ICWRER Special Session Proposal

2022 International Conference on Water Resources and Environment Research (ICWRER)

**Special Session Title**

***Food-Energy-Water Nexus Analysis for*** ***Mitigating Climate Change Impact and Improving Sustainable Development***

**Session Organizer**

**Chair**

Jiangxiao Qiu, PhD

Assistant Professor of Landscape Ecology

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**Co-Chair**

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**Session Description**

Many cities across the globe are facing difficult challenges managing their food, water and energy systems. The challenges stem from the fact that the issues of food, water and energy are often tightly connected with each other, not only locally but also globally. This is known as the Food- Energy- Water (FEW) nexus. An effective solution to a local water problem may cause new local problems with food or energy, or cause new water problems at the global level. On a local scale, it is difficult to anticipate whether solutions to one issue in the nexus are sustainable across food, water and energy systems, both at the local and the global scale. Innovative solutions that encompass the nexus are particularly important to enable cities to better manage their food, water and energy systems and understand the benefits and tradeoffs for different solutions. This triggers the need to generate actionable information by analyzing the distributed production and storage of materials and energy flows into, out of, and within a community/city/region given their consumption patterns and supply chains associated with various FEW nexuses.

Therefore, we propose to organize a special session at the 2022 ICWRER conference by inviting scientists from multidisciplinary research areas to discuss the following topics:

(1) possible top-down or bottom-up approaches in a multi-scale modeling framework to address the inter-relationship between multiple stressors affecting the FEW nexus;

(2) assessment of the impacts of increasing metropolitan populations, rapid land use change, shifting social, economic and governance norms, escalating climate variability, and changing ecosystem services within each of the investigated FEW nexus to elucidate the resultant water, carbon, and ecological footprint for each location;

(3) knowledge discovery to understand both the physical and social resilience of the location and community to potential scenarios to understand the trade-offs and balances between various drivers and their impacts on each segment on the nexus which will help to develop scenarios that can optimize the sustainability of the FEW components for each location.

Invited Speakers:

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| Invited Speaker | Affiliation | Presentation Title |
| Andrea Valencia and Ni-Bin Chang | Stormwater Management Academy, University of Central Florida, USA  nchang@ucf.edu | Linking green infrastructure and urban food-energy-water nexus for a low carbon city – Orlando, Florida |
| Sankar Arumugam and Hemant Kumar | Department of Civil, Construction, and Environmental Engineering, North Carolina State University  sarumug@ncsu.edu | Food-Water-Energy System: Challenges in Modeling and Quantifying the Nexus |
| Jinagxiao Qiu | School of Forest, Fisheries, and Geomatics Sciences  Fort Lauderdale Research and Education Center/IFAS, University of Florida, USA  qiuj@ufl.edu | The sustainability role of urban farming network in an urban food-energy-water nexus: A case study in Miami, Florida |
| Tonghui Ding1  Junfei Chen2  Liping Fang3 | 1Business School, Hohai University, Nanjing, China  2Yangtze Institute for Conservation and Development, Hohai University, Nanjing, China  3Jiangsu Research Base of Yangtze Institute for Conservation and Sustainable Development, Nanjing, China  Department of Mechanical and Industrial Engineering, Ryerson University, Toronto, Canada  171312070009@hhu.edu.cn  chenjunfei@hhu.edu.cn, lfang@ryerson.ca | Assessing supply and demand of ecosystem services based on the water-energy-food nexus in the city of Suzhou, China |
| Gisele de Lorena Diniz Chaves | Department of Engineering and Technology, Federal University of Espírito Santo (UFES), São Mateus, Brazil  gisele.chaves@ufes.br | Community scale opportunities for urban food-energy-water nexus in Brazilian Cities |