MELISSA BAUSTIAN, Ph.D.

THE WATER INSTITUTE OF THE GULF

Company Role
Coastal Ecologist / Director of RESTORE Act Center of Excellence for Louisiana

Project Role / Focus Areas
- Water quality subject matter expert
- Coastal ecology subject matter expert
- Development and application of coastal ecosystem models

Education
- Postdoc – Aquatic Ecology, Michigan State University, 2013
- Ph.D. – Oceanography & Coastal Sciences, Louisiana State University, 2011
- M.S. – Oceanography & Coastal Sciences, Louisiana State University, 2005
- B.S. – Biology, Iowa State University, 2003

Professional Membership
- Coastal and Estuarine Research Federation
- Gulf Estuarine Research Society
- Association for the Sciences of Limnology and Oceanography

Experience Profile
Melissa M. Baustian, Ph.D. is a Coastal Ecologist with The Water Institute of the Gulf. She has more than 15 years of experience in researching the water quality, benthic ecology, and wetland ecology of coastal ecosystems.

Dr. Baustian's current research is focused on providing technical support in the data collection and development of analyses and ecosystem models to examine nutrient and carbon related dynamics from restoration efforts in Louisiana's coastal zone. She is also examining climate change related effects on coastal vegetation and ecosystem processes. This includes model improvements and field investigations of organic matter, including decomposition and short-term and long-term soil carbon accumulation rates in herbaceous wetlands across a salinity gradient and determining how black mangrove expansion might alter basal carbon sources in benthic food webs of salt marshes and soil carbon storage.

In addition to being a researcher at the Institute, Dr. Baustian is the Director for the RESTORE Act Center of Excellence for Louisiana (LA-COE) where she leads the administration of a competitive coastal research grants program. She is also adjunct faculty in the Department of Oceanography and Coastal Sciences at Louisiana State University in Baton Rouge.

Professional Experience

The Water Institute of the Gulf 2013-Present
- *Coastal Ecologist*

RESTORE Act Center of Excellence for Louisiana
- *Director* 2018-Present
- *Deputy Director* 2017-2018

Louisiana State University 2015-Present
- *Adjunct Faculty, Department of Oceanography and Coastal Sciences*

Michigan State University 2011-2013
- *Post-doctoral Research Associate, Center for Water Sciences*

Louisiana State University & Louisiana Universities Marine Consortium
- *Graduate Research Associate (Ph.D.)* 2005-2011

Louisiana State University & Louisiana Universities Marine Consortium
- *Graduate Research Associate (M.S.)* 2003-2005

Limnology Laboratory, Iowa State University
- *Undergraduate Research Associate* 2002-2003

Boston University, Woods Hole, MA 2002
- *Marine Program, Research Experience for Undergraduates*

Iowa State University 2001-2002
- *Limnology Laboratory Technician*

Selected Projects

Coastal Carbon Sinks (2021– current). This project is estimating the amount of carbon that can be potentially sequestered with and without the 2017 Louisiana Coastal Master Plan. Current estimates suggest that Louisiana's wetlands account for a notable fraction of the carbon buried in the soil around the world and those assessments need to continuously be updated and refined as new scientific research becomes available. This project will allow the Institute to host technical meetings with various groups across Louisiana and the Gulf of Mexico to gather what is known about carbon capture in existing and restored wetlands and combine it with the 2017 Louisiana Coastal Master Plan model output of habitat areas to assess the net greenhouse gas flux of the coastal area to align with the Governor's greenhouse gas reduction targets of 2025, 2030, and 2050. Project webpage is here.

Lower Trophic Level Inventory for Barataria Estuary, Louisiana (2021-current). Working with partners NOAA, Dynamic Solutions, Louisiana State University, and the University of Louisiana at Lafayette to design a lower trophic level baseline inventory for the Barataria Estuary. The work includes 1) Identifying sources and determining how much existing data is already available. 2) Synthesizing existing data to identify what needed information is currently missing, and 3) Developing a lower trophic level baseline inventory sampling and analysis protocol and design to ensure the work will capture baseline conditions in the Barataria Basin. This baseline inventory will be instrumental in evaluating future changes in the lower trophic community in a way that will be compatible with existing databases. Project webpage is here.

Partnership of our Working Coast Phase II, Port Fourchon, Louisiana (2019-current). Collaborating with natural and social scientists to identify beneficial and nature-based solutions for dredged material to contribute to Louisiana's coastal sustainability efforts, protect coastal communities, and support America's Working Coast. Evaluating the co-benefits of the placement of dredged material for created wetlands, including carbon capture in wetland soils and water quality improvements. Funded by Shell, Chevron, Danos, Greater Lafourche Port Commission and National Fish and Wildlife Foundation. Project webpage is here.

Selected Peer-reviewed Publications

1. **Baustian, M.M.,** Stagg, C.L, Perry, C.L., Moss, L.C., Carruthers, T.J.B., and M. Allison. 2021. Long-term carbon sinks in marsh soils of the Mississippi River Deltaic Plain are at risk to wetland loss. Available here.
2. **Baustian, M.M**, Jung, H., Bienn, H., Barra, M., Hemmerling, S. Wang, Y., White, E., and E. Meselhe. 2020. Engaging coastal community members about natural and nature-based solutions and assessing their ecosystem functions. Ecological Engineering. Available here.
3. **Baustian, M.M.** Meselhe, E., Jung, H., Sadid, K, Duke- Sylvester, S., Visser, J., Allison, M., Moss, L., Ramatchandirane, C, van Maren, B., Jeuken, M., and Bargu, S. 2018. Development of an Integrated Biophysical Model to represent morphological and ecological processes in a changing deltaic and coastal ecosystem. Environmental Modeling and Software. Available here.
4. **Baustian, M.M**., Bargu, S., Rabalais, N.N, and W.L. Morrison. 2018. The polychaete, *Paraprionospio pinnata*, is a likely vector of domoic acid to the benthic food web in the northern Gulf of Mexico. Harmful Algae. Available here.
5. **Baustian, M.M.,** Hansen, G., de Kluijver, A., Robinson, K., Henry Norton, E., Knoll, L., Rose, K, and C. Carey. 2014. Linking the bottom to the top in aquatic ecosystems: mechanisms and stressors of benthic-pelagic coupling. Invited Eco-DAS X chapter for Association for Sciences of Limnology and Oceanography e-book. Available here.

Selected Other Documents

1. **Baustian, M.,** Reed, D, Visser, J, Duke-Sylvester, S., Snedden, G., Wang, H., DeMarco, K, Foster-Martinez, M., Sharp, L., McGinnis, T. and E. Jarrell. 2020. Technical Report of ICM-Wetlands, Vegetation, and Soils Model Improvement Team for 2023 Coastal Master Plan. Prepared for and funded by the Coastal Protection and Restoration Authority (CPRA) under Task Order 71. Baton Rouge, LA. (125 p and available online)
2. **The Water Institute of the Gulf.** 2019. Monitoring Plans for Louisiana's System-Wide Assessment and Monitoring Program (SWAMP), Version IV. Prepared for and funded by the Coastal Protection and Restoration Authority (CPRA) under Task Order 6, Contract No. 2503-12-58. Baton Rouge, LA. 235pp. Available here.

Other Relevant Experience

1. Peer-reviewer for journals: Continental Shelf Research, Ecosystems, Estuaries and Coasts, Freshwater Biology, Global Change Biology, Hydrobiologia, J of Restoration Ecology, Marine Ecology Progress Series, Marine Pollution Bulletin
2. Peer-reviewer for institutions: U.S. Geological Survey, U.S. Environmental Protection Agency
3. Peer-reviewer for funding agencies: Florida, Louisiana, and Maryland Sea Grant, National Science Foundation,
4. Effective communicator of science. Interviewed with local and national journalists and reporters from various institutions, including: Associated Press, CNN, GRIST online news, NOLA.com, Advocate, WaterMarks magazine, BRAF Currents magazine.