

OPERATIONAL CLIMATE SERVICES: A DIALOGUE ON PRACTICAL ACTION

Seasonal Forecast over Khorasan-Razavi Province, Iran using Statistical Post processing MRI-CGCM3 Output

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Abstract:

Seasonal to inter annual climate forecasts have become essential for policy makers and risk managers in the planning of several activities, including those related to the agriculture, water resource management. Although numerical models are increasingly being used to generate operational seasonal forecasts, the reliability of these products remains relatively low. In this regard, for improving the accuracy of seasonal precipitation forecasts, the outputs of MRI-CGCM3 seasonal forecast model have been used to statistical post-processing of the model precipitation over synoptic weather stations of khorasan-Razavi province which is located in the Northeast of Iran, in the neighboring of Turkmenistan and Afghanistan, over the period of 1981-2007. We got the model outputs data from *Tokyo Climate Centre*. The outputs of MRI-CGCM3 are available to registered National Meteorological and Hydrological Services (NMHSs) on the website of the Tokyo Climate Center of the Japan Meteorological Agency (JMA/TCC).

Statistically significant predictions are produced from model output with no forecast skill prior to post-processing. MRI-CGCM3 was produced 30 years reforecast covering the period of 1981-2008. Reforecast data used to produce post-processing multivariate relations between reforecast parameters and observed precipitation in the training period of 1981-2001. The skill of multivariate post-processing was evaluated using Mean Square Skill Score, Mean Bias Error, relative error and categorical skill score over the training and evaluation periods. Categorical skill score is determined by computing the skill of post processed and raw model data in forecasting five precipitation category of above normal, above normal to normal, normal, normal to below normal and below normal. After post processing, bias and relative error decreased from 107.43 to 2.99 and 66.15 to 0.78 at mashad station. Station averaged bias error is decreased from 94.3 to 3.5mm and categorical skill is improved from 25.3% in raw data to 62.2% in post processed data. Bias and relative error were significantly decreased in the other stations. The result shows that multiple regression method can significantly use to increase the accuracy of the model predictions over Khorasan-Razavi province.

The success of the GFCS is dependent on the availability of reliable climate information such as seasonal forecast. In this regard, this study can use as operation method to improve the seasonal forecast over those countries which are suffering from low skillful seasonal forecasts.

Keywords: Seasonal forecast, Post processing, Precipitation, Statistical downscaling, MRI-CGCM3.