DROUGHT PREDICTION OVER KHORASAN PROVINCE IN NORTH-EAST OF IRAN BY USING DOWNSCALING TECHNIQUE ON DIRECT GCM OUTPUT

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The Khorasan Province rainfall regime is characterized by a strong seasonal cycle and large inter annual variability. Typically, frequency distributions of monthly precipitation present a large spread of values, implying frequent episodes of very wet or very dry years. Unfortunately, the most recent generation of general circulation models (GCMs) still has serious problems when modeling monthly precipitation over Iran. However, these models are able to reproduce the main patterns of atmospheric circulation, such as those derived from a principal component analysis of the sea level pressure anomaly field. Many downscaling techniques have been developed in recent years, all having in common the need to establish statistical links between the large-scale circulation and the observed data at a local or regional scale. The final objective is usually the application of such transfer functions to GCM output. We know several centers in the world are producing climate data in deferent scenarios. So, choose the better one that is suitable in selection area and then use them for giving forecast on Drought is the main propose of this paper. In this paper, we try to find correlation between observed data and models outputs to find best one for downscale monthly precipitation over the Khorasan province in North-East of Iran. It was found that between seven climate Data centers, Australian Center is benefit and suitable for use in this region. GCM data from a control integration run from the Australian Climate Model were used to reproduce present-day precipitation over Khorasan province. It was found that the precipitation characteristics (mean, variance, and empirical distribution) were better reproduced by the downscaled results than by the GCM direct output. With using Precipitation parameter constructed for the future (2005–2090) in SPI (Standard Precipitation Index) we could predict drought disaster in this region and it will improve drought risk management. Such scenarios are in good agreement with those obtained by other researchers using different downscaling techniques with other scenarios data for using them in management systems.

Keywords: Downscaling; Models, GCM; Climate Data Centers; Drought; Management