



Panta Rhei – Everything Flows
Change in Hydrology and Society
IAHS Scientific Decade 2013-2022
www.iahs.info/pantarhei

Details of the Proposal

Title of the Working Group

Water Footprint of Cities

Abstract of the proposed research activity

Cities drive global water use through their economic power and global trade network. This working group will develop and test hypotheses on how specific parts of the urban economy create different pressures on water. In the urban economy, we will examine the virtual water in both the consumption and production of goods and services to better incorporate the complex trade dynamics of cities. To work on this topic, we propose to develop and implement an empirical framework for quantifying and characterizing the water footprint of cities and their surrounding areas. Ultimately, the goal is to use this framework to identify novel patterns, emergent properties, and feedbacks that may be useful in the future for developing predictive models. We envision this working group contributing in different ways (e.g., through meetings and workshops, publications, research proposals, etc.) to the following activities: developing and implementing methodologies for urban water footprint analysis, identifying data needs and gaps from local to global scale, and identifying the structure and key properties of urban virtual water through a comparative hydro-economic empirical analysis of cities around the globe.

Panta Rhei Research Themes, Targets and Science Questions addressed by the Working Group

The proposed work is directly or indirectly related to all the scientific questions outlined by Panta Rhei in their Science Plan. It will contribute to an improved understanding of water resources sustainability in a way that can be highly informative to society and stakeholders. It represents an initial and necessary step toward developing more predictive frameworks of how cities create demand for actual and virtual water, and drive global water patterns. The work will cover data and water footprint estimation from a global and local perspective. The local perspective will look at water footprint in the context of cities within different developed and developing countries.

Societal impact of the Working Group activity

We envision that the approaches and tools developed as a result of this collaborative work could be of interest and potential utility to a wide audience of scientists, policy makers, and practitioners. The proposed work could be of direct relevance to society

as it will contribute to quantifying water resources sustainability and developing a better understanding of the connection between local and global water issues. This work will offer an opportunity for establishing new and strengthening existing collaborations with various different groups that hold a strong interest in the linkages among water, cities, and sustainability. For example, the Penn State Center in Pittsburgh, USA, the Susquehanna River Basin Commission in PA, USA, the Centro de Desarrollo Urbano Sustentable in Santiago, Chile, and others. We will seek to present our findings in regional conferences and involve stakeholders in workshops. We will also look and encourage opportunities for developing educational material that can be used in the classroom and outreach activities.

List of Participants

Name of Participant	Affiliation (full address and email)	Role in Working Group (Chair or Member)	Main expertise
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Willa Paterson (USA)	Department of Civil and Environmental Engineering, The Pennsylvania State University Address: 215B Sackett Building, University Park, PA 16802 Email: willabp@gmail.com	Member	Hydrology, water resources, and finance
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Megan Konar (USA)	<p>Civil and Environmental Engineering, University of Illinois at Urbana-Champaign</p> <p>Address: 2525 Hydrosystems Laboratory University of Illinois at Urbana-Champaign Champaign, IL 61820</p> <p>Email: mkonar@illinois.edu</p>	Member	Water, food, and trade; virtual water trade; networks
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