Reliability evaluation of tropical cyclone best track data from correlation with climate variability over the western North Pacific

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It is a very active research topic to understand how climate has changed the activity of tropical cyclones (TSs) and to predict how they will change in the future, which requires an accurate TC records. Prior to the satellite, limited synoptic observation network led to an indefinite number of tropical cyclones (TSs) hampering a reliable long-term analysis, but many studies have investigated TC activity so far using the indefinite TC climatological records of pre-satellite era and reported important conclusions on the connections between TC activity and various climatic factors. This study investigates the reliability of TC best track data for the pre-satellite period in the western North Pacific, particularly focusing on TC genesis location and frequency. Various statistical comparisons of TC genesis position and frequency between the pre- and post-satellite rea reveals a significant nonhomogeneity of the dataset. It is also found that the pre-satellite data led to an inconsistent TC response to some climate indices that are well known to be strongly connected to TC genesis and activity. These results implies that the incompleteness of TC climatology prior to the satellite era negatively impacted the previous results on the connections between the TC and climate indices, suggesting that using pre-satellite TC records needs cautions for climate studies.

Key words: Tropical cyclones, western North Pacific, best track data, climate variability

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