

Changes in the duration of the WNPSM along the twentieth century

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In a recent work by Vega et al. (DOI <https://doi.org/10.1175/JCLI-D-17-0336.1>) a new index, the so-called Western North Pacific Directional Index (WNPDI), measuring the intensity of the Western North Pacific Summer Monsoon (WNPSM), was presented. This index is based on historical wind direction observations taken aboard sailing ships and preserved in the ships' logbooks. The original WNPDI, which is available since the late nineteenth century at monthly resolution, suggests the existence of a change in the duration of the monsoon season along the twentieth century. Nevertheless, its coarse temporal resolution prevents further analysis in this line. Usually, indices based on daily or at least pentad precipitation and outgoing longwave radiation are required to determine the onset, withdrawal and the duration of the monsoon. Thus, the current climatologies for the duration of the WNPSM are limited to the last decades of the twentieth century.

In this work, we show that it is possible to compute a daily record for the WNPSM since the late nineteenth century using currently available historical wind direction observations. We have found that this daily index is highly correlated ($r>0.8$, $p<0.05$) with the daily precipitation in some regions in the Western North Pacific sector such as Cambodia, southern Laos, central Thailand and western Philippines for the calibration period 1988-2013, allowing for a precise determination of the monsoon onset and withdrawal at these locations. Our preliminary analysis of the complete WNPDI daily series indicates that the duration of the WNPSM season has been steadily and significantly shortened along the twentieth century.

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