

Poleward migration as global warming's possible self-regulator to restrain future western North Pacific Tropical Cyclone's intensification

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Poleward migration is an interesting phenomenon regarding the shift of Tropical Cyclones (TCs) towards higher latitudes. As climate warms, TCs' intensification is promoted, and yet over certain oceans, TCs may also migrate poleward into colder waters. To what extent this poleward shift can impact future TC's intensification is unclear, and a quantitative understanding of these competing processes is lacking. Through investigating one of the most likely TC basins to experience poleward migration, the western North Pacific (WNP), here we explore the issue. Potential Intensity (PI, TC's intensification upper bound) along TC's intensification locations (from genesis to the lifetime maximum intensity location) are analysed. We find that poleward migration can partially cancel global warming's positive impact on future WNP TC's intensification. With poleward migration, the PI increasing trend slope is gentler. We estimate that poleward migration can reduce the increasing trend slope of the proportion of Category-5 PI by 42% (22%) under a strong (moderate) emission pathway; and 68% (30%) increasing trend slope reduction for the average PI.

Reference:

Part 1

Lin, I-I*, Suzana J. Camargo, Chun-Chi Lien, Chun-An Shi, James P. Kossin, Poleward migration as global warming's possible self-regulator to restrain future western North Pacific Tropical Cyclone's intensification. *npj Clim Atmos Sci* **6**, 34 (2023). <https://doi.org/10.1038/s41612-023-00329-y>

Part 2 (If there is time)

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