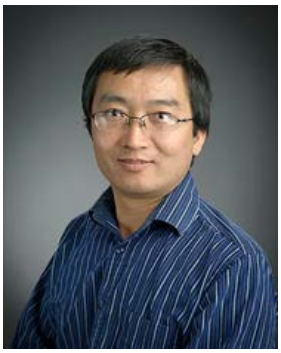
The Department of Civil and Environmental Engineering at the University of Houston presents...

The CIVE 6111 Graduate Seminar Series

Understanding Water-Energy-Ecology Nexus from an Integrated Earth-Human System Perspective



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Friday, September 14, 2018
2:45PM-3:45PM
Classroom Business Building (CBB) Room 108

Abstract
Both Earth and human systems exert notable controls on streamflow and stream temperature that influence energy production and ecosystem health. An integrated water model representing river processes and reservoir regulations has been developed and coupled to a land surface model and an integrated assessment model of energy, land, water, and socioeconomics to investigate the energy-water-ecology nexus in the context of climate change and water management. Simulations driven by two climate change projections following the RCP 4.5 and RCP 8.5 radiative forcing scenarios, with and without water management, are analyzed to evaluate the individual and combined effects of climate change and water management on streamflow and stream temperature in the U.S. The simulations revealed important impacts of climate change and water management on hydrological droughts. The simulations also revealed the dynamics of competition between changes in water demand and water availability in the RCP 4.5 and RCP 8.5 scenarios that influence streamflow and stream temperature, with important consequences to thermoelectricity production and future survival of juvenile Salmon. The integrated water model is being implemented to the Energy Exascale Earth System Model (E3SM), a coupled Earth System Model, to enable future investigations of the energy-water-ecology nexus in the integrated Earth-Human system.

Bio
Dr. HongYi Li joined UH since September 1, 2018. He obtained his B.E. (2000) and M.E. (2003) both at Tsinghua University and Ph.D. (2010) in watershed hydrology at University of Urbana-Champaign. In 2010-2016 he worked at the Pacific Northwest National Laboratory as a postdoc then research scientist. In 2016-2018 he was a tenure-track associate professor in the Land Resources and Environmental Sciences department at Montana State University. His research interests center on hydrological modeling and analysis at the watershed, regional and larger scales in order to improve the understanding and representing of interactions and feedbacks between Human and Earth Systems and their implications to the climate-water-energy-ecology nexus. He is the developer of a large-scale river transport model, which has been adopted as part of both the Energy Exascale Earth System Model (E3SM, sponsored by the Department of Energy) and Community Earth System Model (CESM, hosted by the National Center for Atmospheric Research). He has published over 40 peer-reviewed papers in top hydrology and interdisciplinary journals. He is also an associate editor with Stochastic Environmental Research and Risk Assessment (Springer).