



# Louisiana Universities Marine Consortium

## Annual Report Summary FY 2001–FY 2005

Louisiana Universities Marine Consortium  
W. J. DeFelice Marine Center  
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## ***LUMCON's Mission:***

*To increase society's awareness of the environmental, economic and cultural value of Louisiana's coastal and marine environments by conducting research and education programs directly relevant to Louisiana's needs in marine science and serving as a facility for all Louisiana schools interested in marine research and education*

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## *Message from LUMCON's Executive Director* **Dr. Nancy N. Rabalais**

**September 18, 2006**

It is an honor to bring you LUMCON's accomplishments for fiscal years 2001–2005. You might ask, “What took you so long?” There is a good answer: transition. Dr. Michael Dagg stepped down as Executive Director of LUMCON in 2002, and Mr. Kerry St. Pé, Director of the Barataria-Terrebonne National Estuary Program, stepped up to serve as LUMCON's Interim Administrator for the next three years. I was appointed LUMCON Executive Director in June 2005. It will become obvious in this report that LUMCON has been following its tradition of excellence, increasing its programs and activities, and continuing to serve the citizens of Louisiana, the United States and the world. I am proud to have been part of it all as a faculty member and researcher, and I look forward to LUMCON's continued achievements.

LUMCON's research portfolio expands our knowledge of estuaries, coastal waters and open ocean ecosystems, and supports issues of importance to Louisiana's needs in marine science and coastal resources. The Marine Education group relates our research programs and the issues that affect Louisiana to society at many age and education levels. LUMCON's Information Technology (IT) group has likewise expanded its responsibilities and skills in advanced computing and network systems, electronic communications and successful public information activities. IT and Marine Operations also worked diligently to involve LUMCON in the development of a national coastal environmental data acquisition and sharing network. LUMCON's Environmental Monitoring System added four monitoring stations in coastal Louisiana between FY 01–05.

LUMCON's research vessels continue to provide excellent services to the research and education community. The *R/V Pelican*'s role in the Nation's university research vessel fleet has been outstanding, and it continues to maintain a high standard of performance and service. The *R/V Acadiana* serves both research and educational missions of LUMCON, working the coastal waters of the northern Gulf of Mexico and hosting numerous K–12, university, and public educational groups. We also operate Tulane University's *R/V Eugenie* in the Mississippi River and coastal waters.

The Barataria-Terrebonne National Estuary Program (BTNEP) became part of LUMCON on July 1, 2001. The State of Louisiana, through the Board of Regents and a supplement to the LUMCON budget, helped to make this a reality. We welcome our new partners as we join forces in coastal restoration and environmental education. LUMCON remains the mechanism for the transfer of funds for restoration projects funded by the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), which is commonly and fondly known as the Breaux Act. LUMCON also serves as the fiscal agent for CREST, Coastal Restoration and Enhancement through Science and Technology, located at Louisiana State University, Baton Rouge, and funded by the National Oceanic and Atmospheric Administration.

The progress and successes of LUMCON are proudly presented in this five-year report, with more to come in the future.

# Governance and Organizational Structure

LUMCON operates under the authority of a six-member Executive Board comprised of chief executive officers of Louisiana State University and A&M College, Nicholls State University, and the University of Louisiana at Lafayette. The Executive Board reports to the Louisiana Board of Regents.

## LUMCON Executive Board Members for FY 2005

**Dr. Ray Authement, Chairman**

President, University of Louisiana at Lafayette

**Dr. Stephen Hulbert, 1st Vice Chairman**

President, Nicholls State University

**Chancellor Sean O'Keefe, 2nd Vice Chairman**

Chancellor, Louisiana State University and Agricultural and Mechanical College

**Dr. David Boudreaux**

Vice President for Institutional Advancement, Nicholls State University

**Dr. Harold Silverman**

Interim Vice Chancellor/Dean of the Graduate School, Louisiana State University and Agricultural and Mechanical College

**Dr. Robert Stewart**

Vice President of Research & Graduate Studies, University of Louisiana at Lafayette

## Executive Director

**Dr. Nancy N. Rabalais**

June 14, 2005–present

The Executive Board appointed LUMCON Professor Dr. Nancy Rabalais as LUMCON Executive Director on June 14, 2005. Barataria-Terrebonne National Estuary Program Director Mr. Kerry St. Pé served as Interim Administrator of LUMCON from June 1, 2002 to June 14, 2005. His leadership followed the resignation of LUMCON Professor Dr. Michael Dagg as Executive Director on June 30, 2002.

## LUMCON Members

LUMCON's W. J. DeFelice Marine Center and Port Fourchon Laboratory serve as marine science research and education facilities for the following higher education institutions in Louisiana:

- ♦ Centenary College of Louisiana
- ♦ Dillard University
- ♦ Grambling State University
- ♦ Louisiana Association of Independent Colleges and Universities
- ♦ Louisiana College
- ♦ Louisiana State University and A&M College
- ♦ Louisiana State University in Shreveport
- ♦ Louisiana Tech University
- ♦ Loyola University
- ♦ McNeese State University



- ♦ Nicholls State University
- ♦ Northwestern State University
- ♦ Our Lady of Holy Cross College
- ♦ Southeastern Louisiana University
- ♦ Southern University in Baton Rouge
- ♦ Southern University in New Orleans
- ♦ Tulane University
- ♦ University of Louisiana at Lafayette
- ♦ University of Louisiana at Monroe
- ♦ University of New Orleans
- ♦ Xavier University

Students in LUMCON's 2005 summer university course *Marine Field Ecology* identify fish and invertebrates they collected in a seine.



# Facilities

## *W. J. DeFelice Marine Center*

LUMCON's primary facilities are located at the W. J. DeFelice Marine Center in Cocodrie, approximately 85 miles southwest of New Orleans. Situated within the estuarine wetland complex of the Mississippi River deltaic plain between the Atchafalaya and Mississippi rivers, the Marine Center provides researchers, educators and students with access to the Gulf of Mexico and the most productive estuaries in the United States.

The Marine Center's 26,000 square-feet of laboratory space is divided into a wet wing and a dry wing, with the wet wing containing running seawater to support research projects. LUMCON's laboratories contain state-of-the-art analytical instruments, microscopes, seawater tanks, environmental chambers and many types of scientific equipment. A large wet lab houses several fish holding tanks, live food culture facilities, and a racetrack flume that researchers use to study the effects of water movement on geological, biological, and chemical processes. Dormitories and apartments can accommodate up to 80 people. A cafeteria/general meeting room, a 99-seat auditorium, and a distance learning classroom can be utilized for teaching activities, seminars, and conferences.



### Library

Between 2001 and 2005, the library added approximately 3,700 titles to its collection. Acquisitions included conference proceedings, books, technical reports, federal documents, and U.N.-related publications. Arrangements with publishing companies have enabled the library to make nearly 75% of its journals available online. Through the use of private and public donations, the library has replaced its microfiche reader/printer and has added missing journal issues and volumes to its historical collection. Current holdings include approximately 4,000 monographs, 5,800 bound volumes, 200 journal titles, 128 current journal subscriptions, 850 maps, 35 atlases, 3,600 government documents, and 3,200 reprints.

### Information and Technology

LUMCON's computer network provides wireless access to the Marine Center, the *R/V Pelican* (when in port) and much of the grounds. Between 2004–05, the Information and Technology Department upgraded the network to Windows 2003 with Active Directory, upgraded the mail server to Exchange 2003, and added anti-spam software to the email system. Each of these advances increased the network's security and efficiency. The distance learning classroom was upgraded to provide video conferencing over the Internet, as well as through the Bell South system. *LUMCON News*, the Consortium's quarterly newsletter covering LUMCON's research and education activities, expanded its readership to over 1500 subscribers. LUMCON's website ([www.lumcon.edu](http://www.lumcon.edu)) was redesigned in stages during 2004 and 2005 to provide the public with easily-accessed, up-to-date information.



## *Port Fourchon Laboratory*

LUMCON's Port Fourchon Laboratory, located near the mouth of Bayou Lafourche, provides field access to vast salt and brackish marshes, barrier islands and offshore environments of the northern Gulf of Mexico. Its laboratory and housing facilities are frequently used by researchers, educators and students throughout the state.

# LUMCON's Research Program

The location of LUMCON's DeFelice Marine Center on the upper end of Terrebonne Bay makes it an ideal venue for the study of coastal Louisiana. Five general themes form the basis of research by resident faculty and staff: river/ocean interactions, productivity, living resources, human and industrial impacts, and coastal change. Many of our research programs focus on restoring coastal habitats, enhancing fish populations and fisheries, understanding the Mississippi River and its influence on the Gulf of Mexico and coastal ecosystems, examining the interactions of the petroleum industry with the coastal landscape, studying living resources in their physical, chemical and biological settings, and analyzing changes in nutrients, carbon, sediments, and chemistry in Louisiana's waters and the global ocean. The Marine Center's resident faculty and their research programs include:



## Dr. Edward J. Chesney, Associate Professor, University of Rhode Island, 1984

Expansion of the mariculture industry is currently limited by the technical knowledge needed to efficiently and cost-effectively propagate marine finfish. Many tropical and subtropical marine fish species are difficult to spawn and propagate in captivity due to their small larvae, their need for live food as larvae, and complicated spawning cycles and behaviors as adults. With Sea Grant funding, Dr. Chesney and his collaborators are improving the spawning and rearing of commercially important Gulf coast marine fishes for use in aquaculture. Topics of study include the cryopreservation and refrigerated storage of sperm for larval production, larval feeding behavior, live food production, and the development and identification of optimum feeds to improve larval survival and growth. Dr. Chesney's team has been actively engaged in outreach, working with commercial partners to transfer this knowledge directly to the mariculture industry.

Dr. Chesney works to improve the rearing of larval fish, such as this cobia that hatched at the Marine Center.



## Dr. Michael J. Dagg, Professor, University of Washington, 1975

Dr. Dagg and his collaborators have been examining the extent to which bacterial-based food webs contribute to hypoxia in the northern Gulf of Mexico (NGOM). Nutrients from the Mississippi and Atchafalaya Rivers stimulate biological production in the NGOM. Some of this production sinks and decomposes near the bottom, contributing to hypoxia. Bacteria and other small organisms are not usually considered important contributors to hypoxia, however, some zooplankton stimulate the transfer of microbial productivity to bottom waters. In August 2004, gelatinous plankton provided  $> 1 \text{ g m}^{-2} \text{ d}^{-1}$  of organic carbon for the development and maintenance of hypoxia in

the NGOM. For comparison, phytoplankton production is about  $0.5 \text{ g C m}^{-2} \text{ d}^{-1}$ . Dissolved organic carbon supporting this bacterial-based food web may in part originate from Louisiana's coastal wetlands, providing an important link between our eroding wetlands and coastal hypoxia.

Zooplankton, such as this larvacean, may contribute to hypoxia formation by transferring carbon to bottom waters.



## Dr. Quay Dortch, Associate Professor, University of Washington, 1970

The quantity and types of nutrients that enter local bays and the coastal Gulf of Mexico partially determine the abundance and types of phytoplankton that grow in these waters. We examine ambient water quality, phytoplankton community composition, and the response of phytoplankton to changes in nutrients in local waters. The phytoplankton research group is highly skilled in phytoplankton identification in estuarine and offshore waters. We maintain a long-term phytoplankton database with ancillary physical, biological, and chemical variables that dates back to 1990. We also maintain a list of harmful algal bloom species and their occurrences. LUMCON responds to requests from state and federal public health agencies concerning harmful algal blooms that may be toxic to humans through the consumption of shellfish or exposure through activities on the water.

Research associate Wendy Morrison identifies algae in a sample of water collected from Lake Salvador.





### **Dr. Christopher M. Finelli, Associate Professor, University of South Carolina, 1997**

Dr. Finelli's lab is interested in the effects of water flow on ecological processes. Recently, they completed a water quality study along the Bayou Lafourche-Bayou Terrebonne-Bayou Petit Caillou complex in Terrebonne Parish, LA. Their results show degraded water quality, including persistent hypoxia, along much of the bayou. Water quality was consistently highest in Cocodrie and Thibodaux, two points that receive flushing from tides or the Mississippi River. The lowest water quality was in downtown Houma and in Chauvin, where the bayou is stagnant and receives pollutant input from developed areas. In addition to these results, they measured the effects of Hurricanes Katrina and Rita on local water quality. Importantly, they documented persistent increased salinity in Houma resulting from Hurricane Rita. Their work suggests that increasing flow into the bayous may mitigate the effects of poor water quality and hurricanes by flushing the bayou with fresh water.

Graduate student Laurie Rodrigue deploys a meter that will measure the dissolved oxygen in Bayou Terrebonne.



### **Dr. Rodney T. Powell, Associate Professor, Florida State University, 1995**

Dr. Powell's lab is interested in macronutrient biogeochemistry in the Mississippi River and its coastal plume and trace element chemistry in the open ocean. His laboratory is currently conducting research into the nitrate supply to the coastal zone of the Gulf of Mexico. This supply of nitrogen has been linked to the annual hypoxic zone, which occurs in bottom waters of the Louisiana continental shelf. As part of this research, Dr. Powell maintains an in situ nitrate meter that is moored in the Mississippi River near Audubon Park in New Orleans. This instrument conducts hourly measurements of nitrate, allowing us to better observe the short-term changes in nitrate concentrations in the River. As a result, we may be able to better understand the relationship between nutrient supply and hypoxia in the Gulf of Mexico.

Research associate Amy Wilson-Finelli adjusts a meter that records nitrate levels in the Mississippi River in New Orleans.



### **Dr. Nancy N. Rabalais, Professor, University of Texas, 1983**

The occurrence and frequency of oxygen deficiency in aquatic systems has increased exponentially since the 1960s. The second largest zone of coastal hypoxia in the world's ocean is on the Louisiana coast, stretching from the Mississippi River past the Louisiana/Texas border. The oxygen is low enough in this area that fish, shrimp and crabs must migrate away or perish, while sediment-dwelling organisms eventually succumb to the suffocating conditions in the region thus popularized as "The Dead Zone." We have studied the distribution and dynamics of Louisiana's hypoxic area since 1985, and have generated a better understanding of those aspects, the relationships with physical, chemical, and biological parameters, and the influence of the Mississippi River, particularly nutrient flux, which has tripled over the last 50 years. We also employ historical indicators of enhanced coastal productivity and worsening oxygen conditions in estuaries (Louisiana and Florida) and in the nearshore Gulf of Mexico.

An oceanographic instrument called a CTD is lowered into the Gulf of Mexico during a research cruise.



### **Dr. Paul Sammarco, Professor, State University of New York, 1977**

Dr. Sammarco's research projects include his examination of Louisiana's offshore oil and gas platforms for coral recruitment and diversity. His research has shown that these platforms have been colonized by Caribbean reef-building corals and other reef organisms, expanding their biogeographic range throughout the Gulf. He has also shown that these coral populations are relatively isolated genetically from those on other reefs in this part of the Atlantic. The results of these recent studies have modified our perspective on how these structures are viewed by the public, industry, and federal and state government. Legislation has recently been passed to change how these structures will be regulated in the future, allowing some to be preserved as artificial reefs and others to be potentially utilized for alternate purposes such as mariculture and wind and thermal energy generation.

Dr. Sammarco surveys a platform in the Gulf that is populated by a variety of coral species and tropical fish.





# Adjunct Faculty



**Dr. Brent A. McKee**

Adjunct Professor  
North Carolina State University, 1986

Dr. McKee's research focuses on the sedimentary and geochemical processes in coastal environments influenced by major rivers. Much of his work involves the study of the fate of trace elements and radionuclides.

**Dr. Denise J. Reed**

Adjunct Professor  
University of Cambridge, England, 1986

Dr. Reed's research focuses on the geomorphology and hydrology of coastal marshes and estuaries and on sediment dynamics, deposition, and accretionary processes needed for marshes to combat relative sea-level rise.



\* Dr. Quay Dortch, listed under LUMCON faculty, became an adjunct faculty member in 2005.

## Post-Doctoral Associates

**Dr. Nazan Atilla** (2001–03): Dr. Atilla studied the relationships of phytoplankton pigments, phytoplankton cell counts and volumes, and chemical signatures of specific phytoplankton as part of the project *Refining Chloropigment Data for Estuarine Phytoplankton Community Composition*, which was funded by Louisiana Sea Grant. (N. Rabalais, advisor).

**Dr. Sarah Frias Torres** (2002–03): Dr. Frias Torres worked on a retrospective statistical and modeling analysis of fishery data to understand the effects of hypoxia and other coastal stresses on coastal fishes and their habitats in the northern Gulf of Mexico. (E. Chesney, advisor).

**Dr. Rebecca Green** (2003–05): Dr. Green worked on the modeling of water column processes in the Mississippi River plume. (M. Dagg, advisor).

**Dr. Grady Hanrahan** (2002–03): Dr. Hanrahan's research focused on nutrient cycling. He oversaw two projects: the determination of the importance of sediment re-suspension in Lake Pontchartrain and the initial use of in situ nitrate sensors in the Mississippi River. (R. Powell, advisor).

**Dr. Hongbin Liu** (2000–02): Dr. Liu worked on microzooplankton and mesozooplankton processes in the northern Gulf of Mexico and the Gulf of Alaska. (M. Dagg, advisor).

**Dr. Steve Money** (2000–02): Dr. Money's research centered around the optimization of an electrochemical technique for the determination of organic complexation of mercury. (R. Powell, advisor).

**Dr. Ling Ren** (2003–present): Dr. Ren examined nutrient limitations and effects of Mississippi River diversions on the phytoplankton communities of the upper Barataria estuary, a component of the NOAA-funded project *Multistress: Coastal Stressors in the Northern Gulf of Mexico*. (N. Rabalais, advisor).

**Dr. Riki Sato** (2002–04): Dr. Sato worked on larvacean population dynamics in the Gulf of Mexico and Gulf of Alaska. (M. Dagg, advisor).

**Dr. Malinda Sutor** (2004–06): Dr. Sutor worked on fine scale vertical distribution of plankton in the Mississippi River plume and northern Gulf of Mexico. (M. Dagg, advisor).

**Dr. Ted Switzer** (2003–04): Dr. Switzer worked on a retrospective statistical and modeling analysis of fishery data to understand the effects of hypoxia and other coastal stresses on coastal fishes and their habitats in the northern Gulf of Mexico. (E. Chesney, advisor).

**Dr. Juanita Urban-Rich** (1997–2000): Dr. Urban-Rich worked on zooplankton population dynamics in the Southern Ocean, zooplankton production of colored dissolved organic matter in the Mississippi River plume and northern Gulf of Mexico. (M. Dagg, advisor).

**Dr. Wai Hing "David" Wong** (2003–05): Dr. Wong worked on the top down control of phytoplankton biomass by pelagic and benthic grazers in the upper Barataria estuary, a component of the NOAA-funded project *Multistress: Coastal Stressors in the Northern Gulf of Mexico*. (N. Rabalais, advisor).

**Dr. Jinchun Yuan** (2002–03): Dr. Yuan worked on satellite remote sensing in the northern Gulf of Mexico. (M. Dagg, advisor).



# LUMCON's University Education Program

## University Courses

LUMCON's University Education Program offers undergraduate and graduate students a variety of marine science courses for credit through member and affiliate universities and colleges. In 2002, LUMCON changed its core course curriculum to better meet the needs of Louisiana students and to improve student enrollment by offering alternating sets of courses that complement LUMCON's location, facilities and areas of faculty expertise. The new courses were taught mainly by LUMCON faculty, but some were taught by faculty from Louisiana universities. Some summer instructors were supported by teaching assistants, an arrangement that gave graduate students experience teaching at the college level. The LUMCON Foundation provided highly qualified LUMCON summer students with scholarships to cover room and board expenses.

## Internship Program

In 2001, LUMCON's summer internship opportunities were expanded into a formal program thanks to support from the LUMCON Foundation. The Foundation provided money for student stipends, room and board expenses, research supplies, a symposium social, and a field day. From 2001 through 2005, the Foundation supported 25 interns, five of which registered for and earned a total of 15 university credit hours. The internships were available in marine science research, information technology, marine education and library science.

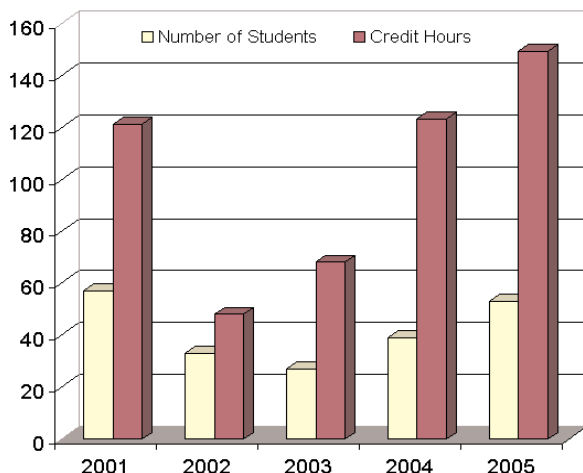
## LAMP Program

The LUMCON-Louis Stokes-Louisiana Alliance for Minority Participation (LS-LAMP) program was one of eleven LAMP programs in Louisiana. Phase I was initiated in 1995 by LUMCON professor Dr. Paul Sammarco and continued through the completion of Phase II in 2004. The program's purpose was to increase representation of undergraduate minority students in the fields of science, mathematics, engineering and technology, and to encourage them to pursue graduate degrees in those fields. LUMCON was the sole representative for marine science within the state. The program was co-funded by the National Science Foundation and the Louisiana Education Quality Support Fund. LAMP offered students research fellowships and educational scholarships, provided room and board at the Marine Center, and supported participation in national and international conferences. LUMCON sponsored 25 LAMP students between FY 01–05, many of whom were supervised by members of the LUMCON faculty and conducted research projects while in residence at the Marine Center.

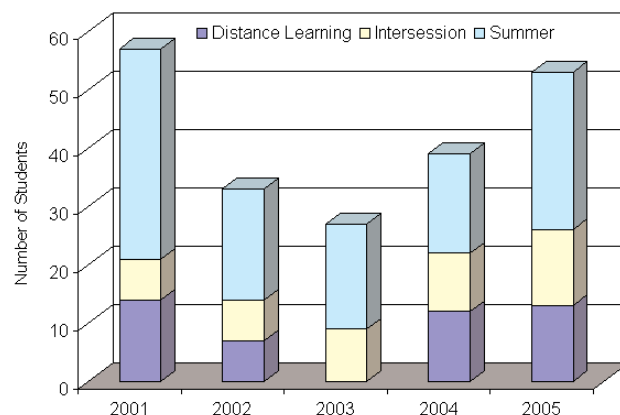
### University Courses Offered During FY 01–FY 05\*

Aquatic Chemistry  
Biogeochemical Field Methods  
Cetacean Field Studies  
Changing Coastal Oceans  
Coastal Habitat Loss  
Coastal Landscape Photography  
Coral Reef Ecology  
Introduction to Marine Environmental Chemistry  
Introduction to Marine Zoology  
Marine Field Ecology  
Marine Fish Ecology  
Marine Field Geology  
Marine Invertebrates in their Environment  
Marine Plankton  
Special Problems in Marine Science  
Wetland Biogeochemistry  
Wetland Vegetation

\* All courses are not offered every year



Number of students and credit hours earned in LUMCON university courses. Students who took multiple classes count once.



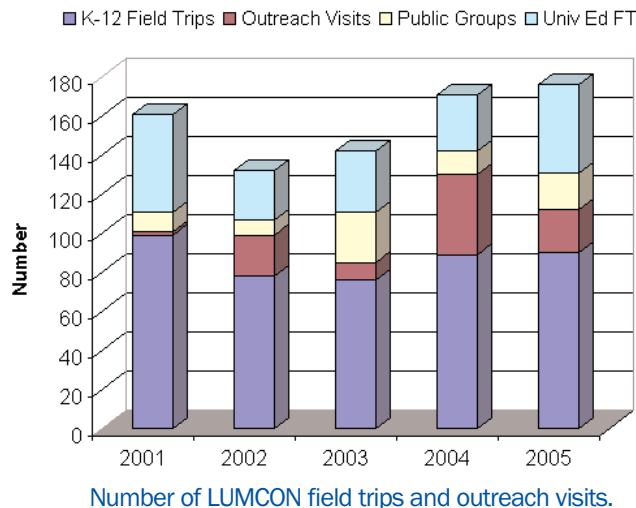
Number of students enrolled in a LUMCON university course by category.

# LUMCON's Marine Education Program

From FY 2001–05, LUMCON's Marine Education Department diversified its programs and increased its offerings for K–12, university, teacher, and public groups. All programs address one or more of the Department's goals: 1) inform LUMCON visitors of the research activities of LUMCON scientists, 2) promote awareness of marine environments and their connection to land, and 3) clarify the scientific process and how it is used to make environmental decisions.

## Bayouside Classroom

In 2001, Marine Education Instructor Dr. Jessica Kastler and Associate Professor Dr. Chris Finelli collaborated to develop a water sampling program for students in grades 7–10. Students involved in this program learn to test the water quality of their local waterways and enter their data into an online database. While initially focused on schools in Terrebonne Parish, the success of the program has resulted in its expansion to 27 additional schools outside of the Parish. The program has been funded by the National Science Foundation, the Barataria-Terrebonne National Estuary Program and the Terrebonne Parish Public School District.

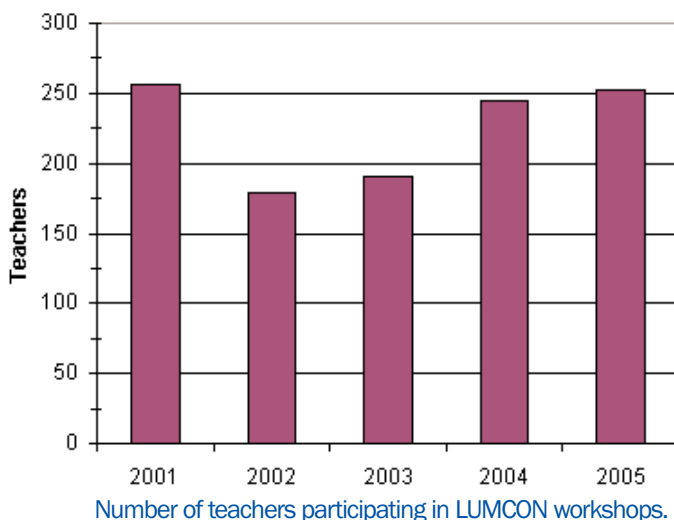


## Wetland Education Through Maps And Aerial Photography (WETMAAP) Workshop

LUMCON hosted three WETMAAP teacher workshops at the DeFelice Marine Center in 2001. The workshops, sponsored by the Barataria-Terrebonne National Estuary Program, provided educators and students with an introductory lesson in wetland ecology and land-loss issues through hands-on applications such as wetland mapping and the utilization of digital databases and GIS technology.

## Students and Teachers as Educational Partners (STEPS)

Since 2002, the STEPS workshop has been held annually at the Marine Center as a way of providing Louisiana teachers with the training necessary to involve their students in LUMCON's Bayouside Classroom. In addition to this training, teachers are given a thorough lesson in the challenges facing the Barataria-Terrebonne Estuary.

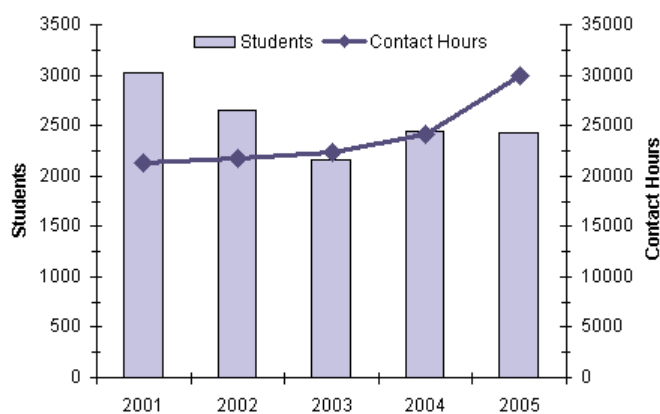


## Centers for Ocean Sciences Education Excellence (COSEE): Central Gulf of Mexico

LUMCON hosted the annual COSEE summer institute at the Marine Center for 2003–05. The central Gulf of Mexico COSEE program brings together K–12 teachers and research scientists from the Gulf coast states for an intense week-long educational experience. Teachers learn about marine science through lectures and field and laboratory work, and scientists learn new methods of relating their work to the public. The program was initiated in 2003 with funding from the National Science Foundation to the University of Southern Mississippi (lead institute), and renewed for five years in 2005.

## Faculty Institutes Reforming Science Teaching II (FIRST II):

FIRST II is a National Science Foundation collaboration between Michigan State University and the University of Oregon that provides opportunities for faculty to improve their science teaching. Focused at eight biological field stations and marine laboratories across the country, teams of scientists interact in a supportive environment where teaching and learning can be fully integrated into their professional culture. Drs. Christopher Finelli, Jessica Kastler and Rodney Powell hosted FIRST II at LUMCON's Marine Center in 2002, recruiting teams of faculty from Louisiana State University (Baton Rouge and Shreveport campuses), Nicholls State University, Northwestern State University, and the University of New Orleans. After a series of professional development workshops, the field stations and teams continue to work together, providing a reinforcement of university education and Consortium goals.



Number of K-12 students visiting LUMCON's Marine Center on field trips and student contact hours generated during their visits.

## LUMCON Estuarine Awareness and Diversity Camp (LEAD):

Since 2001, LEAD Camp has annually provided a powerful, residential field experience for a select group of 10–15 high school students. To be considered for the program, campers need only express a sincere desire to spend a week learning Louisiana coastal ecosystem science and stewardship. Participants conduct field work, laboratory assignments, and class work in pursuit of a greater understanding of how this part of the world functions.

## Education Event Highlight: *JASON Expedition Films at DeFelice Marine Center*

The JASON Foundation for Education focused on Louisiana's *Disappearing Wetlands* for its 2004–05 JASON Expedition. JASON Expeditions filmed 30 live interactive broadcasts January 31–February 5, 2005, at LUMCON's DeFelice Marine Center, LUMCON's Port Fourchon Laboratory, and the Jean Lafitte National Historic Park and Preserve, Barataria Preserve. The broadcasts brought the importance, complexity and fragility of south Louisiana's wetlands to over 33,000 teachers and 1.7 million students worldwide. Included in this audience were students from Montegut Middle School and Houma Junior High School, who visited LUMCON's Marine Center to watch the broadcasts and meet the production team. Live transmissions are just one part of JASON's hands-on standards-based science curriculum for fourth–ninth grade teachers and students, which has focused on a different scientific location annually for the past sixteen years. The JASON Program was developed by Dr. Robert Ballard, discoverer of the *H.M.S. Titanic*.

The four Host Researchers for this Expedition were Dr. Denise Reed, a geology professor at the University of New Orleans and an adjunct professor at LUMCON, Dr. Earl Melancon, a marine science professor at Nicholls State University, Dr. Jacoby Carter, an ecologist with the United States Geological Survey National Wetlands Research Center and Mark Schexnayder, a marine biologist with Louisiana State University AgCenter. In addition to participating in the broadcasts, the researchers helped to develop the *Disappearing Wetlands* curriculum and scheduled live online question and answer sessions with students across the globe.



JASON student scientists (called Argonauts) film a segment of the JASON Expedition with Dr. Denise Reed in the marsh behind LUMCON's Marine Center.



# Vessel Operations

## LUMCON's Research Vessels

### R/V Pelican

The *R/V Pelican* was built in 1985 at Allied Shipyard in Larose, LA, with funding provided by the State of Louisiana. It was designated a Universities National Oceanographic Laboratories System (UNOLS) vessel in 1986, and is now one of three UNOLS vessels home-ported in the Gulf of Mexico (GOM). The *Pelican* is an important asset to researchers in the Gulf, accommodating approximately 80% of the UNOLS-GOM vessel days at sea in this region.



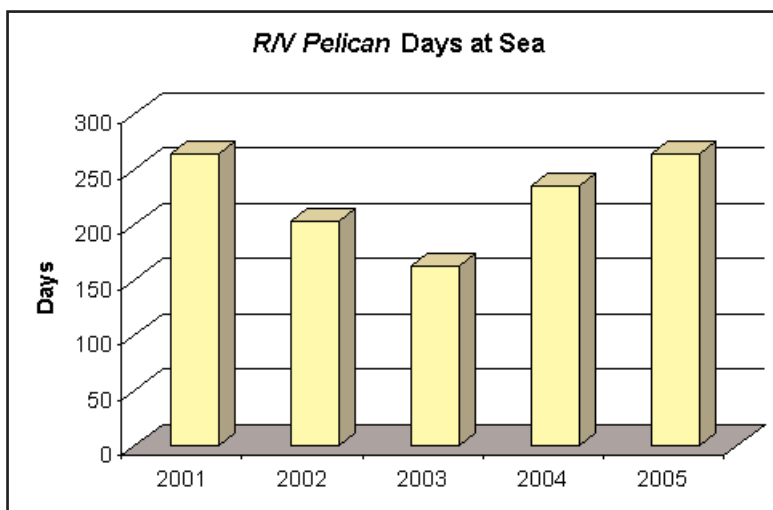
In 2002–03, the State of Louisiana and the National Science Foundation (NSF) provided funds to refit and expand the length of the *Pelican*. The ship was dry docked for six months at Conrad Shipyard in Morgan City, Louisiana, where 10 feet were added to her stern, increasing her length from 106 to 116 feet. As part of the \$3 million refit, Conrad Shipyard gutted the interior of the ship and replaced all walls, floors and overhead coverings with new modern sound proofing materials. Bilge, ballast, potable, and seawater systems were upgraded, and all piping associated with these systems was replaced. The ship's steering system, internal communication system, alarm system, navigation panels and entire electrical system, including fixtures and

panels, were also replaced. The engine and generators were removed and rebuilt, and the generators were shock mounted to improve the overall acoustic qualities of the ship. The NSF provided funding for a new main deck Dynacon trawl/coring winch, a new Appleton folding boom crane, and a 75 KHz RDI phased array Acoustic Doppler Current Profiler.

During the 2001–05 operating period the *Pelican* continued its role as the most utilized small/medium UNOLS vessel in the fleet, with an average of 230 days at sea/year (exclusive of the 2003–04 season, which was shortened by the refit). The 2004 operating year extended the *Pelican's* normal operating range from the northern GOM to the Caribbean and Gulf waters off the northwestern tip of the Yucatan Peninsula. For two research cruises, the ship operated off Jamaica, the Dominican Republic, Haiti, Puerto

Rico, Trinidad and Tobago, St. Vincente, and the Grenadines, in support of programs sponsored by the U.S. Office of Naval Research, U.S. Department of Energy, and U.S. National Oceanographic and Atmospheric Administration. In June 2004, the *Pelican* traveled to Progreso, Mexico, with scientists from the University of Louisiana at Lafayette to conduct NSF-funded science in the Gulf of Campeche.

The *Pelican* will continue to serve science in this region of the world's ocean and provide opportunities for ocean scientists in the GOM and Caribbean Sea.

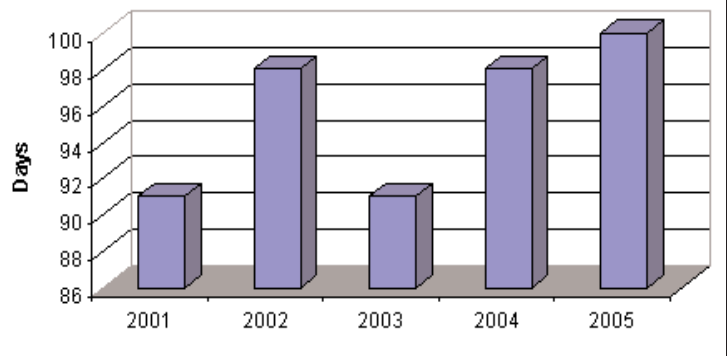


## R/V ACADIANA

The *R/V Acadiana* was built in 1986 with funding from the State of Louisiana and has been the primary vessel for sponsored research activities in the shallow bays and near-shore coastal areas inaccessible to deeper draft vessels. The 58-foot vessel typically spends an average of 95 days at sea annually in support of sponsored research programs and teaching activities along the coasts of Louisiana, Texas, Mississippi, and Alabama. The *Acadiana* is used approximately 50% of the time as a support vessel for the LUMCON Marine Education Program. In this capacity, the *Acadiana* is used to transport students to Terrebonne Bay near the DeFelice Marine Center where they are introduced to various oceanographic sampling techniques. Students sample the water column in the bay using the ship's installed hydrographic sampling equipment and retrieve marine organisms from the bottom with a 25' otter trawl. The remainder of the year the *Acadiana* conducts sponsored research cruises in support of activities as diverse as surveys of hypoxic bottom waters in the Gulf of Mexico, to archeological expeditions in search of Civil War relics in the lower reaches of the Mississippi and Atchafalaya rivers.



**R/V Acadiana Days at Sea**



## R/V EUGENIE

Tulane University purchased the *R/V Eugenie* (ex. *R/V Onrust*) from the State University of New York in 2001, and in 2003, asked LUMCON to assume responsibility for managing and operating the vessel. The *Eugenie* is the vessel of choice for Tulane scientists studying linkages between the Mississippi River and the Gulf of Mexico. These studies have taken the *Eugenie* as far west as Galveston, Texas, and as far east as Mobile Bay, Alabama.

## SMALL BOATS

LUMCON maintains a fleet of small outboard boats ranging in size from 14 to 30 feet. All of these boats (except the pontoon) are trailerable and are available for scientists and educators working in Louisiana's coastal environments.

### LUMCON's Small Boats



- Dos Gris*—30' aluminum pontoon
- Whiskey Pass*—23' aluminum V hull
- Grey Goose*—22' aluminum hull with cabin
- Coli*—21' aluminum hull, partial cabin
- Fearman*—19' aluminum tri-hull work boat
- Big Al*—17' aluminum tri-hull work boat
- Silver Bullet*—17' aluminum flat boat
- Marsh Bug*—16' aluminum air boat
- Swamp Thing*—14' aluminum flat boat
- Dinghy*—14' aluminum flat boat
- Odie*—14' aluminum flat boat



# LUMCON's Environmental Monitoring System

LUMCON's Environmental Monitoring System collects and archives real-time meteorological and hydrographic data to provide a broad community of scientists, educators, students, and the public with quality-controlled environmental data from Louisiana's Gulf coast. In the last five years, LUMCON's monitoring system has expanded from two stations, one located at the DeFelice Marine Center and one in Terrebonne Bay (destroyed in 2004, but destined for reconstruction), to six stations spanning the southeastern Louisiana coastline.

LUMCON's monitoring stations were created primarily to support research programs. The Lake Pontchartrain station was constructed in 2000 to study sediment re-suspension during storm events. The Tambour Bay station was added shortly afterwards to complement Nicholls State University professor Dr. Tom Soniat's oyster research. The Audubon-Mississippi River station in New Orleans was brought online in 2003 to support the study of nutrient loading in the River. In 2005, LUMCON installed monitoring instruments at the Branch Pilot's station at Southwest Pass to record environmental conditions near the mouth of the Mississippi River.

Meteorological and hydrographic instruments installed at the stations record wind speed and direction, air temperature, relative humidity, precipitation, barometric pressure, solar radiation, quantum radiation, water temperature, water height, salinity, conductivity, turbidity and chlorophyll concentration. These data are utilized for many purposes, including research, weather forecasting, commercial fishing, resource management, habitat restoration, public health, and education.

Funding for station construction and for the purchase of instrumentation was obtained through grants from NOAA, EPA, NASA, USGS, and the State of Louisiana. Maintenance and operation costs have been borne by various grants and LUMCON. Archived and current meteorological and hydrographic data from LUMCON's stations are available at [weather.lumcon.edu](http://weather.lumcon.edu).

LUMCON installed a Vaisala 915 mega-hertz LAP®-3000 Lower Atmosphere Profiler and a radio acoustic sounding system at its DeFelice Marine Center in 2004. This equipment collects meteorological data as part of a three-year Minerals Management Services environmental studies program that is examining the effects of meteorological conditions and industry emissions on visibility within Breton National Wilderness Area. Data collected from these instruments will also be used in other regional studies that address ozone, particulate matter and regional haze.



LUMCON's DeFelice Marine Center monitoring station.



## The Barataria-Terrebonne National Estuary Program

The Barataria-Terrebonne National Estuary Program (BTNEP), one of 28 National Estuary Programs in the United States, works to coordinate agency and stakeholder efforts related to restoration in the Barataria-Terrebonne system and to create a sense of environmental stewardship for the natural resources of the 4.2 million-acre estuarine system. The BTNEP, previously under the administration of the Louisiana Department of Environmental Quality, came under the administration of LUMCON in July 2001.

The BTNEP works towards meeting the objectives of its 51 action plans outlined in its Comprehensive Conservation and Management Plan, in ways ranging from facilitating coastal restoration projects like the Fourchon Maritime Forest Ridge and Marsh Restoration project, to outstanding education and outreach initiatives. These initiatives foster a greater understanding and appreciation of the estuary system by connecting estuary residents, visitors and policymakers to the natural, cultural and historic resources of these two basins in tangible ways. Popular outreach programs include the annual La Fête d'Ecologie festival and Paddle Bayou Lafourche. BTNEP's volunteer program provides multiple ways for citizens to become involved in restoration and monitoring activities in the estuary, including vegetative plantings, invasive species removals and water quality monitoring. In 2005, the BTNEP introduced its competitive Mini-Grants Program. This program funds selected community-based restoration, outreach and education projects designed to increase awareness of the issues facing the estuary, while working with the BTNEP towards creating effective solutions.

BTNEP volunteers learn how to plant *Spartina alterniflora*, a common wetland plant used in coastal restoration projects.





# LUMCON Events Spotlight

## *LUMCON Reinstates Marine Center Open House*

On April 12, 2003, LUMCON welcomed visitors to explore its DeFelice Marine Center with an open house that marked the first such activity since 1996. An estimated 600 visitors received behind-the-scenes tours of LUMCON's



Visitors at the 2003 open house used microscopes to look at live phytoplankton.



research labs, spoke one-on-one with scientists, participated in a host of educational activities, and joined in educator-led cruises aboard LUMCON's *R/V Acadiana*. Based on the great success of this open house and strong public interest in the event, the Marine Center again opened its doors in May 2005, with an open house that celebrated the Consortium's 25-year anniversary. Over 1000 people attended this

Visitors tested the water quality of LUMCON's front pond by following BayouSide Classroom protocols.

day-long event. LUMCON will continue to host open houses biennially to showcase the research and education activities of its employees and members.

## *Local Students Connect With Discoverer of H.M.S. Titanic*

On June 7, 2004, students from Terrebonne Parish schools assembled at LUMCON's DeFelice Marine Center for a rare opportunity to participate in an exclusive live web interaction with Dr. Robert Ballard, the esteemed scientist who discovered the *R.M.S. Titanic* in 1985. Ballard answered students' questions from aboard the National Oceanic and Atmospheric Administration research vessel *Ronald H. Brown* that sat off the Grand Banks of Newfoundland, positioned 12,000 feet above the remains of the *Titanic*, which sank after hitting an iceberg on April 14, 1912.

LUMCON's webcast was one of only five *ultimate* fieldtrips that occurred nationwide through the JASON Foundation for Education, a leading provider of experience-based science and math curriculum supplements and professional learning for grades four–nine that was founded by Ballard in 1989. The webcasts coincided with the May 30–June 9, 2004, *Return to Titanic* expedition that marked Ballard's second return to the *Titanic* since he discovered the ship. The crew's primary mission was to document the extent of the ship's deterioration over the past 19 years and determine the natural and anthropogenic factors that are contributing to its decline.

## *Graduate Student Symposium Draws Students to Cocodrie from Across the South*

Seventy marine science graduate students from ten universities across the southern United States converged at LUMCON's DeFelice Marine Center January 28–30, 2005, to participate in the sixth annual Graduate Student Symposium. Many of the students were returning for their second or third time to participate in this intensive weekend event that aims to provide graduate students with a supportive environment for presenting their research, sharing information and ideas, and building relationships among their peers.

The Symposium was held at the Marine Center for the first time in 2005, which also marks the first time it was organized by the Marine Environmental Researchers (MER) graduate student organization at Louisiana State University. In previous years, the Symposium was organized by marine science graduate students at the University of Southern Mississippi or the University of South Alabama. After the highly-successful symposium, MER and LUMCON's Marine Center will likely be added to the rotation as symposium organizer and hosting facility.

Lindsey Kramer, Melissa Baustian, Jennifer Spicer, and Ryan Eytan (left to right) received awards for their presentations at the Symposium.



# LUMCON's Financial Report

LUMCON as a state agency has a yearly appropriation that is supported by House Bill 1 (HB1), which sets LUMCON's operating and ancillary budgets. HB1 specifies the amount of money LUMCON receives from state general direct funding, self-generated funding, statutory dedicated funding, interagency funding, and federal funding. State general funds provide 40% or less of LUMCON's overall budget.

Significant State Budgetary Items:

- **FY 01–02:** LUMCON received a transfer of \$305,243 in state general funding due to the Barataria-Terrebonne National Estuary Program being moved from the Louisiana Department of Environmental Quality to LUMCON.
- **FY 02–03:** LUMCON received a \$200,000 state general enhancement to fund additional research faculty and support LUMCON's environmental monitoring program.
- **FY 03–04:** LUMCON received a \$250,000 state general enhancement for the Barataria-Terrebonne National Estuary Program to help restore previously-cut funding and meet EPA federal funding match requirements.

All other adjustments to state general funding have been due to changes in fringe benefits or insurance premiums or budget cuts resulting from limited state general funds.

Self-generated funds are derived from billings for cafeteria, dorms, public customers of vessels, and grants from private entities. Statutory dedicated funds are from the Support Education in Louisiana First fund, which is dedicated towards faculty pay increases. The interagency funds are received from other state agencies such as the Louisiana Board of Regents and Facility Planning and Control. Federal funding is from federal agency grants or from federal customers of LUMCON's research vessels.

## LUMCON Total Funding for FY 01–05

Funding Source	Fiscal Year					TOTAL
	00–01	01–02	02–03	03–04	04–05	
State Appropriation	1,808,571	2,192,697	2,462,568	2,800,728	2,879,517	12,144,081
Statutory Dedication	0	110,060	58,516	31,290	31,335	231,201
Federal	2,256,072	3,024,944	3,271,773	3,254,775	4,534,867	16,342,231
Interagency	315,994	731,578	641,390	626,303	1,174,259	3,489,524
Self-Generated	475,670	193,588	337,486	697,789	1,200,000	2,904,533
<b>TOTAL</b>	<b>4,856,307</b>	<b>6,252,867</b>	<b>6,771,733</b>	<b>7,410,885</b>	<b>9,819,778</b>	<b>35,111,570</b>

## LUMCON Grant Funding for FY 01–05

Funding Source	Fiscal Year					TOTAL
	00–01	01–02	02–03	03–04	04–05	
NOAA	182,635	3,211,586	1,914,208	196,662	0	5,505,091
National Science Foundation	1,341,487	1,407,400	488,775	63,519	329,580	3,630,761
Environmental Protection Agency	0	436,278	384,143	428,802	516,887	1,766,110
Louisiana Board of Regents	1,530,320	185,250	0	0	0	1,715,570
U.S. Office of Naval Research	0	417,804	662,491	0	0	1,080,295
U.S. Army Corps of Engineers	359,450	100,000	99,000	0	99,000	657,450
Minerals Management Service	90,896	0	0	311,350	0	402,246
National Marine Fisheries Service	0	0	0	266,416	0	266,416
Dixie Fish Farm	0	0	0	25,446	0	25,446
Texas A&M University	0	25,000	0	0	0	25,000
La. Dept. of Environmental Quality	0	23,104	0	0	0	23,104
U.S. Geological Survey	5,996	0	0	14,956	0	20,952
NASA	0	0	20,030	0	0	20,030
<b>TOTAL</b>	<b>3,510,784</b>	<b>5,806,422</b>	<b>3,568,647</b>	<b>1,307,151</b>	<b>945,467</b>	<b>15,138,471</b>

## Appendix A: LUMCON Graduate Students for FY 2001–05

**Atchison, Amy**, M.S. 2005. Dept. of Oceanography and Coastal Sciences, Louisiana State University (LSU). *Offshore oil and gas platforms as stepping stones for expansion of coral communities: A molecular genetic analysis*. (P. Sammarco, advisor).

**Atila, Nazan**, Ph.D. 2001. Dept. of Zoology & Physiology, LSU. *Colonization of meiofauna on artificial substrates*. (N. Rabalais, committee member).

**Baustian, Melissa M.**, M.S. 2005. Dept. of Oceanography and Coastal Sciences, LSU. *Benthic communities in the northern Gulf of Mexico hypoxic area: Potential prey for demersal fish*. (N. Rabalais, advisor).

**Das, Anandita**, Ph.D. 2004–present. Dept. of Oceanography and Coastal Science, LSU. (N. Rabalais, committee member).

**Flanagan, Sharon**, Ph.D. 2000. Dept. of Curriculum and Instruction, LSU. *Regional differences in understanding between two groups of high school science students of a complex environmental science concept known as the dead zone of the Gulf of Mexico: A web-based approach*. (N. Rabalais, committee member).

**Fontenot, Jacques**, M.S. 2004–present. Dept. of Biology, Nicholls State University (NSU). *Behavioral responses of coral planulae to critical temperature thermoclines*. (P. Sammarco, advisor).

**Gavio, Brigitte**, Ph.D. 2002. Dept. of Biology, University of Louisiana at Lafayette (ULL). *Systematics of the Rhodymeniales-Cryptonemiales complex (Rhodophyta), with emphasis on taxa from the Western Atlantic*. (P. Sammarco, committee member).

**Gothreaux, Craig**, M.S. 2003–present. School of Renewable Natural Resources, LSU. (E. Chesney, committee member).

**Grace, Bryan**, Ph.D. 2003–present. Dept. of Earth and Environmental Science, Tulane University. (R. Powell, committee member).

**Groat, Derrick**, M.S. 2002. School of Renewable Natural Resources, LSU. *Effects of feeding strategies on the growth of Florida pompano (*Trachinotus carolinus*) in closed recirculating systems*. (E. Chesney, committee member).

**Guo, Tianpeng**, Ph.D. 2005. Dept. of Civil and Environmental Engineering, LSU. *Speciation, equilibria and kinetics for rainfall runoff metals in adsorptive-filtration unit operations and processes*. (R. Powell, committee member).

**Harris, Roger**, M.S. 2003–present. Dept. of Biology, ULL. *Chemical composition of *Didemnum perlucidum* (Ascidacea): Its variance in the northern Gulf of Mexico, potential biomedical applications, and ecological implications*. (P. Sammarco, advisor).

**Knight, Christie**, M.S. 2003. Dept. of Biology, ULL. *The influence of temperature and salinity on burrow ventilation rates in *Lepidophthalmus louisianensis* (Schmitt) and *Callichirus islagrande* (Schmitt) Crustacea: Decapoda: Thalassinidea*. (C. Finelli, advisor).

**Kozlowski, Greg**, Ph.D. 2000–present. Dept. of Earth and Environmental Science, Tulane University. (R. Powell, committee member).

**Maier Brown, Alisa**, Ph.D. 2000–present. Dept. of Oceanography and Coastal Sciences, LSU. (Q. Dortch, advisor).

**Platon, Emil**, Ph.D. 2001. Dept. of Geology, LSU. *Effect of seasonal hypoxia on the benthic foraminiferal community of the Louisiana inner continental shelf: The 20th century record*. (N. Rabalais, committee member).

**Prerost, Julie**, Ph.D. 2004–present. Dept. of Biological Sciences, LSU. *Chemosensory abilities of three species of infaunal ghost shrimp (Crustacea: Decapoda: Thalassinidea)*. (C. Finelli, advisor).

**Quiñones, Zoraida**, Ph.D. 2002–present. Dept. of Oceanography and Coastal Science, LSU. (N. Rabalais, committee member).

**Riley, Ken**, M.S. 2003. School of Renewable Natural Resources, LSU. *Refrigerated Storage and Cryopreservation of Sperm for the Production of Red Snapper and Snapper Hybrids*. (E. Chesney, co-advisor with T. Tiersch).

**Rinker, Katherine**, M.S. 2005. Dept. of Earth and Environmental Science, Tulane University. *Distribution of dissolved organic phosphorus and nitrogen in the Mississippi River plume*. (R. Powell, advisor).

**Robinson, Eve**, M.S. 2004–present. Dept. of Marine Science, University of Texas at Austin. *The turbulent lives of copepods: How flow over a coral reef affects their ability to detect and avoid predators*. (C. Finelli, committee member).

**Rodrigue, Laurie**, M.S. 2004–present. Dept. of Biology, NSU. *Characterization of summertime water quality along the Bayou Lafourche, Bayou Terrebonne, and Bayou Petit Caillou Complex, Louisiana*. (C. Finelli, advisor).

**Rouse, Mary-Anne**, M.S. 2001. Dept. of Oceanography and Coastal Sciences, LSU. *The effects of metal and diesel contamination on copper speciation in salt marsh pore waters*. (R. Powell, advisor).

**Satterwhite, Michelle**, M.S. 2004–present. Dept. of Oceanography and Coastal Sciences, LSU. (E. Chesney, committee member).

**Savage, Candida**, Ph.D. 2004. Dept. of Systems Ecology, Stockholm University. *Effects and indicators of increased nutrients in Himmerfjärden Bay, Sweden*. (N. Rabalais, external opponent).

**Stake, Joel**, M.S. 2002. Dept. of Biology, ULL. *Effects of pressure on the swimming behavior of planula larvae from the hermatypic coral *Porites astreoides* Lamarck*. (P. Sammarco, advisor).

**Stake, Joel**, Ph.D. 2003–present. Dept. of Biology, ULL. *New genetic markers for studies in scleractinian corals: Systematic studies of the genera *Porites* and *Agaricia* from the Caribbean*. (P. Sammarco, committee member).

**Stead, Mark A.**, M.S. 2002. Dept. of Oceanography and Coastal Sciences, LSU. *Swimming performance of juvenile Florida pompano (*Trachinotus carolinus*) and Atlantic Spadefish (*Chaetodipterus faber*) exposed to sublethal concentrations of ethylene glycol and methanol: Individual and synergistic effects*. (E. Chesney, committee member).

**Strychar, Kevin**, Ph.D. 2001. Dept. of Biology, Central Queensland University, Rockhampton, Qld., Australia. *Bleaching in soft and scleractinian corals: Comparison of the physiology, genetics, and biochemistry of *Symbiodinium**. (P. Sammarco, advisor).

**Switzer, Ted**, Ph.D. 2003. Dept. of Oceanography and Coastal Sciences, LSU. *The ecology of two estuarine dependent tonguefishes, the blackcheek tonguefish (*Symphurus plagiusa*) and the offshore tonguefish (*S. cavitatum*), in coastal Louisiana*. (E. Chesney, committee member).

**Vavrinec, John III**, Ph.D. 2004. Dept. of Biology, Darling Marine Center, University of Maine at Orono. *Resilience of green sea urchin (*Strongylocentrotus droebachiensis*) populations following fishing mortality: Marine protected areas, alternate stable states, and larval ecology*. (P. Sammarco, committee member).

**Wortham-Neal, Jennifer**, Ph.D. 2001. Dept. of Biology, ULL. *The social interactions and reproductive morphology of a spearer mantis shrimp, *Squilla empusa**. (N. Rabalais, committee member).

**Zhang, Zhengzhong**, Ph.D. 2002–present. Dept. of Civil and Environmental Engineering, LSU. (E. Chesney, committee member).



## Appendix B: LUMCON Publications From FY 2001–05

### 2005

- Acosta, A., **P. W. Sammarco**, and L. F. Duarte. 2005. New fission processes in the zoanthid *Palythoa caribaeorum*: description and quantitative aspects. *Bull. Mar. Sci.* 76(1): 1–26.
- Atila, N.**, J. W. Fleeger, and **C. M. Finelli**. 2005. Effects of habitat complexity and hydrodynamics on the abundance and diversity of small invertebrates colonizing artificial substrates. *J. Mar. Res.* 63: 1151–1172.
- Chesney, E. J.** 2005. Copepods as live prey: a review of factors that influence the feeding success of marine fish larvae, p. 133–150. In C. S. Lee, P. O'Bryen, and N. Marcus (eds.), *Copepods in aquaculture*. Blackwell Publishing, Ames, Iowa.
- Conover, J.** and **S. Duhon**. 2005. *Effects of oil and gas development: a current awareness bibliography, 2000–2004*. OCS study MMS 2005-019. Minerals Management Service, New Orleans.
- Dagg, M. J.** and S. L. Brown. 2005. The potential contribution of fecal pellets from the larvacean *Oikopleura dioica* to vertical flux of carbon in a river dominated coastal margin, p. 293–307. In G. Gorsky, M. J. Youngbluth, and D. Deibel (eds.), *Response of marine ecosystems to global change: ecological impact of appendicularians*. Gordon and Breach.
- Finelli, C. M.** 2005. Bioirrigation as a source of nutrients for benthic algae: a study of burrow ventilation by ghost shrimp (Thalassinidea) from the northern Gulf of Mexico. *Geochim. Cosmochim. Acta*. 69 (10 Suppl) A114.
- Finelli, C. M.**, D. Ebert-May, and J. Hodder. 2005. Collaborative learning: a jigsaw. *Front. Ecol. Environ.* 3(4): 220–22.
- Kolian, S. and **P. W. Sammarco**. 2005. *Mariculture and other uses for offshore oil and gas platforms: rationale for retaining infrastructure*. Technical Report No.1. Eco-Rigs of Eco-Endurance Center, Baton Rouge, Louisiana.
- Liu, H.**, **M. J. Dagg**, C. J. Wu, and K. P. Chiang. 2005. Mesozooplankton consumption of microplankton in the Mississippi River plume, with special emphasis on planktonic ciliates. *Mar. Ecol. Prog. Ser.* 286: 133–144.
- Platon, E., B. K. Sen Gupta, **N. N. Rabalais**, and R. E. Turner. 2005. Effect of seasonal hypoxia on the benthic foraminiferal community of the Louisiana inner continental shelf: the 20th century record. *Mar. Micropaleontology* 54: 263–283.
- Rabalais, N. N.** 2005. *Relative contribution of produced water discharge in the development of hypoxia*. U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, Louisiana. OCS Study MMS 2005-044.
- Rabalais, N. N.** 2005. The potential for nutrient overenrichment to diminish marine biodiversity, p. 109–122. In E.A. Norse and L.B. Crowder (eds.), *Marine conservation biology: the science of maintaining the sea's biodiversity*. Island Press. Washington, D.C.
- Rabalais, N. N.** and R. E. Turner. 2005. Oxygen depletion in the Gulf of Mexico adjacent to the Mississippi River. In B. B. Jørgensen, J. W. Murray, and L. N. Neretin (eds.), *Past and present marine water column anoxia*. NATO Science Series: IV-Earth and Environmental Sciences.
- Strychar, K. B., M. Coates, **P. W. Sammarco**, T. J. Piva, and P. T. Scott. 2005. Loss of *Symbiodinium* from bleached Australian soft corals *Sarcophyton ehrenbergi*, *Sinularia* sp., and *Xenia* sp. *J. Exp. Mar. Biol. Ecol.* 320: 159–177.
- Suzuki, K., A. Hinuma, H. Saito, H. Kiyosawa, **H. Liu**, T. Saino, and A. Tsuda. 2005. Response of phytoplankton and heterotrophic bacteria in the northwest subarctic Pacific to in situ iron fertilization as estimated by HPLC pigment analysis and flow cytometry. *Prog. Oceanogr.* 64: 167–187.
- Thessen, A. E.**, **Q. Dortch**, M. L. Parsons, and **W. Morrison**. 2005. Effect of salinity on *Pseudo-nitzschia* species (Bacillariophyceae) growth and distribution. *J. Phycol.* 41: 21–29.

### 2004

- Dagg, M. J.**, R. Benner, S. Lohrenz, and **D. Lawrence**. 2004. Transformation of dissolved and particulate materials on continental shelves influenced by large rivers: plume processes. *Cont. Shelf Res.* 24: 833–858.
- Fleury, B. G., J. C. Coll, **P. W. Sammarco**, E. Tentori, and S. W. Duquesne. 2004. Variability in complementary (secondary) metabolites related to interspecific competition between a soft and hard coral on the Great Barrier Reef. *J. Exp. Mar. Biol. Ecol.* 303: 115–131.
- Justic, D., R. E. Turner, and **N. N. Rabalais**. 2004. Perspectives for coastal marine hypoxia in a warmer world, p. 57–72. In G. L. Rupp and M. D. White (eds.), *Proceedings of the 7th International Symposium on Fish Physiology, Toxicology and Water Quality*, Tallinn, Estonia. May 12–15, 2003. U.S. Environmental Protection Agency, Ecosystems Research Division, Athens, Georgia. USA. EPA/600/R-04/049.
- Lawrence, D.**, **M. J. Dagg**, **H. Liu**, S. R. Cummings, P. B. Ortner, and C. Kelble. 2004. Wind events and benthic-pelagic coupling in a shallow subtropical bay in Florida. *Mar. Ecol. Prog. Ser.* 266: 1–13.
- Liu, H.**, **M. J. Dagg**, L. Campbell, and J. Urban-Rich. 2004. Pico-phytoplankton and bacterioplankton in the Mississippi River plume and adjacent waters in the Gulf of Mexico. *Estuaries* 27(1): 147–156.
- Liu, H.**, K. Suzuki, and H. Saito. 2004. Community structure and dynamics of phytoplankton in the western subarctic Pacific Ocean—a synthesis. *J. Oceanogr.* 60: 119–137.
- Rabalais, N. N.** 2004. Hipoxia en el Golfo de México. In M. Caso, I. Pisanty y E. Excurra (compiladores), *Diagnóstico Ambiental del Golfo de México Vol. II*, Instituto Nacional de Ecología, Mexico, D.F.
- Rabalais, N. N.** 2004. Chapter 21: Eutrophication, p. 819–865. In A. R. Robinson, J. McCarthy, and B. J. Rothschild (eds.), *The global coastal ocean: multiscale interdisciplinary processes, the sea*. Vol. 13, Harvard University Press.
- Rabalais, N. N.** (ed.). 2004. Proceedings from Alliance for Coastal Technologies Workshop: State of Technology in the Development and Application of Dissolved Oxygen Sensors. UMCES Technical Report Series: TS-444-04-CBL. Ref No. [UMCES]CBL 04-089. ACT Indexing No. ACT-04-01.
- Rabalais, N. N.**, **N. Atila**, C. Normandeau, and R. E. Turner. 2004. Ecosystem history of Mississippi River-influenced continental shelf revealed through preserved phytoplankton pigments. *Mar. Pollut. Bull.* 49: 537–547.
- Riley, K. L.**, C. G. Holladay, **E. J. Chesney**, and T. R. Tiersch. 2004. Cryopreservation of sperm of red snapper, *Lutjanus campechanus*. *J. Aquac.* 238: 183–194.
- Sammarco, P. W.**, **A. Atchison**, and G. L. Boland. 2004. Expansion of coral communities within the northern Gulf of Mexico via offshore oil and gas platforms. *Mar. Ecol. Prog. Ser.* 280: 129–143.
- Strychar, K. B., M. Coates, and **P. W. Sammarco**. 2004. Loss of *Symbiodinium* from bleached Australian scleractinian corals (*Acropora hyacinthus*, *Favites complanata*, and *Porites solida*). *Mar. Freshw. Res.* 55: 135–144.
- Strychar, K. B., M. Coates, **P. W. Sammarco**, and T. J. Piva. 2004. Bleaching as a pathogenic response in scleractinian corals: evidence by concentrations of apoptotic and necrotic zooxanthellae. *J. Exp. Mar. Biol. Ecol.* 304: 91–121.
- Strychar, K.B., **P. W. Sammarco**, and T. J. Piva. 2004. Apoptotic and necrotic stages of *Symbiodinium* (Dinophyceae) cell death activity: bleaching of soft and scleractinian corals. *Phycologia* 43: 768–777.
- Soniat, T. M., **C. M. Finelli**, and **J. T. Ruiz**. 2004. Vertical structure and predator refuge mediate oyster reef development and community dynamics. *J. Exp. Mar. Biol. Ecol.* 310: 163–182.
- Stanzel, C. D.** and **C. M. Finelli**. 2004. The effects of temperature and salinity on ventilation behavior of two species of ghost shrimp (Thalassinidea) from the northern Gulf of Mexico: a laboratory study. *J. Exp. Mar. Biol. Ecol.* 312: 19–41.

- Turner, R. E., **Q. Dortch**, and **N. N. Rabalais**. 2004. Inorganic nitrogen transformations at high loading rates in an oligohaline estuary. *Biogeochemistry* 68: 411–422.
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# Appendix C: LUMCON Grants for FY 2001–05

## Research and Education

### 2004

*Coastal Eutrophication and Hypoxia: Implications for Mercury Methylation, Mercury Biomagnification and Human Health.* NOAA, Oceans and Human Health Initiative. PI: David Senn, Harvard School of Public Health. Co-PIs: **Edward Chesney** and **Nancy Rabalais**. \$44,190 (yr 1); \$35,857 (yr 2). Start: 09/01/04 (3 yrs).

*Determining the Geographical Distribution, Maximum Depth and Genetic Affinities of Corals on Offshore Platforms, Northern Gulf of Mexico.* Minerals Management Service, Louisiana State University (LSU) Coastal Marine Institute. PI: **Paul Sammarco**. \$352,304. Start: 09/01/04 (2 yrs).

*Captive Spawning of Marine Fishes as a Stimulus to Research and Industry Development.* Louisiana Sea Grant College Program. PI: **Edward Chesney**. \$104,322. Start: 02/01/04 (3 yrs).

*A Proposal to Assist Commercial Aquaculture Development at Dixie Fish Farm, LLC.* Dixie Fish Farm, LLC. PI: **Edward Chesney**. \$25,456. Start: 01/19/04 (2 yrs).

### 2003

*The Effects of Water Movement and Zooplankton Escape Behavior on Planktivory by Coral Reef Fishes in Different Microhabitats, Collaborative Research and RUI.* National Science Foundation. PI: **Chris Finelli**. Co-PIs: Ed Buskey, University of Texas Marine Science Institute and Ray Clarke, Sarah Lawrence College. \$81,243,25. Start: 10/01/03 (3 yrs).

*N-GOMEX 2003, Hypoxia Studies in the Northern Gulf of Mexico.* NOAA. PI: **Nancy Rabalais**. \$1,656,205. Start: 05/01/03 (3 yrs).

*Regional Center for Ocean Science Education Excellence (COSEE)-Central Gulf of Mexico.* National Science Foundation. PI: Sharon Walker, University of Southern Mississippi. Co-PI: **Jessica Kastler**. \$129,198. Start: 01/01/03 (2 yrs).

### 2002

*Multistress: Cumulative Coastal Stressors: Northern Gulf of Mexico.* NOAA. PI: **Nancy Rabalais**. Co-PIs: **Quay Dortch** and R. E. Turner, LSU. \$1,123,700. Start: 09/01/02 (5 yrs).

*Education Program for Nonpoint Source Pollution in the Barataria and Terrebonne Watersheds.* Louisiana Dept. of Environmental Quality. PI: **Jessica Kastler**. \$23,104.30. Start: 04/15/02 (2 yrs).

*FIRST II Field Station Team* (Collaborator), National Science Foundation. PI: **Christopher Finelli**. \$33,660. Start: 01/04/02 (4 yrs).

*Collaborative Research: Interactive Influences of Atmospheric Deposition and Phytoplankton on Trace Metal Speciation.* National Science Foundation; LUMCON. PI: **Rodney Powell**. Co-PI: John Donat, Old Dominion University. \$177,275. Start: 03/15/02 (4 yrs).

*Optimizing Methods for Captive Spawning of Marine Fish and Mass Rearing of Their Larvae.* Louisiana Sea Grant College Program. PI: **Edward Chesney**. \$69,222. Start: 02/01/02 (2 yrs).

*Human Activities and a Changing Climate in Louisiana—Strategic Improvement Plan.* Environmental Protection Agency. PI: **Michael Dagg**. \$185,250. Start: 06/10/02 (4 yrs).

*Decoupling the Effects of Mass Transfer, Water Motion and Temperature in Reef Health.* NOAA, National Undersea Research Program. PI: **Christopher Finelli**. \$17,318. Start: 06/01/02 (1 yr).

*Refining Chlorophyll Data for an Accurate Determination of Estuarine Phytoplankton Community Composition.* Louisiana Sea

Grant College Program. PI: **Nancy Rabalais**. Co-PI: **Quay Dortch**. \$161,551. Start: 02/01/02 (3 yrs).

*Long-Term Estuary Assessment Group (LEAG): Science in Service of Policy in the Mississippi River/Gulf of Mexico Estuary.* NOAA. PI: J. McLachlan, Tulane University. Co-PIs: **Michael Dagg** and **Rodney Powell**. \$151,585, 2002; \$259,003, 2003–2005; \$14,956 (suppl.) 2004–2005.

### 2001

*LUMCON Enhancement for FY 2001–2002, Faculty and Monitoring Support.* Louisiana Board of Regents. PI: **Michael Dagg**. \$200,000. Start: 10/15/01 (2 yrs).

*Effects of Offshore Oil and Gas Development: Continuation of a Printed and Web-Based Current Awareness Bibliography.* Minerals Management Service. PI: **Michael Dagg**. \$90,896. Start: 09/30/04 (4 yrs).

*Hypoxia, Nekton and Habitat in the NGOM: Modeling and Retrospective Analyses.* NOAA. PI: **Edward Chesney**. \$87,299. Start: 09/01/01 (3 yrs).

*Controls on the Optical Properties of Coastal Waters in the Northern Gulf of Mexico.* NASA-EPSCoR; Louisiana Board of Regents. PI: **Michael Dagg**. \$1,240,320. Start: 09/01/01 (4 yrs).

*A Regional Framework for Interconnectivity of Coastal Observing Systems.* National Science Foundation; SURF. \$166,579. Start: 09/01/01 (2 yrs).

*N-GOMEX 2001: Retrospective Analysis and Modeling of Food Web Dynamics in the Mississippi River Plume.* NOAA. PI: **Michael Dagg**. \$65,336. Start: 09/01/01 (3 yrs).

*Metadata Creation and Implementation Assistance.* USGS. PI: **Ben Cole**. \$5,996. Start: 08/01/01 (1 yr).

*Captive Spawning and Larval Rearing of Cobia, *Rachycentron canadum*, to Support LA Mariculture Development.* Louisiana Sea Grant College Program. PI: **Edward Chesney**. \$10,000. Start: 06/01/01 (2 yrs).

*CAREER: Career Development Plan: Interdisciplinary Research and Education in Marine Habitats.* National Science Foundation. PI: **Christopher Finelli**. \$551,755. Start: 04/02/01 (6 yrs).

*GLOBEC 2000: Responses of the *Neocalanus* spp. Microplankton Community to Physical Forcing in the Coastal Gulf of Alaska.* National Science Foundation. PI: **Michael Dagg**. Co-PI: S. Strom, University of Washington. \$604,458. Start: 02/15/01 (6 yrs).

*Documentation of Hypoxia Effects on Living Resources.* NOAA, National Undersea Research Program. PI: **Nancy Rabalais**. \$20,000. Start: 01/01/01 (2 yrs).

### 2000

*Gulf Drilling Platforms as an Environmental Asset: Long-Term Artificial Reefs and Sites for Coral Recruitment.* Minerals Management Service. PI: **Paul Sammarco**. \$337,960. 10/01/00 (3 yrs).

*Enhancement of Minority Participation in Marine Science in Louisiana, Louis Stokes Louisiana Alliance for Minorities Program (LAMP), Phase II.* Louisiana Board of Regents, NSF EPSCoR. PI: **Paul Sammarco**. \$120,000. Start: 09/01/00 (4 yrs).

*Picoplankton and Optical Characterization of Surface Waters in the Northern Gulf of Mexico.* Louisiana Board of Regents. NASA EPSCoR. PI: **Michael Dagg**. \$29,197. Start: 08/01/00 (1 yr).

Environmental Research in Coastal Louisiana. Louisiana Board of Regents; EPA EPSCoR. PI: **Michael Dagg**. Co-PIs: **Brent McKee** and **Nancy Rabalais**. \$350,000. Start: 08/15/00 (3 yrs).

*Wind Events and Benthic-Pelagic Coupling in Western Florida Bay.* NOAA. PI: **Michael Dagg**. \$112,240. Start: 08/01/00 (2 yrs).

*NGOMEX 2002, What Nutrients Really Determine C Flux and Hypoxia?* NOAA. PI: **Quay Dortch**. \$85,699. Start: 08/01/00 (3 yrs).

*N-GOMEX 2000, Hypoxia Studies in the Northern Gulf of Mexico.* NOAA, Coastal Ocean Program. PI: **Nancy Rabalais** Co-PIs: **Quay Dortch**, R. E. Turner, LSU, W. J. Wiseman, Jr., LSU, and D. Justic, LSU. \$920,295. 08/01/00 (3 yrs).

*Impacts of Climate Variability on Coastal Fisheries in Low Oxygen Environments.* U.S. Department of Energy, NIGEC. Co-PIs: **Nancy Rabalais**, D. Justic, LSU, and R. E. Turner, LSU. \$94,290. Start: 07/01/00 (3 yrs).

*Transport and Transformation of Dissolved and Particulate Materials on Continental Shelves Influenced by Large Rivers.* Office of Naval Research. PI: **Michael Dagg**. \$26,250. 07/01/00 (2 yrs).

*Physical and Biological Processes Affecting the Distribution of Hypoxia on the Louisiana Continental Shelf.* Louisiana Board of Regents; EPA EPSCoR Program. PI: **Nancy Rabalais**. Co-PIs: R. E. Turner, LSU, W. J. Wiseman, Jr., LSU, D. Justic, LSU. \$320,000. Start: 03/01/00 (3 yrs).

## LUMCON Fiscal Agent

### 2005

*Coastal Wetlands, Planning, Protection and Restoration Act (CWP-PRA), Academic Assistance.* U.S. Army Corps of Engineers. PI: Jenneke Visser, LSU. \$239,450. 2001; \$100,000, 2002; \$99,000 2003–2004; \$99,000, 2005.

### 2002

*Coastal Restoration and Enhancement Through Science and Technology (CREST).* NOAA. \$2,109,568. Start: 02/02/02 (6 yrs).

## Barataria Terrebonne National Estuary Program

*Base funding.* U.S. EPA. PI: **Kerry M. St. Pé**. \$436,273. FY01–02; \$510,000, FY02–03; \$506,685, FY03–04; \$506,984, FY04–05.

### 2003

*Public Outreach Services for the Mississippi River Water Reintroduction into Bayou Lafourche.* Louisiana Department of Natural Resources. PI: **Leslie McVeigh**. \$205,000. Start: 04/01/03 (2 yrs).

*Gulf Shoreline Restoration Science Advisory Report.* University of New Orleans Research & Technology Foundation, Louisiana Department of Natural Resources. PI: **Richard DeMay**. \$40,000. Start: 02/01/03 (1 yr).

*Maritime Forest Ridge and Marsh Restoration at Port Fourchon, Louisiana.* Gulf of Mexico Foundation, U.S. EPA. PI: **Richard Demay**. \$101,700. Start: 01/01/03 (3 yrs).

*Maritime Forest Ridge and Marsh Restoration at Port Fourchon, Louisiana.* NOAA. PI: **Richard Demay**. \$90,000. Start: 01/01/03 (3 yrs).

### 2002

*Monitor the Effects of Stormwater Discharge at the Proposed Pointe Aux Chenes Pumping Station.* Gulf of Mexico Program. PI: **Andrew Barron**. \$212,500. Start: 09/01/0202 (5 yrs).  
*Educational Publications-State CIAP Implementation.* Louisiana Department of Natural Resources, NOAA. PI: **Kerry M. St. Pé**. \$100,000. Start: 08/01/02 (2 yrs).

### 2001

*Assessment Status of Non-Indigenous Invasive Species of Plants in the Barataria–Terrebonne Estuary.* U.S. EPA, Gulf of Mexico Program. PI: **Michael Massimi**. \$54,000. Start: 08/01/02 (2 yrs).

*Implement a Vegetative Model for Restoration, Conservation, and Habitat Enhancement on Beneficial use Dredge Sediments.* Gulf of Mexico Program, U.S. EPA. PI: **Richard DeMay**. \$179,750. Start: 08/01/02 (3yrs).

## Facilities and Marine Operations

*Long Distance Learning T-1 Line.* Board of Regents Long Distance Learning Initiative Through the Office of Telecommunications. \$8,100, 2003; \$8,100, 2004; \$8,100, 2005.

### 2004

*Simultaneous Measurements of Atmospheric Visibility, Particulate Matter and Mixing Height at the Breton Area IMPROVE Site, Louisiana.* Minerals Management Service; LSU Coastal Marine Institute. PI: **Steven Rabalais**. \$17,438. Start: 07/01/04 (1 yr).

*Restructuring and Automating LUMCON's Environmental Monitoring System (LEMS).* NOAA. PI: **Michael Dagg**. \$48,150. Start: 03/01/04 (2 yrs).

*Ship Time.* NOAA National Marine Fisheries Service, Northeastern Cruise. PI: **Steven Rabalais**. \$266,416. 03/01/04 (3 yrs).

### 2003

*Building of a Boardwalk on LUMCON Property, Terrebonne Parish, Protection of Habitat for Migratory and Resident Birds.* Collaborative LUMCON & BTNEP. \$8,000. Start: 10/01/03 (2 yrs).

*Fabrication and Deployment of an Environmental Station to be Located at the Mississippi River Lighthouse, Southwest Pass, LA.* NASA. PI: **Michael Dagg**. \$20,030. Start: 09/12/03 (2 yrs).

*Oceanographic Technical Services.* National Science Foundation. PI: **Steven Rabalais**. \$130,000. Start: 04/01/03 (2yrs).

### 2002

*Ship Operations.* National Science Foundation. PI: **Steven Rabalais**. \$898,778. Start: 03/01/02 (4 yrs).

### 2001

*Enhancement of the Basic Oceanographic Analytical Capabilities at LUMCON.* Louisiana Board of Regents Enhancement Fund. PI: **Rodney Powell**. \$110,000. Start: 07/01/2001 (1 yr).

*Ship Time,* Office of Naval Research. PI: **Steven Rabalais**. \$417,804, 2002; \$113,520, 4 years; \$662,491, 3 years; \$329,589, 03/1/05–2/28/10.

*Oceanographic Instrumentation.* National Science Foundation. PI: **Steven Rabalais**. \$48,526, 2001; \$91,800, 2002; \$212,887, 2003; \$34,719, 2003; \$43,000, 2004.

*Shipboard Scientific Support Equipment.* National Science Foundation. PI: **Steven Rabalais**. \$136,748, 2001–02; \$113,520, 2003–05; \$126,734, 2004–06.







