

## **Streams of Water and Information: Managing Water Supply, Treatment, and Delivery in the 21<sup>st</sup> Century**

Session co-chairs: Meagan S. Mauter, Carnegie Mellon University, and Martina Scheer, Engineering Consultants Scheer

Whereas water in the 20<sup>th</sup> century was solidly in the purview of civil, environmental, and sanitary engineering disciplines, the diverse challenges facing water in our century require engineers to collaborate with data scientists, economists, psychologists, and systems scientists. This session will highlight the interdisciplinary challenges of water supply, treatment, delivery, and pricing in the 21<sup>st</sup> century.

The session will begin with a presentation by Branko Kerkez (University of Michigan) and a look at real time monitoring and data analytics for management of water systems. The interface between watershed-level monitoring and decision making surrounding water supply and treatment will be explored. This talk will also address emerging needs in sensor technology and real-time data analytics, a topic relevant to engineers across disciplines.

The session will continue with a talk by Jochen Hack (Technical University Darmstadt) that will look at the major drivers of many of our changing water needs; rapidly shifting climate and precipitation patterns, combined with rapid urbanization and concentration of water demands, and changing water needs with respect to water, food and energy production. This talk will also cover the value of systems science and integrated water resource management in planning for these substantial shifts in the distribution of water availability and water demand.

Next, we will transition to a presentation by Alexandra Dehnhardt (Technical University Berlin) about the value of source water quality protection, with a special focus on deriving numerical estimates of the value of improved water quality. This interdisciplinary work at the interface of engineering and economics is critical to holistic decision making about our water resources.

Finally, the session will conclude with a focus by Chad Seidel (Corona Environmental) on innovative water treatment technologies to respond to the challenges of compromised source water quality and ageing infrastructure. The complimentary role of centralized and distributed water treatment, the role of low energy technologies, and the role of the consumer and the regulator in protecting water will be discussed.