



## **Evaluations of Tropical Cyclone Formation and Activity Forecasts Using the NCEP 35-Day Global Ensemble**

Hsiao-Chung Tsai (1), Tzu-Ting Lo (2), Meng-Shih Chen (2), Chia-I She (1), and Wei Bai (1)

(1) Tamkang University, Department of Water Resources and Environmental Engineering, New Taipei City, Taiwan (hctsai75@gmail.com), (2) Central Weather Bureau, Taiwan

Recent studies have shown the potential of the extended-range tropical cyclone (TC) forecasts provided by the global ensemble models. In this study, the predictabilities of weeks 1-4 TC formation and activity forecasts from the NCEP Global Ensemble Forecast System (GEFS) are evaluated. The NCEP GEFS forecasts have extended to 35 days for the Subseasonal Experiment (SubX; <http://cola.gmu.edu/kpegon/subx/>). The SubX version of the GEFS (GEFS-SubX) provides the reforecasts during 1999-2016 and also the forecasts starting from 30 June 2017. In this study, the reforecasts are used to analyze the extended-range TC forecast skills and also the characteristics of model biases. TC formations and subsequent tracks in the GEFS are objectively detected by using an improved version of the TC tracking method developed by Tsai et al. (2011). The relationships between the TC forecast skill and the large-scale environment are investigated. Then the statistical bias correction methods are attempted to improve the raw forecasts during the 2017 season.

Preliminary results show that the TC activity forecast skills in the western North Pacific are slightly better for the reforecasts initialized during the MJO Phases 5-7, and the skills are below average during the Phases 1-3 and 8. For the week-3 and week-4 TC activity forecasts, the skills generally remain similar level of predictability as in week-2 in terms of the hit rate, false alarm rate, threat score, etc. The predictabilities before and after TC formations will also be presented in the meeting. Finally, the skill in predicting TCs affecting Taiwan will be explored to investigate the potential for the decision-making processes of water resource management and hydrological operations.