

Assessment of Climate Change Impact on Meteorological Droughts

Authors : Alireza Nikbakht Shahbazi

Abstract : There are various factors that affect climate changes; drought is one of those factors. Investigation of efficient methods for estimating climate change impacts on drought should be assumed. The aim of this paper is to investigate climate change impacts on drought in Karoon3 watershed located south-western Iran in the future periods. The atmospheric general circulation models (GCM) data under Intergovernmental Panel on Climate Change (IPCC) scenarios should be used for this purpose. In this study, watershed drought under climate change impacts will be simulated in future periods (2011 to 2099). Standard precipitation index (SPI) as a drought index was selected and calculated using mean monthly precipitation data in Karoon3 watershed. SPI was calculated in 6, 12 and 24 months periods. Statistical analysis on daily precipitation and minimum and maximum daily temperature was performed. LRAS-WG5 was used to determine the feasibility of future period's meteorological data production. Model calibration and verification was performed for the base year (1980-2007). Meteorological data simulation for future periods under General Circulation Models and climate change IPCC scenarios was performed and then the drought status using SPI under climate change effects analyzed. Results showed that differences between monthly maximum and minimum temperature will decrease under climate change and spring precipitation shall increase while summer and autumn rainfall shall decrease. The precipitation occurs mainly between January and May in future periods and summer or autumn precipitation decline and lead up to short term drought in the study region. Normal and wet SPI category is more frequent in B1 and A2 emissions scenarios than A1B.

Keywords : climate change impact, drought severity, drought frequency, Karoon3 watershed

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