Spatiotemporal evaluation of drought in the Philippines using Standardized Precipitation Index

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ABSTRACT

Drought is considered to be the most complex and costliest natural disaster that can occur anywhere in the world. This phenomenon is normal, recurrent feature of a climate system which is primarily caused by deficiency in precipitation. Drought indices are used to monitor droughts, and are traditionally ground based. This study will investigate past drought occurrences in the Philippines through the use of Standardized Precipitation Index (SPI) derived from freely available satellite precipitation product of Tropical Rainfall Measuring Mission (TRMM 3B43). SPI is one of the most used indices in characterizing drought due to its simplicity for it only uses precipitation as an input, and versatility to monitor different drought types. The TRMM-derived SPI will be evaluated against the ground-based SPI. The onset, duration, areal extent, and termination of a drought event will be examined. Finally, hierarchical clustering will be performed to determine drought homogeneous areas and to analyze the trends for each drought areas. The results of this study will provide detailed information on the spatial and temporal distribution of drought and will demonstrate the potential use of freely available satellite data for drought monitoring in the country, which can be important in drought preparedness and mitigation.

Keywords: drought, TRMM, SPI, hierarchical clustering