



William Crumpton

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Ecology, Evolution & Organismal Biology

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Bio Sketch

My training is from Michigan State University (PhD, Limnology) and the University of West Florida (MS, marine science, BS, interdisciplinary science). Before coming to ISU, I spent two years as a Postdoctoral Research Associate at the UC-Davis field station at Lake Tahoe.

Research Interest

My research focuses on wetland processes and functions, including the dynamics of energy flow and nutrient transformation in wetlands, the fate and effects of agricultural contaminants in wetlands, and the role of restored and constructed wetlands in watershed hydrology and water quality. My work combines experimental studies in wetland mesocosms, field studies in natural and restored wetlands, and dynamic simulation modeling in an effort to understand critical processes and predict wetland performance.

Broader Impact of My Work

Much of my current work focuses on the development and application of performance forecast models for siting, design and assessment of wetland restorations in agricultural watersheds. We have developed and field validated a general model for nutrient loss in wetlands receiving non-point source loads and have integrated this model in a watershed-scale framework for performance forecast modeling of alternative wetland restoration scenarios. This work provided the research foundation for the Iowa Conservation Reserve Enhancement Program, a ten-year, \$89 million program using targeted wetland restorations to reduce nitrate loads from tile-drained agricultural watersheds.

Key Words

Wetlands, water quality, biogeochemistry, hydrology, greenhouse gas emissions, restoration, aquatic ecology, ecosystems analysis

Four Key Environmental Science Publications

- Stenback, G.A., **W. G. Crumpton**, K.Schilling and M. Helmers. 2011. Rating curve estimation of nutrient loads in Iowa rivers. *Journal of Hydrology*. 396:158-169
- Miller, B. A., **W.G. Crumpton**, and A. van der Valk. 2009. Spatial distribution of historical wetland classes on the Des Moines Lobe of Iowa. *Wetlands*, 29:1146-1152
- Rose, C. and **W.G. Crumpton**. 2006. Spatial patterns in dissolved oxygen and methane concentrations in a prairie pothole wetland in Iowa, USA. *Wetlands*, 26:1020-1025
- **Crumpton, W.G.** 2001. Using wetlands for water quality improvement in agricultural watersheds: the importance of a watershed scale perspective. *Water Science and Technology*. 44: 559-564

Grant Funding

Over the past three years, Dr. Crumpton has served as the primary or co-investigator for approximately \$2,170,000 in extramural research grant funding related to environmental science.