

Fudeyasu, H., and R. Yoshida, 2019: Statistical analysis of the relationship between upper tropospheric cold lows and tropical cyclone genesis over the western North Pacific. *J. Meteor. Soc. Japan*, **97**, 439-451.

Special Edition on Tropical Cyclones in 2015–2016

<https://doi.org/10.2151/jmsj.2019-025>

Plain Language Summary: This study examined the statistical characteristics of tropical cyclones (TCs) for which the cyclogenesis (TCG) process was modulated by upper tropospheric cold lows (UCLs) over the western North Pacific during the 38 years from 1979 to 2016. Most TCs having TCG influenced by UCLs in the northwest quadrant of the TC region (UL-TCs) occurred in the summer, with large variability in the annual occurrence rate of UL-TCs during June to October, ranging from 0 to approximately 30%. The annual variation was related to the activity of the Tibetan high and the summer temperature anomaly over Japan. The UL-TCs at the time of TCG were more favorable for the development of TCs. In contrast, the atmospheric and oceanic environmental parameters around UL-TCs at the time of tropical storm formation (TSF) were less favorable for the development of TSs, such that UL-TCs tended to remain at weak in intensity.

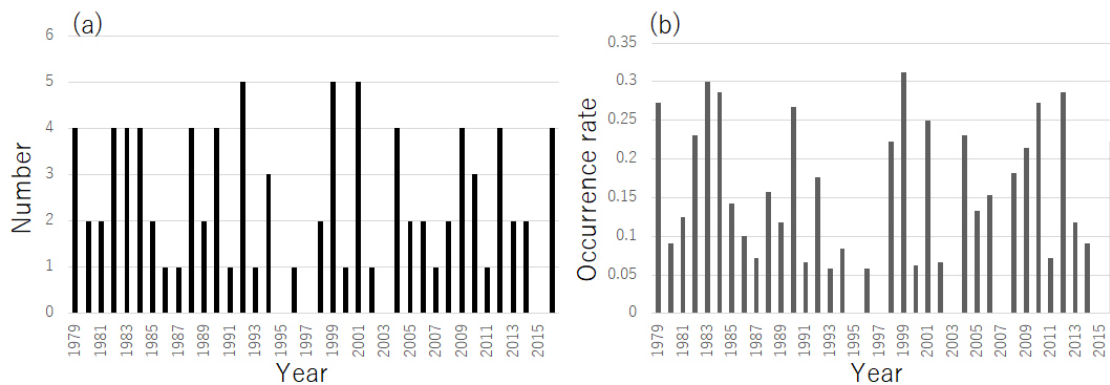


Figure 1. Annual variation in (a) UL-TC occurrence over the 38-year analysis period and (b) occurrence rate of UL-TCs normalized by the total number of TCs from June to October.

- UL-TCs tended to remain at weak intensity, and rarely developed into intense TCs.
- UL-TCs tended to move northward at the time of TSF. The occurrence rate of UL-TCs that made landfall in Japan was approximately double that in other countries.
- Many UL-TCs in lower tropospheric environments were associated with the shear line (SL), confluence region (CR).