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Integrating Ecohydraulics and Ecohydrology in Environmental Flow Assessment and implementation

Description

Environmental Flows refer to water provided within a river or wetland to maintain ecosystems and the benefits they provide for people. E-flows can be thought of as 'ecological water demand', similar to agricultural or industrial water demands. E-flows is effectively a balance between water resources development and the need to protect freshwater-dependent ecosystems. However, many worldwide e-flows studies focused only on minimum flows, neglecting the diverse ecologically-relevant components of the rivers and streams flow regimes. Since the 1990s, new ecohydrologic approaches based on the natural flow regime have been advocated, emphasizing the natural variability of the aquatic ecosystems. Some assessment tools also address social and economic aspects.

Major challenges remain in the assessment and implementation of e-flows or environmental water assessment methods. In particular, there is a need to strengthen methods for scaling assessments from individual sites to a whole basin, and integrating multiple components within an environmental flow regime, considering the natural synchronicity of the ecohydrological processes and the life-history of aquatic species, together with habitat modeling and water quality modeling. The integration of ecohydraulic and ecohydrological approaches is fundamental to resolving these challenges. In this session, we aim to share experiences on the interaction between ecohydraulics and ecohydrology, from different perspectives. This can include scientific studies at the microhabitat, mesohabitat or larger scales, integrative and holistic methods or procedures for e-flow assessments, challenges in studies of ecological responses to hydrological alteration, methods coupling habitat modeling and population

dynamics, challenges in the assessment and implementation, and basin-scale assessment.

Conveners:

- **Francisco Martinez-Capel**, Universitat Politècnica de València, Spain
- **Shinji Fukuda**, Tokyo University of Agriculture and Technology, Japan
- **Michael McClain**, IHE Delft Institute for Water Education, the Netherlands
- **Daniele Tonina**, University of Idaho, USA