
[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-P01] WebGIS based representation of hotspots for Stormwater harvesting in Dehradun, India

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Geographic Information Systems (GIS) have been widely accepted for maintaining and manipulating spatial data for hydrologic model operations. Information technologies including GIS and internet have provided a great platform to overcome the limitations that are associated with computer-based models. This increases the opportunity for interoperability which refers to accessing and sharing data across multiple information sources. It is important to document the growing volume of geospatial datasets which can be used by multiple organizations for various purposes. The present study focuses on representing the identified hotspots for stormwater harvesting in Dehradun, India by utilizing remote sensing and GIS techniques through webGIS. The geospatial dataset and metadata associated with the study are organized as a repository in the open source database server (PostgreSQL/PostGIS). The accessibility, sharing, editing and interoperability of geospatial dataset have been achieved using Geoserver as it provides full support for interoperability through OGC specific web services such as WMS, WFS, WPS, CSW, etc. As the dataset has no natural visual component thus, it is styled in Geoserver using the XML based markup language called Style Layer Descriptor (SLD). For geovisualization, the hotspots are customized and designed using Javascript openlayers integrated with geoserver for the web browser environment. This technique represents the geospatial datasets not only limited to one's computer but to the public domain's websites that can be accessed and visualized across the world.

Initially, the potential hotspots are identified for stormwater harvesting using screening parameters such as availability of stormwater, water demand and distances to end use locations in GIS environment. For further screening of hotspots, several parameters are involved i.e. available storage capacity, land ownership, environmental impact, proximity to existing infrastructure, social impact, habitat concerns etc. Some of the parameters require opinions from public and neighborhoods. For this, it is very difficult for the water planners to visit and gather response from everyone. Thus, Web-based Geographic Information Systems (webGIS), is a promising option for entering and storing heterogeneous datasets which have the potential to involve public participation and store responses which assist the stakeholder's/water planners to take a quick decision.