[EE] Evening Poster | H (Human Geosciences) | H-DS Disaster geosciences

[H-DS06]Advanced remote sensing toward Mega-Disaster Response

convener:Young-Joo Kwak(ICHARM-UNESCO: International Centre for Water Hazard And Risk Management), Wataru Takeuchi(Institute of Industrial Science, The University of Tokyo), Biswajet Pradhan

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Natural disaster under climate change is a serious threat to sustainable development, and in recent years natural disasters, i.e., hydro-geo-meteorological hazards and risks, have been frequently experienced by both developing and developed countries.
In this circumstance, advanced remote sensing can play a vital role in disaster risk management. Satellites enable monitoring and detection of changes in a widespread area and assist mapping such information.

This session introduces papers focused on both remote sensing fundamentals and applications to promote investment in disaster risk management using advanced satellite data and integrated GIS data. Earth observation (EO) products may include monitoring information and in-situ observations on global and regional mega-disasters under climate change; for example, land surface dynamics, land cover and land use changes, numerical simulation, and social applications between near-real time observation and long-term trends with water/hydrological cycle.

We encourage the presentation of new research findings and novel approaches on natural disasters, such as mega-floods, tropical cyclones (typhoons), storm surges, earthquakes, tsunamis, landslides, and wildfires, from local to global scales.

[HDS06-P02]Bangladesh flood map using GIS and remote sensing

★ Invited Papers

*Kazumitsu Muraoka[1], Young-Joo Kwak[2] (1.Yamaguchi University, 2.ICHARM-UNESCO: International Centre for Water Hazard And Risk Management)

Keywords:Bangladesh, Integrated flood management (IFM), Flood action, Risk information

After the development of a flood action plan (FAP) in 1988, the Bangladesh government has led practical actions for nationwide flood management. However, Bangladesh is on its way to improve the capacity and knowledge of sustainable infrastructure and non-structural countermeasures. Local government and communities are also struggling to mitigate flood risk and severe damage. Therefore, a government-driven strategy of capacity building on sustainable flood risk management is an inevitable process to support local authorities’ responsibility under the leadership. This pilot study introduced the GIS-based integrated flood management (GiFM) for improving nationwide flood risk management at different levels from communities. First, we proposed the conceptual framework of GiFM to strengthen local government-based capacity focusing on a cost-effective way under the FAP. Then the proposed GiFM employed hydro-GIS geo-database and Earth Observation (EO) data for sharing information on the current flood risk situation including flood monitoring, forecasting and river embankment erosion in transboundary river basins. For flood risk reduction, the prototype of GiFM showed a good example of consultation and action plan to realize high-priority demands at all levels of multi-stakeholders, from decision makers to residents who are living in vulnerable low-lying floodplains of Bangladesh.

Ideas and lessons learned from the study implementation are listed below:

(1) According to the results of the inventory survey with GIS mapping, most embankment failures along the Manu River concentrate in the outer bends of the river.

(2) GIS-based maps with MODIS-detected flood analysis can show the conditions of embankment failure and help understand the relationship between the critical points and inundation areas.

(3) GiFM will be able to improve the prototype of a flood hazard map and contribute to community-based disaster risk reduction and sustainable water related infrastructure management as non-structural measure. In particular, it will be very useful for undetected flood areas in developing countries like Bangladesh.