

Drought Forecasting with Regionalization of Climate Variables and Generalized Linear Model

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Abstract

Spring drought forecasting in South Korea is essential due to the skewness of rainfall which could lead to water shortage especially in spring when managed without prediction. Therefore, drought forecasting over South Korea was performed in the current study by thoroughly searching appropriate predictors from the lagged global climate variable, mean sea level pressure(MSLP), specifically in winter season for forecasting time lag. The target predictand defined as accumulated spring precipitation(ASP) was driven by the median of 93 weather stations in South Korea. Then, it was found that a number of points of the MSLP data were significantly cross-correlated with the ASP, and the points with high correlation were regionally grouped. The grouped variables with three regions: the Arctic Ocean (R1), South Pacific (R2), and South Africa (R3) were determined. The generalized linear model(GLM) was further applied for skewed marginal distribution in drought prediction. It was shown that the applied GLM presents reasonable performance in forecasting ASP. The results concluded that the presented regionalization of the climate variable, MSLP can be a good alternative in forecasting spring drought.

Keywords : Regionalization, Climate Indices, Drought, Forecasting, Generalized Linear Model

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