

Future drought assessment in the Nakdong basin in Korea under climate change impacts

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Abstract

Climate extreme variability is a major cause of disaster such as flood and drought types occurred in Korea and its effects is also more severe damage in last decades which can be danger mature events in the future. The main aim of this study was to assess the effectiveness of climate change on drought for an agriculture as Nakdong basin in Korea using climate change data in the future from data of General Circulation Models (GCM) of ECHO-G, with the developing countries like Korea, the developed climate scenario of medium-high greenhouse gas emission was proposed of the SRES A2. The Standardized Precipitation Index (SPI) was applied for drought evaluation. The drought index (SPI) applied for sites in catchment and it is evaluated accordingly by current and future precipitation data, specific as determined for data from nine precipitation stations with data covering the period 1980-2009 for current and three periods 2010-2039, 2040-2069 and 2070-2099 for future; time scales of 3month were used for evaluating. The results determined drought duration, magnitude and spatial extent. The drought in catchment act intensively occurred in March, April, May and November and months of drought extreme often appeared annual in May and November; drought frequent is a non-uniform cyclic pattern in an irregular repetitive manner, but results showed drought intensity increasing in future periods. The results indicated also spatial point of view, the SPI analysis showed two of drought extents; local drought acting on one or more one of sites and entire drought as cover all of site in catchment. In addition, the meteorology drought simulation maps of spatial drought representation were carried out with GIS software to generate for some drought extreme years in study area. The method applied in this study are expected to be appropriately applicable to the evaluation of the effects of extreme hydrologic events, the results also provide useful for the drought warning and sustainable water resources management strategies and policy in agriculture basins.

Key words : Standardized precipitation index, climate change, GIS software, catchment.

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