



Pantarhei – Everything Flows  
Change in Hydrology and Society  
IAHS Scientific Decade 2013-2022  
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### Proposal for a Working Group

#### Title of the Working Group

Comparative Study on the Co-evolution of Coupled Human-Water Systems (CCHWS)


#### Abstract of the proposed research activity (150 words)


The proposed working group will bring together scientists from several countries and disciplines who share a common interest in the co-evolution of coupled human-water system under human impacts as well as climate change. The research goal is to collect and collate data from different basins, perform comparative analysis of emergent behavior exhibited by them, develop predictive models, and look for common organizing principles. A particular focus will be on interactions between the diversity of time scales of various subsystems of the coupled human-water system. This working group will function as a platform to share data across different basins, share ideas and visions, debate on new conclusions and theories, and develop and improve socio-hydrological models.


#### Pantarhei Research Themes, Targets and Science Questions addressed by the Working Group

Research Themes: Global Change in Hydrology and Society

Science questions:

SQ1: What are the key gaps in our understanding of hydrologic change? 

SQ4: How can we use improved knowledge of coupled sociohydrological systems to improve model predictions, including estimation of predictive uncertainty and assessment of predictability? 

SQ5: How can we advance our monitoring and data analysis capabilities to predict and manage hydrologic change? 

SQ6: How can we support societies to adapt to changing conditions by considering the uncertainties and feedbacks between natural and human-induced hydrologic changes?

Targets: 2. Estimation and Prediction; 3. Science in Practice

#### Societal impact of the Working Group activity (150 words)

Interactions between time scales play an important role in the interplay among several subsystems, including the hydro-climatic system, economic system, technological system, institutional system and social value system. Identifying different characteristic time scales for different systems and observing the change of time scales will be a key towards developing generalized understanding of how these coupled systems evolve. Also, how the change of time scales due to human impacts affects the interactions and feedbacks between the coupled human and water system should be studied, in order to understand the emergence of new behavior regimes in the evolution of the coupled human-water system. Over the past 5 years several case studies have appeared in the literature documenting the history of co-evolution of coupled human-water systems in Australia, China, and USA. The proposed working group will assemble and archive these data sets and work with other scientists around the world to assemble many more such datasets, which could become the basis for collaborative studies aimed at developing generalized understanding of coupled human-water systems. Such a chronosequence for the socio-hydrology community developed through such comparative analyses would assist in identifying and interpreting the different emergent behaviours, and the development of new theories and innovative models to be used for developing predictive understanding, which can assist with risk management and water security in the emergent Anthropocene.

## List of Participants

Participant (Alpha. Order by first name)	Affiliation (full address and email)	Role in Working Group (Chair or Member)	Main expertise
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