

TROPICAL CYCLONES ACTIVITY IN THE WESTERN NORTH PACIFIC OCEAN: RELATIONSHIP WITH ENSO

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Western North Pacific Ocean (WNP) basin is characterized by the largest activity of tropical cyclones (TC). According to (Mokhov et al., 2014) annually about 9 of 25 TCs in the WNP basin from observations since 1970 are transformed into extratropical cyclones. The TC activity in the WNP basin shows strong interannual variations (with standard deviation larger than 4 TC per year) with significant influence of the El Niño / Southern Oscillation (ENSO).

We analyze here relationship with ENSO of the TC activity in the WNP basin using the data from (<http://www.meteoinfo.ru/tropicyclones>) for TCs and different El Niño indices for the period 1970-2016.

Figure 1 shows integral and local wavelet-spectra for the annual number of WNP TCs (a) and El Niño indices Nino3 (b) and Nino4 (c) in January for the period 1970-2016. Figure 1a exhibits maximum for the period about 4 years and maximum for interdecadal variations. Such maxima are characteristic for the El Niño processes. It is noted remarkably larger contribution of interdecadal variability for Nino4 and for TCs in WNP basin than for Nino3.

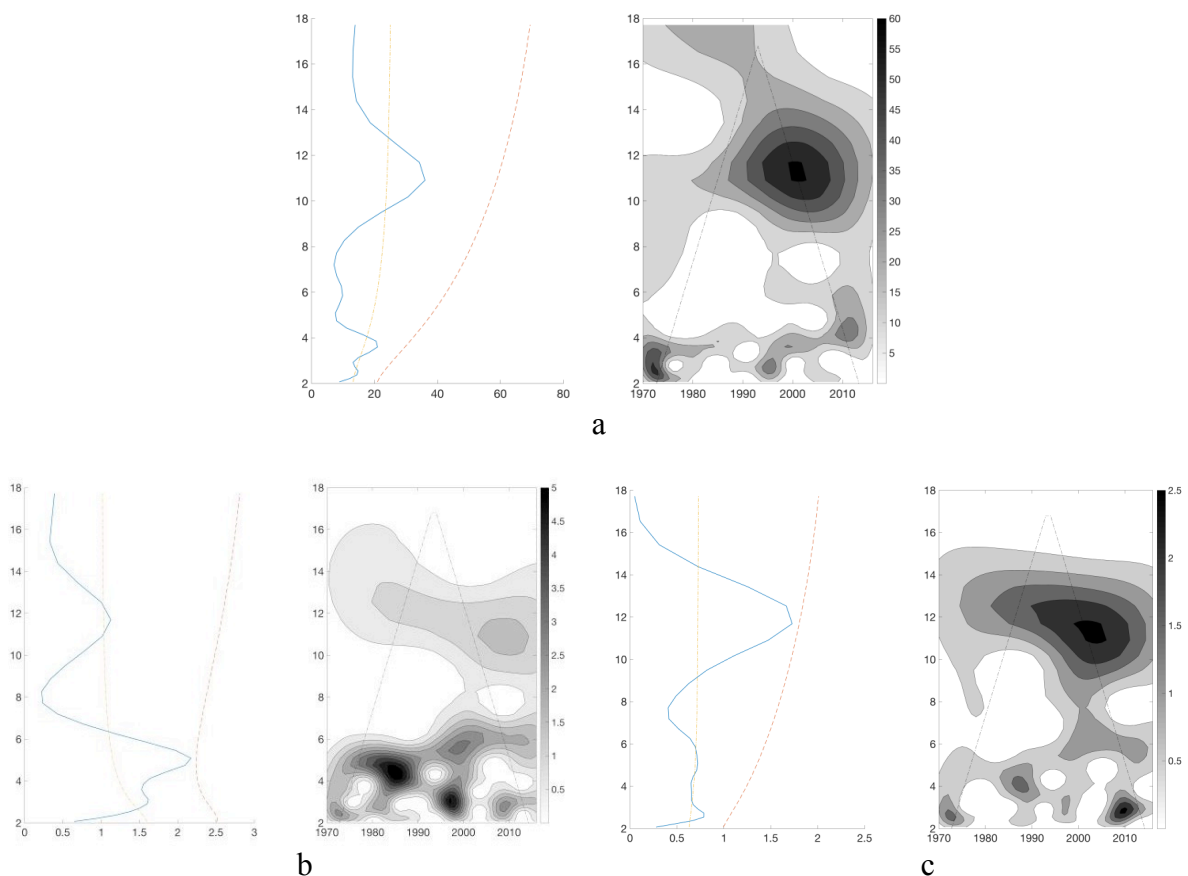


Fig. 1. Integral (left) and local (right) wavelet-spectra for the annual TC number for WNP basin (a) and El Niño indices Nino3 (b) and Nino4 (c) in January for the period 1970-2016 (ordinate - periods [years], abscissa – time [years]).

Figure 2 shows local wavelet coherence of the El Niño indices Nino3 (a) and Nino4 (b) in January with the annual number of tropical cyclones for WNP basin for the period 1970-2016. According to Fig. 2 the coherence between El Niño indices and TC number variations with periods about 5 years is more statistically significant since 1990s (with negative correlation).

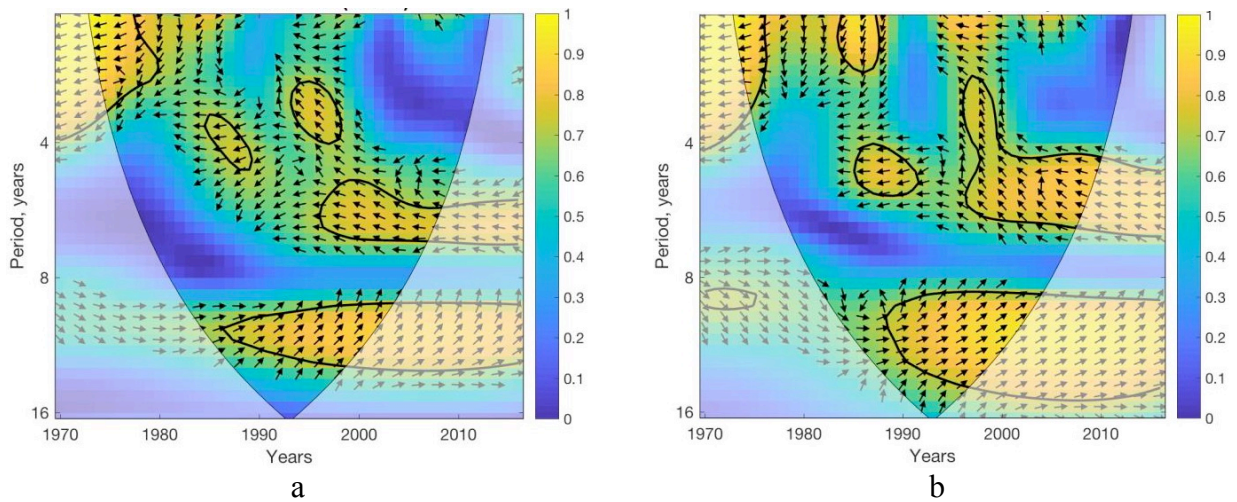


Fig. 2. Local wavelet coherence of the El Niño indices Nino3 (a) and Nino4 (b) in January with the annual number of tropical cyclones for WNP basin for the period 1970-2016.

Local coherence between El Niño indices and TC number interdecadal variations is more statistically significant since the end of 1980s (with positive correlation).

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References

Mokhov I.I., E.M. Dobryshman and M.E. Makarova (2014) Extratropical transition of tropical cyclones: Tendencies of change. *Doklady Earth Sci.*, **454**(1), 59-63.