normal rainfall in many parts of the Philippines are caused by below normal tropical cyclone occurrences.

Key words: *climate variability, tropical cyclone, El Niño*