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**LUMCON's Research Experience for Undergraduates (REU) Program:
*Interdisciplinary Research Experiences in
Louisiana's Changing Coastal Environments***

2023 LUMCON REU Mentors and Project Opportunities

Mentors and mentor teams will be selected from LUMCON faculty members, their post-docs and graduate students, and visiting scientists who have active research programs addressing basic and applied research questions in and around the Mississippi and Atchafalaya Rivers, their deltas, adjacent wetlands, and nearby shallow coastal or deep ocean waters.

In the summer 2024, REU opportunities are available in several research areas, including:

- ecosystem ecology
- biogeochemistry
- habitat forming species
- dissolved organic matter cycling
- microbial ecology and diversity
- sea level rise
- phytoplankton ecology
- marsh and estuarine biodiversity
- wetland science
- disturbance ecology
- bioimaging and fluid mechanics
- behavioral ecology

The following mentors at LUMCON are accepting students for the 2024 LUMCON REU program (this list will change yearly).

Dr. Brian Roberts is an ecosystem ecologist and biogeochemist. His research group studies how ecosystems along the freshwater-estuary-ocean continuum process and retain nutrients and energy and how this is altered as a result of human perturbations to the landscape. His research interests also include biogeochemical cycling, microbial ecology, plant ecology, and predator-prey interactions in wetlands and estuarine pelagic and benthic environments and involves field observations and controlled mechanistic experiments conducted both in field and laboratory settings. Dr. Roberts is interested in mentoring REU students with interests in working with a team of researchers to develop independent projects that fit within the context of our group's diverse, larger efforts. *Some potential research projects include: wetland biogeochemistry; marsh plant ecology; controls on N cycling rates; microbial communities and CH₄ fluxes / C-cycling rates in marsh and offshore sediments; marsh predator-prey interactions; the role of mussels and/or oysters in living shorelines; disturbance impacts on sand shoal ecosystems; conducting a biodiversity survey of LUMCON's property to augment our Natural History collection (co-advised with Dr. Archer).*

Dr. Stephanie Archer is an ecologist with a research program focused on elucidating the role that habitat forming species (e.g. sponges, oysters) play in maintaining biodiversity and ecosystem function in the Anthropocene. Specifically, the Archer lab is interested in determining how human activities impact the habitat-forming organisms in these systems and the consequences for their associated communities. To address these questions, we use a variety of approaches including natural history, food web ecology, passive acoustics, and analytical chemistry. Our work spans from inland waterways to the deep sea and from the Gulf of Mexico to the Northeastern Pacific. *Dr. Archer is interested in mentoring REU students interested in oyster reef or soundscape ecology. Potential projects include identifying patterns of acoustic behavior in reef-associated taxa, examining the impacts of environmental conditions on oyster feeding behavior, examining the role of soundscapes in juvenile oyster settlement, developing soundscape indicators of biodiversity on Louisiana's artificial reefs, or conducting a biodiversity survey of LUMCON's property to augment our Natural History collection (co-advised with Dr. Roberts).*

Dr. Marshall Bowles investigates the microbiology and geochemistry of salt marsh, coastal, and deep sea environments. The ocean has a great abundance of microbes (e.g. bacteria), indeed they outnumber humans by much more than a million times! We know microbes, though small, change how chemical elements move on Earth. My goal is to understand how microbes in the coast and the ocean interact with the world around them. This means that I typically try to figure out how microbes actually change the chemistry in their environment or are themselves influenced by the chemical environment around them. REU projects in Dr. Bowles' lab will be field and lab based and utilize a variety of microbiological analytical tools, as well as analytical chemistry equipment. *This summer we are looking for students interested in: exploring microbial diversity in salt marsh sediments; describing nutrient fluxes; describing plant microbe interactions; and understanding methane fluxes from coastal sediments.*

Dr. Kevin Du Clos is a biological oceanographer working at the intersection of biology and physics. Research in the Du Clos lab examines how marine organisms interact with their fluid environments through swimming, feeding, sinking, and other behaviors. We use advanced imaging techniques and mathematical modeling to study individual scale behaviors and interactions in the context of large scale ocean processes, such as carbon cycling. We work with a range of organisms, including phytoplankton, oysters, and jellyfish. Dr. Du Clos is particularly excited to mentor students with interests spanning some combination of marine biology, engineering, imaging, and fluid mechanics. REU projects will likely be based mainly in the lab with field collections. *Potential projects include 3D laser scanning of gelatinous organisms, phytoplankton sinking behavior, and effects of oyster reef architecture on feeding on larval recruitment.*

Dr. Guillaume Rieucou is a Marine and Coastal Behavioral Ecologist studying the role of behavior in structuring fish communities and trophic interactions in marine and estuarine ecosystems. He is interested in understanding the fundamental processes that mediate predator-prey interactions, habitat use and aggregative tendencies of marine organisms (from forage fish, elasmobranchs and marine mammals) in a fluctuating environment. He explores how group-living organisms collectively react to external factors such as predators, environmental conditions, anthropogenic disturbances, fishery activities and habitat structure. He addresses most of these questions by conducting laboratory, mesocosm and in situ behavioral experimentations using advanced technology (high resolution imaging sonar, unmanned aerial vehicles) and multi-target computer tracking, video analysis to quantify fine-scale dynamic behavioral responses. He is also using his experience in animal behavior to provide information for conservation and management plans. Potential REU research this summer: *Exploring social interactions of overwintering Floridian manatees (*Trichechus manatus latirostris*) using drone-based photogrammetry and social network analysis.*