Relationship Between Summer Drought of Mid-latitudes in East Asia and Tropical Cyclone Genesis Frequency in the Western North Pacific

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Using the effective drought index, this study has found that a summer (July, August, and September) drought in the mid-latitudes of East Asia such as Korea, middle China, and Japan has a high negative correlationship with the frequency of a tropical cyclone (TC) genesis over the western North Pacific (WNP). This was solidified by a case study that a TC genesis frequency (TCGF) was the highest (lowest) in 1994 (2003) year that is the strongest (weakest) summer drought year in Korea during the period of 1978-2007. However, although TCs in 1994 year more occurred over the WNP and then more affected Korea than those in 2003 year, the summer drought in Korea did not return to the normal in the end.

This relationship between TCGF over the WNP and East Asian summer drought could be explained as a secondary circulation that ascent flows develop over the subtropical WNP and simultaneously, descent flows develop in the mid-latitudes of East Asia during the East Asian summer drought years, and *vice versa*.

Keywords: Effective drought index; tropical cyclone; secondary circulation.

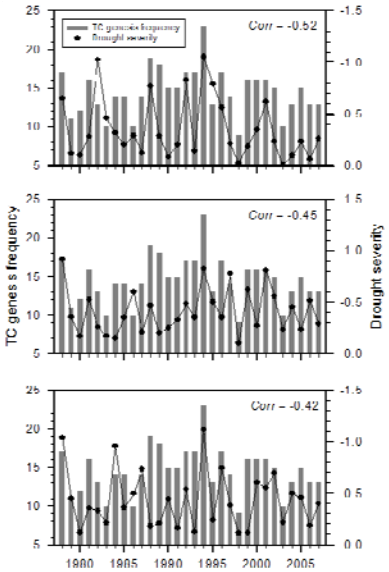

Figure 1. Time-series of TC genesis frequency in the western North Pacific and drought severity in (a) Korea, (b) central China, and (c) Japan for the moths of July, August, and September.