

## Long-term changes of heavy rainfalls in Vietnam

MATSUMOTO, Jun<sup>1\*</sup>, Nguyen Thi Hoang Ahn<sup>1</sup>, Nobuhiko Endo<sup>2</sup>

<sup>1</sup>Tokyo Metropolitan University, <sup>2</sup>JAMSTEC

Every year, Vietnam is strongly affected by the TCs which are originated within the South China Sea (SCS) or are entered the SCS from the Western North Pacific with high frequency in the northern and central region and low frequency in the southern region. Impact from typhoon or TC and its consequence is one of the major natural hazards to the coastal region in Vietnam. This study focuses to understand the long-term change of rainfall and heavy rainfall days caused by TC in the period 1961-2008 for the coastal region of Vietnam using the TC best-track data obtained from the UNISYS website archive and daily rainfall data from 15 weather stations observed by the Vietnamese National Hydro-Meteorological Service.

The results show that TC rainfall has an increasing trend in all regions along the coastline. For TC heavy rainfall day (> 50 mm d<sup>-1</sup>), a significant increasing trend is found in the central region, but no significant trend is detected in the south region. The long-term change of heavy rainfall occurrences was noted in the previous study, and contrastive trend was noted in northern and southern Vietnam. However, the reason for that feature was unknown. The results suggest that the cause of the increasing trend in heavy rainfall in the central Vietnam can be explained by TC rainfall, while that contrastive trend in the north and south region can be answered by non-TC rainfall.

A significant increasing trend of the annual average TC rainfall and TC heavy rainfall day over 15 selected stations are also found for the 48-year period, in particular, a strong significant increasing trend is seen for the period 1976-1995, but it tends to decrease in the following stage.

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