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Session abstract

Title: Hydrological Remote Sensing Monitoring and Modelling of Global Changes for Sustainability

Convener: Prof. Ni-Bin Chang

Co-Conveners:

Prof. Keuth Hipel

Dr. Carsten Montzka

Dr. Kaveh Madani

Background: The 21st century will experience widespread global climate change due to climatic variations, shifting demographics, land use changes, population migration, and economic development. As the world is being transformed at an unprecedented pace and in uncertain directions, these changes are expected to have a significant impact on the quantity and quality of land, water, air and ecosystem inextricably linked across the globe. Yet, hydrologic systems are highly dynamic at varying spatial and temporal scales. Our knowledge of these systems and their behavioral patterns in response to climate change is often uncertain. Managing ecosystem and water resources in the presence of these uncertainties is always a challenge and requires multiple-disciplinary knowledge. There is an acute need to develop a new approach for hydrological sensing, monitoring, networking, and feedback control to enhance optimal decision making for adaptive startegies and achieve sustainable development goal throughout natural systems and the built environment.

Over the last decade, industries, government agencies, and academic societies have been giving increasing attention to the creation of synergistic effects through the development of environmental cyber-infrastructures and hydrological observatories for global climate change studies. This interest grows out of the need to streamline the integrative process of tailored hydrological sensing, monitoring, networking, and decision making to deal with a wealth of issues embedded in environmental and ecosystems regionally and globally. The vigorous progress of this research field is fueled by continuous transfer of techniques, methods and concepts from relevant scientific and engineering fields and further fanned by emerging applications via innovative breakthroughs. The key to success is related to supporting interface technologies in relation to multi-scale hydrological observatories that can smooth out data acquisition, data communication, data and knowledge storage, data mining and knowledge discovery, and data and knowledge dissemination and utilization.