

**Smart Rivers 2019 Conference**  
**/ September 30 - October 3, 2019**  
**Cité Internationale / Centre de Congrès**  
**Lyon FRANCE /**

**Ref. author:**

**Jeffrey K. King – US Army Engineer Research and Development Center,**  
**US Army Corps of Engineers**  
3V10 (3rd Floor), 441 G Street NW, Washington DC, 20314-1000  
United States  
[jeffrey.k.king@usace.army.mil](mailto:jeffrey.k.king@usace.army.mil)

**Co-authors:**

**Robert Holmes – Auburn University**  
413 Dudley Hall, Auburn University 36849  
United States  
[rbh0012@auburn.edu](mailto:rbh0012@auburn.edu)

**Gena Wirth –**  
address  
United States  
[scapestudio.com](http://scapestudio.com)

**Justine Holzeman**  
Address  
Canada  
[justineholzeman@daniels.utoronto.ca](mailto:justineholzeman@daniels.utoronto.ca)

**Sean Burkholder**  
Address  
United States  
[seanburk@design.upenn.edu](mailto:seanburk@design.upenn.edu)

**Tosin Sekoni - US Army Engineer Research and Development Center,**  
**US Army Corps of Engineers**  
Environmental Laboratory, EZS, 3909 Halls Ferry Rd., Vicksburg, MS 39180  
United States  
[Tosin.a.sekoni@usace.army.mil](mailto:Tosin.a.sekoni@usace.army.mil)

**Burton Suedel - US Army Engineer Research and Development Center,**  
**US Army Corps of Engineers**  
Environmental Laboratory, EZS, 3909 Halls Ferry Rd., Vicksburg, MS 39180  
United States  
[Burton.Suedel@usace.army.mil](mailto:Burton.Suedel@usace.army.mil)

**Brandon Boyd - US Army Engineer Research and Development Center,**  
**US Army Corps of Engineers**  
Coastal Hydraulics Laboratory, 3909 Halls Ferry Rd., Vicksburg, MS 39180  
United States  
[brandon.m.boyd@usace.army.mil](mailto:brandon.m.boyd@usace.army.mil)

**Todd S. Bridges – US Army Engineer Research and Development Center,  
US Army Corps of Engineers**  
Environmental Laboratory, EZS, 3909 Halls Ferry Rd., Vicksburg, MS 39180  
United States  
[todd.s.bridges@usace.army.mil](mailto:todd.s.bridges@usace.army.mil)

**Keywords:**

Engineering With Nature®, Natural Infrastructure, Landscape Architecture, Land Planning

**Title:**

**Incorporating Ecological and Social Benefits into Land Planning and Development  
through Integration of Engineering With Nature® (EWN®) and Landscape  
Architectural Practices**

**Abstract:**

**Abstracts must not exceed 1 page and must not exceed 500 words. No graph no picture included. (Times New Roman, 11pt).**

The U.S. Army Corps of Engineers (USACE) is responsible for maintaining coastal navigation assets in the United States that include: 1,067 navigation projects, 19 lock chambers, 13,000 miles of channels, 929 navigation structures, and 844 bridges. USACE inland navigation assets include: 27 inland river systems, 207 lock chambers (at 171 lock sites), and 12,000 miles of inland river channels. In many instances, USACE-maintained assets and/or future-anticipated, water-dependant projects offer opportunities to incorporate ecological and social benefits while still accomplishing the desired engineering outcomes. Recently, the USACE's Engineering With Nature® (EWN®) Initiative commenced a research and development project that is investigating ways to facilitate the aforementioned, "value-added" approach to infrastructure through more deliberative collaborations with a team of landscape architects. By way of background, the EWN Initiative enables more sustainable delivery of economic, social, and environmental benefits associated with water resources infrastructure through a program of activities that sustainably deliver economic, environmental, and social benefits through collaborative processes.

As disciplines, the EWN Initiative and landscape architecture (LA) consider many of the same opportunities related to infrastructure design and performance, such as the re-imagining of existing infrastructure to meet more diverse and functional engineering criteria, providing greater ecological value, and delivering recreational opportunities as well as aesthetic benefits. While EWN engineers and scientists bring a knowledge of natural processes and an understanding of how these processes get integrated, landscape architects (LAs) are formally trained to think about how people interact with a design. LAs translate the conceptual stage of a project directly into a specific drawing, using a visual vocabulary for communicating how natural processes can be integrated into traditional engineering projects. Given the complimentary nature of these two disciplines and mutual interest in infrastructure enhancement, this research project was initiated to further promote those shared design principles and precedent knowledge, which can be integrated into EWN approaches that are collaboratively pursued among engineers, hydrologists, biologists, ecologists, and landscape architects.

During this presentation, attendees will be introduced to several USACE's water resource infrastructure projects that are being evaluated as part of this study. Information specific to the original projects' primary purpose and need will be offered in an effort to establish a baseline of initially intended outcomes. Subsequent project designs will illustrate the iterative approach used by the EWN engineers/scientists and LAs to incorporate measures that result in the addition of environmental and social benefits. Finally, LA renderings will be highlighted to further illustrate the benefits of pursuing infrastructure projects using this innovative approach that integrates EWN and LA techniques. Case studies may include, but are not limited to: Comite Canal, Louisiana, US; Moses Lake Tide Gate, Texas, US; Port Arthur Levee System, Texas, US; W.P. Franklin South Recreation Area, Florida, US; and the Moore Haven Lock & Dam, Florida, US.