



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

Thirsty Future: Energy and Food Impacts on Water

Abstract of the proposed research activity

Much of the dialogue around the concept of sustainable development has focused on improving the environmental performance of specific infrastructures. However, increasing pressures on vital natural resources due to climate change and population growth necessitate a paradigm shift in the way we perceive sustainable development and manage water resources. Long-term sustainability can only be achieved by stronger integration across water supply and demand management, energy generation and food production sectors. The main focus of this working group will be to develop conceptual understanding and integrated modelling frameworks in order to quantify complex linkages between these interrelated sectors. The interdisciplinarity of group members' expertise will foster complementary research that will be integrated through workshops, student exchange programmes, joint publications and research project proposals.

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

The working group will focus primarily on the first two of the Panta Rhei research themes. In this regard, the group will initially address the conceptual understanding of the aforementioned research topic in contrasting environments (developed vs. developing countries). Subsequently, we aim to develop tools for assessment and prediction of coupled systems including estimations of uncertainty in projected hydrological changes. In particular, the following research questions will be addressed: 1) How can integrated modelling be improved and used to advance our understanding of future system trajectory and policy effectiveness, and 2) What methodologies can be used to increase the translation of modelling outputs into robust, real-world natural resources management and societal improvement.

Societal impact of the Working Group activity

The integrated approaches and tools developed as result of collaboration in this working group will provide a valuable insight into complex relationships between water, food and energy. Knowledge of these relationships and how they may evolve under changing climatic and socio-economic conditions will be used to guide stakeholders in identifying technologies or operational strategies that could simultaneously reduce water and energy consumption in coming decades, improve agricultural productivity, and contribute to more effective policy development at various temporal and spatial scales. We will also seek to integrate these activities with other relevant projects outside of the Panta Rhei initiative, such as the W4EF: Water for Energy Framework Action Group within The European Innovation Partnership on Water led by Electricite de France (EDF), which is composed of various stakeholders such as international organisations, energy companies, consulting firms and NGOs.

List of Participants (by country)

| Name of Participant | Affiliation (full address and email) | Role in Working Group | Main expertise |
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