Products

Journal Articles

- Jaegge, A., B. Lavergne, E. Pell, B.A. Stauffer (in preparation for submission to Gulf and Caribbean Research in Spring 2021) Combined effects of increased salinity and temperature on the growth of a non-toxic strain of Microcystis aeruginosa. (under preparation)
- Xu, Y.J. and Xu, Z. Extreme floods increase continental carbon export – Results from the unprecedented 2019 Mississippi River mega flood. (to be submitted to Water Research)
- Xu, Y.J. and Xu, Z. Carbon transport and transformation in a 244-km reach of the lowermost Mississippi River. (to be submitted to Journal of Hydrology)

Conference Presentations


Pell, E., A. Jaegge, G. Kurtay, B. Lavergne, B.A. Stauffer. grow it like it's hot: how warming and freshening of estuaries support the growth of cyanobacteria. Poster presentation at the 2020 Midwest Fish & Wildlife Conference in Springfield, IL, Jan 2020.

Lewis, T.L., A. Jaegge, J. Raabe, B.A. Stauffer. Effects of the 2019 Floods on Water Quality and Phytoplankton Communities in South. Louisiana Estuaries. 3rd Annual Symposium for Undergraduate Research Exploration (SURE), University of Texas at Austin, Austin, TX, Nov 2019


Dissertations


Information Transfer Program
The research results were disseminated through journal publications, conference presentations, and student dissertations.

Student Support
Undergraduate: 3
Graduate: 9
Postdoc: 0

Notable Achievements and Awards
- Graduate student Andrea Jaegge of Dr. Stauffer was recognized with the Best Graduate Student Presentation award at the 2020 Gulf Estuarine Research Society (GERS) conference for her presentation of this research.
- Dr. Stauffer was awarded NSF-funded Healthy Streams, Healthy Coasts Research Experience for Undergraduate (REU).
- Director Tsai is the lead institute PI (LA) for the awarded NSF EPSCoR Track-II, IGM--A Framework for Harnessing Big Hydrological Datasets for Integrated Groundwater Management.
- Director Tsai initiated a Memorandum of Understanding (MOU) signed by Louisiana State University and U.S. Geological Survey, Lower Mississippi-Gulf Water Science Center to facilitate research and data exchange between LSU and USGS-LMG.
Assessing Present And Potential Effects Of Cyanotoxins In South Louisiana Estuaries

**Project Type:** Annual Base Grant  
**Project ID:** 2019LA119B

**Project Impact:**
This research project is quantitatively assessing presence of these cyanobacteria and the toxins they produce in estuarine waters of south Louisiana. While cyanotoxin analyses are still underway, this study found that concentrations of particulate microcystins are present in Vermilion Bay. Cyanobacteria were important members of the flood-impacted phytoplankton communities. The flood in 2019 created distinct physical and chemical environment, as indicated by multivariate analyses of several important environmental factors including temperature, salinity, dissolved nutrients, dissolved oxygen (DO), and others. The flood-impacted estuarine waters were, in general, relatively lower in nutrients like nitrate (NO3) and in DO than in previous years. Salinity was also substantially lower throughout the estuaries than previous years. As a proxy for cyanobacteria biomass, we quantified phycocyanin concentrations during the flood period (mainly July-August 2019) and also towards the end of the low salinity period (September 2019). These concentrations showed an inverse relationship with salinity, suggesting that a lot of the cyanobacterial biomass was attributable to freshwater-tolerant species, i.e. the toxin-producing taxa we are interested in. These taxa tend to be smaller in size, at least on the individual cell level, and we also saw increased dominance in the smaller size classes in summer 2019. That dominance was reduced when salinities started to increase in September, again pointing to an important role of small, freshwater-tolerant species in this event. This project is advancing our understanding of the occurrence, prevalence, and environmental drivers of cyanobacterial toxins with animal- and human-health impacts in this region.