



Master Plan 2016 - 2020

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 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.



Overview of the Planning Process

Passage of House Resolution 50 of the Regular Session, 2011, of the Louisiana Legislature called for the Board of Regents to “study the role, mission, and structure of the Louisiana Universities Marine Consortium” along with an “examination of the relation of LUMCON to other consortia to determine the appropriate authority and funding levels needed.”

The Board of Regents convened an external review panel composed of three out-of-state consultants: Dr. George Crozier, Panel Chair, Executive Director, Dauphin Island Sea Lab; Dr. Bruce Corliss, Director, Duke/University of North Carolina Oceanographic Consortium; and Dr. John Wells, Dean and Director, Virginia Institute of Marine Science. The panel met at the LUMCON Marine Center in Cocodrie with LUMCON resident faculty and staff to review materials provided by Dr. Nancy Rabalais, Executive Director of LUMCON, and the Board of Regents staff. A second meeting at the Board of Regents in Baton Rouge involved interviews with university and agency leaders. The report was submitted to the Board of Regents in September 2011. The Board of Regents convened a Task Force to consider the findings of the External Review Team and subsequently submitted a report to the Legislature in early 2012 with the following recommendations (font pattern indicates *completed*, existing but under revision, **new**):

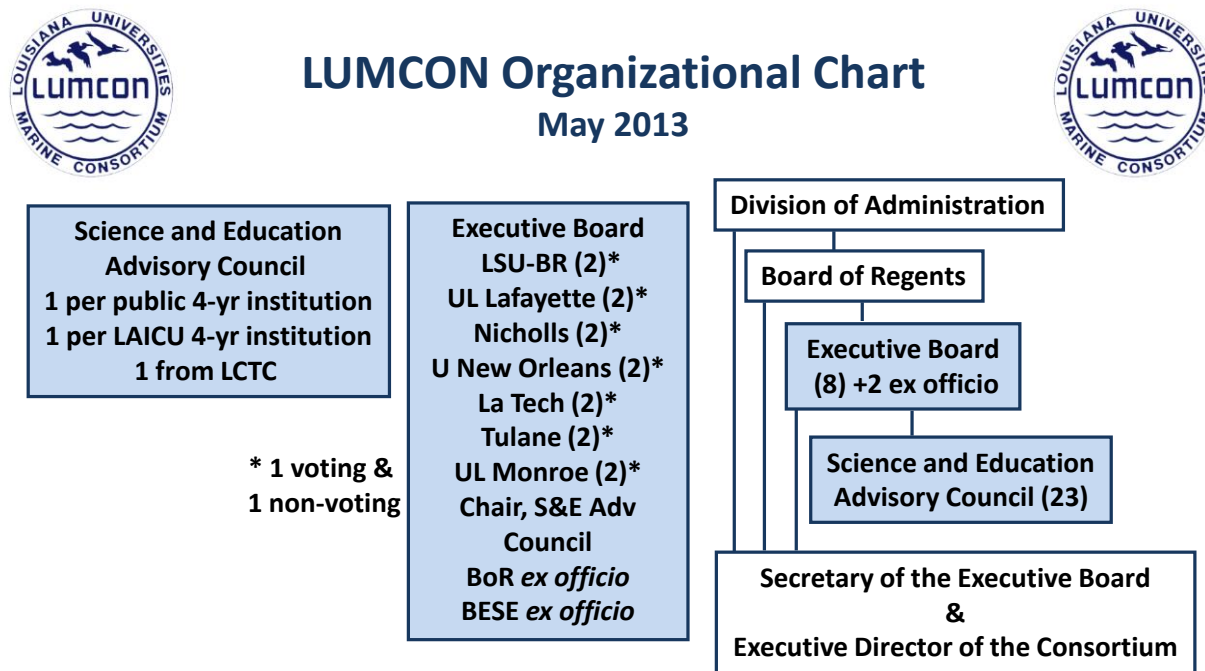
- *Reorganization of the Executive Board and Science and Education Advisory Council*
- **Define and clarify LUMCON's mission**
- **Define and clarify the role and functions of the Science and Education Advisory Council**
- *LUMCON shall continue to include all public and private four-year universities*
- **Develop a five-year Master Plan**
- *Promote collaboration among member campuses and faculty, including interaction of Marine Center in-residence faculty with the greater Louisiana academic community*
- *Develop policies for LUMCON's share of indirect cost recovery on grants and contracts including LUMCON faculty (in-residence Marine Center faculty and campus-based faculty with LUMCON assignments) and use of LUMCON-managed facilities*
- *Define the status and function of LUMCON-managed vessels (RV Pelican, RV Acadiana, and small boats), DeFelice Marine Center, Port Fourchon Laboratory, and Barataria-Terrebonne National Estuary Program*
- *Establish a table of organization for LUMCON, including the number and distribution of Marine Center in-residence faculty positions*
- *Establish policies and procedures for development of Marine Center in-residence faculty, including tenure at member institutions, participation in education and graduate training programs, and access to member campus resources*
- *Afford opportunities for all LUMCON-assigned faculty to provide regular programmatic input*
- **Expand K-Ph.D. educational programs and establish policies regarding tuition and fee recovery for courses taught by Marine Center in-residence faculty at the Marine Center, on member campuses, and via distance learning**
- *Determine policies and plans for sharing LUMCON-managed and campus-based facilities for coastal and marine research*
- **Explore mechanisms to create and sustain post-doctoral fellowship and faculty sabbatical programs**
- *Create policies governing provision of space for visiting researchers at the Marine Center*
- *Address LUMCON's long-term financial and other resource needs*
- *Support State needs through collaboration with relevant State agencies, including the Governor's Office of Coastal Protection and Restoration, Department of Wildlife and Fisheries, Department of Health and Human Services, Department of Environmental Quality, and the Department of Natural Resources*
- **Define the Executive Director's primary role to exercise leadership in developing collaborative activities among LUMCON member institutions, including research, education and outreach**
- **Executive Director, Chair of the Executive Board, and Chair of the Science and Education Advisory Council to report to the Board of Regents annually on progress with the Master Plan**

Legislation in the Regular Session of 2012 amended the enabling legislation for the Louisiana Universities Marine Consortium for Research and Education to constitute a new governance structure for the Executive Board and the Science and Education Advisory Council (SEAC), and called for a “5-year master plan for the consortium's marine science and education programs and initiatives.” The structuring of the Master Plan and its content began in earnest with the first meeting of the SEAC and an *ad hoc* committee on May 31, 2013 at the LUMCON Marine Center in Cocodrie, LA. The resulting Strategic Plan went through many revisions and was presented to the LUMCON Executive Board in January 2015 for its consideration. This Master Plan combines the many considerations and iterations from the committees, the LUMCON Executive Board, the broader Louisiana academic community, and the LUMCON Marine Center faculty and staff. The 2016-2020 Master Plan was adopted by the LUMCON Executive Board on August 19, 2015, and delivered to the Louisiana Board of Regents on September 23, 2015.

Institutional Context

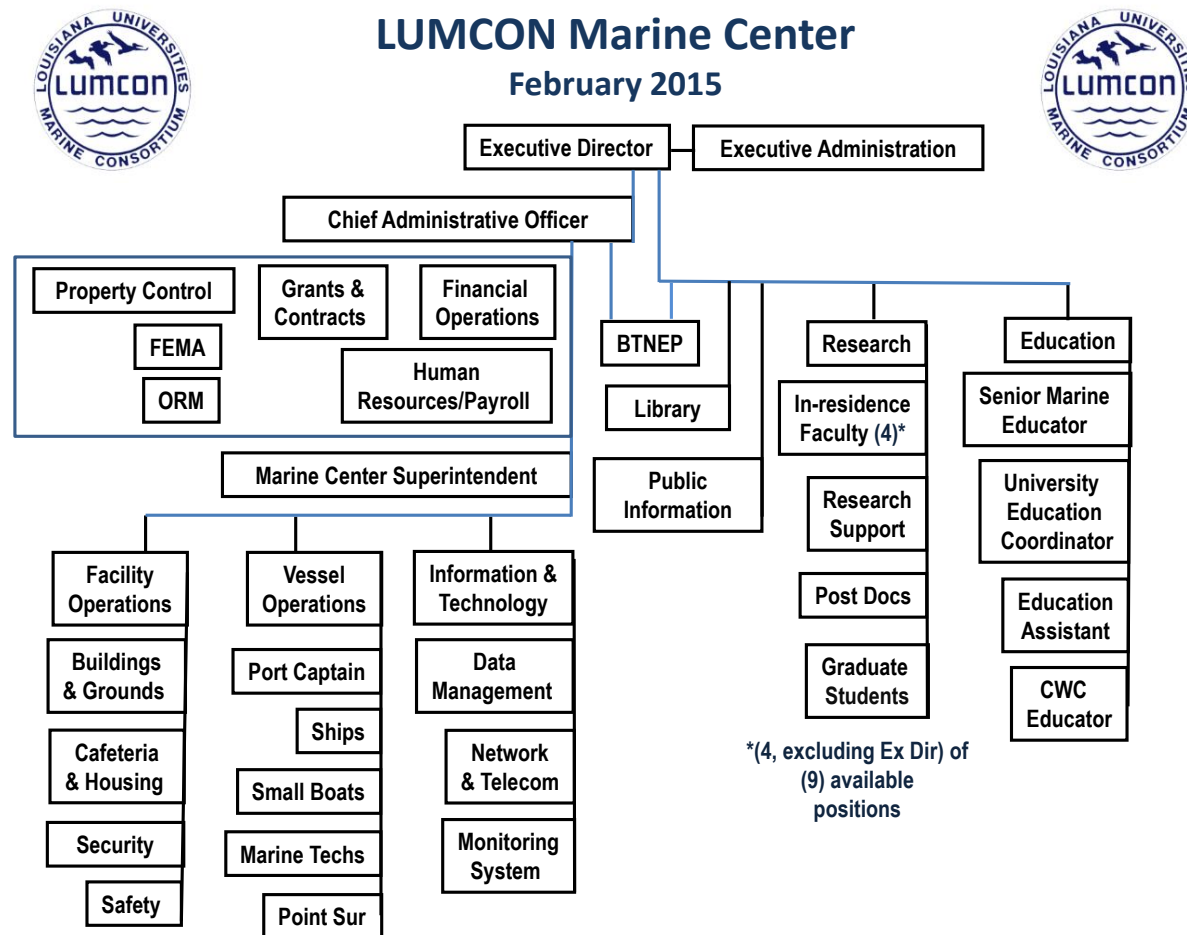
The Louisiana Universities Marine Consortium for Research and Education was enacted into law in 1979 as a body corporate under the Board of Regents “with the primary function of conducting research and promoting education in the marine sciences and marine technology, particularly where related to coastal resources and the impact of energy related industries upon these coastal resources. Such functions shall be performed principally at the Louisiana Universities Marine Consortium Center on the Louisiana Gulf Coast.” It was “composed of all public institutions of higher education now or hereafter offering a four-year curriculum toward a baccalaureate degree in science or engineering in Louisiana.”

The original governing structure for LUMCON was a 13-member Council, amended in 1995 to an Executive Board of three governing universities (Louisiana State University and Agriculture and Mechanical College, the University of Southwestern Louisiana (now University of Louisiana at Lafayette), and Nicholls State University). The 2012 legislation further amended the governing structure of LUMCON as illustrated below:



Since 1979 the State has dedicated land and capital outlay for the building of a research and education facility, including two research vessels and small boats, hired an Executive Director, research faculty, and staff, and developed research and education directions. The LUMCON's Woody J. DeFelice Marine Center is strategically located in Cocodrie, LA, in the upper end of one of Louisiana's larger estuaries, Terrebonne-Timbalier Bay about two hours from New Orleans and 3 hours from Baton Rouge.

The financial operations of LUMCON manage an average of \$4.0 million in expenditures from outside grants and contracts for LUMCON researchers and their collaborators, including Louisiana universities, with approximately 45 ongoing awards per annum. Grants include funds from the National Science Foundation, the National Oceanic and Atmospheric Administration, the Office of Naval Research, U.S. Geological Survey, Bureau of Ocean Energy Management (formerly MMS), National Marine Fisheries Service, Louisiana Sea Grant, the BP/Gulf of Mexico Research Initiative, multiple state agencies, private industry and non-governmental organizations. The distribution of the Marine Center faculty, staff and operations are shown below:



LUMCON Financial Operations also serves as the fiscal agent and contracting officer for the U.S. Environmental Protection Agency, Barataria-Terrebonne National Estuary Program at \$800,000 per annum, the U.S. Army Corps of Engineers, Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Science Advisory Team at ~\$1 million per annum, and previously the NOAA, Office of Response and Restoration program Coastal Restoration through Enhanced Science and Technology (CREST) at \$900,000 to \$2 million per annum. At one time, LUMCON managed the Bureau of Ocean Energy Management's Gulf Research Initiative (now at LSU). LUMCON is the fiscal agent, as well as a research partner, in one of fifteen BP/Gulf of Mexico Research Initiative grants (Coastal Waters Consortium: CWC-I for \$12 million, 2011-2014; CWC-II for \$16 million, 2015-2017). The current award is shared with 15 institutions, with over half of the research funding awarded to Louisiana academic institutions.

The Consortium is the state fiscal partner for the Barataria-Terrebonne National Estuary Program (BTNEP), with primary funding from the U.S. Environmental Protection Agency. Matching funds from the state budget (declining in the last five years) are required to receive the external federal funding. The combination of funding for BTNEP facilitates the program's garnering of external research and education funds. The opportunities, results and successes of BTNEP are incorporated into LUMCON's aggregated performance measures.

LUMCON VISION

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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 VALUES

LUMCON's core values, as we collaborate toward the fulfillment of our vision.

- Focus on quality education at university, K-12, and public levels through partnerships with Louisiana universities and other State institutions.
- Commitment to the highest standards of scientific inquiry, academic integrity, intellectual freedom, and the cooperative exchange of ideas and information.
- Continue to enhance and expand opportunities for under-represented minority students in marine sciences
- Pursuit of increasing society's awareness of the environmental, economic and cultural value of Louisiana's coastal and marine environments.
- Support for a unique research and education structure, in terms of people, facilities and resources.

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, three major Strategic Goals are addressed.

- 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.
- Enhance the opportunities for research led by Louisiana's university faculty that utilize LUMCON's outstanding facilities and resources to their best advantage.
- Support and maintain an outstanding research facility for coastal and marine studies.

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.

The role and function of the Consortium in facilitating and coalescing research and education across member universities needs to be supported and facilitated within the structure of Louisiana higher education. The future ability to accomplish the level of effort proposed in the Strategic Goals is contingent upon continued and expanded support from State funds as appropriated by the Legislature and apportioned by the Louisiana Board of Regents. The strong support of the member universities and their broader academic pursuits in marine sciences are necessary elements for success. Such a level of growth and incorporation of member universities into a functioning consortium enterprise will require the stated, logistical, and financial buy-in of the universities and their commitment to the Consortium.

1 | EDUCATION

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.

The education programming at the Marine Center for undergraduate and graduate courses provides unique field-immersion opportunities in marine science not available on many Louisiana university campuses. A distance learning course, along with a weekend field trip to habitats near the Marine Center, provides access to marine science for land-locked Louisiana universities. Courses taught at the Marine Center in coastal and marine science are offered to all member universities, with tuition and credits accruing to the universities. The resident faculty support graduate students at the member universities that can take advantage of the unique facilities and environment at the Marine Center. They also mentor postdoctoral research associates in their research programs.

1.1 | Assess Consortium university credit courses

The viability and utility of Consortium courses taught at the Marine Center should be assessed, along with other opportunities for improvement of a marine science curriculum that serves the State's universities. The courses have evolved since 1983 when first offered and uniformly cross-listed with 13 universities. With poor

enrollment in some of the courses, they were purged from individual university catalogues. More specific topic courses (4000-level) are now offered in alternating summers, along with alternating 2000-level courses. These remain in many university catalogues as named courses and in others as “Special Topics in

Recommendations: the Senior Marine Educator, University Education Coordinator, in resident faculty, the Science and Education Advisory Council members, and relevant academic units on campuses, should:

- 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.

1.2 | Increase participation of member university faculty teaching coastal and marine science courses at the Marine Center and across universities

The number of resident faculty at the Marine Center is insufficient to teach the breadth of the Consortium offerings at the Marine Center. There is currently an enlistment of university academics to teach courses at the Marine Center, with expenses born by the LUMCON budget (usually Indirect Cost Recovery). In addition, there should be opportunities for additional courses taught by member university faculty at the Marine Center, specific to the faculty member’s area of expertise. Intersession courses have proven popular for specific topics originating with non-resident faculty. For example, Dr. Ben Hall of Tulane University, as part of an NSF Career Award, taught an intersession course in neurophysiology for three summers at the Marine Center. Tuition, fees and credits were retained by Tulane University, and Tulane University supported the salary of the instructors and relevant fees for use of the Marine Center facilities, including vessels.

Recommendations: the Senior Marine Educator, University Education Coordinator, resident faculty, the Science and Education Advisory Council members, and relevant academic units on campuses, should:

- Work with the member universities to identify faculty that are interested in teaching at the Marine Center for summer or intersession courses. Encourage a broader network of potential instructors, especially among newer faculty.
- Work with the member universities to identify courses that their faculty could teach at the Marine Center for a semester, part of a semester, summer or intersession courses.
- Work with member universities to develop a statewide curriculum in marine sciences that benefits multiple universities.

The Executive Director should

- Work with the Board of Regents, the systems, and the universities to develop an equitable exchange of course offerings, course credits, teaching credits, and apportionment of tuition and fees for courses taught at the Marine Center or at member universities.

1.3 | Strengthen education experiences in coastal and marine science

Undergraduates enrolled in a coastal and marine science degree (or other relevant title) or an emphasis in Marine Science or Marine Biology would benefit from having part of their curriculum—the skill-based, field intensive courses—at the Marine Center or its associated facilities, including ships. Nicholls State University requires that

an undergraduate Marine Biology emphasis student take at least one course at the Marine Center. A Master in Marine and Environmental Science is also required to take a course offered at the Marine Center. There are other university curricula that could benefit from specialized courses or partial course credit at the Marine Center, or with programs at another university. The intent is to not compete with, but to augment member institution offerings, and to provide greater flexibility in acquiring marine science course work.

Recommendations: University programs offering a marine, coastal or similarly named degree emphasis should:

- Identify university curricula that would benefit from a closer affiliation with courses that would fulfill degree requirements in a marine and coastal science emphasis or similarly named degree.
- Develop or identify unique marine science courses that can be taught by the university faculty and offered electronically as a marine science "Consortium" curriculum offered to students at member universities that currently offer a limited marine science curriculum.
- Encourage a student in a Marine Science emphasis to take at least one LUMCON field-intensive course at the Marine Center or its affiliated facilities, including ships, that will accrue credit to their degree.
- Encourage universities with a Marine and Coastal Science emphasis or degree to have a semester, partial semester, intersession or summer intensive skills-based, field-intensive course experience. Academic faculty will be drawn from the member universities and the resident faculty at the Marine Center. Income, costs and credits to be apportioned among member universities, if more than one.
- Encourage increased university class field trips (fees apply and member universities would need to support their students' participation)

1.4 | Increase enrollment in Marine Center courses

Should a review of the marine science curricula across the state indicate a need and a desire for member university involvement in Marine Center courses, the SEAC members and their university's relevant academic units should work with the education staff at the Marine Center to encourage and support greater enrollment in semester, partial semester, intersession and summer courses at the Marine Center.

Recommendations:

- Facilitate enrollment in LUMCON courses at the Marine Center through interactions of the marine education staff with department chairs, Science and Education Advisory Council liaisons and the university registrar.
- Review and modify methods of advertisement as necessary.
- Work with multiple departments at member universities to encourage their students to attend the unique skills-based, field-intensive courses at the Marine Center.
- Encourage faculty teaching at the Marine Center to enroll their students.

1.5 | Maintain undergraduate education research programs

The resident faculty at the Marine Center have long sponsored undergraduates in their research programs. A highly reviewed and successful NSF-OCE sponsored REU (Research Experiences for Undergraduates), co-funded by additional funds from the resident faculty research projects, was held for 10 weeks each summer from 2011 through 2014, and enrolled 29 interns from Louisiana and around the country. The success centered on a cohesive, multi-level education experience in addition to the research projects. The REU was unable to continue because of the lack of faculty mentors (unfilled positions at the Marine Center) for the attendees. The ability

to re-establish an NSF REU program at the Marine Center will necessitate the increase in resident faculty members or the commitment of a member university faculty to be present for 10 weeks at the Marine Center as a mentor.

Recommendations: Resident faculty should:

- Continue to offer research experiences for undergraduates, as their research programs allow.
- Encourage member university faculty to offer undergraduate research programs at the Marine Center.
- Explore options with member universities for an NSF REU in-residence program at the Marine Center.

1.6 | Design equitable mechanism for apportionment of tuition and teaching credits

LUMCON as a consortium has much to offer with regard to the potential member university academic contributions to core courses and unique courses offered at the Marine Center. With a goal to increase the involvement of member university faculty members in the courses taught at the Marine Center, there needs to be clear mechanisms of tuition and fee apportionment and credit for courses taught by contributing university faculty. These arrangements may be difficult initially to perceive and design, but the overall benefit to Louisiana university students to take a broad array of marine and coastal science courses would be enhanced. The goal is to have a unique capability among Louisiana universities to provide the best selection of coastal and marine science courses among its peers in the national university systems.

Recommendations: The LUMCON Executive Director should work with the provosts and academic units of member universities and the Louisiana Board of Regents to develop:

- Policies regarding tuition and fee recovery for courses taught by resident Marine Center faculty or member university faculty at the Marine Center.
- Cross-university credit and sharing of tuition for courses related to coastal and marine science offered at the Marine Center or within a specific Louisiana university, but offered to multiple universities.
- A uniform academic year calendar that allows cross-listing and attendance in multiple marine science courses at Louisiana universities.

1.7 | Facilitate the recruitment of high school students to STEM education at Louisiana's universities, especially as related to marine and coastal sciences

The K-12 and public education programs at the LUMCON Marine Center are well-known, effective and well-attended. The field trips offered to students are based on learning new skills and participating in inquiry-based activities. Each trip is designed around the needs of the group to ensure each experience is unique to the needs and level of the students attending. High school students are engaged in topic-specific camps at the Marine Center that focus on experimental methodology, conducting research projects, and integrating science results with high-resolution mapping techniques. The purpose of these camps is to identify capabilities among the attendees and their potential careers in marine and coastal sciences STEM activities. These students are actively building networks of people that can help them achieve future success at university or in the professional job market. A majority (about 98%) of students that attend a LUMCON summer camp choose a Louisiana University for their undergraduate degree. At least sixteen students from the last three LEAD Camps have gone on to or are actively pursuing university programs that are STEM-based degrees.

Recommendations: The LUMCON Senior Marine Educator should, with the input of the Science and Education Advisory Council:

- Enlist the input of the BESE ex-officio member of the LUMCON Executive Board in developing plans to transfer high school students into STEM education opportunities at Louisiana universities.

- Develop summer camps that will provide high school students with research opportunities in STEM as related to coastal and marine science.
- Encourage the attendance at a Louisiana, or other, university where their prospects and needs for STEM in coastal and marine science are met.

1.8 | Continue to provide continuing education for K-12 teachers in marine science skills and curricula

LUMCON Marine Educators typically hold two teacher workshops each year, and provide service learning opportunities for educators at the Louisiana Environmental Education Symposium and teacher professional organizations, such as the Louisiana Science Teacher Association, National Marine Educators Association, and the Southeastern Marine Educators Association.

Straightforward recommendations along these lines are:

- Continue to hold service learning opportunities for formal and informal educators.
- Continue to seek through grants the funding to continue these opportunities.

2 | RESEARCH

Enhance the opportunities for research led by Louisiana's university faculty that utilize LUMCON's outstanding facilities and resources to their best advantage

The Marine Center resident faculty and associated research staff comprise a group of established and talented scientists focused on basic research with broad societal applications. Their research programs are relevant to the broader needs of Louisiana's coastal ecosystems and economy. Their success in grant acquisitions benefits the technical and logistical support of the Marine Center and the broader Louisiana coastal science enterprise. Their performance standards and academic standing are comparable to faculty members at Research I universities.

The Marine Center's location on the upper end of Terrebonne Bay and its proximity to the Mississippi River and Atchafalaya River deltas, extensive estuaries and coastal wetlands, and coastal waters to the deep-water Gulf makes it an ideal venue studies in marine science. Resident faculty and the broader Louisiana marine science community are able to take advantage of the unique facilities of the Marine Center.

2.1 | 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

When a faculty member brings a student out in the field, s/he helps students understand where to sample, helps provide equipment necessary, and provides critical insights as students analyze and publish results. Given the complex and changing nature of Louisiana's coastal zone, this task is not easy; instead it requires faculty with extensive experience in Louisiana's marine environment. The proximity of the Marine Center to the coastal zone means that in-residence and university faculty can develop these skills. 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.

Recommendation: The Executive Board, member university faculty, and in-residence faculty should:

- Encourage faculty to develop innovative marine research programs.

- Use the Marine Center's location as a recruiting tool for new faculty.
- Develop mechanisms for Marine Center faculty and member university faculty to share and use facilities and instrumentation at their respective institutions with agreed upon procedures and rates.
- 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.

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

The excellent facilities, technical instrumentation, and field logistical support at the Marine Center for research programs of in-residence faculty, collaborating faculty and visiting faculty are unique with well-equipped laboratories maintained by the in-residence faculty, including state-of-the-art instrumentation to share with collaborators. The sources of funding for the highly technical instrumentation are multiple, but under the supervision of an in-residence faculty member, these assets can be shared with research project collaborators and visiting scientists.

Recommendations: The LUMCON Executive Director and Marine Center faculty should work with the Science and Education Advisory Council to:

- Identify and facilitate collaboration with potential collaborators at member universities and resident faculty on research of mutual interest.
- Encourage proposals by member university faculty to conduct their research, if relevant, at the Marine Center.
- Better advertise the availability of research space and support for visiting member university faculty to conduct research at LUMCON.
- Work with member university faculty on logistical fees for conduct of research at the Marine Center.

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

The 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 net usable square feet of laboratory, classroom, office, and library space. Six laboratories are equipped with running sea water. Six laboratories are reserved for dry applications and instrumentation. There are multiple-use wet laboratory facilities on the main floor and on the downstairs 'floodable' area. All laboratory space is used for both research and teaching. There are offices with individual but smaller research areas. It is the policy of the Executive Director to work with in-residence faculty and visiting scientists to find the space that is necessary to support multiple research needs.

Recommendations: The LUMCON Executive Director and Marine Center faculty should work with visiting researchers to:

- Arrange for space for visiting researchers as needed and for agreeable occupation time. These arrangements so far have been suitable and equitable.
- Advertise and encourage the use of the Marine Center facilities to university researchers who would desire to conduct their research at the Marine Center.

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

The LUMCON property is situated from the western edge of Highway 56, across the area from the dredge spoil line on the north to the edge of the marina on the south across the expanse of marsh to the Houma Navigation Canal. These areas are available for the use of in-residence faculty and visiting researchers. Maps of the

LUMCON property are available. The adjacent property is owned by private interests and permission should be sought from them with regard to access to their land for any research project. There is limited space for conduct of research, and a desire to leave the LUMCON property as pristine as possible.

Recommendations: The LUMCON Executive Director and Marine Center faculty should develop policies for conduct of research on LUMCON property so that:

- The pristine nature of marshes within the Marine Center boundaries is minimally impacted by research projects.
- There is a plan for implementation and removal of all experimental equipment and signature upon the marsh.
- There is no contamination of LUMCON property through research activities.
- The Executive Director should work with the Wisner Foundation and the City of New Orleans to develop a policy for conducting research on the property adjacent to the Fourchon field station.

2.5 | Expand marine science graduate education opportunities and postdoctoral experiences

Currently the Marine Center faculty support graduate students at the member universities who can take advantage of the unique facilities and environment at the Marine Center. Many of these students are co-supervised with member university faculty. In-residence faculty also mentor postdoctoral research associates in their research programs. These types of activities should be expanded to the member universities for a greater utilization of the Marine Center research space and logistical support.

Recommendations: The LUMCON Executive Director and in-residence faculty should work with interested faculty at member universities to expand research opportunities for graduate students and postdoctoral research associates, in the following ways:

- Encourage member university faculty to identify students that can work closely with them and the staff at the Marine Center on their research projects.
- Encourage member university faculty to design research programs at the Marine Center that would engage graduate student participation.
- Encourage member university faculty to design research programs at the Marine Center that would engage Postdoctoral Research Associates.
- Develop a mechanism with member universities to provide teaching assistantships and logistical support for graduate students sponsored by in-residence Marine Center faculty.
- Facilitate use of undergraduate research experiences or courses taught at the Marine Center to encourage enrollment of graduate students in marine science degrees, or emphases.

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

In-residence faculty at the Marine Center hold one or multiple adjunct positions with member universities and advise and support graduate students via this mechanism. One of the recommendations from the Board of Regents to the Legislature (see page 1) was to “Establish policies and procedures for development of Marine Center in-residence faculty, including tenure at member institutions, participation in education and graduate training programs, and access to member campus resources.” Closer collaborations among Marine Center faculty and faculty of member universities would be beneficial. A preliminary document concerning how this might be accomplished was discussed by the Executive Board at its January 2015 meeting, and several procedural and financial implications were brought up. The Executive Board’s decision was to develop an *ad hoc* committee to examine alternative mechanisms and evaluate this further.

The LUMCON Executive Director and the Academic departments of member universities should work to:

- Establish adjunct status for in-residence Marine Center faculty with member universities. Many of these appointments exist, but more could be established.
- Establish an adjunct status for member university faculty with the LUMCON Marine Center, and develop guidelines for such an appointment.

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

The electronic media available for sharing of information should be engaged by the marine and coastal science academic community for exchange of information concerning coastal and marine science and discussion of applications to resource management and directions for future research. An initial activity that might enhance this exchange is:

- A Consortium-sponsored research seminar series or special sessions at other meeting venues. Faculty within the consortium with marine science interests would be identified that would have research of broad interest within the state, and they would be enlisted to give seminars that would be broadcast to various sites within the consortium universities.
- This could lead to meetings of consortium interests to present marine science research findings and bolster the profile and outreach of the consortium.”
- These activities should necessarily not try to replace such venues as the State of the Coast Conference but should strive to achieve a venue for exchange of current scientific information as it applies to coastal processes and restoration of coastal Louisiana.

3 | FACILITIES

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

The Marine Center provides a unique setting with excellent laboratories, modern and well-maintained instrumentation, seawater and wet lab facilities, teaching classrooms and laboratories, housing services, and ready access to coastal environments. The state general fund supports some of the operations and maintenance, administrative and operation staff salaries, and currently four faculty members (excludes the Executive Director). The in-residence faculty research grants, their staff and related indirect cost recovery returns support the operational and technical backbone of the Marine Center facilities and equipment. Ancillary funds support the cafeteria and dormitory operations. Vessel operations are supported by fees.

The 75,000 sq. ft. building and the neighboring maintenance and vessel operations center of 5,500 sq. ft. are the anchor of the Marine Center. The center was designed with ample protection from hurricane flooding and winds: the main level of 26,000 sq. ft. of research, educational and administrative space is elevated 18 feet above mean sea level, the exterior is constructed to withstand wind gusts of up to 250 miles per hour, and the laboratories are centrally located within the building to protect LUMCON's research and supporting scientific instruments and equipment. Additional Main Floor structure provides housing and cafeteria services for visiting researchers, educators and students.

Below the main level, facilities include a fisheries lab, seawater system, lobby display area, and storage. The facility has persevered through multiple tropical storms and major hurricanes, (Juan, Ivan, Lilli, Katrina, Rita, Gustav, Ike), sometimes with severe setback (Andrew), but in other circumstances has survived well. The design and resilience of the facility will serve marine research and education well into the future, but only with adequate funding for annual operations and longer-term deferred maintenance.

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. The R/V *Pelican* is a 116-foot fully equipped research platform and is a highly regarded and often-

used member of the National Science Foundation's University National-Oceanographic Laboratory System (UNOLS). A 57-foot coastal research vessel, the R/V *Acadiana*, is designed for estuarine and near-shore coastal waters. LUMCON maintains a bare-boat charter with LSU for the operation of its Coastal Studies Institute R/V *Coastal Profiler*. A variety of outboards, dinghies, a pontoon boat, and an airboat rounds out the fleet. LUMCON recently assumed the operation of the University of Southern Mississippi's R/V *Point Sur*.

The Fourchon Lab at Port Fourchon was built in 1973 for the Nicholls State University (NSU) biology program with funding from the Wisner Foundation. At that time, this field laboratory near Grand Isle with access to the Gulf through Belle Pass was the only marine science station on the Louisiana Gulf Coast. In 1979, NSU subleased the building to LUMCON, providing Consortium members with a research and education base for trips to nearby beaches, lakes, bays and the Gulf of Mexico. The facility is currently undergoing hurricane repairs to the main bulkhead and should become operational in spring 2016.

The Marine Center sits in a vulnerable environment (as do most marine laboratories) with the effects of salty air, moisture, hurricanes and tropical storms, and susceptibility to coastal subsidence and sea level rise. The 30-year old facility is in very good condition. But, continued maintenance and improvements have not been fully supported by State funds. The LUMCON Marine Center administration works closely with the Board of Regents staff and Office of Facility Planning and Control to address deferred maintenance needs.

3.1 | Plan for maintenance of integrity of Marine Center assets

The LUMCON Marine Center has a long-standing and often-revised schedule for Deferred Maintenance and Capital Outlay. Emergency repairs often disrupt the best laid plans. Members of the Board of Regents, Regents staff and the Office of Facility Planning Control visited the Marine Center within the last year to broadly inspect the facility and discuss priorities for maintenance. Their impressions were that the Marine Center is a unique and critical asset for research and education related to coastal and marine science and should be financially supported.

Actions can be taken to enhance a clearly-defined plan of facility management:

- Develop a master plan for the Marine Center deferred maintenance schedule and capital outlay.
- Continued pursuit of these sources of funding by LUMCON administration.
- Plan for replacement of technical and scientific equipment; continue pursuit of improvements through funding opportunities.
- Create an Asset Management Plan for the LUMCON-managed Port Fourchon Laboratory, including necessary actions for the continued sub-lease of the facility with Nicholls State University and the City of New Orleans. [The facility is currently closed awaiting bulkhead repair. The current lease with Nicholls State and Nicholls State with the City of New Orleans expires 2022, but is renewable for an additional 50 years.]

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

- Create an Assessment Management Plan for LUMCON-owned vessels (R/V *Pelican*, R/V *Acadiana*, and small boats).
- Plan for eventual retirement of the R/V *Pelican* and exit from NSF academic fleet.
- Develop preliminary plans for site security or expansion in the event of the acquisition of a larger vessel.
- Continue discussion with the Board of Regents concerning the capital outlay request to plan for a new or larger vessel, i.e., improve LUMCON's competitiveness in the eventual distribution of new NSF vessels.

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. It has fared well during many hurricanes and tropical storms. These events, while greatly disruptive, do provide opportunities for repair and mitigation to the facility with post-storm funds from FEMA, Louisiana Office of Risk Management, and Louisiana OFPC. These are funds that the Consortium pursues continually and persistently. Issues of sea level rise and shoreline erosion face not only the Marine Center but the transportation network to Cocodrie. Louisiana's Comprehensive Master Plan for a Sustainable Coast is the construct for coastal restoration and protection measures and is overseen by the Coastal Protection and Restoration Authority (CPRA). 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.

3.4 | Increase external funding to support research and education missions conducted at the Marine Center

The proportion of the LUMCON budget that is funded by State General Funds (FY2015-2016) is 23 percent of the total annual budget of \$11.8 million compared to 34% in FY2008. Thus, LUMCON, as with Louisiana's state universities, has endured large budget cuts over recent years. Unlike the universities, however, LUMCON is not part of the formula for funding and does not collect tuition or raise tuition to offset costs. The remainder of the budget is mostly from research awards and self-generated funds. Self-generated funds are from vessel rentals and activities of the Marine Center, such as cafeteria and dormitories, that support research and educational opportunities. The research scientists, their staffs and the funds from their research grants that funnel back into the operation of the Marine Center form the base foundation for Marine Center facilities and services. The education, information technology, administrative, vessels and maintenance staff are committed to supporting the mission of LUMCON and pride themselves on the opportunities and services that the Marine Center provides.

Necessary actions are:

- Undertake a cost-benefit analysis of revenues and expenditures associated with meeting the Consortium mission.
- Develop a diverse funding portfolio for long-term sustainable programmatic needs of the Consortium
- Direct resources toward organizational "advancement" and fund raising.
- Explore educational offerings in marine education that may generate funding.
- Explore educational offerings in technical college courses and professional development that may generate funding.
- Return of LUMCON's state budget to at least its funding level of the mid-2000s, and that it be linked on a reward-based system with external funds awarded, since tuition return is not part of the present funding mechanism.

NEW ACTIONS

Next steps for the implementation of the Five-Year Master Plan are the development of an action plan to achieve the strategic goals outlined, and a business plan to consider longer-term financial security. The LUMCON Executive Board agreed at its August 19 meeting to develop the business plan first. A task team is in the process of developing the Business Plan. The draft plan is to be delivered to the LUMCON Executive Board on October 15 for their examination, comment and further discussion at the next Executive Board meeting on October 29, 2015. The actions outlined in the Master Plan still require prioritization and metrics of achievement over the 5-year period. They cannot all be addressed at once, and the outcomes may not be measurable for years. The Action Plan development, which depends in part on the Business Plan, is expected to be completed by the end of 2015, for discussion at a January 2016 meeting of the Executive Board. Success of the Master Plan requires the involvement and strong commitment of the LUMCON Executive Board, the Science and Education Advisory Council, the member universities, the Board of Regents, the Regents' staff, and the LUMCON staff.

EVOLUTION OF THE 5-YEAR MASTER PLAN AND ITS ASSESSMENT

The 2012 amended LUMCON legislation called for “timely revisions to such plan as warranted and necessary.” An assessment of actions in the implementation of the plan is called for in an “annual report at the end of the calendar year of the activities of the consortium to the executive board together with any additional information the executive board may require.” The Chair of the Executive Board, the Executive Director of the Board, and the Chair of the Science and Education Advisory Council will “produce a joint report to the Board of Regents regarding the consortium’s efficacy in achieving its overall mission through implementation of the master plan.”

An additional annual report is legislated for a report of the fiscal year activities of the consortium to the Executive Board together with any additional information the executive board may require. This report is to be provided by the Executive Director and delivered to the Executive Board by the end of the calendar year.

