

University of South Florida – Civil & Environmental Engineering
Environmental and Water Resource Engineering Graduate Seminar- Spring 2017

Phosphorus and Nitrogen and Carbon, OH MY!

The role of wetlands in mitigating pollutants in our landscape and globe

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Friday, February 24, 12:30 – 1:15 pm

ENG 4

Abstract: The world is faced with unprecedented threats to aquatic ecosystems from excess nutrients caused by agricultural and urban runoff. More than 750 aquatic ecosystems suffer from hypoxia, dead zones, and harmful algal blooms, most due to excessive nitrogen and phosphorus (N&P). And we have increased the atmospheric pool of carbon by 40% since industrial times leading to impacts related to climate change. At the same time, it has also been estimated that, on a global scale, we have lost half of our wetlands to our current extent of 8 to 12 million km², with most of that loss in the 20th century. I am proposing here a sizeable increase in worldwide wetland resources to solve the diminishing wetland problem but with the strategic purpose of mitigating the excess N, P and carbon in a sustainable fashion. Examples include minimizing phosphorus inflows to the Florida Everglades and Lake Erie in the Laurentian Great Lakes and reducing nitrogen fluxes by wetlands and riparian forests in Midwestern USA to reduce hypoxia in the northern Gulf of Mexico. Finally, freshwater and coastal wetlands are being proposed as carbon sinks through carbon sequestration to mitigate human-caused emissions of greenhouse gases.



Biosketch: Bill Mitsch is an Eminent Scholar and Director of the Everglades Wetland Research Park, and Juliet C. Sproul Chair for Southwest Florida Habitat Restoration at Florida Gulf Coast University. He was Distinguished Professor of Environmental Science at The Ohio State University and is Founding Director of the *Oleantangy River Wetland Research Park*. He holds courtesy appointments at University of Florida, University of Notre Dame, and the University of South Florida. His research and teaching have focused on wetland ecology and biogeochemistry, wetland creation and restoration, and ecological engineering. His publications include 5 editions of the text/reference book *Wetlands*. He is also founder (1992) and continues as editor-in-chief of the international journal *Ecological Engineering*. He founded the American Ecological

Engineering Society in 2000. He was awarded the 2004 Stockholm Water Prize, the Ramsar Award for Merit (2015), the Lifetime Achievement Award from Society of Wetland Scientists (2007), and the Theodore M. Sperry Award from the Society for Ecological Restoration (2005). Dr. Mitsch has advised, with thesis or dissertation, 77 graduate students at 4 universities. Nineteen of his former grad students and post docs are teaching in universities in the USA and world.