



Predictability of Heat Wave Occurrence in Korea during Summer 2013

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South Korea experienced an unusually strong heat wave in the summer of 2013 which was characterized by the enhancement of the Northwestern Pacific high resulting from an anomalous convergence over the South China Sea. As a result, we proposed the KHI to assist in the medium-range forecasting of heat waves in Korean. This study investigated the predictability of extreme heat wave in the summer of 2013 using five operational medium-range ensemble forecasts: CMC, ECMWF, KMA, NCEP and UKMO.

We compared the heat wave forecast skill with Maximum Temperature(TMAX), Bias Corrected Temperature(BCT), and Korean Heatwave Index (KHI) for the period July and August in 2013. By using TMAX, KMA showed the best prediction skill for heat wave occurrence due to the daily maximum temperature being overestimated compared to other models. However, all models cannot predict the occurrence of a heat wave from 9 July to 15 July with a five day lead time. Therefore we should not expect the current models always to reproduce the daily maximum temperature.

The forecasting of heatwaves using BCT is more realistic than using TMAX. In particular, NCEP predicts that there will be the heat wave from 9 July to 15 July when it is a difficult period to forecast a heat wave using by TMAX. The value of ETS for BCT was approximately 10 times as much as that of TMAX

The highest skill in forecasting the heatwaves is given by using KHI even during the period from 8 July to 27 July, when it had a lower probability, compared to the previous two methodologies (BCT, TMAX). It should be pointed out that to achieve high PC, TS, and ETS for all lead times. Results in predicting heat wave occurrence by KHI indicates significant skill in both the short-range and medium-range.

The results might help us to get reliable information on heat waves in advance and this can provide more prevention time for the public in Korea. Therefore advanced planning and preparedness is essential and can reduce the health impacts of exposure to extreme climate events like heat wave.