

Utilization of seasonal climate predictions for the application fields

Yonghee Shin

APEC Climate Center, Republic of Korea

APEC Climate Center (APCC) is producing and offering a multi-model ensemble (MME) seasonal forecasts that is evaluated the predictive performance of world-class, but the utilization of climate prediction information for applications such as agriculture and water resources is still very low. To assess the reliability of hindcast prediction data, comparison of 6 months hindcast data and B.C. NCEP reanalysis data were made during 24 years between 1983 and 2006 for average temperature of July-September in main rice growing periods. As a result of having analyzed the temperature prediction by prediction model, the uncertainty range in accordance with the prediction model appeared quite large. Uncertainty range is reached in the case of the USA about 6.3 °C. In order to take advantage of seasonal climate forecast directly in agricultural applications, bias correction process is essential. Simple bias correction method has been used for about 6 months hindcast bias correction to take advantage of the seasonal forecasts in agriculture production research. The reliability of the prediction was evaluated through the analysis of RMSE and TCC for bias-corrected temperature forecasts by country. In the case of China, reliability of predictions about the average temperature of July to September is relatively higher in NASA and NCEP model. In the case of India, reliability of predictions is relatively higher in MSC_CANCM3 model. For crop yield simulation, temperature, precipitation, diurnal temperature, solar radiation and wind speed data that are required by the crop model were reproduced to daily unit and reliability of prediction was evaluated. Results of reliability evaluation of reproduced daily prediction data, reliability for the average temperature in September were relatively high in China. RMSE and TCC analysis results are about 0.4 °C and 0.7 respectively in MSC_CANCM3, NASA, NCEP model. However, since the reliabilities of other climate were considerably lower than temperature this problem must be solved before applying to application study.