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How sustainable are ecology and hydrology of floodplain lake systems of the large river basins under rapidly changing climatic and social dimensions?

Description

The freshwater resources of the world's large river basins have faced critical sustainability challenges during the 21st century. The dynamics of ecology and hydrology of many large river systems, which maintains basin sustainability, have been profoundly modified by increased rate of climate change and human interventions. Unprecedented level of the use of water for irrigation, hydropower generation and human consumption has led to substantial reduction in the river flows. Climate change has intensified the condition of flows and the overall change of hydrology causing considerable implications for ecology and associated ecosystem services in many large river basins worldwide. Apart from the amount of water available for use in the basin, excessive application of fertilizers in agriculture, and discharge of nutrient rich water into most rivers has led to widespread eutrophication posing greater risks to ecosystem and public health. Conflicts in water resources use have increased substantially over the recent decades due to the growing population demand of clean water and high-quality food.

Many lowland floodplain lake systems connected to large rivers are some of the most important mosaics of environmental and fluvial systems that create complex habitat gradients in the basins. Such lake systems, which harbor unique biota, including the rare and highly specialized species of high conservation value, provide important ecosystem services, such as fisheries, water supply, flood mitigation, carbon sequestration and nutrient retention. However, the ecological integrity of many of these floodplain lake systems in large river basins worldwide has been compromised by rapid societal changes from urbanization and industrial development

with increased demand for water and energy. The most pervasive impacts have been made through flow regulation and modification of drainage schemes, introduction of invasive species and widespread use of fertilizers and other chemicals leading to unprecedented eutrophication and water pollution. Climate-induced drought, flooding, and variability in the transport of carbon have altered carbon fluxes and storage capacity of many floodplain systems. When the world's scientific community is working for the carbon neutral society by the middle of this century, studies of large river floodplain systems holds considerable significance. This session invites submission of abstracts from the range of research topics that addresses sustainability issues of the large river floodplains lakes including ecology and hydrology, biogeochemical processes, nutrient cycling, river regulation and connectivity, species invasions, habitat modifications, water policy and rights, changes in biodiversity, food webs and ecosystem services including hydropower generation, water-energy-food nexus as well as the predictive ability of carbon dynamics in floodplain wetland/peatland systems to assess carbon neutrality through mapping greenhouse gas emissions using remote sensing technology and other in-situ observations.

Conveners

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