

Record High Sea Surface Temperature in the Pacific Ocean and Its Relation to Typhoon Haiyan

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ABSTRACT

The typhoon Haiyan, which devastated the Visayan Islands in the Philippines on 8 November 2013, was recorded as the strongest typhoon ever-observed using satellite data. Typhoons in the region usually originate from the mid-Pacific region that includes the Warm Pool, which is regarded as the warmest ocean surface region globally. Two study areas were considered: one in the Warm Pool Region and the other in West Pacific Region near the Philippines. Among the most important factors that affect the strength of a typhoon are sea surface temperature (SST) and water vapor. It is remarkable that in November 2013 the average SST in the Warm Pool Region was the highest observed during the 1981 to 2014 period while that of the West Pacific Region was among the highest as well. Moreover, the trend in SST was around 0.20°C per decade in the warm pool region and even higher at 0.23°C per decade in the West Pacific region. The yearly minimum SST has also been increasing suggesting that the temperature of the ocean mixed layer is also increasing. Further analysis indicated that water vapor, clouds, winds and sea level pressure for the same period did not reveal strong associated signal in 2013. SST is shown to be well-correlated with the wind strength of historical strong typhoons in the country and the observed trends in SST suggest that highly destructive typhoons like Haiyan are likely to occur in the future.

KEYWORDS: sea surface temperature; Warm Pool; typhoon; Haiyan