

Organisation of Special Topical Sessions on IRES at international freshwater conferences

Conference. EGU General Assembly 2019

Location. Vienna, Austria

Dates. 7-12 April 2019

Title. HS2.2.3 Hydrological connectivity: linking surface and subsurface flow

Convenors. Ilja van Meerveld, E. Sauquet, Luisa Hopp, Daniele Penna, Francesc Gallart

Description. Hydrological connectivity describes the degree of connection between and across landscape elements through water flow, and determines the ease with which water and solutes may move across the landscape or through a river system. Connectivity occurs across a wide range of spatial scales, from macropores to landscapes, and has been recognized as a first-order control on runoff generation, travel times, and solute transport. The concept of hydrological connectivity has the potential to enhance our understanding of hydrological processes, to link processes across scales and between field and modelling studies, and to provide a unifying framework to organize hydrologic behavior.

This session consists of two blocks: 1) a block that focuses on subsurface hydrological connectivity, linking hillslopes to the stream network and 2) a block that focuses on ephemeral and intermittent streams, including how surface connectivity in intermittent stream networks is established. We hope that together, these studies will enhance our understanding and stimulate discussions on how the concept of hydrological connectivity can be used to link surface and subsurface flows at the catchment scale.

We encourage contributions on all aspects of hydrological connectivity at the catchment scale or ephemeral and intermittent streams, including field studies and modeling studies on how, when and where connectivity is established, how stream networks expand and contract, and how this can be described or modeled, as well as the effects of connectivity or stream network expansion on stream water quantity and quality and stream biodiversity.

Conference. ASLO-SFS (Society for Freshwater Science) Joint Summer Meeting

Location. Madison, Wisconsin, USA

Dates. 7-12 July 2020

Title. Special Session 35 Drying in freshwater systems: merging lotic and lentic perspectives in an era of global change

Convenors. Daniel Allen, Rachel Stubbington, Meryl Mims, Thibault Datry, Nathan Jones

Description. Drying is an important abiotic factor in non-perennial freshwaters, influencing organismal biology and ecosystem processes at local and landscape scales. Despite the ecological importance and growing awareness of drying in lotic and lentic ecosystems, the majority of freshwater research focuses on systems that do not dry. Furthermore, drying regimes in both lentic and lotic ecosystems are changing due to climate change and human water use, with drying expected to increase in many parts of the world. In this session, we seek to bridge traditional boundaries across disciplines and scales (e.g., lentic–lotic, organismal–ecosystem, aquatic–terrestrial, ecology–hydrology) to help advance the broad

science of drying in freshwater systems. This session will focus on fundamental and applied research exploring population dynamics, community composition, ecosystem functions, and ecohydrology in aquatic systems that regularly dry. First, we will aim to characterize principal drivers of drying regimes in freshwaters. Second, we will explore the role that drying plays in processes across levels of biological organization, from organisms to ecosystems. Third, we will investigate shifts in drying regimes in an era of global change and their implications for freshwater ecosystems. The overall aim of this session is to identify common objectives and approaches that span lentic and lotic research, and how research in these areas could better inform management, restoration, and policy related to freshwater systems that regularly dry.

Conference. EGU General Assembly 2020

Location. Vienna, Austria

Dates. 3-8 May 2020

Title. HS2.1.8 Zero flow: hydrology and biogeochemistry of intermittent and ephemeral streams

Convenors. Catherine Sefton, Eric Sauquet, Ilja van Meerveld

Description. A large proportion of the global stream network comprises channels that cease to flow or dry periodically. These systems range from near-perennial rivers with infrequent, short periods of zero flow to rivers experiencing flow only episodically following large rainfall events. Intermittent and ephemeral rivers support a unique high-biodiversity because they are coupled aquatic-terrestrial systems that accommodate a wide range of aquatic, semi-aquatic and terrestrial flora and fauna. Extension and connection of the flowing stream network can affect the quantity and quality of water in downstream perennial rivers. In many arid conditions, they are the main source of fresh water for consumptive use. However, in many places intermittent and ephemeral rivers lack protection and adequate management. There is a clear need to study the hydrology, ecology and biogeochemistry of natural intermittent and ephemeral streams to characterize their flow regimes, to understand the main origins of flow intermittence and how this affects their biodiversity, and to assess the consequences of altered flow intermittency (both increased and decreased) in river systems.

This session welcomes all contributions on the science and management of intermittent and ephemeral streams, and particularly those illustrating:

- current advances and approaches in characterizing and modelling flow intermittency,
- the effects of flow in intermittent streams on downstream perennial streams,
- the factors that affect flowing stream network dynamics
- land use and climate change impacts on flow intermittency,
- links between flow intermittency and biogeochemistry and/or ecology.

Conference. Symposium for European Freshwater Sciences 11

Location. Zagreb, Croatia

Dates. 1-2 July 2019

Title. Special Session 1. Science and management of intermittent rivers and ephemeral streams: a European perspective

Convenors. Thibault Datry, Gabriel Singer, Rachel Stubbington, Daniel von Schiller, Petr Pařil

Description. Much the European river network is composed of intermittent rivers and ephemeral streams (IRES). Intensified research in recent years has shed new light on IRES ecology, which have been overlooked by freshwater scientists for too long. IRES contribute substantially to catchment-scale biodiversity and biogeochemistry and provide important ecosystem services. In response to growing academic interest, IRES are now also receiving increased attention from water resource managers, notably within the context of the Water Framework Directive. Building on the development of the COST Action SMIRES (www.smires.eu), this special session will present the latest European research on IRES ecology in the context of global change, to inform advances that address the challenges of managing these ecosystems.

Conference. Society for Freshwater Science Annual Meeting

Location. Salt Lake City, Utah, USA

Dates. May 19-23 2019

Title. Special Session S02: Advancing knowledge on intermittent rivers and ephemeral streams: across disciplines and dimensions

Convenors. Ross Vander Vorste, Hana Moidu, Daniel C. Allen, Katie H. Costigan, and Thibault Datry

Description. Much the world's river networks are composed of intermittent rivers and ephemeral streams (IRES), which are becoming even more common due to global change. Research on IRES streams has grown exponentially during last decades. Although our knowledge on these ecosystems is still limited compared to perennial streams, research in recent years has shed new light on IRES geomorphology, hydrology, and ecology. We now know that IRES contribute substantially to catchment-scale biodiversity and biogeochemistry and provide important ecosystem services. Growing evidence indicates that IRES are ideal study systems to progress general geomorphological, hydrological, and ecological theory and to advance multi- and trans-disciplinary research. This session aims to showcase the latest research advances about the ecology of non-perennial streams, while highlighting the diverse and integrative approaches being applied, including field studies, mesocosms, lab studies, statistical modelling, social surveys, and theoretical approaches. This session will gather contributions from multiple disciplines across the four dimensions of river systems: 1) the longitudinal dimension, along which drying stresses the need to develop meta-ecosystem approaches to improve understanding of processes leading to flow cessation and drying and how communities and processes respond to this in a landscape perspective. 2) The lateral dimension, across which terrestrial and aquatic sciences meet, offering ideal arenas to develop trans-disciplinary research. 3) The vertical dimension, linking surface water and ground water science. And 4) the temporal dimension, intimately linked to the high dynamism of IRES in the short-term and the effect of global change in the long-term. Additionally, this session will highlight trans-disciplinary research and studies that integrate, sociology, economy, education, public policy, and humanities. This session will promote a

bigger and more inclusive picture of IRES that will provide a better understanding of these complex ecosystems, which should be the base for actionable management outcomes.

Conference. Symposium for European Freshwater Sciences 10

Location. Olomouc, Czech Republic

Dates. 3-4 July 2017

Title. Special Session 12. Science and management of intermittent rivers and ephemeral streams: a European perspective

Convenors. Thibault Datry, Gabriel Singer

Description. A large proportion of the European river network is composed of intermittent rivers and ephemeral streams (IRES). Intensified research of the past decade now sheds new light on the ecohydrology of these systems that have been overlooked by freshwater scientists for too long. IRES contribute substantially to catchment-scale biodiversity and organic matter processing and they provide important ecosystem services to human societies, such as groundwater recharge. Following the growing interest from the academic sphere, IRES are receiving increased attention from water resource managers, notably within the WFD framework. Building on the development of the recent H2020 COST Action SMIRES (www.smires.eu), this special session will present the latest research on the ecohydrology of IRES in the context of climate change and address potential challenges in managing these ecosystems.