**Statistical tropical cyclone intensity predictions in the western North Pacific based on a track-pattern clustering approach**

**Il-Ju Moon1), Sung-Hun Kim1), Ki-Ryong Kang2), Woo-Jeong Lee2), Won-Tae Yun2)**

1)Graduate School of Interdisciplinary Program in Marine Meteorology, Jeju National University, Jeju, Korea

2)National Typhoon Center, Korea Meteorological Administration, Jeju, Korea

A state-of-the-art statistical tropical cyclone (TC) intensity prediction model has been developed using a track-pattern clustering approach and implemented to operational intensity predictions for the western North Pacific. TC track patterns are classified into seven based on the Fuzzy c-mean clustering of historical TC tracks. Multiple linear regression models for each pattern are constructed based on the statistical relationship between the TC intensity change, in terms of maximum wind speed, and environmental predictors. This study has developed new key oceanic predictors considering vertical mixing effects underneath a storm such as ocean heat content (OHC) and mixed ocean temperature (MOT) up to various depths from 30 m to 120 m (10-m interval). Maximum potential intensity (MPI) is calculated using the MOTs at various depths instead of sea surface temperature (SST). Calculation areas of the predictors are also carefully tested for various radiuses from storm center and shapes. Atmospheric and oceanic predictors are obtained from NCEP/GFS and HYCOM/NCODA, respectively. The hindcasts of the TC intensity for 2013 exhibit good and improved skills in reproducing the observed intensity. We believe that this is mainly accomplished by proper track-pattern-based selections for newly-developed high-impact oceanic predictors.