

July 2014

2014 TROPICAL CYCLONE LANDFALL PREDICTIONS

Introduction

A recent study¹ in 2014 by Huang² and Chan³ shows it is possible to use a regional climate model to more accurately predict the number of tropical cyclone (TC) formations compared to predictions based solely on a global climate model. In this document, RegCM3 refers to this Regional Climate Model, Version 3, while CFSv2 is the global Climate Forecast System, version 2, from the U.S. National Centers for Environmental Prediction.

The global Climate Forecast system is used by the RegCM3 as initial boundary conditions for a dynamic downscaling model to predict the number of tropical cyclone formations and the number of landfalls with a lead time of one to six months. Predictions are for three regions listed below and shown in the subsequent map.

- *Southern Tropical Cyclones (STC) – those making landfall in South China, Vietnam and the Philippines*
- *Middle Tropical Cyclones (MTC) – those making landfall in East China (Taiwan, Fujian, Zhejiang and Jiangsu Provinces, and Shanghai municipality)*
- *Northern Tropical Cyclones (NTC) – those making landfall in the Korean Peninsula and Japan.*

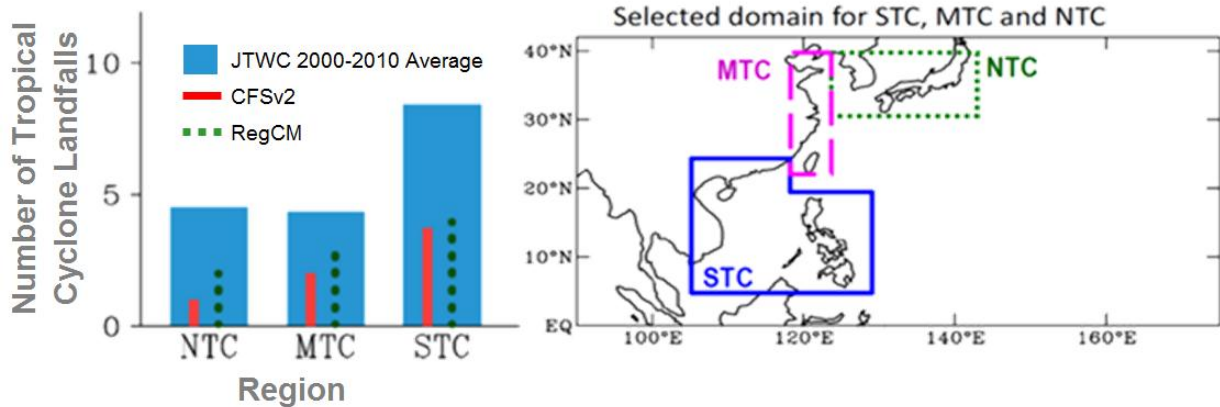
The tentative forecast suggests fewer than average TCs will make landfall in East Asia in 2014 for the months June through November. In Figure 1 (next page) the chart on the left shows the landfall predictions based on the regional cyclone model (green dotted line), the global model (red lines) and the 2000 through 2010 historical average (blue bars).

¹ Huang, Judy W.R. and Chan, Johnny C. L., 2014: *Dynamical downscaling forecasts of western North Pacific tropical cyclone genesis and landfall*. *Climate Dynamics*, 42, 2227–2237.

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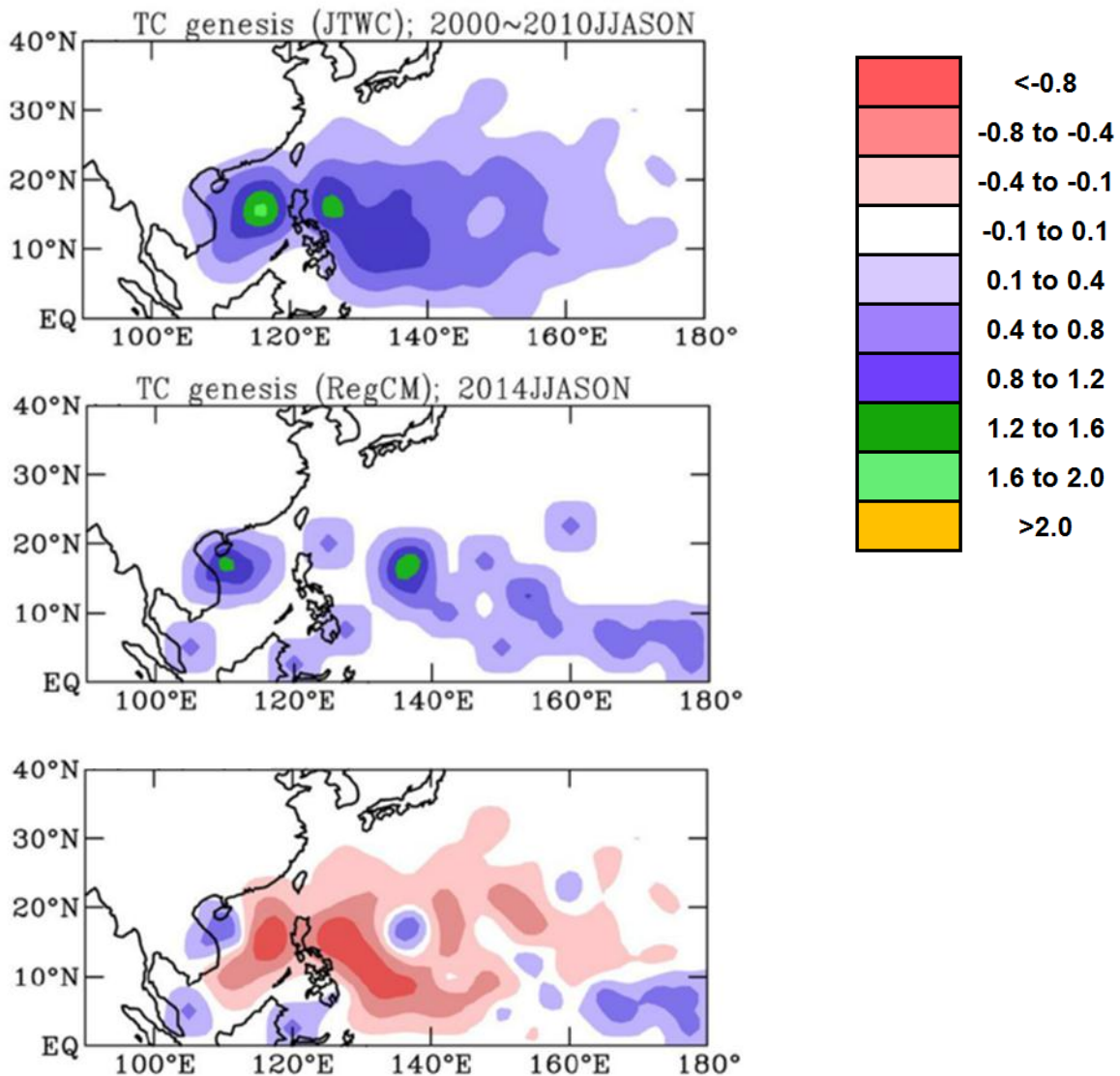
Figure 1



Source: *Experimental Forecasts of Seasonal Forecasts of Tropical Cyclone Landfall in East Asia* by Johnny C. L. Chan and Judy W. R. Huang.

The charts below in Figure 2 show the TC formations for June through November. The legend refers to the number of TC formations in an area corresponding to 5 degrees latitude and 5 degrees longitude over a one year period.

Figure 2

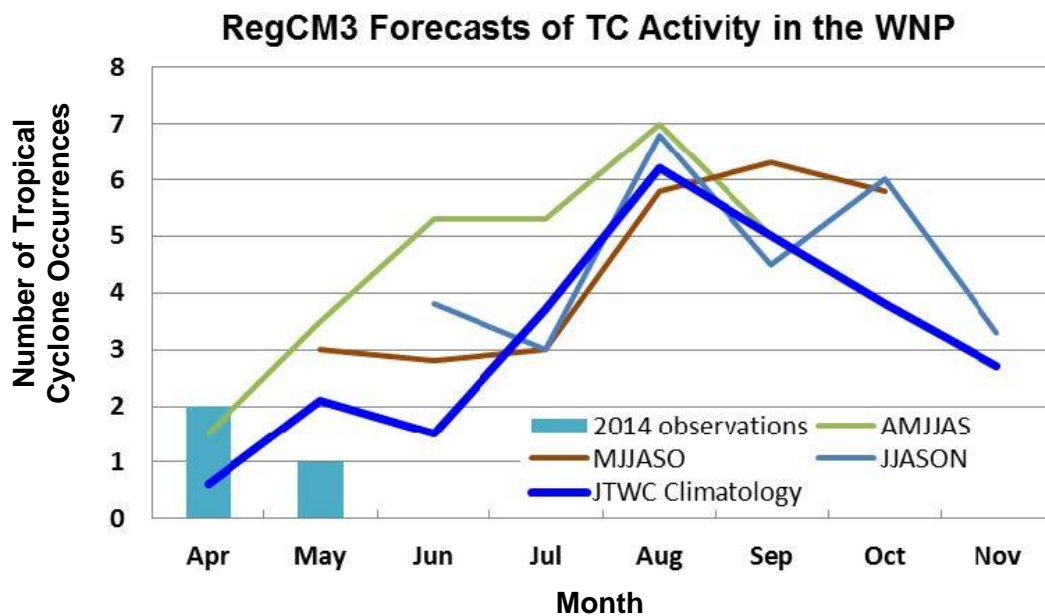


Source: *Experimental Forecasts of Seasonal Forecasts of Tropical Cyclone Landfall in East Asia* by Johnny C. L. Chan and Judy W. R. Huang.

The top chart in Figure 2 (previous page) shows the average of TC formations per year from 2000 through 2010 for the months June, July, August, September, October and November. The middle chart shows the RegCM3 predictions and the bottom chart shows the difference with red areas being a decrease in TC formations and the blues being an increase from the historical average.

Each TC prediction is for a six month period. In Figure 3 below, the light green line represents the initial predictions for the months April, May, June, July, August and September (AMJJAS). These predictions have been updated twice for May through October (MJJASO) and June through November (JJASON). The light blue line represents the most recent predictions. The dark blue line is the historical average for 2000 through 2010 based on data from the Joint Typhoon Warning Center (JTWC). While the region climate model is predicting slightly higher than average TC formations for June through November, a less than average number are expected to make landfall. The forecasts are based on an ensemble of simulations, which is why there can be a fractional number of landfalls.

Figure 3



Source: *Experimental Forecasts of Seasonal Forecasts of Tropical Cyclone Landfall in East Asia* by Johnny C. L. Chan and Judy W. R. Huang.

Updates to this study will be available on a monthly basis and the full report can be found at <http://www.cityu.edu.hk/gcacic>.

Readers should be aware that these are predictions and, as such, the actual tropical cyclone activity can vary significantly from the predictions shown in this report.

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