

"CHANGES in TROPICAL CYCLONE ACTIVITY over the WESTERN NORTH PACIFIC, DOWNSCALED
from NCEP/NCAR and ERA 40 REANALYSIS"

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Abstract

In order to derive climate statistics, long and homogeneous time series are needed. Observational data sets ('best track data') of tropical cyclone (TC) activity in the western North Pacific basin show strong discrepancies in long-term trends derived for the last six decades. Therefore an atmospheric regional model (CCLM) is employed to derive alternative data set. For this purpose TC climatology is dynamically downscaled (1948-2011) from two reanalysis: NCEP/NCAR 1 and ERA 40, as discrepancies between them may potentially impact TC long-term trends.

The reconstructed yearly variability of intense tropical cyclone numbers yields remarkable agreement with the observed one. However, reconstructed and observed long-term trends (1948-2011) of TC activity differ. While observation-based data sets show rather decadal variability, both simulations reveal a strong increase.

An upward trend of downscaled TC activity for 1948-2011 is probably influenced by inhomogeneities introduced in 1978 by satellite-based observations to reanalyses. Simulated TC intensity in both simulations revealed strong shift towards higher values and higher variability. Differences between the regional climate model simulations forced by either NCEP/NCAR 1 or ERA 40 point to uncertainties associated with intrinsic features and quality of the reanalyses' (eg. observational data and methods of data assimilation). Therefore the interpretation of dynamically downscaled reanalyses should be treated with caution when analysing TC activity, especially for the pre-satellite period.