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[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-HW Hydrology & Water Environment

## [A-HW22]Hydrological Cycle and Water Environment

convener:Seiya Nagao(Institute of Nature and Environmental Technology, Kanazawa University), Isao Machida(Geological Survey of Japan), Shin'ichi Iida(国立研究開発法人森林研究・整備機構森林総合研究所森林研究部門森林防災研究領域水保全研究室, 共同), Takeshi Hayashi(Faculty of Education and Human Studies, Akita University)

Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

We focus on various issues of water cycle and environment and aim to answer questions of hydrological and earth system sciences including 1) surface, subsurface and evapotranspiration processes of water cycle; 2) natural and anthropogenic hydrothermal systems, 3) environments issues and studies on a watershed or global scale, 4) water-related issues with ecological, environmental, and geochemical aspects, and 5) other issues in hydrological sciences. This session welcomes presentations regarding various kinds of approaches and techniques such as field survey, remote sensing, isotope tracers, numerical simulation, and theoretical analysis.

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## [AHW22-P16]A Fuzzy Logic based Modified Drought Hazard Index for Comprehensive Assessment of Drought Hazard

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Keywords:Drought, Climate Change, India

Drought is one of most the costliest natural hazard and occurs mostly in all part of worlds. Multivariate phenomena such as drought need a comprehensive assessment of hazard to reflect the various characteristics of drought. This study presents a modified drought hazard index (MDHI) based on fuzzy logic theory to overcome limitations of currently available hazard assessment indices. Ensemble-averaged projected precipitation and temperature data for RCP 8.5 from 7 RCM models namely, CCCma-CanESM2, CERFACS-CNRM-CM5, GFDL-ESM2M, MOHC-HadGEM2, MIROC-MIROC5, MPI-ESM-LR, and MPI-ESM-MR has been used to calculate standardized precipitation evapotranspiration index (SPEI) at 12-month scale to characterize the droughts. A comprehensive analysis of droughts for India has been performed using MDHI to map various high drought hazard regions over four different time periods i.e. 2021-2040, 2041-2060, 2061-2080 and 2081-2100 for the 21<sup>st</sup> century. Results of this study suggest an overall increase in the drought hazard over India with the progression of time. Odisha, Jharkhand, Parts of Bihar, West Bengal, Telangana, and Maharashtra are expected to have severe droughts hazard in Period 3 (2061-2080). All Himalayan states in India including Northeastern states are expected to have severe drought hazard in Period 4 (2081-2100).