

Atlantic hurricanes and NW Pacific typhoons: ENSO spatial impacts on occurrence and landfall

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Abstract. Hurricanes are the United States' costliest natural disaster. Typhoons rank as the most expensive and deadly natural catastrophe affecting much of southeast Asia. A significant contributor to the year-to-year variability in intense tropical cyclone numbers in the north Atlantic and northwest Pacific is ENSO - the strongest interannual climate signal on the planet. We establish for the first time: (1) the spatial (0.5 degree grid) impacts of ENSO on the basin-wide occurrence and landfall strike incidence of hurricanes and typhoons; (2) the spatial (7.5 degree grid or US state level) statistical significance behind the different incidence rates in warm and cold ENSO episodes; and (3) the effect of strengthening ENSO on regional strike rates and significances (hurricanes only). Our data comprise 98 years (1900-97) for the Atlantic and 33 years (1965-97) for the NW Pacific. At the US state level, we find several regions where the difference in landfalling incidence rate between warm and cold ENSO regimes is significant at the 90% level or higher. Our findings offer promise of useful long-range predictability to seasonal forecasts of landfalling tropical cyclones.

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