



# A DIRECTOR'S VIEW

LUMCON's Next 5 Years

CONNECT.  
ENRICH.  
TRANSFORM.

The background of the page features a large, faint, circular seal of the Louisiana Universities Marine Consortium (LUMCON). The seal contains the text "LUMCON" in the center, "UNIVERSITY OF LOUISIANA" at the top, and "MARINE CONSTITUTION" at the bottom. In the center of the seal, there are three birds in flight and a stylized wave pattern below them.

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# INTRODUCTION

The following document, serving as a guide for LUMCON during the next five years (2017-2022), is an ambitious one that calls for expansion and strengthening on many fronts including: vessels, facilities, research scope, faculty and staff, education programs, and the Consortium network.

The following document provides a refinement of the Master Plan (2016-2020) while adhering to its main tenets.

With an overarching aspiration to grow LUMCON into a truly collaborative research and education Consortium for the engagement and benefit of Louisiana's higher education community, while maintaining and enhancing the highly-regarded research and education activities conducted at the Marine Center...

~ LUMCON Master Plan 2016-2020

The Master Plan called for the "definition and clarity of LUMCON's mission." Three main goals were provided in the Master Plan that spoke to LUMCON's education, research, and consortium missions. These three pillars also occur in LUMCON's mission, vision, and core value statements.

## LUMCON MISSION

To promote, facilitate and conduct research and education collaborations among Louisiana's universities in marine and coastal sciences relevant to the sustainability of coastal and marine environments of the Gulf of Mexico.

## LUMCON VISION

The Louisiana Universities Marine Consortium will maintain a national and international reputation as a leading marine research and education Consortium, and stimulate, coordinate, and facilitate scientific research among the marine science and education programs within Louisiana.

## LUMCON VALUES

- » Quality education at university, K-12, and public levels through partnerships with Louisiana universities and other State institutions.
- » The highest standards of scientific inquiry, academic integrity, intellectual freedom, and the cooperative exchange of ideas and information.
- » Opportunities for under-represented students in marine sciences.
- » Increasing societal awareness of the environmental, economic, and cultural values of Louisiana's coastal and marine environments.
- » Unique research and education structures, in terms of people, facilities and resources.



## OUR TAGLINE

These mission and vision statements are further enhanced with a new tagline for LUMCON.

The new tagline emphasizes our mission to serve as the hub of the Consortium for Louisiana marine science, to be a leader in transformative marine science, to develop and provide the tools needed to conduct transformative marine science, and to engage the state's diverse citizenry about marine environments.

The **HEART** of  
Louisiana marine  
science.

## CORE PRINCIPLES

Our mission statement, vision statement, and strategic plan reinforce the three core principles called for in the Louisiana legislation that created LUMCON. We introduce new language for branding that continues to focus and strengthen our dedication to these principles. With intent, these are given equal weight and demonstrate a balanced commitment and investment to all three principles.



### CONNECT

Enhance research collaboration and exchange by linking the Consortium through stronger partnerships.



### ENRICH

Give back to the community through education and outreach initiatives.



### TRANSFORM

Contribute to science and conservation in meaningful and profound ways.

# STRENGTHS

The Consortium represents a unique portfolio of expertise and capabilities of Louisiana's marine and coastal academic community, a highly regarded and productive resident faculty at the Marine Center in Cocodrie, and a renowned set of assets that support marine and coastal research and education for Louisiana. The Consortium, as a statewide academic endeavor, is poised to focus and strengthen the effectiveness of the foundational knowledge needed to address the environmental and socio-economic challenges facing Louisiana immediately and into the future.

~ LUMCON Master Plan 2016-2020

The following evaluation of LUMCON's strengths will serve as both the foundation and leverage for future growth.

## 1. LOCATION

The LUMCON W. J. DeFelice Marine Center is located in Cocodrie, LA., approximately 85 miles southwest of New Orleans. Previous strategic plans have viewed the DeFelice Marine Facility, not as strength, but as a weakness to

be overcome. "Given the remoteness of its location, LUMCON's Marine Center is a difficult place to recruit resident faculty..." However, by design LUMCON's location serves as an ideal and immersive location for research and education. The Marine Center is situated in the heart of the estuarine wetland complex of the Mississippi River deltaic plain, between two active distributaries--the Atchafalaya River and the Mississippi itself. This site provides ready field access to the most productive estuaries in the United States and one of the largest wetlands in world. In addition to the access to vast salt, brackish and freshwater marshes, the Marine Center also affords proximity to the barrier islands, and offshore coastal and blue, deep waters of the northern Gulf of Mexico. The distance from a major urban center and universities also affords opportunities for retreat. Consortium faculty, students, and other stakeholders may find solitude removed from institutional distractions that allow them to focus on both research and education.

## 2. FACILITIES

The DeFelice Marine Center is a modern, 75,000 square foot complex of research, instructional, housing, and support facilities completed in 1986. The Center includes 26,000 usable square feet of laboratory, classroom, office, and library space. Dormitory rooms and five apartments provide housing for up to 80 persons. A cafeteria/general meeting room is situated in the center of the complex. Eight laboratories are equipped with running sea water. Six additional laboratories are reserved for dry applications and instrumentation. Laboratories are used for both research and education. Education areas include three classrooms and two teaching laboratories. In the fall of 2016, LUMCON completed renovations on a new 99-seat auditorium and flex-use space equipped with high-speed wireless, four large monitors, and both projection and audio systems. It can be configured in multiple arrangements for

teaching and meetings. The Marine Center also includes nearly 50 indoor and outdoor mesocosms with running seawater that allow for a variety of scientific experiments and observations. Overall, the variety, adaptability, and utility of the dormitory, educational, and research spaces at the DeFelice Marine Center are unique and allow LUMCON to serve the Consortium in a variety of ways.

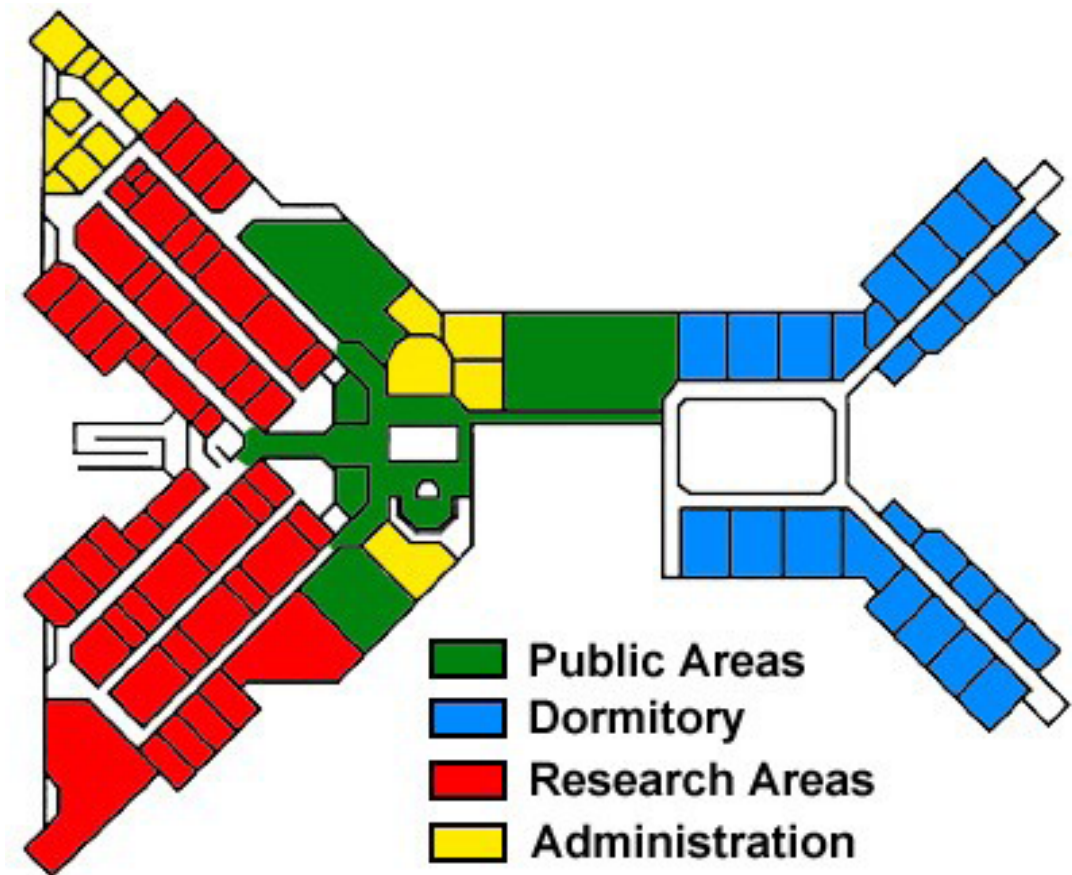
### 3. RESEARCH VESSELS

LUMCON operates and maintains one of the largest fleets of research vessels along the Gulf of Mexico. With a long and distinguished career of service, LUMCON's marine operations are unmatched in the Gulf of Mexico.

From the Master Plan, LUMCON's research vessels, crew, and marine technicians have long been an integral part of the Consortium's success. LUMCON's vessel operations have gained the Consortium respect from researchers and educators worldwide.

At the focal point, the icon of marine operations and the fleet, is the 116' R/V *Pelican*. The R/V *Pelican* was built in 1985 at Allied Shipyard in Laose, Louisiana with capital outlay funds provided by the State of Louisiana. In 2003, the R/V *Pelican* underwent a refit upgrading a majority of the scientific equipment onboard and adding an additional 10' to the stern. The main deck runs the length of the vessel and covers approximately 1,056 sq. ft of open aft deck and about 1,000 sq. ft. of interior deck space forward.

The R/V *Pelican* was designed and outfitted to conduct a variety of oceanographic research missions. The reliability, utility, and seaworthiness of the vessel and the crew are well demonstrated and heralded by the scientific community. Often referred to by oceanographers as the "Workhorse of the Gulf," the R/V *Pelican*







*R/V PELICAN*

has a long track record of successful scientific research including: trawling, large box core sampling, thirty foot piston cores, shallow seismic surveys, ROV operations, buoy deployment and recovery, and hydrographic casts with CTD-rosette systems.

LUMCON is a member of the Universities National Oceanographic Laboratory System (UNOLS) and the R/V *Pelican* is a designated UNOLS vessel. This guarantees the R/V *Pelican*'s usage by the UNOLS system as it assigns funded investigators to the vessel. UNOLS affiliation, along with additional contracts, provides a full schedule for the R/V *Pelican*. In 2017, the R/V *Pelican* will be at sea approximately 250 days. Currently at \$10,000 per day, this generates considerable revenue for LUMCON in support of vessel operations.

An additional strength of LUMCON's fleet is the R/V *Acadiana*, designed and built by Breau's Bay Craft, Inc. in Loreauville, LA with funding for her construction provided by the State of Louisiana capital outlay funding to LUMCON. At 58 feet, the R/V *Acadiana* is well suited to both educational and research activities in Terrebonne Bay and nearby coastal waters. The R/V *Acadiana* has installed deck equipment including trawl winch, capstan, and davits that allow for usage of profiling CTD, trawls, and other scientific equipment. The *Acadiana*'s flexibility of usage prove a true asset to the Consortium's education and research activities.

The R/Vs *Acadiana* and *Pelican* are complemented by a fleet of 14 small vessels able to conduct education and research in a variety of habitats ranging from the marsh to offshore operations.

## 4. COMMUNITY

With nearly 100 staff members, LUMCON possesses an intrepid and resilient group of people from a broad set of backgrounds and expertises. The research conducted by the scientific group is internationally recognized and has had great impact. Marine operations and the crews of the research vessels are well known for their proficiency, professionalism, and determination. The LUMCON administrative and facilities staff have weathered hurricanes, politics, and financial tribulations. These challenges, in conjunction with the remoteness of the DeFelice Marine Center, have created deep and lasting connections between the staff. The staff at LUMCON represents much more than a group of employees but rather a cohesive community and family. Staff members want to build their colleagues' successes and support their endeavors. Their ability to work as a team is unparalleled among scientific institutions. Moreover, the staff at LUMCON have a willingness to serve and include others into this community.

## 5. CONSORTIUM

LUMCON not only represents a traditional marine laboratory, the DeFelice Marine Center, but also a Consortium of marine scientists across more than two dozen member institutions (Table 1). LUMCON's strength is that it serves as a center for the synthesis of ideas and data, yet is also equipped with the



## UNIVERSITY OF LOUISIANA SYSTEM

Grambling State University  
Louisiana Tech University  
McNeese State University  
Nicholls State University  
Northwestern State University  
Southeastern Louisiana University  
University of Louisiana - Lafayette  
University of Louisiana - Monroe  
University of New Orleans

## LOUISIANA STATE UNIVERSITY SYSTEM

Louisiana State University and A & M College  
Louisiana State University in Alexandria  
Louisiana State University in Eunice  
Louisiana State University in Shreveport

## LOUISIANA COMMUNITY AND TECHNICAL COLLEGE SYSTEM

## SOUTHERN UNIVERSITY SYSTEM

Southern University in Baton Rouge  
Southern University in New Orleans

## LOUISIANA PRIVATE INSTITUTIONS

Centenary College of Louisiana  
Dillard University  
Louisiana College  
Loyola University  
Our Lady of Holy Cross College  
Our Lady of the Lake College  
Tulane University  
Xavier University





R/V ACADIANA





tangible laboratory and field research tools to bolster scientific progress. As the hub of this Consortium, LUMCON can draw from a wide variety of resources and expertise ultimately serving as an incubator and leader for Louisiana, Gulf of Mexico, national and international marine science. LUMCON has the diversity of tools and knowledge through Consortium partnerships to find solutions to problems facing coastal Louisiana, the Gulf of Mexico, and ocean ecosystems at large.

## 6. OPPORTUNITY AND GROWTH

From research to education and across concrete and intangible assets, LUMCON affords multiple opportunities to attract funding. The diverse and proven research and education programs provide exciting avenues for growth and the long-term viability of LUMCON.

CONNECT.  
ENRICH.  
TRANSFORM.



# CONNECT

Enhance research collaboration and exchange by linking the Consortium through stronger partnerships

The core to LUMCON's mission is collaboration and support of marine science across Consortium members.

To promote, facilitate and conduct research and education collaborations among Louisiana's universities in marine and coastal sciences relevant to the sustainability of coastal and marine environments of the Gulf of Mexico.

Much work is needed to realize this mission. LUMCON must both promote the scientific synthesis of information, concepts, and knowledge and support research and education across disciplinary, institutional, geographic, and demographic boundaries to realize this mission. LUMCON's recommitment to collaboration in marine science must remove barriers to collaboration and provide the tools to bolster scientific investigation. However, for LUMCON to succeed in its mission, Consortium members must also be engaged as enthusiastic collaborators and supporters committing resources and faculty to this effort.

## THE CONSORTIUM IN ACTION

### 1. REMOVE BARRIERS FOR COLLABORATION AND LEVERAGE GROUP KNOWLEDGE

An unrealized opportunity in the state and in fields of marine science and conservation is providing opportunities for scientific teams to explore ideas that are risky, that require novel combinations of expertise, or simply require people to be in the same room. For example, many different groups are focused on coastal science, conservation, water resources, and restoration in the state including: Tulane's ByWater Institute, USGS's National Wetland Research Center, The Water Institute of the Gulf, LSU's Coastal Sustainability Studio, LSU's Department of Oceanography and Coastal Sciences, LSU's Sea Grant College

Program, the LSU Ag Center, Center for Renewable Resources, and several non-governmental organizations to name a few. A regular forum to help coordinate efforts would prove extremely valuable to efforts in the state. Leveraging expertise across Consortium members will also prove valuable in competing successfully for external research funds.

2.7 | Enhance communications and exchange of research results among Louisiana universities interested in marine and coastal science

~ LUMCON Master Plan 2016-2020

Several models already exist and have proven successful for establishing collaborative networks and promoting synthesis (e.g., National Center for Ecological Analysis and Synthesis, Santa Fe Institute, National Humanities Center, National Evolutionary Synthesis Center). Such a center is lacking that focuses exclusively on marine science. Given LUMCON's established mission this represents a great opportunity for coordination of marine science syntheses in Louisiana, the Gulf Coast, and beyond.

LUMCON will begin to provide opportunities for two new types of meetings, Consortium Catalysis Meetings and Consortium Working Groups. Meetings will be held at the DeFelice Marine Center in Cocodrie, LA, and will support living expenses, meeting facilities, and trained facilitator(s), if requested.

Catalysis Meetings are one-time meetings bringing together ~30 scientists from diverse disciplines to focus on a major question or research area in marine science and conservation. Catalysis meetings are intended to:

- » focus on a theme that is grand enough to excite and inspire,
- » increase the scale and ambition of our scientific vision,
- » design avenues for scientific synthesis,
- » identify classes of primary data that must be collected before grand-scale synthesis is possible,
- » initiate a dialogue across disciplinary boundaries,
- » influence the research programs of potential collaborators,
- » facilitate the assembly of scientific networks.

Working Groups involve small groups of scientists (10-12 participants) collaborating intensively on the analysis or synthesis of data, models, theory or a combination of all three, to address a major question in marine science and conservation. The working groups will typically meet 3-4 times over two years, with each meeting lasting 3-5 days. Working Groups should:

- » address an important and outstanding question in marine science and conservation,
- » be “risky” endeavors with a reasonable chance of success,
- » reflect LUMCON’s scientific mission to advance research that addresses fundamental questions in marine science through collaboration,
- » provide evidence that sufficient data are available to tackle the question,
- » provide evidence that appropriate analytical tools are available or will be developed during the project,
- » incorporate diverse groups of scientists that go beyond existing collaborations and include multiple disciplines, emerging scientists including graduate students, and international linkages,
- » generate products that typically fall into (but are not restricted to) three broad categories:
  - » collaborative papers and reviews,
  - » databases allowing others to build on the foundation generated,
  - » software or mathematical tools that solve a major analytical problem.

## 2. BOLSTER MARINE RESEARCH OF CONSORTIUM SCIENTISTS

LUMCON will continue to provide world class facilities, vessels, and tools that allow marine scientists the ability to conduct field research across a variety of habitats. Indeed, this is historically true and continues to be one of the strengths LUMCON leverages for success.

Consortium member faculty utilize LUMCON facilities in multiple important ways including:

1. R/V *Acadiana* usage,
2. small vessel usage,



3. room and board while conducting field work near the DeFelice Marine Center,
4. meeting facilities,
5. staging field operations,
6. utilizing unique mesocosm and laboratory facilities,
7. collaborating with educators to provide course-based tours and lectures.

LUMCON will strive to keep fees for these amenities and services at a minimum seeking simply to recover costs associated with covering educator and/or vessel operator salaries as well as the maintenance, cleaning, and supplies (food, fuel, etc.) needed to provide these essential services. The rates are well below commercial rates, e.g. lodging at Cocodrie or Grand Isle, LA, and, in most cases, have not been raised in a decade. However, each of these activities still incurs an expense for either the faculty or the department. Feedback with faculty at Consortium institutions suggests that these fees remain a barrier to LUMCON usage.

The Master Plan and Strategic Business Plan for LUMCON call for substantially increased usage of the LUMCON Marine Center by Consortium members.





2.2 | Enhance the research opportunities for collaborators with in-residence faculty or for independent university researchers needing access to the unique facilities offered by the Marine Center.

2.3 | Create policies governing provision of space for visiting researchers at the Marine Center

2.4 | Create policies governing use of LUMCON property for experimental research design

~ LUMCON Master Plan 2016-2020

In the spirit of this and in the attempt to reduce barriers for LUMCON usage, Consortium members should create their institutional support funds to support LUMCON Marine Center activities. The benefits of this are multiple and include:

1. increasing collaboration between Consortium and LUMCON faculty, students, and other researchers,
2. providing bridging funds for faculty between grants,
3. allowing faculty to collect pilot data necessary for grant proposals and

proof of concepts,

4. allowing graduate students to add field components and training to their research,
5. increasing experiential learning opportunities for graduate and undergraduate students and courses.


To date, ULL, LSU, and ULM have committed to support funds to be allocated through a small proposal process overseen by a committee at the respective institutions.

In addition, to support the recruitment and success of new faculty at Consortium institutions, LUMCON will create an internal support fund to waive usage fees for faculty in the first two years of their position. This will allow faculty to collect pilot data necessary for grant proposals and proof of concepts while creating the potential for long-term users and financial support of the facilities.

### **3. PROMOTE CROSS INTEGRATION OF MARINE CENTER FACULTY AND CONSORTIUM FACULTY**

Traditionally, DeFelice Marine Center faculty are highly collaborative and initiate new research projects with Consortium faculty. This often includes successfully funded grants with Consortium faculty as co-PIs. Faculty at Consortium member institutions often only engage with LUMCON's facilities and vessels but rarely initiate new collaborations with DeFelice Marine Center faculty. Opportunities for cross integration is also lacking for DeFelice Marine Center faculty in departments across Consortium institutions. Consortium affiliations by DeFelice Marine Center faculty are often acquired ad hoc by individual DeFelice Marine Center faculty.

These points were also noted in the Master Plan:



2.6 | Provide for formal associations of in-residence Marine Center faculty with member universities and also formal associations of member university faculty conducting research at the Marine Center

~ LUMCON Master Plan 2016-2020

A more formal process and association is needed for DeFelice Marine Center faculty to gain affiliations with Consortium institutions. LUMCON is not a degree granting institution, which is vital for DeFelice Marine Center faculty to have graduate students. Official affiliations of Marine Center faculty with Consortium member institutions will also create a stronger Consortium. The Strategic Business Plan argued for jointly funded appointments (i.e. the shared faculty concept), however, a major concern still exists for creation of an impossible situation for scientists to be successful. The joint appointments could possibly lead to the faculty member never quite integrating into the DeFelice Marine Center or the Consortium institution. Vital to the success of any researcher is reliance on an academic community for creative and intellectual support. The shared faculty and formal affiliation processes needs to be evaluated cautiously to find a model that leads to Consortium success.

A more formal process is also needed to promote cross integration and collaboration among faculty of Consortium members with the DeFelice Marine Center. LUMCON will work to develop a sabbatical program that allows Consortium faculty to take up residence and integrate with faculty at the DeFelice Marine Center.

Likewise, a model and process for adjunct appointments by Consortium faculty at LUMCON's DeFelice Marine Center needs to be defined. Given the DeFelice Marine Center's location, vessels, and other assets, there may reasonable situations in which Consortium faculty passing grants through the LUMCON system is appropriate.

#### **4. PROVIDE THE INFRASTRUCTURE NEEDED ACROSS CONSORTIUM MEMBERS**

Several tools and programs are needed by Consortium scientists that are not sustainable by a single institution, either because of limited need within a single Consortium institution or the logistics and funding needed for viability. LUMCON will continue to provide these tools and programs needed across Consortium members for marine science. The best examples of this are the research fleet, field sites, and the DeFelice Marine Center itself.

In addition, programs such as the Research Experiences for Undergraduates (REU) Program and proposed GEOPATHS Program (discussed in the ENRICH section) are best served by LUMCON with its experience and infrastructure for running cross-Consortium programs, its ability to form an in-residence community, and its ability to leverage expertise across the Consortium. LUMCON will also work toward a cross-Consortium, post-doctoral fellow program. The basic model would require fellows to spend two years at the DeFelice Marine Center engaged in research, under the supervision of a Marine Center faculty member or a Consortium member faculty member, or a co-sponsorship. During this time a











Consortium institution, feasibly Nicholls State University given proximity, would provide teaching workshops and training to the postdoctoral fellow. In the third year, the fellow would spend a year teaching courses in a Consortium institution serving under-represented groups in STEM. This program will be modelled after the highly successful SPIRE postdoctoral program at the University of North Carolina, Chapel Hill.

Another mechanism for growth and enhanced service to Consortium members is LUMCON's Diving Safety Program (DSP). The DSP assists faculty, staff, and students in safely using SCUBA as a tool to conduct underwater research. The DSP ensures, trains, and maintains students, faculty, and staff in compliance with LUMCON scientific diving regulations, as well as Federal Occupational Safety and Health Administration (OSHA) and the American Academy of Underwater Sciences (AAUS) requirements.

The Diving Safety Program offers the following:

1. Scientific diving certification and associated courses needed to meet LUMCON, OSHA and AAUS standards.
2. Review of all scientific diving proposals.
3. Networking for Louisiana scientific divers and divers at other marine science institutions;
4. Diving assistance, tools, and diving vessels for research (e.g. support divers, boats, and air refills).
5. Resource center for diving safety, equipment, and general diving information.
6. Opportunities for advanced and diving leadership training.

The AAUS is responsible for the promulgation of the AAUS Standards for Scientific Diving Certification and Operation of Scientific Diving Programs. These are the consensual guidelines for scientific diving programs in the US, and are recognized by OSHA as the "Standard" for scientific diving. In the state of Louisiana, LUMCON possesses the only AAUS-certified Dive Safety Program and Officer in academia. Currently, only LUMCON faculty and staff, or duly recognized reciprocity agreements from AAUS institutions, are certified through LUMCON's DSP. Thus, scientific divers from Consortium institutions are not in compliance with AAUS. LUMCON's DSP can work with diving candidates from Consortium member institutions to achieve AAUS status for diving operations.

LUMCON will expand its DSP to include training, oversight, and certification for all scientific divers (plus other benefits listed above) for Consortium institutions. This would include campus visits by LUMCON's dive safety officer to oversee testing and checkout dives as well as regular standard and advanced training courses offered out of the DeFelice Marine Center. LUMCON will ask member institutions to commit an annual institutional membership fee at a cost far below each institution maintaining its own DSP.

## **5. PROMOTE LOUISIANA MARINE SCIENCE ACROSS CONSORTIUM MEMBERS TO INSTILL PASSION, AWE, AND RESPONSIBILITY FOR THE OCEANS**

The backbone of LUMCON's mission is the support and promotion of marine science in all its forms. Thus, a role LUMCON should play is highlighting and promoting the science of both DeFelice Marine Center and Consortium members. More simply, LUMCON should represent Louisiana marine science on the national and international stage.

As of the fall of 2016, LUMCON is seeking a social media coordinator/science communicator. The position is charged with developing a social media and

science communication plan that highlights Louisiana marine science across our Consortium members; the science, natural history, and facilities available at the DeFelice Marine Center in Cocodrie, LA; and conveys the excitement and energy for the new growth phase of LUMCON. The position will be required to manage day-to-day content production and execution for Facebook, Twitter, Instagram, YouTube, Pinterest, and other web platforms to engage and connect with the public, Louisiana residents, students, and various LUMCON stakeholders. The expectation is that the social media coordinator/science communicator will be embedded in the laboratory and field activities of the DeFelice Marine Center and do rotations through laboratories and field sites of Consortium member researchers.

#### **6. PROVIDE AND CREATE INNOVATIVE SCIENCE-INFUSED FIELD AND SKILL COURSES VALUABLE ACROSS CONSORTIUM MEMBERS**

As highlighted in the Strategic Business Plan and the Management Plan, better integration with Consortium institutions and cost recovery is needed for the undergraduate and graduate courses offered by LUMCON Marine Center faculty or their hired instructors. Plagued by a variety of issues, including costs, attendance and Consortium engagement of the courses has drastically diminished over time.



The University Education program is fundamental to LUMCON's mission. It serves a valuable role for marine education for both undergraduate and graduate students. It also offers LUMCON research and teaching staff opportunities to interact with member university faculty and students, thus complementing university research and education programs across the state. However, the University Education program, as presently structured, is not fulfilling its promise in two important ways...enrollment and university participation aside, the Marine Center incurs faculty and other instructional costs in conducting courses but student tuitions and fees remain at the universities through which students register.

In sharp contrast to LUMCON is the Dauphin Island Sea Lab, where member Alabama universities send 90% of the tuition and fees they collect to DISL.

- Review the courses identified as "LUMCON" courses in member university catalogues.

- Seek uniformity among the course offerings among the universities, e.g., name, credits, course description, etc.



- Assess the needs of the member universities for Marine Center courses within a university's curriculum, e.g., will the course count as credit in a curriculum or just as an elective with no credit to the degree, do their students need courses at the Marine Center.
- Identify gaps in Marine Center course offerings, or identify courses that may not be useful, either as credit to a degree or as an elective.
- Consider strengthening intersession courses and long distance learning (one LUMCON course is broadcast and includes a required field trip).
- Develop a schedule of Marine Center courses that satisfies the needs of member universities, as best as can be accommodated.

~ Strategic Business Plan 2015

Moving forward, four specific actions are needed. LUMCON leadership is currently coordinating with the Associate Commissioner of Academic Affairs from the Board of Regents as well as key leaders from Consortium members to work toward these goals.

1. LUMCON courses need to better integrate into Consortium institutions' needs and requirements. A formal assessment of LUMCON offerings and development of a cross Consortium matrix that pairs LUMCON courses with Consortium members' course listings is greatly needed.
2. For viability and financial sustainability, LUMCON must increase undergraduate/graduate student enrollment and exposure. This can be achieved through targeted social media campaigns, regular visits by LUMCON staff to promote courses, Consortium faculty promoting LUMCON courses with students, and greater advertising and media about course offerings.
3. Consortium institutions must also be committed to an educational relationship with LUMCON. This includes, but is not limited to, properly listing LUMCON courses in catalogs, promoting of LUMCON courses, and developing processes that easily enroll students in the courses.
4. Consortium institutions must also be committed to returning tuition for the courses to LUMCON. Currently, LUMCON loses ~\$100K per year supporting these programs with no cost recovery from Consortium members. This is not a financially sustainable option for LUMCON.

## 7. CONTINUE TO BUILD THE TOOLS AND PROCESSES NEEDED FOR A HEALTHY CONSORTIUM

Several tools are required to continue to expand and support the Consortium.

An Advisory Council is being established. This Council will provide recommendations to the Executive Director about mission fulfillment, new initiatives, program effectiveness, building the Consortium, and overall strategic planning. Council members are invited and serve at the will of the Executive Director. The current membership includes: Dr. Gary LeFleur (Nicholls State University), Dr. Mark Benfield (Louisiana State University), Dr. Beth Stauffer (University of Louisiana, Lafayette), and Beth Guidry (Ellender High School). New members will continue to be added as new relationships are built across the Consortium.

Additionally, a new Consortium coordinator position needs to be created and funded. The position would coordinate and promote class offerings with Consortium undergraduate and graduate programs, consortia meetings, and use of LUMCON facilities. Likewise, the position would identify new ways to serve universities and areas for opportunity as well as establish contacts among Consortium members.

Similar positions were called for in the Strategic Business Plan

University Education Programs Coordinator: Promote within or recruit a University Education Programs Coordinator to develop MOUs, expand courses, and participation.

University Research Coordinator: Create, advertise and fill this new position to help build research collaborations with member universities and beyond.

~ Strategic Business Plan 2015

The new roles of both the Executive Director and the Associate Director for Education and Outreach relieve some of the burden of this position. However, a Consortium coordinator that combines aspects of these position is still warranted and support is needed.

For the continued viability and expansion of LUMCON, pledges of support and financial commitment will be necessary. Consortium institutions and scientists must be active participants in LUMCON.

# CONNECT ENRICH TRANSFORM









## 8. EXPAND THE CONSORTIUM NETWORK

“

Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world.

~ Louis Pasteur

”

“

Science knows no boundaries, and efforts to create barriers – whether to keep new ideas within or to prevent new ones from entering from the outside – have universally proved harmful to progress.

~ Sidney Drell

”

Although the mission of LUMCON will always be Louisiana-focused, the educational and research programs are well served by recruiting institutions, researchers, and students from nearby, non-coastal states. LUMCON will seek formal arrangements, and inclusion into the Consortium, to serve as the marine laboratory for institutions in the land-locked states of Arkansas, Oklahoma, and Tennessee. This will serve to both create a larger network of expertise and greater usage and financial viability.

# ENRICH

Give back to the community through education and outreach initiatives

LUMCON's education and outreach programs have traditionally lacked mission and served a marginal role in LUMCON's overall mission compared to the research programs.

Education and outreach will become one of the three main pillars of LUMCON's new focus captured in the new CONNECT, TRANSFORM, ENRICH terminology. With a move to a focused education and outreach program, the new mission of the LUMCON's education and outreach program is

**...to enable the next generation of marine scientists and ocean literate citizens. We will reach this goal by providing meaningful and relevant place-based and skill-based experiences for all visitors, while aiming to have significant impacts on Louisiana's diverse citizenry including those populations underrepresented and underserved in marine science.**

Note the initial Five-Year Master Plan called for local and skill based education as well as focus on underserved groups as defined by LUMCON values. These are worth pursuing in the next five years.

- » Enhance Louisiana universities' marine science curricula with engagement in skill-based, field-based courses at the Marine Center and collaborative teaching opportunities across the state's universities.

- » Continue to enhance and expand opportunities for under-represented minority students in marine science.

## THE NEW EDUCATION AND OUTREACH MISSION OF LUMCON

The key to this mission is focusing on underrepresented and underserved populations. The landscape of Louisiana represents one of considerable diversity, and the struggle to provide opportunities across these diverse populations remains. Louisiana's poverty rate (19.6%) is well above the national average of 12.4%. Child poverty nationally is 21.9% while Louisiana's is a shocking 27.8%. Twenty-four of Louisiana's parishes are considered persistent poverty parishes with more than 20% of the population falling below the poverty line consistently since 1970. Thirty-two parishes are classified as African-American, high poverty areas (from Louisiana's Rural Poverty). These poverty rates place Louisiana number one among the 50 states in both poverty and child poverty levels. The ramifications of this poverty, often concentrated among African Americans, is seen in higher education in Louisiana. The adult population with bachelor's degree or more nationally is 32.5% while in Louisiana it is 14.7% and among African Americans the national average is 14.7% compared to the 13.4% in the state.

Historically, the racial, ethnic, and socioeconomic diversity of the geosciences is the lowest among all STEM fields (National Center for Science and Engineering Statistics, 2015). The lack of diversity may be even more dire in ocean sciences and getting worse. According to NSF statistics, between 2004-2013, 1,071 Doctoral degrees were awarded in ocean sciences, with only 11 awarded to African Americans (NSF Statistics 2015). In 2012, African Americans accounted for 1.7% of all Doctoral degrees in ocean sciences, well below any other STEM











discipline and below the 6.6% average for all doctoral degrees awarded that year. By 2013 that number fell to 1.6 % (NSF Statistics 2015). African Americans seeking masters' in ocean sciences decreased 2% from 2.7% to 0.7% while other areas in science increased from 10.2% to 11.4% (NSF Statistics 2015). Although specific data is lacking for the role of socioeconomic status on entering ocean sciences, students from low income families are significantly less likely to enter and persist in STEM disciplines including ocean sciences. Despite the growing demand in marine science, the recruitment and retention of underrepresented groups remains a challenge. This lack of diversity significantly impacts the marine sciences as group diversity bolsters problem solving, strengthens collaboration, and promotes ingenuity.

Although we lack the Louisiana-specific statistics, given the combination of issues facing Louisiana compounded with those facing marine sciences, programs focused on the recruitment and retention of underrepresented groups in marine science in Louisiana is greatly needed.

Previously, the Strategic Business Plan posited several critical ideas about the education programs at LUMCON. These were incorrectly based on the idea that education programs, especially K-12, were a net loss of funds. The "low-price/high-volume model" was not sustainable nor impactful. The Strategic Business Plan moved away from this model suggesting that a premium "high-impact/high-value" was warranted. "These programs would target a more "attractive" niche of students-in terms of academic achievement and also willingness to pay a premium for the LUMCON experience." Further suggestions included moving K-12 programs to BTNEP.

The focus of LUMCON's education and programs should be the exact opposite of what was advocated for in the Strategic Business Plan. In actuality, the education and outreach programs at LUMCON are cost neutral with costs balanced by both a combination of minimal fees charged for room, board, vessel, and educators

and grant funding. In many years, the cost center has run a few thousand dollar surplus. Moreover, in a state facing such extreme poverty levels any premium education programs are unlikely to find an audience or be financially viable. If such an audience for these premium programs did exist, these programs would still exclude much of the population, including those that would most benefit from programs such as LUMCON's. Thus LUMCON would no longer serve the diverse set of taxpayers that support LUMCON's activities. Last, because of the new focus of the education programs on low-income and underserved populations, opportunities abound for funding through multiple foundations and initiatives with similar missions.

Although impact of any education and outreach program is hard to track, there are many K-12 students who have visited LUMCON's camps and/or field trips and continued into undergraduate and graduate programs in marine science. These students often return to LUMCON to participate in other research and education opportunities as their career progresses. Below are some direct quotes from students, parents of students, and teachers that have participated in LUMCON education programs.





## HALLIE ROGERS

*First year LSU student*

"I've been doing well!  
I can basically teach  
my oceanography and  
environmental science classes!

LUMCON has taught me a great deal,  
and right now I am so thankful that I am familiar with the  
terms they are using and the material they are teaching. It  
has taken some weight off of my shoulders knowing that  
I don't have to worry about bad grades in those classes."



## TORI HERBERT

*Second year student at USM*

"I have been visiting  
LUMCON for my entire  
life. Whether it be for school

field trips, Open Houses, or the  
occasional workshop, I don't think six  
months has ever gone by without a stop by the Marine  
Center. I first attended the education program's LEAD  
Camp in 2012. This camp made me fall in love with marine  
science and with LUMCON, and it opened doors for new  
opportunities. Because of my experiences at LUMCON, I  
was able to take almost every biology class offered by the  
Louisiana School and gain research experience at school,  
at Nicholls State and on two research trips through the  
Ecology Project International. None of this would have been  
possible had it not been for the educational programs I  
was involved with at LUMCON."





## DOUG RIPLEY

*Parent of a  
LEAD Camp student*

"As the summer is starting to wind down I wanted to send you a note after we have had time to reflect. We have had a great summer filled with adventure and challenges and I wanted to let you know that Evan Ripley's highlight of his entire summer has been his time at your camp in June. His mother and I have seen the growth in him every day, the maturity, the recognition of things he never before considered are all much more evident after he spent a week doing something he absolutely loved with people he didn't know in an environment he wasn't familiar with. I just want to thank you for the opportunity you gave him and hope you appreciate all you are doing for these kids."



## JOHN BOUDREAUX

*Teacher at Covington High School*

"My involvement with LUMCON and the teacher workshops they offer has been a big asset to me as an educator. I have learned things that I was never taught in school. I have had experiences most teachers are never given the opportunity to have. I have become a more hands-on teacher that is not afraid to take his students outside. What I learned at LUMCON has allowed me to more fully and confidently teach my students my students about the world around them."

Although the recommendation was to outsource education programs to BTNEP and remove or reduce other programs, LUMCON's education and outreach programs remain the only continued and assured way it reaches and serves Louisiana's populations across the state. If LUMCON is to remain sustainable, then LUMCON must connect with and prove its worth to the Louisiana citizens that sustain it. Moreover, LUMCON needs to instigate a formal evaluation of the education programs to define metrics for success and effectiveness.

## EDUCATION AND OUTREACH IN ACTION

### 1. CONCENTRATE ON SKILL- AND LOCATION-BASED PROGRAMS.

As outlined previously, LUMCON's strengths include its facilities, vessels, and location. LUMCON is unique in Louisiana. Its location along the Gulf of Mexico is an asset to our education programs. The DeFelice Marine Center represents the only field marine laboratory in the state. In this regard, we can provide education and outreach experiences that many institutions cannot. Moreover, studies have indicated that education programs that provide skill-based and immersive programs are more likely to retain and impact students in STEM disciplines.

### 2. REACH STUDENTS AND SCHOOLS LACKING THE RESOURCES TO VISIT THE DEFELICE MARINE CENTER

Not every student and school has the financial resources to visit the Marine Center. LUMCON will commit over the next five years to find the support and funding to change this. LUMCON will actively seek and partner with foundations, business, corporations, and private donors to see this endeavor to fruition. The goal is to secure funding for transportation, substitute teacher fees, room and board, and boat and facilities fees for low-income school districts. Moreover,

LUMCON will be committed to finding additional funds that provide scholarships for low-income and underserved students to attend camps and courses at the facility.

LUMCON will also commit to building meaningful programs that take our educational opportunities to the schools and students themselves. To this effect, LUMCON will build a program called the "Ocean Roadshow," an annual event that places teams of Consortium marine scientists into the classrooms across the state. These teams will talk about their research programs, a life in science, and career opportunities in science. The goal is that each team will have contact with groups of students in small classroom settings where free dialogue is promoted. The "Roadshow" teams will be accompanied by a LUMCON educator who will have helped the team design their presentation. In some cases, the presentation may be hands-on and interactive with some aspect of the team's research theme. In other situations, research equipment may be displayed, but the goal is to immerse students in the research of Louisiana scientists. By actively engaging with scientists, students will get an in-depth view into the world of science that is personal and interactive. These qualities are imperative to motivating students to become conscious of the way they interact with science and scientists in their daily lives. Students that participate in the "Roadshow" will also become involved with Consortium members that will yield relationships that may last years. Lasting relationships can help to get more of our students into STEM career paths.

**Every public school in Louisiana will visit LUMCON or be visited by LUMCON**











### **3. PROVIDE THE SKILLS AND OPPORTUNITIES THAT INSPIRE THE NEXT GENERATION OF MARINE SCIENTISTS AND LEAD THEM TO SUCCESSFUL CAREERS**

LUMCON will add to its education and outreach opportunities for students in both primary and secondary schools to gain a range of skills. At the K-12 level, LUMCON will provide short skill camps that focus on environmental science and marine technology. For example, a new ROV workshop for high school seniors and juniors was initiated in the Fall of 2016. This workshop engaged students on a broad, interdisciplinary scale. Students were tasked with learning about deep sea research, basic engineering skills, and how open source technology can be applied to scientific research. They practiced teamwork and time management, and experienced a unique and unparalleled look at ship-based research. Very few places can offer students the kind of experience the participants of this workshop received, but LUMCON is uniquely situated to do just that.

At the university level, LUMCON has added skill-based courses to its summer offerings. These one-week, intensive skill-based courses are intended for undergraduates, graduate students, and junior faculty seeking to add new skills to their portfolios. In the summer of 2017, four skill-based courses are planned including: social media and science communication for marine scientists, small boat operations, marine bioinformatics, and marine digital photography.

### **4. CREATE OPPORTUNITIES FOR UNDERREPRESENTED AND UNDERSERVED GROUPS IN MARINE SCIENCE**

LUMCON needs to more fully realize its mission to those underrepresented and underserved in marine science. LUMCON will build stronger partnerships with those Consortium members focused on low-income (e.g. McNeese) and/or underrepresented groups (e.g. Southern University at Baton Rouge) to create

pathways for students from these institutions to become active in LUMCON programs.

As example, LUMCON will be seeking funding from the NSF GEOPATHS program to form a Consortium network with Consortium members that serve low-income and underrepresented groups in marine sciences to build up a mentoring and research program with LUMCON. This initial proposal will involve a collaboration with McNeese University, Nicholls State University, Southern University at Baton Rouge, and Grambling State University but the goal is to expand the program. This will provide a cohort of students from these institutions to exposure and training in marine science and career paths in STEM disciplines. The design of this program is multi-tiered not only to deliver a quality education program, but also to assist students with some of the most difficult transitions of a student's academic and professional career. Along with research-based experience, one of the program goals is to provide mentorship in soft-skills that are essential to being successful as a student and young science professional. Such skills include (but are not limited to) a solid foundation in communication skills, resume development, interview and media training, creating and delivering successful presentations, and grant writing. Helping students envision possibilities, set goals, and then ultimately achieve those goals is foundational to the LUMCON education program. If we can achieve a higher level of success in students that traditionally do not choose or succeed in marine science, we must offer support to those students through transition from high school to college and/or college to workforce/graduate school. This program will allow us to do that by supporting students on a long-term basis with the support of our Consortium members.

## 5. ELEVATE EMERGING AND YOUNG SCIENTISTS THROUGH THOUGHTFUL AND LASTING MENTORSHIP

Lasting mentorship and training is vital to the success of students and young scientists in STEM disciplines. LUMCON has a long history of mentoring undergraduate students in research through a variety of internship programs. LUMCON established a highly successful, NSF-funded REU site program in 2011 that ran for 4 years. Since that time, LUMCON faculty have supported a scaled-down (~3 students per year) program supporting REU interns each summer. In addition to attracting strong students from around the country, LUMCON has made it a focus to support students from throughout the Consortium as part of our internship programs. With the current and future faculty cluster hires, LUMCON has been in discussions with NSF about applying to reestablish our REU site with a proposal in 2017. LUMCON will continue to build this program seeking to develop innovative methods that better provide the knowledge and skills for students to succeed in science. The REU program will be augmented with the aforementioned GEOPATHS program and other new programs that will provide laboratory and field experiences for high school students. Throughout these programs, LUMCON aims to provide opportunities to both postdoctoral fellows and graduate students to gain experience in mentoring. Additionally, graduate students and postdoctoral fellows working with DeFelice Marine Center faculty will also be better served by the addition of a professional development discussion series that will focus on such topics as teaching, ethics, and grant writing.

In addition, students entering into LUMCON during K-12 programs have often informally been mentored by the education staff. Mentorship of students is not unique to LUMCON, but the assets of LUMCON are very valuable to students with limited resources to break into marine science. Coming up through the LUMCON system first as a student, then a student instructor, the student has become highly trained in research techniques, has a deep understanding of the complex

ecosystems of coastal Louisiana, and is very good at communicating science in an informal setting. This mentoring has included education and career advice and incorporation into new LUMCON programs as undergraduates and even graduate students to ensure that students of Louisiana are highly competitive with other students nationally. These students often may serve as counselors and instructor's aids in other LUMCON K-12 programs. Several students have been tracked through this informal program from K-12 student into their successful acceptance into graduate school and/or the workforce. In the coming years, LUMCON will formalize this program, continue to assess its impact, and provide additional resources to promote its success.

## 6. DELIVER UNIQUE, INNOVATIVE SKILL AND LOCATION BASED UNDERGRADUATE/GRADUATE COURSES

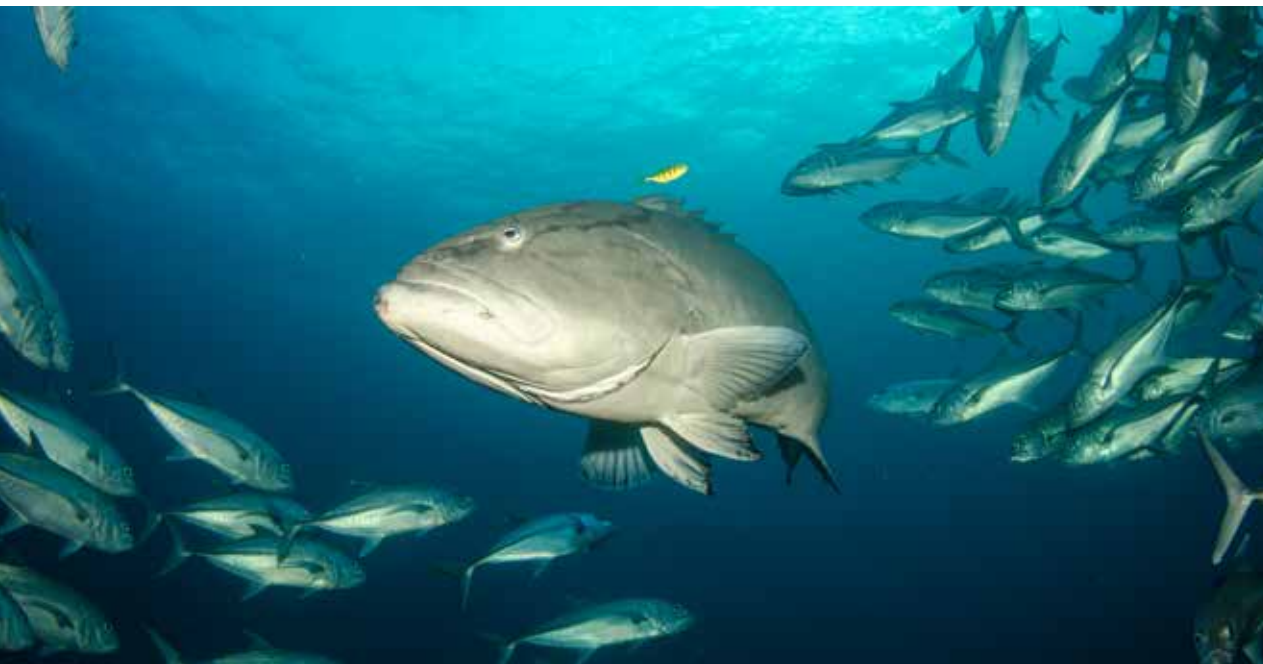
LUMCON is well positioned to be more adaptable and innovative with education and outreach programs because of the minimal institutional inertia and complexity. LUMCON leadership will continue to seek out and develop new models for education and outreach and demand the same of course/workshop instructors. LUMCON also is unique among marine field stations, in that research expertise extends beyond biological sciences. LUMCON's educational programs have and will continue to provide courses in chemical and geological sciences while seeking new areas to provide courses. One such example is marine atmospheric science course to be taught in 2018 in partnership with Consortium member University of Louisiana, Monroe.



# TRANSFORM

Contribute to science and conservation in meaningful and profound ways

In marine science, few institutions can boast the productivity and creativity of Bell Laboratories. Institutions lack some critical component of the Bell Laboratories recipe whether the tools, resources, critical mass of scientists, or the expertise. LUMCON is uniquely situated to be able to provide the tools and resources, a key part of the mission. Through both the DeFelice Center faculty and researchers of the Consortium, LUMCON is well poised to build a thriving intellectual community. The action items below keep the Bell Laboratories model in mind with the view of developing a center of innovation, creativity, and productivity in marine science and conservation.



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At its peak, Bell Laboratories was the premier facility of its type, developing a wide range of revolutionary technologies, including radio astronomy, the transistor, the laser, information theory, the operating system Unix, the programming languages C and C++. Eight Nobel Prizes have been awarded for work completed at Bell Laboratories.

~ Wikipedia

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To innovate [the] labs required the smartest people—and it needed a lot of them, so as to foster explosive ideas. There were other ingredients for innovation, too. Bell Labs needed to house its critical mass of scientists and engineers close to one another so they could exchange ideas; it also needed to give them all the tools they needed.-How Do You Manufacture Innovation?

~ Jon Gertner, Time Magazine, March 23, 2012

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## SCIENCE IN ACTION

### 1. CONTRIBUTE DIRECTLY TO SCIENCE AND CONSERVATION THROUGH THE RESEARCH OF DEFELICE MARINE CENTER FACULTY

As noted in the Strategic Business Plan, faculty numbers have dwindled at the DeFelice Marine Center. The Master Plan also noted this issue.

Recruit, retain and support leading marine science in-residence and member university faculty, particularly those with an emphasis on field-based research in Gulf of Mexico ecosystems...The in-residence faculty and their staff are key to the backbone support of research and education activities at the Marine Center through their research programs.

~ LUMCON Master Plan 2016-2020

LUMCON will, in the first years of the implementation of this Master Plan, initiate two faculty cluster hires. The target will be to fill vacancies in the expertise of the DeFelice Marine Center and Consortium as a whole. The goal is to reach a total of 12 active research faculty in residence at the Marine Center.

The responsibilities of faculty will differ from faculty at more traditional academic institutions. Specifically, faculty will be expected to contribute across the Connect, Transform, Enrich mission. Faculty will be expected to collaborate with

Consortium faculty and contribute significantly to the education and outreach programs. Annual assessments will not only evaluate their contributions to science (i.e. transform mission), but these additional Connect and Enrich missions as well. Likewise, faculty will be sought that utilize the DeFelice Marine Center's unique location, facilities, and tools. These are in line with the recommendations of the Master Plan.

- » Encourage faculty to develop innovative marine research programs.
- » Enhance the opportunities for research led by Louisiana's university faculty that utilize LUMCON's outstanding facilities and resources to their best advantage.
- » Use the Marine Center's location as a recruiting tool for new faculty.
- » Plan for transitions when faculty retire; work to ensure that knowledge and facilities are transferred to new faculty.
- » Coordinate in-residence faculty hires so they complement on-campus faculty.
- » Involve the member universities in hiring decisions.

In response to the last recommendations, the faculty descriptions, searches, and interviews have been, and will continue to be coordinated with members of the advisory council (see description in the CONNECT section above) that comprises members of Consortium institutions and stakeholders.

Currently, LUMCON possesses no formal postdoctoral or graduate programs. Currently, postdoctoral fellow and graduate students associated with the marine center faculty are supported through the individual research programs and funding of the faculty. This, of course, limits the total number of postdocs in residence at the Marine Center. In the next 5 years, LUMCON will actively



seek funding to support a formal postdoctoral fellow and graduate student programs. This will increase the critical mass and expertise of the center. Models for the program include the programs at the Monterey Bay Aquarium Research Institute and Smithsonian's National Museum of Natural History.

## 2. PROVIDE INFRASTRUCTURE NEEDED FOR TRANSFORMATIVE SCIENCE

Key to the Bell Lab's success was the resources and equipment needed for the science enterprise. LUMCON provides four categories of tools and resources for Consortium scientists including: research vessels and oceanographic assets, the DeFelice Marine Center facility as both housing and laboratories, unique experimental systems with running seawater, and a marine science-focused library.

The Master Plan also comments on the importance of this infrastructure.

Support and maintain an outstanding research facility for coastal and marine studies...

3.1 Plan for maintenance of integrity of Marine Center assets

3.2 Ensure long-term viability of research vessels and small boats for use by the Louisiana academic community and other customers studying the Gulf of Mexico

~ LUMCON Master Plan 2016-2020

## Research Vessels

The research vessel fleet, as outlined earlier, represents one of the major strengths of LUMCON. LUMCON will continue to provide these world-class assets and marine operations.

A vast majority of the major scientific findings on the Gulf of Mexico ecosystem are based on data collected aboard the R/V Pelican, making it an essential tool for Louisiana and international marine science. Moreover, the vessel and its accomplishments continue to bring notoriety and attention to the state of Louisiana and LUMCON. New scientific teams consistently rotate (an average of 34 teams, 475 scientists, per year) through Louisiana, to access the vessel at its homeport, purchasing supplies and services and bringing revenue to the state and the local economy. The R/V Pelican is undoubtedly a valuable asset. However, the vessel is nearing the end of its operational life. While the R/V Pelican's talented crew are to be commended on their rigorous upkeep and refitting of the vessel, their continued efforts will only extend its service for another 5-10 years. Urgent action is needed to replace the R/V Pelican. Two potential options include:

### Option 1: Design/build vessel similar in size and function to current LUMCON vessel – R/V Pelican

LUMCON/State money required to design/build 130-150' research vessel to operate in the Gulf of Mexico, Southern Atlantic Ocean and Caribbean. Scientific outfitting to support federal, state and privately funded research activities. Along with supporting infrastructure (facility improvements to current LUMCON dock and maintenance building), supporting equipment such as forklifts and crane, vessel crew (7-8) and supporting staff (2) during build phase.

\$350,000	DESIGN OF VESSEL
\$20-25 MILLION	VESSEL CONSTRUCTION
\$2-4 MILLION	SCIENCE OUTFITTING
\$500,000	DOCK IMPROVEMENTS
\$1 MILLION	FACILITY
\$125,000	SUPPORTING STAFF
\$1.2 MILLION	VESSEL CREW
\$1.5 MILLION	MISC EQUIPMENT & SUPPLIES
<hr/>	
\$26.7-33.7 MILLION	TOTAL

**Option 2: Source out used vessel of 5-10 years old and 130-170’ in length. Perform refit into research vessel**

LUMCON/State money required to source out used vessel to be purchased or donated from local vessel operators along the Gulf coast. Refit selected vessel to support federal, state and privately funded research activities. Transfer some/all scientific support equipment (winches, crane, CTD, ADCP’s, etc.) from existing R/V Pelican. Along with supporting infrastructure (facility improvements

to current LUMCON dock and maintenance building), supporting equipment such as forklifts and crane, vessel crew (7-8) and supporting staff (2) during refit phase.

DONATED-\$10 MILLION	VESSEL
\$300,000-2 MILLION	SCIENCE OUTFITTING
\$500,000	DOCK IMPROVEMENTS
\$500,000-1.5 MILLION	FACILITY
\$125,000	SUPPORTING STAFF
\$300,000-1.2 MILLION	VESSEL CREW
\$500,000-1.5 MILLION	MISC EQUIPMENT & SUPPLIES
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\$2.25-16.9 MILLION	TOTAL

The LUMCON small boat fleet also continues to expand through Consortium partnerships and donations. This has greatly inflated the fleet beyond usage creating LUMCON costs beyond Consortium need. Currently, 2-3 vessels need to retired from the small boat fleet. Additional acquisitions need to concentrate on specific needs of researchers and educators. Small boat usage needs to be assessed on annual cycle to evaluate the necessity of each vessel.



No Gulf of Mexico institution currently provides consistent tools for deep- and blue-water research. Historically these assets have existed at some institutions but have been downsized because of costs in the last two decades. This has occurred despite the growing need for such assets in the Gulf. LUMCON would serve both the Consortium, and the marine science community as whole, well by providing these type of assets. Autonomous underwater vehicles (AUVs), including gliders, could be provided through strategic collaborations with groups at LA Tech and LSU to seek grant funding to launch a program. Partnerships are already being explored with Oceaneering International, Inc., located in Morgan City, LA, one of the largest operators and builders of remotely operated vehicles (ROV) in the world. Through a strategic partnership, ROVs deployed off the R/V Pelican could be provided to researchers for the first time in a consistent manner. This partnership would also ease the burden of the logistics and funding for individual researchers.

### **DeFelice Marine Center**

The Marine Center and its location, as outlined above, represents another of the major strengths of LUMCON. A lack of maintenance and upgrade funding have left the facility in desperate need of many repairs and upgrades. LUMCON will focus heavily in the next five years in revitalizing its physical core. This includes upgrading both laboratory and dormitory space. In addition, remodeling of meeting and classrooms into flex use space will greatly increase the capabilities of the center. Repurposing spaces into visiting scientists labs and offices as well as recreational spaces are also greatly needed.

### 3.3 | Address mitigation issues of a changing coastal landscape

The Consortium's Marine Center is located in a vulnerable position with regard to subsidence and sea level rise...Issues of sea level rise and shoreline erosion face not only the Marine Center but the transportation network to Cocodrie. The Consortium should be known for its leadership in responding to coastal threats and long-term coastal change. While actions to protect the Marine Center and the areas south of the new levee system are not addressed in the plan, LUMCON administration should:

- Develop a plan for Marine Center and other facilities mitigation measures in the face of sea-level rise and tropical storms.
- Pursue greater involvement in coastal protection and restoration plans as they related to the Marine Center.
- Prepare for capital outlay expenditures that will ensure the integrity of the Marine Center facilities.
- Engage businesses and residents in the region as they develop their plans to cope with sea level rise, climate change and hurricanes.

~ LUMCON Master Plan 2016-2020

In the history of LUMCON, no expansion of facilities has occurred. If growth and a renewed commitment to LUMCON's mission is intended, there will be a great need for increased laboratory and dormitory capacity. LUMCON will work actively to increase the physical footprint by both securing funding and exploring options. As part of the latter, a committee has been formed, comprised of representatives of the DeFelice Center faculty and various experts from Consortium members and state agencies, to provide guidance for the growth of the LUMCON facilities. Given coastal loss and the challenges the DeFelice Center already faces, including persistent flooding of the grounds, it is prudent to address questions about the feasibility and mechanism for building on the site versus migration of the facilities to a new location.

### Experimental Systems

LUMCON provides a host of experimental tanks and aquaria, i.e. mesocosms, with running seawater and filtration that allow for experimental organismal and biological community research. To this a specially designed racetrack flume system allows for investigation of hydrodynamics on organisms, sediments, and physical processes. These systems allow for research questions to be addressed that could not be conducted in natural systems because of variable conditions. LUMCON will continue to maintain and update these systems. Moreover, LUMCON will continue to look for both novel applications of these systems and new systems that will expand this capacity.

### Library

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**“The library is the only centralized location where new and emerging information technologies can be combined with traditional knowledge resources in a user-focused, service-rich environment that supports today's social and educational patterns of learning, teaching, and research. Whereas the Internet has tended to isolate people, the library, as a physical place, has done just the opposite.”**

**~ Council on Library and Information Resources.  
Library as Places: Rethinking Roles, Rethinking Space**

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Throughout academia, libraries are undergoing change as they become multidimensional spaces to accommodate the growth of digital media and user needs in the 21st Century. However, the physical space and contents of academic (and, particularly, special) libraries are still vastly important to clientele as areas for individual and group-related research, as well as social areas that foster the free exchange of ideas. LUMCON's library is no different.











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“LUMCON spends more money on maintaining a library - mostly a legacy of books inherited from Nicholls - than it does on arguably more important mission-critical operations... At a time when organizations are turning to digital collections, spending funds on staffing and maintaining a book/publication collection seems quaint and not a very good use of taxpayer dollars.”

~ LUMCON Strategic Business Plan

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Much of the physical holdings that comprise LUMCON's library—both monographic and serial content—predate the digital era and fall outside of the realm of material that will ever be expected to be available digitally to LUMCON's user base. So, LUMCON's physical holdings are especially valuable to marine researchers and students that need ready access to comprehensive information on a given topic. This essential resource extends beyond the local LUMCON community and groups of users that pass through the facility for workshops, classes, or overnight visits. For instance, consortia member libraries rely on LUMCON's holdings to supplant their information resources for campus faculty. In the last five years, 1,069 separate requests for LUMCON materials were made by consortia member institutions via Interlibrary Loan. Currently, along the Gulf Coast and in the United States, LUMCON's holdings represent one of the largest repositories of marine focused literature, and thus, an invaluable asset.

**Given the vast expanse of scientific knowledge still residing in physical volumes, not yet and potentially never being in digital format, LUMCON will continue to invest in physical holdings. Indeed, because this information has proven so valuable to Consortium scientists LUMCON will continue to seek out new physical holdings and expand collections.**

While recognizing the strength of LUMCON's physical holdings, LUMCON will continue to embrace technological change and digital resources to increase efficiency and productivity among its staff, and to make research much faster and easier for users. As well as commit to the concept of the academic library as a learning commons.

LUMCON's library has been at the forefront of engaging technology. The original card catalog was digitized in the early 1990s to aid in searching the collection and to create a backup of the catalog. In 1999, LUMCON became a member of LALINC, giving the facility the ability to search the library collection from any internet-ready computer. LALINC membership allowed LUMCON access to LOUIS digital resources, including subject indexes and the first full-text databases. Within three years, with increased purchasing power of LOUIS, came a browser-based library catalog and a flood of full-text resources spanning material from newspapers to doctoral dissertations. At the same time, the library digitized a long-running in-house bibliography on offshore oil and gas development, and later created a comprehensive web-based annotated bibliography of oil-spill dispersant research. In 2010, the library started the process of creating an Institutional Repository of published research, one of the few academic institutions in Louisiana that has a functioning IR.

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**“The emergence of the learning commons as a central element in contemporary library design offers an opportunity to transform the library’s role on campus from a provider of information to a facilitator of learning.”**

~ Richard A. Holmgren

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The learning commons is a strategic and spatial concept that combines the uses of a library’s facilities, services, and equipment, especially the use of information technologies. A learning commons helps to fulfil the education mission of an institution by encouraging interactivity among library users, leading to co-learning and situated (or team) learning. The physical space and its contents is the hub, and when combined with services, resources and technological innovations, provides a ripe environment for productive work. Over many years, the LUMCON library has made strides within physical and fiscal constraints to transition into a space that realizes this ideal. LUMCON’s LALINC membership—providing access to digital material and electronic databases to patrons that was otherwise prohibitively expensive—was a large step in this direction. Also, the library’s seating was arranged to promote group formation and collaboration. Indeed, the library as physical space is one of the most actively used areas at the DeFelice Marine Center. LUMCON will continue to commit resources to evolving the library to provide the necessary physical and digital space for independent learning and group collaboration.

Libraries have not stopped evolving in recent years, and the library at LUMCON is no exception. Newer concepts, such as Library 2.0 have taken hold to improve access and satisfaction for patrons. Library 2.0 also means reconfiguring the physical space of a library to make the space scalable for changing roles of the department as user needs evolve. The library was recently renovated to open up 15% of additional useable floor space. Now one section of the library can be used as a small classroom while another area houses LUMCON’s computer lab. Other space can be utilized once funding becomes available for the creation of a 3-D printing lab. Thus, the library becomes a hub of multiple educational and research activities that coexist simultaneously, in contrast to the anachronistic concept of a library as a glorified book warehouse—a building where students go to quietly study in isolation.

For each step in LUMCON library’s evolution, the librarian has been the essential ingredient. In a special library like LUMCON’s the librarian performs duties that are meted out to multiple staff members at university libraries, such as reference, circulation, interlibrary loan, collection development, system administration, research, serials invoicing, and other tasks essential to the maintenance of a library. Without a librarian on staff, there is no backup plan for a researcher needing to correct a vague, incomplete citation for a paper in revision. There is nobody else with the expertise to coordinate e-textbook purchases for classes. There is no other professional that is allowed to receive an invoice for LOUIS services. The librarian makes all these things possible at LUMCON.



### **3. CONTRIBUTE TO SCIENCE RANGING FROM THE MARSH TO BLUE WATER**

Coastal and restoration science have become the foci of many programs in Louisiana. While this is understandable considering the severe and unprecedented loss of coastal systems in the state, expertise and communities of practice for many important areas of conservation and research are still lacking in the state. Pragmatically, funding for this research through such mechanisms at the RESTORE Act and BP settlement funds represents a very competitive and crowded landscape of researchers. LUMCON would be well served by exploring and leveraging expertise in additional subdisciplines that do not exist, are rare, or have been lost in the state. Given the movement of oil drilling to deeper oceans and the importance of fisheries, these two areas warrant further exploration. In addition, LUMCON should investigate how it might contribute uniquely to coastal and restoration science. One possibility is supporting work and hiring faculty in social science to research the impacts of climate change and coastal loss on the communities of Louisiana. Given the Marine Center's location and the proximity to the Isle de Jean Charles community, the nation's first climate refugees, LUMCON provides a unique opportunity in this area.

### **4. PROVIDE A RESOURCE OF ENVIRONMENTAL MONITORING AND LONG-TERM DATASETS FOR THE REGION**

Since LUMCON's inception, environmental monitoring has been a core focus and asset. The DeFelice Marine Center's location again proves a strength in collecting and providing not only baseline environmental data, but data that quantify the changes to Louisiana's coastal ecosystem. In the next five years, a major expansion of the environmental monitoring staff, scope, and resources is planned. These include:

- » refine and build a long-term environmental monitoring mission,
- » provide support and funding to collate, integrate, and make accessible all long-term data, environmental, and biological data collected throughout LUMCON's history,
- » identify gaps in baseline knowledge and data,
- » identify and establish monitoring sites to adequately quantify and document changes to Louisiana's marine ecosystems,
- » provide the adequate tools and staff needed for the program success,
- » further integrate LUMCON monitoring with local, regional, and national efforts.

Furthermore, LUMCON is positioned in an area impacted by the 2017 Coastal Master Plan. As such, LUMCON is in a unique position to provide baseline and time-series data on changes in the physical, chemical and biological environment as the Master Plan is implemented. The routine and high-frequency transits by the R/V Acadiana between the DeFelice Marine Center and the Gulf of Mexico would enable time series data on water quality and important biological parameters (e.g. chlorophyll, phytoplankton, zooplankton, fishes). These parameters, mentioned as important in the Master Plan, need to be monitored on the time and space scales to assess how the Master Plan is impacting marine life in our highly productive and economically and ecologically vital estuaries.

# THE WHITE BOOT SCHOOL

Linking Across the Connect, Transform, and Enrich Mission

From university level courses, graduate students, visiting scientists in residence, REU and other summer internship programs, K-12 summer camps, and Consortium faculty conducting field research, summers at LUMCON represent a thriving community. LUMCON will formalize and enrich its summer program under its White Boot School. Inspired by the thriving intellectual communities that occur during the summers at the Bread Loaf School of English or over the course of the year at the Santa Fe Institute or at the prime of the NSF sponsored synthesis centers, LUMCON seeks to provide a place of innovation in research and education, while providing a research environment for networking and collaboration.

At the core of the White Boot School are two sessions of 3-week, full (3) credit, undergraduate and graduate courses on a variety of topics in marine science, integrating innovative teaching methods and rich field experiences. During the intersession, four skill-based courses will provide a variety of tools and experiences in everything from social media and informatics to photography and small boat operations. Simultaneously, a set of K-12 camps will provide opportunities for students to learn and be inspired by marine science and habitats of coastal Louisiana. Active research will be thriving through the science programs of the resident faculty and their laboratories, as well as a host of visiting scientific teams from across Louisiana's universities and research centers.

To create a community atmosphere, everyone will be encouraged to take meals together in a newly revamped cafeteria and participate in coordinated activities and programs. Evening and weekend programs, including field trips, kayak tours, cruises on the R/V Acadiana, social hours, concert series, and movie nights, will provide opportunities for exploration of ideas and the landscape while allowing time for informal discussion and networking.

The brand itself, The White Boot School, is based on the white rubber "shrimp" boots worn by Cajuns who fish the waters of coastal Louisiana, the white color

providing some cooling in the extreme Louisiana summer sun. A vital piece of equipment for work in the muddy marshes or decks of boats, the white boots have been adopted by many of the staff and researchers of LUMCON. The White Boot is a representation of something uniquely southern Louisiana, an homage to the bayou culture in which the LUMCON Marine Center is embedded. Most importantly, it represents an icon that when seen by strangers immediately creates a connection. These connections are key to establishing The White Boot School as the epicenter of marine science in the Gulf of Mexico.

The previous sections have outlined the updating and remodelling of the facilities, increased coordination with Consortium members, building capacities for transformative research, and focusing education programs on location, skill, and innovation based offerings. These are all vital to the success of the White Boot School.





# SUSTAIN

Key to LUMCON's Connect, Transform, Enrich mission is the financial security and vitality to allow for the maintenance and growth of programs. Financial reserves will insulate LUMCON against funding volatility while providing accessory budgets that allow for innovation and development of new initiatives. From the Strategic Business Plan,

Recommendation 13: Identify and prioritize such community organizations based on mission match and potential for creating value relationships. Identify organizations that support solicited and unsolicited grant applications.

Identify the need for new staff members (e.g., Development Officer) and any structural changes, such as the establishment of a 501(c)(3), to help implement the Plan.

Target grants, donations and gifts in a focused development program.

~ Strategic Business Plan 2015

Although fundraising activities directed toward donors should not provide the basic operating income for LUMCON, it can be a significant component of overall financial health. Any opportunity to generate an endowment should be taken. For example, ideally a portion of funding for capital improvements would be set aside in a maintenance endowment to provide future annual income toward the expense of staff and materials for facility upkeep.

~ Strategic Business Plan 2015

## PLAN OF ACTION

### 1. BUILD A STRONG, DIVERSE, AND THRIVING DEVELOPMENT PROGRAM

LUMCON's budget is primarily supported through state funding, indirect funds from state, federal, and private grants, and revenues gathered from vessel operations. Given the volatility of all of these revenue generating mechanisms and the continued shrinking of the first two sources in particular, there is a strong need to seek out other revenue streams. To this effect, LUMCON is immediately dedicated to establishing a development program by hiring a

director of development and diversifying the funding portfolio to include:

- » foundational support and long-term relationships, historically underrepresented in the LUMCON budget,
- » annual donor giving that reaches out to the strong connections formed with the alumni of field trips, camps, and courses at LUMCON,
- » connecting with the support and dedication to the LUMCON Marine Center already exhibited by the local communities across Terrebonne Parish, which includes connecting with community at local events and festivals,
- » building relationships with major donors to support and expand our educational and research enterprise through such programs as building campaigns and endowed chairs,
- » seeking out corporate and business partnerships where missions align to achieve success for both institutions.

## **2. INCREASE THE AWARENESS AND EXPOSURE OF LUMCON AMONG LOUISIANA'S AND THE NATION'S DIVERSE AUDIENCES**

LUMCON has had challenges with generating exposure and communicating activities and events. Several actions are being taken to increase the exposure of LUMCON to the general public, stakeholders, public officials, researchers, and others. Some of these actions build from effective strategies used historically, while others are new and innovative.

- » In the past LUMCON has held its Bi-annual Open Houses at the DeFelice Marine Center. These events drew large numbers (~1200-1500) of the general public from surrounding communities and locations as far away as

Baton Rouge. This event continues to increase our public profile and both maintains and establishes new relationships with local communities and stakeholders. The next Open house is currently planned for spring 2018.

- » In the alternating years LUMCON will host an event much like an Open House, but will instead use LUMCON research vessels to promote LUMCON goals, assets, and activities. These “Meet the Fleet” events will bring LUMCON into new communities by exhibiting the research and vessels of the Consortium. These events will take place at large docks around the state and allow touring of the docked vessels (R/V Pelican and R/V Acadiana). In addition to tours of the vessels, visitors will also have the chance to interact with LUMCON science and education staff. Each faculty member will have an exhibit to showcase their research programs in an engaging and interactive way. Education staff will also provide hands-on activities for children. The first Meet the Fleet event will be held in Baton Rouge on May 19-21, 2017.
- » To better establish online communications, LUMCON is currently seeking a social media coordinator. The social media coordinator will be charged with building an innovative and dynamic social media program. This will help engage our online community and help to communicate the marine science being done both at the marine center and all Consortium members. The social media coordinator will have access to all the LUMCON assets and science to best translate LUMCON activities (including special events) through proven and effective techniques for social media outreach.
- » LUMCON staff will continue to attend and exhibit at community events, festivals, and conferences. LUMCON currently has strong ties to many events, but increasing the number and strength of these relationships will add to the visibility of LUMCON. Several potential partners and strategies have already been identified and this is an attainable short-term goal.













8124 Hwy. 56  
Chauvin, LA 70344  
985-851-2803  
[www.lumcon.edu](http://www.lumcon.edu)



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