

## Performance Evaluation of Remote Sensing-based Drought Indices for Agricultural Drought Impact Assessment

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Agricultural drought refers to circumstances when soil moisture is insufficient and results in the lack of crop growth and production. It primarily concerns itself with short-term drought situations. Agriculture can rebound or be impaired within a very short period of time depending upon the strength of drought conditions or precipitation events. Since agricultural droughts occur in a wide region, drought analysis methods using remote sensing technique have been used in various previous studies. In this study, five drought indices (Normalized Difference Vegetation Index (NDVI), Vegetation Stress Index Anomaly (VSIA), Vegetation Health Index (VHI), Microwave Integrated Drought Index (MIDI), and Drought Severity Index (DSI)) were performed in Korea from 2001 to 2014. These remote sensing-based agricultural drought indices were generated by Moderate Resolution Imaging Spectroradiometer (MODIS), Tropical Rainfall Measuring Mission (TRMM), and Global Precipitation Mission (GPM) data, which include land surface temperature (MOD11) products, vegetation indices (MOD13) products, land surface albedo (MOD43) products, MOD16 evapotranspiration products, TRMM 3B42 precipitation, and GPM IMERG precipitation products. The above-mentioned agricultural drought indices were calculated by a combination of vegetation indices (NDVI and Enhanced Vegetation Index (EVI)) and various hydrometeorological variables. The main purpose of this study is to assess the impact of hydrometeorological variables for agricultural drought in order to accurately identify agricultural drought. The hydrological variables used in this study are soil moisture, evapotranspiration, and land surface temperature, and analyze how well these variables represent drought conditions when compared to actual drought conditions. Through this study, we can evaluate the performance of agricultural drought indices and enable customized agricultural drought analysis according to land cover classification.