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

[A-HW21] Human-Natural system interactions and solutions for environmental management

convener: Yuei-An Liou (National Central University)

Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Natural system, environmental quality, and anthropogenic processes have strong relationship.

Environmental changes and their causes increase the needs to address the consequences taking place in the structural and functional ecosystems. Much progress of anthropogenic activities has been made and significantly improves social economics. However, human system has been altering and raising burden on the natural system by alerting land use and land cover, bringing up water, soil and air pollution, changing regional and global climate, and increasing frequency of natural disasters, e.g., floods, landslides.

Planners are increasingly pressured with challenges of balance between demands and developments while lessening the detrimental impact of social processes on environment. Remote sensing and GIS have been proved with their advantages in providing data and tools to model and visualize spatiotemporal environmental changes and influential factors so that practical policy for environmental protection and management can be proposed.

This session seeks for papers on advancements in the development of techniques and models with remote sensing and GIS to contribute environmental applications, to exhibit and visualize influences of human activities on environmental changes and to improve understanding of the relationship between anthropogenic activities and natural system and climate patterns. Solutions for environmental management in short- and long-term visions are very welcome.

[AHW21-P02] Flood Hazard Assessment in the Hindon River through a Coupled Hydrologic and Hydrodynamic Model

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Keywords: Floodplain Development, Flood Risk, International River Interface Cooperative (iRIC), Soil and Water Assessment Tool (SWAT), Geographic information System (GIS)

Snowballing population and anthropogenic influences, and ensuing chaotic development and climate uncertainty, have posed unprecedented challenges for the flood management. The flood risks have worsened because of unplanned urbanization, and consequent flood plain violations. This necessitates a holistic study to examine and weigh any proposed or existing development in the flood plain and its proximity.

The present study is focused on the scientific demarcation of the flood plain zones for a range of anticipated flood risks in the Hindon River of Northern India. In this study, a 2-D hydrodynamic model, International River Interface Cooperative (iRIC), has been coupled with Soil and Water Assessment Tool (SWAT) hydrological model in a geospatial environment, to simulate the hazards from the floods of different return periods. With minimal data, resource and time requirement, the developed model has been efficacious in capturing the flood dynamics and is able to reasonably predict the magnitude, extent and time of occurrence of the flood. With heightened flood risks in densely populated nations like India, economic yet integrated approach such as this, can facilitate policy makers in methodical flood plain development for effective mitigation of the future floods.