

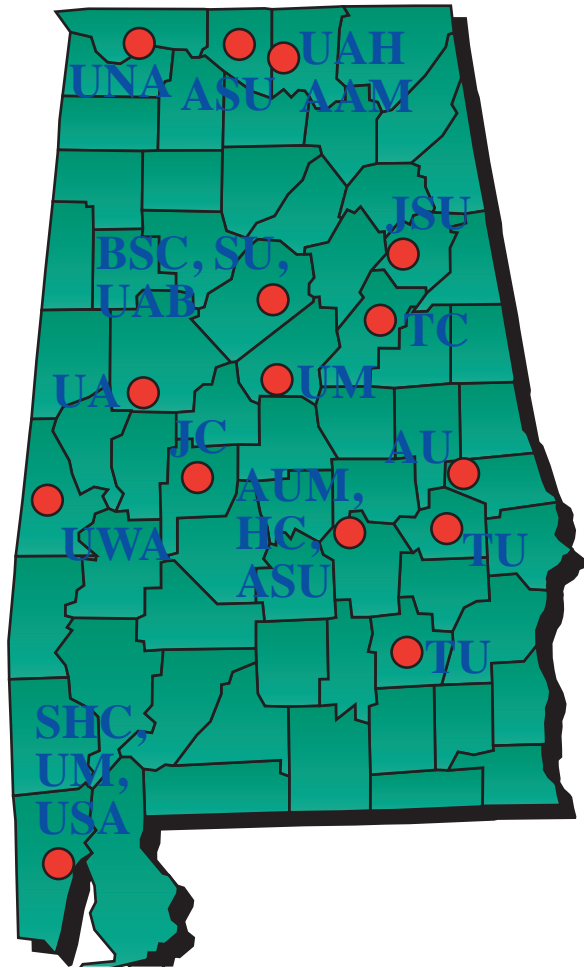
Dauphin Island Sea Lab

2015
Annual Report



Alabama's Marine Science
Education and Research Institution

The Twenty-Two Member Schools of the Dauphin Island Sea Lab/ Marine Environmental Sciences Consortium



- Alabama A&M University, Huntsville, AL*
- Alabama State University, Montgomery, AL*
- Athens State University, Athens, AL
- Auburn University, Auburn, AL*
- Auburn University at Montgomery, Montgomery, AL
- Birmingham Southern College, Birmingham, AL
- Huntingdon College, Montgomery, AL
- Jacksonville State University, Jacksonville, AL*
- Judson College, Marion, AL
- Samford University, Birmingham, AL*
- Spring Hill College, Mobile, AL
- Talladega College, Talladega, AL
- Troy University, Troy, AL
- Tuskegee University, Tuskegee, AL*
- University of Alabama, Tuscaloosa, AL*
- University of Alabama at Birmingham, Birmingham, AL*
- University of Alabama in Huntsville, Huntsville, AL*
- University of Mobile, Mobile, AL
- University of Montevallo, Montevallo, AL
- University of North Alabama, Florence, AL
- University of South Alabama, Mobile, AL*
- University of West Alabama, Livingston, AL

* Schools with Graduate Degree Programs

Statement of Purpose



The Dauphin Island Sea Lab (DISL) is Alabama’s marine research and educational institution. Founded in 1971 by the Alabama Legislature to maximize the marine sciences capabilities of several Alabama institutions and minimize duplication, DISL serves twenty-two Alabama colleges and universities, both public and private. DISL and its faculty work toward the combined purposes of conducting pure and applied research, and sponsoring structured educational programs for individuals and organizations interested in and dependent upon the marine environment.

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Dauphin Island Sea Lab/ MESC provides equal educational opportunity to, and is open and accessible to, all qualified students, without regard to race, color, creed, national origin, sex or qualified handicap/disability with respect to all of its programs and activities.

Disabled students are provided “reasonable accommodations” when they have identified themselves and validated their special need(s). Complete confidentiality is maintained unless authorization for release or information has been given in regards to disability.

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Cover Photos: Top - R/V Alabama Discovery. Bottom left: Tech Support's Renee Collini checking out instrumentation at Middle Bay Lighthouse. Bottom right: Marine Educator Greg Graeber (center) leads an Ocean's Alive class



2015 Letter from the Executive Director

For those of you who are reading this report for the first time, the Dauphin Island Sea Lab (DISL) is the administrative home for the Marine Environmental Sciences Consortium (MESC). Founded in 1971 by 17 university and college presidents from around the state, the clear intent was to create a single marine entity that would serve Alabama while reducing programmatic redundancy in higher education. Among the charges found in the MESC Articles of Incorporation are the following directives:

- Provision of educational programs in the marine sciences
- Promotion and encouragement of pure and applied research in the marine sciences and related areas
- Promotion and encouragement of communication with the public

In what follows, you will see that we have not only continued to live up to the founding presidents' expectations, in many cases we actually now exceed them, some 44 years later. In reading this annual report, the data make it clear that DISL remained a model of productive consistency throughout 2015.

The data resoundingly say the demand for our products remains high. As evidence, I call your attention to the record number of media hits (>600) we received last year. In addition to the local and regional attention, we received coverage from a number of national news organizations. Nearly 81,000 members of the public came to see the educational exhibits found in our Estuarium. That is an attendance record for DISL! Some 600 visitors attended our Boardwalk talks. These performance metrics speak volumes about how our state's citizens view the efforts of our aquarists, educators, scientists, and docents for whom we are grateful.

Similarly, attendance at two of our annual Dauphin Island Sea Lab Foundation (DISLF) events held in Mobile continued to grow. Some 450 people came to the regionally popular Cocktails with the Critters. An additional 250 Alabamians attended the 2015 Marine Environmental Awards Luncheon to hear National Geographic's Photographer David Doubilet speak about the wonders of the world's ocean. If you are interested in attending either of these events, please let me know and I will make sure you get a good seat!

Our college programs continued their gangbuster efforts 2015. Students from 17 of our 22 member schools enrolled in nearly 1,100 credit hours in our 32-class summer program. In these classes, students receive both classroom and hands-on training in the marine science disciplines. During the academic year, we also provided some 600-semester hours of credit to attending graduate students from four of our member MESC schools. Eight University of South Alabama students in residence at the DISL completed their graduate degrees this past year. We had over \$3,000,000 in research expenditures and an approximate \$14,000,000 in awards. It should be noted that a number of MESC investigators, particularly those in residence at DISL, are key collaborators in our recent successes. As an additional measure of the faculty's productivity, approximately 80 papers were published in marine peer-reviewed journals.

Discovery Hall Programs (DHP) had a similarly strong year. DHP educators and staff provided 57,000 contact hours to some 22,000 students, educators and accompanying parents from 50 of the state's 67 counties. Of those, 8,000 made the trip to the DISL campus. Utilizing BayMobile, DHP took their classroom on the road to 40 schools that could not travel to Dauphin Island. Over the course of the year, DHP educators reached 39 schools, and 2,000 students, via the state's ACCESS program. In reading this report, you will also note the reason why there is so much interest in this program - it is the diversity of high quality, innovative and exciting programs provided to DHP's customers.

Overall, it was another good year. I also want to note in passing that none of this would have been possible, were it not for the outstanding efforts of DISL personnel in Data Management, Technical Support, Cafeteria and Vessels.

Among our goals as marine scientists is to use what we have learned from our studies for the betterment of society living in our coastal ecosystems. This is one of the key directives found in our articles of incorporation and to do this we must translate science into messages our citizens can use to develop resilient coastal ecosystems. This also requires us to leave our laboratories and classrooms and engage with the citizens of our

coastal communities. Via our strengthening partnership with the Mobile Bay National Estuary Program, we are now able to make demonstrable contributions to the citizens of our state. In reviewing the information found in this report, I think you can see the MBNEP has become a driving force in coastal ecosystem management. For this reason, we take great pride in our partnership with the NEP as it provides us with an opportunity to give back to our state and region.



Dr. John Valentine, DISL Executive Director

Much to be proud of this past year, and much more to look forward to. With that said, I feel we have yet to reach our full potential. For this reason, we took steps towards reaching that potential by embracing an aggressive, mission critical, renovation of our aging campus infrastructure. In the first phase of our restoration program, we focused on addressing the needs of our customers: the students and visitors coming to DISL from around Alabama. Our craftsmen built a new modern classroom for Endeavor Hall with funding provided by the Dauphin Island Sea Lab Foundation. Following this addition, they replaced leaking roofs, and renovated the DHP classrooms and offices to better serve the needs of visiting K-12 students.

To increase capacity, they converted the old “paper” library into a modern classroom and a computer lab. The new classroom addition now provides us with five distance learning capable classrooms. As we speak, renovations in the last of our old classrooms, Galathea Hall, is on the verge of completion. Challenger’s interior hallways and dorm rooms were repainted and all of the furnishings in Challenger and Beagle were replaced with new ones. Additionally, 2015 was the year we added Handicap Accessible bathrooms to Beagle Dormitory. The showpiece of last year’s campus restoration was the cafeteria. The remarkable renovation has already resulted in acclamations from students and teachers.

Recognizing we do not get a second chance to make a first impression, the parking lots and roads around our dormitories, administrative building, and cafeteria were repaved, then restriped. This alone vastly improved our roadside appeal. With these pieces done, our updates to the infrastructure

provide our University and Discovery Hall Programs with the technology and facilities needed to provide high quality educations to our “K-gray” customers throughout Alabama. It was an effort of the entire DISL staff to bring all the aforementioned tasks to fruition. Still, through the efforts of our incredibly talented staff, we made great strides and I feel DHP facilities are now coming into excellent shape.

In summary, I feel strongly that this year’s performance metrics show we are more than meeting the expectations of our founding presidents. With that said, there is much more to come and I am very excited for the lab’s future!

Dr. John F. Valentine
Executive Director, Dauphin Island Sea Lab



Administration and Facilities

DISL Campus and Resources

During the 2015 reporting year, there were 39 buildings on campus, including eight instructional buildings; three dormitories; nine family-style houses; and two research buildings. In May 2015, the Marine Mammal Research Center opened as Alabama's first research center focused on data collection and research of the state's marine mammals, including manatees, dolphins and whales. Work also progressed on an addition to the Estuarium, which will use innovative technology to further education of Gulf of Mexico ecosystems and animals. The Estuarium addition is scheduled to be open to the public in mid-2016.

The DISL also houses the Auburn Shellfish Laboratory and the Richard C. Shelby Ecosystem-Based Fisheries Management Center, a LEEDS Gold certified building. The Shelby Center and the instructional buildings on the south campus are solar-powered, making the Sea Lab one of the largest solar-power producing entities in the State.

Wet Lab facilities house modular sea-water systems, kreisels, and other instruments for experimental work on living marine organisms. These research laboratories are equipped with state-of-the-art instrumentation for biogeochemical research. Field collection equipment for marine ecological and oceanographic research is available. In 2015, Dr. Kelly Dorgan and her team designed and installed a new flume to further her research on burrowing worms, as well as sediment erosion and stability.

To assist faculty and students with research in the field, DISL maintains two large research vessels, including the 65-ft. R/V *Alabama Discovery* and the 46-ft. R/V *E.O. Wilson*, in addition to a fleet of small boats and skiffs.

Office of the Executive Director

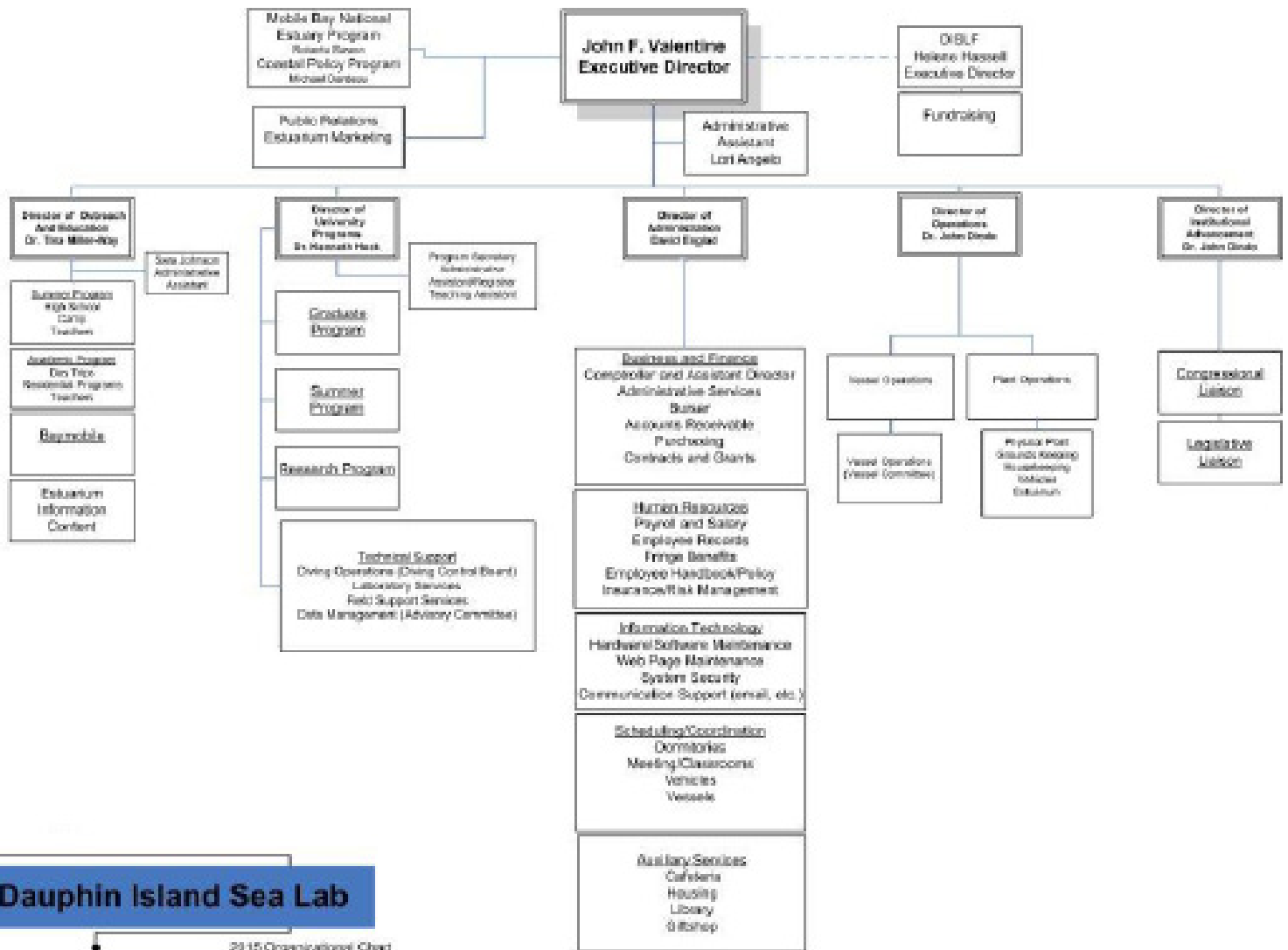
Dr. John Valentine - Executive Director
Lori Angelo-Roberts - Administrative Assistant to the Executive Director
Michael Dardeau - Coastal Policy Programs
Dr. John Dindo - Director, Operations and Institutional Advancement
David England - Director, Finance and Administration
Dr. Kenneth Heck - Director, University Programs
Dr. Tina Miller-Way - Director, Outreach and Education
Lisa Young - Consultant, Public Relations



Photo: Students (l-r) Aaron Macy, Haley Nicholson (not pictured), Alex Marquez and Technician Grant Lockridge examine the new flume.

Business/Finance

The Business Office of the DISL operates under the principles of Fund Accounting set forth by the National Association of College and University Business Officers. The State Examiners of Public Accountants annually audit the procedures, accounting records and policies of DISL.



Dauphin Island Sea Lab

2015 Organizational Chart

Administration Personnel

Marian Alderman-Accounts Payable
 Katy Blankenhorn – Scheduling Coordinator (retired; replaced with Beth Klein in September 2015)
 Ashley Foster-Bursar/Accounts Receivable
 Cindy Grimes – Receptionist
 Angie McKinnell-Grants & Contracts
 Angela Rattler-Human Resources and Payroll
 Daphne Wood-Grants & Contracts

Cafeteria Personnel

Clarissa Beritech-Manager (retired; replaced by Darren Harbison in January 2016)
 Faye Bentley
 Renee Cain
 Stephanie Cain
 Linda Gazzier
 Julie Nabors
 Karen Saunders
 Gail Zirlott

Gift Shop Personnel

Jeana Layne – Manager
 Susi Callister
 Amy Gray
 Cathy Miller
 Fan Murray
 Jamelle Roy - Docent Coordinator
 Janice Watanabe

Information Technology

In 2015 the Information Technology department assessed a campus-wide need for upgrading the Wi-Fi infrastructure to accommodate the continually changing technology needs of our students and staff.

During the assessment it was discovered the current Wi-Fi, originally installed in 2013, was in need of upgrading. Improvement of the Wi-Fi began by installing more access points in 2015 and the remaining upgrades will be completed during the 2016 fiscal year.

IT is currently assisting with the development of technology exhibits that will be part of the new Estuarium expansion. These exhibits will integrate cutting-edge technology into the educational displays, ushering in new ways to promote understanding of our marine ecosystems.

IT has also increased the number of smart card door locks across campus to improve current lab security. More HD recorded cameras have also been placed around campus to ensure the safety of our employees and students.

Information Technology Personnel

Melissa Mills - IT Manager

Sam Hardwick - PC / Network Support Specialist

Shane Johnson - Systems Administrator

Public Relations

2015 was a banner year for Public Relations at the Sea Lab. With a plethora of programs, new developments and events, the promotional efforts were rewarded with over 600 media hits for the calendar year, many of which were from out-of-region news outlets. The national recognition of the lab continues to grow, based on the innovative and quality programs generated by the staff, as well as their sought-after response to ecological occurrences, human-generated or not.

This was exemplified by Dr. Ruth Carmichael's Manatee Sighting Network's rescue of Magnolia, a cold-stressed manatee retrieved from the Magnolia River in Baldwin County, Alabama. Magnolia's journey from the chilly river, where she was found emaciated and wounded from boat strikes, to rehabilitation at SeaWorld in Orlando, to release in the wild, garnered national media attention, including a 2016 feature in ABC's *Sea Rescue*.

Discovery Hall Programs' ROV competition in April drew press attention from as far away as California, as well as drawing local TV stations to interview participants at the competition site in Mobile, Alabama. This annual event, involving both teachers and students, is fast becoming one of the region's most anticipated happenings of the year.

Our Graduate Student Organization continued their tradition of community service with their leadership and participation in the Relay for Life, Adopt-a-Stream, and Alabama's Coastal Clean-up. Their strong record of community involvement continues



The October 2015 stranding of this melon headed whale in Gulf Shores, AL, brought the attention of bystanders, the help of the DISL's Alabama Marine Mammal Stranding Network - and the attention of local news outlets. Credit: Kayla DaCosta.

to both serve and demonstrate how the DISL plays a pro-active role in our coastal community.

Dr. Alison Robertson was featured in the *New York Times* for her work on alligators in the Mobile Delta, as the Ecotoxicology Lab collected samples to improve understanding of the health of these apex predators.

The Marine Mammal Research Center opened its doors in May, bringing state officials and state media to the campus of the DISL.

A slate of popular events also shone the spotlight on the Sea Lab, including our annual Discovery Day; the Distinguished Wiese Lecture Series; and The DISL Foundation's Cocktails with the Critters and Marine Environmental Luncheon.

The Public Relations Department was pleased to welcome ExxonMobil Summer Public Relations Intern Laura Prehn, a senior with the University of Alabama. Her enthusiasm, hard work and dedication were invaluable during the summer of 2015.

With the DISL's steady progress to provide the best in educational programs, public outreach and rigorous research, it's no wonder local, national and international media take such an interest in the state's marine science institution.

Public Relations Personnel

Lisa Young – Public Relations Consultant (until Jan. 2016)

Angela Levins - Public Relations Director (as of Feb. 2016)

Lori Angelo-Roberts - Administrative Assistant to the Executive Director

Robert Dixon - Estuarium Manager

Institutional Advancement

Respect for history and visions of the future combined beautifully this year at the Sea Lab, as campus improvement projects got a boost from a two-million dollar bond to upgrade the lab. The much-weathered paved areas were resurfaced and re-striped; the teaching buildings of Galathea and Endeavor received new roofs; and major overhaul began in the dormitories and cafeteria.

Dedicated young men and women from AmeriCorps came in the spring of 2015 to give the old houses, dating back to the beginning of the Sea Lab, new coats of paint, freshening up their appearances during their month and a half stay.

A new Estuarium addition was completed and work is underway to secure funding for exhibits. The new exhibits will feature the latest in interactive technology combined with a

broader look at Gulf of Mexico ecosystems and their interconnectedness. The new facility is scheduled to open in mid-2016.

For a look at how the campus evolved from a 1950's Air Force base to a thriving marine science institution, come visit the new outdoor kiosk adjacent to the bicycle path near the Shelby Building. Thanks to Gary Finch Outdoors for all their hard work in producing this video. The kiosk and video were unveiled during the 2015 reporting year.

Institutional Advancement Personnel

Dr. John Dindo - Director

Facilities and Vessel Operations

With a crew of skilled "masters-of-all-trades," the Sea Lab manages to keep the physical plant of its campus going and growing. The team undertook projects big and small in 2015, ranging from constructing new decks and ramps for the Estuarium's ray tank; remodeling faculty and staff offices, as well as the welding shop; building a classroom and study room in the library for University Programs; and even installing an osprey nesting site on the south campus.

Electrical and HVAC work had the crew running new conduit all over campus, including the Shelby Bike Path, the library and the parking lots. One of the biggest projects was wiring all the networks and phone cables in the new Marine Mammal Research Center.



AmeriCorps volunteers at the DISL. DISL Facilities Manager Troy McBride is on the left; Dr. John Dindo, Director of Facilities, is on the right.

The crew undertook numerous plumbing jobs as they re-did the heating system for the Beagle dormitory, ran water to the Living Marsh Boardwalk for the new Watershed Display, installed new water pipes for the Auburn Shellfish Lab, replaced new hot water heaters in various buildings on the campus and much more.

The department also handles the DISL's auto and vessels maintenance, hauling the boats out for repairs and inspections and performing the constant upkeep needed to keep everything running smoothly. As many educational field trips and research field work depends on the buses and boats being in good working order, this takes up much of the crew's time and effort.

Housekeeping, as usual, met the challenges of keeping the facilities clean and tidy for the staff, faculty and thousands of students and visitors to the DISL. It is no small job to keep the physical plant running smoothly, and we are grateful to the personnel for their hard work and dedication.

Facilities and Vessel Operations Personnel

Dr. John Dindo - Director
Troy McBride - Manager, Facilities and Vessel Operations

Facilities personnel

Ricky Gibbs – Supervisor
Tommie Blocker
Wilfred Gazzier
Robbie Goleman
Joey Johnson
Tom Pritchett
Jody Schultz

Housekeeping Personnel

Angela Williams - Supervisor
Beverly Elmore
Cindy Johnson - Assistant Supervisor
Tammy Ladnier
Jakarri Smith
Shirley Zane

Vessel Personnel

Capt. Rodney Collier
Capt. Tom Guoba
Capt. William Johnston
Capt. Russell Wilson

2015 Vessel Hours at Sea

| <u>Vessel Name</u> | <u>Hours Used</u> |
|------------------------|-------------------|
| Boston Whaler | 329 |
| <i>Breakwater</i> | 235.8 |
| <i>Coquina</i> | 141.5 |
| <i>Great Blue</i> | 137.8 |
| <i>Nancy M.</i> | 25.5 |
| <i>Oyster</i> | 442 |
| <i>Pelagia</i> | 441 |
| <i>Pelican</i> | 48 |
| Pontoon | 69.5 |
| <i>R/V Mullet</i> | 181.5 |
| <i>R/V Thalassia</i> | 381.5 |
| <i>R/V Vallisneria</i> | 15 |
| <i>R/V Alabama</i> | 580.3 |
| <i>R/V E.O. Wilson</i> | 332 |
| Small Vessels | 2780.1 |
| Large Vessels | 1724.8 |
| Total | 4504.9 |

Technical Support

In April 2015, Technical Support bid farewell to two stalwarts of the department – Michael Dardeau and Alan Gunter. Dardeau had been with the DISL since 1984, becoming acclaimed nationally for his work with scientific diving, particularly with his board service to the American Academy of Underwater Sciences. Longtime dive master for the DISL, Dardeau's immense knowledge of the technical aspects of scientific fieldwork and his expertise in data monitoring made him indispensable in the coastal policy arm of the DISL, collaborating frequently with Drs. George Crozier, former Executive Director of the DISL, and John Valentine, its current head. He helped to bring about the Mobile Bay National Estuary Program, and continued to contribute to its mission throughout the years. Famously, Mike was known for keeping a cool head when both circumstances and people could become overwhelmed.

An admirer of John Steinbeck, Dardeau surely lived up to the writer's famous saying, "An answer is invariably the parent of a great family of new questions. So we draw worlds and fit them like tracings against the world about us, and crumple them when we find they do not fit and draw new ones." Mike's quiet patience and quest for knowledge are legendary, and will long be remembered after his retirement.



Longtime tech support veterans Michael Dardeau (left) and Al Gunter (right) retired in 2015.

Alan Gunter retired from the Sea Lab after 25 years of service. Al served as the backbone of the technical support department, performing a multitude of functions over the years from maintenance of SCUBA gear, support of the weather station system, construction of various sampling tools and facilities enabling DISL scientists' and student research efforts, assistance with countless hours of field support activities and training students and technicians in the safe operation of all of the sampling gear within the department. Al was replaced by Erich Bohaboy in September who came to DISL after serving 14 years with the NOAA Corps.

Grant Lockridge has been actively increasing the technical capabilities of the department with his skill set in electronics and engineering. Starting with a simple Arduino board and some LED lights, Grant has designed and constructed several drifters for Dr. Brian Dzwonkowski, a DISL faculty member. The drifters have GPS tracking and measure the temperature and salinity of the waters they drift through, helping Dr. Dzwonkowski develop and improve models for water movement in and out of Mobile Bay. Similar drifters purchased from instrumentation companies cost from \$10,000 to \$16,000; the ones Grant constructed were put together with just over \$500 of equipment. Dr. Dzwonkowski has deployed (and recovered) the drifters with great success. Other DISL students have been building their own conductivity and temperature sensors at a fraction of the cost for "off the shelf" units based on Grant's original design. Grant also designed and built a system, again with an Arduino controller, for simulating local tides in

support of the GOMRI Wetlands research group in the mesocosm facility modifying the flow through seawater system to a contained system to allow the group to study the effect of oil exposure to a marsh environment. The Arduino board is also coming into play as Grant designs a system for realtime monitoring of Hydrogen Sulfide gas, a potentially deadly substance sometimes emitted by the local drilling rigs. We hope to be able to have a system of sensors located at various points on campus to help ensure the timely notification of a potential H₂S gas leak.

Technical Support assisted with many new and ongoing projects at DISL including monitoring and maintaining the weather station system, designing and deploying a new mooring for the FOCAL site, and constructing support equipment for Dr. Jeff Krauss' participation with the Concord Fall Campaign on the R/V *Point Sur* (through USM). In the Wet Lab, new systems were developed and installed including a flume system for Dr. Kelly Dorgan and holding and experimental systems for Dr. Alison Robertson. Tech Support personnel are also responsible for maintenance and changing out the intake and pumps for the continuous flow water system used by both DISL and Auburn Shellfish Lab.

Tech Support participated with several specimen collection dives in support of the Estuarium, and provided logistical and field support of DISL researchers, summer school courses and visits from researchers from member institutions.

As acting Dive Safety Officer, Grant has designed and built a NITROX blender for the dive locker, providing for safer SCUBA diving by DISL students and researchers. Three students earned AAUS diver certification at DISL, and Grant and Mike Dardeau also attended the AAUS symposium in Key West.

The Analytical Lab has also seen some changes in 2015. The workhorse of the facility, the Skalar San+ autoanalyzer configured for nutrient analysis of water samples was replaced after some 15 years of service. The new version, Skalar San ++ Continuous Flow Analyzer, is equipped with digital (rather than analog) detectors and offers improved detection limits for analytes. In addition, upgrades to the software that runs the system provides for a larger working range of sample concentrations.

The Agilent 7700 inductively coupled mass spectrometer and laser ablation platform from Electro Scientific Industries has been used by two PhD students at DISL generating trace elements in shark vertebrae and fish otoliths. We expect the instruments to be widely used in the upcoming years by more researchers from both member institutions and requests from outside parties for sample analysis. In support of this Laura Linn, who manages the Analytical facility, attended a Laser Ablation workshop in Austin, Texas and expects to attend further training opportunities in 2016.

Outside of her responsibilities in the laboratory, Tech Support Coordinator Laura Linn participated in the Strategic Plan Measures committee, attends the Safety and Environmental Compliance Meetings at USA as an outside member and was named as the committee chairperson for the newly reformed Safety Committee at the Sea Lab.

The Analytical Facility billed out \$2440 of sample charges to Contracts and Grants, \$483 from General accounts at DISL, provided \$2086 as DISL Allocations in support of graduate student support and billed outside parties for \$7685.

In addition to her Tech Support responsibilities at the DISL, Renee Collini is the Program Manager for the

Alabama Real-Time Coastal Observing System (ARCOS). She has maintained real-time functioning of the weather stations, funding, and partner engagement.

Collini collaborated with partners at Mississippi State University and the Weeks Bay NERR on a successful proposal that will keep the Bon Secour weather station running and to upgrade it to include water level and turbidity. The station will support a



Safety first! Renee Collini tests a harness in the safe confines of the tech shop before taking it out in the field.

large research initiative looking at sea-level rise and marsh restoration.

Collini also worked with partners such the Baldwin County School System, Mobile Bar Pilots, National Weather Service, NOAA Restoration Center, Alabama Marine Resources Division, DISL PIs, HMS Ferries, Alabama Department of Public Health, and Alabama Department of Environmental Management to submit letters of support to the Alabama Department of Conservation and Natural Resources to encourage funding for the weather stations. They were able to obtain an additional \$45,000 in funding, keeping the weather stations functioning for another year. Prior to the funding award in late 2015, tech support was able to maintain the high functionality of the stations through hard work, ingenuity, and efficiency. Collini has also worked with local and regional partners to standardize and coordinate monitoring and observations across the Gulf and encourage use of those data in management and policy decision-making.

Technical Support Personnel

Laura Linn - Technical Support Coordinator, Analytical Technician
Erich Bohaboy - Field Technician
Renee Collini – Field Technician
Al Gunter - Field Technician, retired 2015
Yantzee Hintz - Field Technician
Grant Lockridge - Field Technician

Data Management

Data Management at DISL is in charge of the processing, documentation, and archiving of scientific data generated by scientists and researchers at Dauphin Island Sea Lab. Our goal is to make valuable scientific data accessible for generations to come to policy makers, researchers, the general public. To facilitate data entry, data analysis, reporting, archival and retrieval, we design and develop online databases that are both user-friendly and secured. In 2015, Data Management accomplished the following tasks:

1. Data Management for Alabama Center for Ecological Resilience (ACER)

DISL Data Management is responsible for the overall Data Management of ACER. We designed and wrote the Data Management Plan. Working closely with the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC) and ACER researchers, we aim to make quality research data available to users within twelve months of data collection, or prior to the publication of research papers. Thirteen Dataset Information Forms (DIF) have been submitted by the seven

research teams participating in the ACER project, and additional DIFs are expected. We are currently writing metadata, and performing data quality control (QC). DISL Data Management offers Best Practice for Data to researchers to reinforce data standardization. This standardization will enhance the interoperability of datasets in the future.

2. Environmental Monitoring

Data management continues to manage the environmental monitoring data collected from seven stations in Mobile Bay. Data is published near real time on www.mymobilebay.com. Data is transmitted to National Data Buoy Center (NDBC) and Gulf of Mexico Ocean Observing Systems (GCOOS) within thirty minutes of harvest. DISL Data Management is in the fifth year of a 5-year contract with GCOOS titled “Continued Development of Gulf of Mexico Coastal Ocean Observing Systems.” In 2015, funding from this project covered the purchase of a new server, and other materials. The GCOOS grant also allowed, Lei Hu, the Data Manager to attend training sessions and conferences, where she has acquired knowledge needed to keep DISL up-to-date with new developments in information technology and data science.

3. Scientific Data Processing

Data Management supported scientific data processing. We developed and maintained customized online databases to allow users to enter data, check data quality, generate reports, and download data to their personal PCs. We continued to update the databases, in response to changes in research methods, procedures, and to fulfill requirements from the funding agencies. Examples of these databases are: Fisheries Lab Online Database, and Alabama Manatee Sighting Network.

4. Administrative Data Processing

DISL Data Management supported data processing for administrative purposes. Working together with administrators, Data Management developed programs tailored to the unique business operations at DISL. Examples of these databases are: School Trip Reservation, The REU Online Application, DISL Fellowship Application, Analytical Service Request, Fuel Usage, and Faculty Evaluation.

Metadata

DISL Data Management, collaborating with NOAA's Nation Center for Ecological Information (NCEI), offered a metadata training class to faculty, students, and personnel from other agencies in March, 2015. Data Management continued to generate new metadata records for the scientific datasets collected by researchers at Dauphin Island Sea Lab, and to

update existing metadata records to reflect accurate information about the datasets.

When NCEI announced that it would discontinue the support of its metadata tool MERmaid, and eliminate access to its server, DISL Data Management, in a timely manner, provided information on several metadata tools for faculty and students, and offered guidance on how to proceed with the ISO 19115-2 compliant metadata format to generate metadata.

Data Monitoring/Management/Metadata Personnel

Michael Dardeau - Marine Scientist, Diving Safety Officer, retired 2015

Lei Hu - Data Manager

Mimi Tzeng - Data Management Specialist



Mimi Tzeng of DISL's Data Management Center won an award for outstanding community service with NSF's EarthCube initiative, which is about building cyberinfrastructure for the next generation of big data earth science. Marjorie Chan, Award Committee Chair, left, presents an EarthCube community service award to Mimi Tzeng, right. Credit: Jay Pearlman of J&F Enterprise



Discovery Hall Programs

The mission of Discovery Hall Programs (DHP) is education and outreach for K-12 students, K-12 teachers, other educators and the public. We believe strongly in the value of a hands-on and field-based approach to education. Our goals are science literacy and a better stewardship through an appreciation of the importance of the ocean and coastal areas in our lives, especially for Alabama's

students and citizens. To achieve these goals, we offer a variety of programs and activities throughout the year; each are described below. In addition to the programs highlighted below, DHP educators assist DISL research faculty in their education and outreach programs and are, in turn, assisted by faculty participation in DHP programs. In total (excluding attendance at festivals and environmental events), DHP programs touched

more than 22,500 students, teachers and members of the general public and reached students and teachers in 50 of Alabama's 67 counties in 2015.

Academic year programs

During the academic year, DHP offers 11 unique field-based classes for school-age students. These classes range from a sampling cruise aboard DISL's vessel, the *Alabama Discovery*, to a class in which students design, build and then 'fly' their

own remotely operated vehicle (ROV) or underwater robot. Our salt marsh ecology class continues to be our most popular (and messy) class, but is closely followed by our lab class that introduces marine organisms and guides students through a squid dissection.



Verner Elementary seining at the Salt Marsh.

In 2015, DHP hosted 179 school groups including just over 7000 K-12 students and almost 1000 teachers, parents and chaperones. There were approximately equal numbers of day groups, that just come down for the day and take 1 or 2 classes, to groups that stay overnight for 2 or more days and take many classes. In total, DHP faculty taught more than 720 classes to these students. As most of our classes last 3-4 hours, this number reflects more than 54,000 contact hours.

More so than in recent years, most of the school groups visiting DHP come from schools in Alabama (87%). In combination with our outreach programs described below, Discovery Hall Programs served K-12 students in 50 of Alabama 67 counties just in 2015. Approximately 60% of our visiting groups are from public schools and 35% are from private schools with the rest being home school groups, university groups, and Scout troops.

In 2015 DHP hosted the 3rd Annual ROV (Remotely Operated Vehicle) Competition for students. Our event, the Northern Gulf of Mexico competition, is an official regional ROV competition site for the international Marine Advanced Technology Education (MATE) program, offering three levels of design and mission difficulty. This year's event included 12 teams and involved approximately 100 students and teachers. Funding from the Deep-C Consortium again supported the competition. The competition is an integral part of DHP's ROV program, which includes our ROV class and a multi-day workshop for teachers, in which they learn to build ROVs and integrate them into their classroom curriculum. We have also taken our ROV outreach program to many local schools and several robotics competitions and have hosted a ROV Maker Day at one of our partner schools.

Summer programs

In 2015 DHP introduced a new summer camp for high school age students named BayVoyager. The new camp seemed to fill a need, as it was full within one month of opening registration. And the camp was a blast – students, DHP educators and counselors had such a great time, we will be offering it again in the summer of 2016! We offered four sessions of our popular overnight camp for older middle schoolers, Gulf Island Journey and three sessions of our overnight camp for rising 5th and 6th graders, Barrier Island Explorer. Both camps were filled to capacity, and all three programs combined gave 187 school-aged students a chance to learn about our oceans and coasts in a fun and hands-on way. DHP also offers a number of day camps each year. In 2015, 111 students attended Oceans Alive, Survivor Dauphin Island or Art-Sea Discovery and learned or practiced skills ranging from how to bait a hook or catch crabs to ways to observe nature and express it artistically. Campers came from 22 states and as far away as Montana and North Dakota!

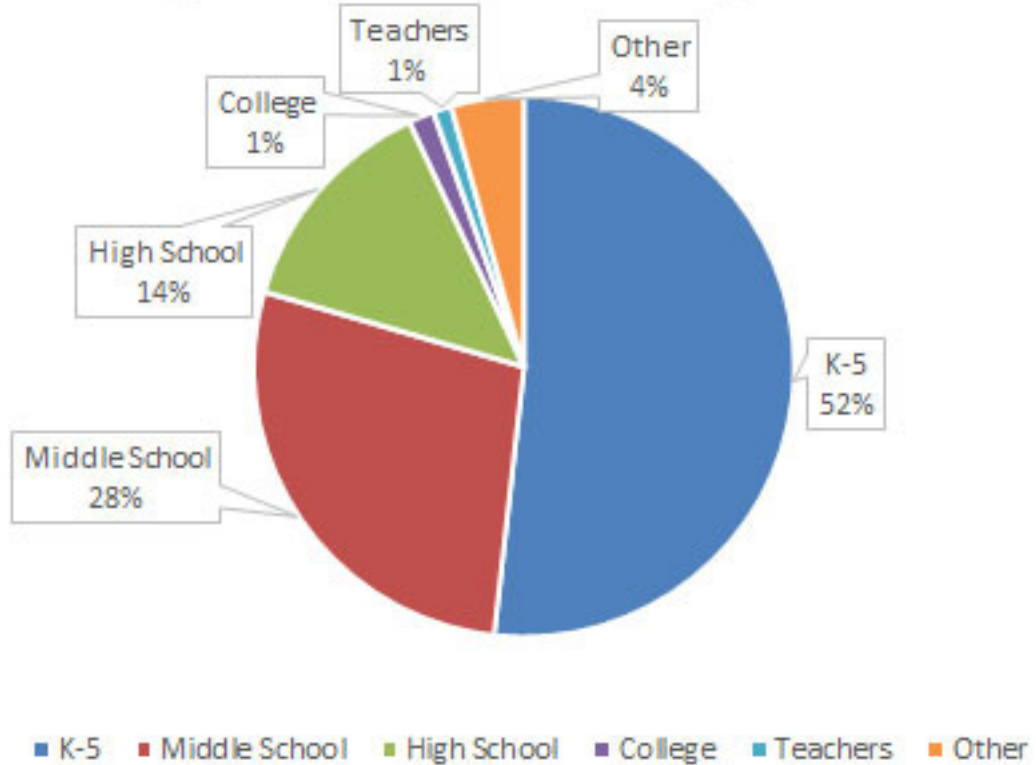
The summer course in marine science for high school students is a signature program for Discovery Hall Programs. This affordable, residential program is unique in the U.S., as it offers an immersive, hands-on environment for students to learn marine sciences and earn high school credit at the same time. Students spend four weeks at DISL, living in

our dorms, studying marine science in our classrooms, being outside in marine habitats learning by experience, going on boat trips, meeting and chatting with marine scientists, learning what they study, how they sample, how they conduct research, and what equipment they use. They get behind the scenes at aquaria, conduct a short research project, explore possible careers in the discipline and make friends that last a lifetime. In 2015, 28 students from 11 states completed the course. We continued our



Campers kayaking Aloe Bay during Bay Voyager.

Discovery Hall Student Participation in 2015



collaboration with Dr. Ishara Ramkissoon (University of South Alabama) increasing the number of under-represented students participating in the class through financial support from the Emerging Scholars in Environmental Health Sciences Academy.

to Title I schools throughout the state of Alabama during the school year. In 2015, BayMobile visited 40 schools and presented programs to more than 10,000 students.

Once again, DHP is indebted to the team of counselors who take care of the students during our summer programs. They are a wonderful, truly caring group of people with that perfect blend of experience and youthful enthusiasm. Our summer programs would not have the great reputation they do without this great team of folks. DHP sends a heartfelt thank you to Marty Dunn, head counselor, and the counselor team. DHP is also indebted to Ms. Alia Barnes of Hampton University, our collegiate environmental education intern and Ms Pashie Siker, our high school summer intern from Alma Bryant High in Mobile County. Both young ladies did an excellent job helping us with all aspects of our summer programs.

BayMobile – School visits & public outreach
While all students need to know about the ocean and Alabama’s coast, not all students are able to visit us in person. Through BayMobile, DHP’s traveling marine science classroom, we take the ocean to them! With the generous support of ExxonMobil (and the PNC Foundation who purchased a new vehicle for us in 2014), it travels



A BayMobile visit to Huxford Elementary

BayMobile also represented DISL at a number of programs for the general public. These included environment-themed events such as Earth Day, Discovery Day and Celebrate the Gulf, as well as regional events showcasing the Gulf region such as ShrimpFest, BirdFest, Delta Woods and Waters, CreekFest and many others. In 2015 DHP faculty attended 39 outreach events over 48 days with the BayMobile. We love taking the message of ocean literacy and stewardship on the road!

In 2015, DHP continued their collaboration with ACCESS – Alabama Connecting Classrooms, Educators and Students Statewide. ACCESS is a program of the Alabama State Department of Education. Through these monthly programs, we interacted with 39 schools across the state and more than 2,000 students got a chance to learn about sharks, animal adaptations, invasive species, wetlands and coastal plants, turtles and marine mammals. Alabama Supercomputer assists with the technical aspects of connecting schools. We thank everyone involved for making our virtual field trips possible.

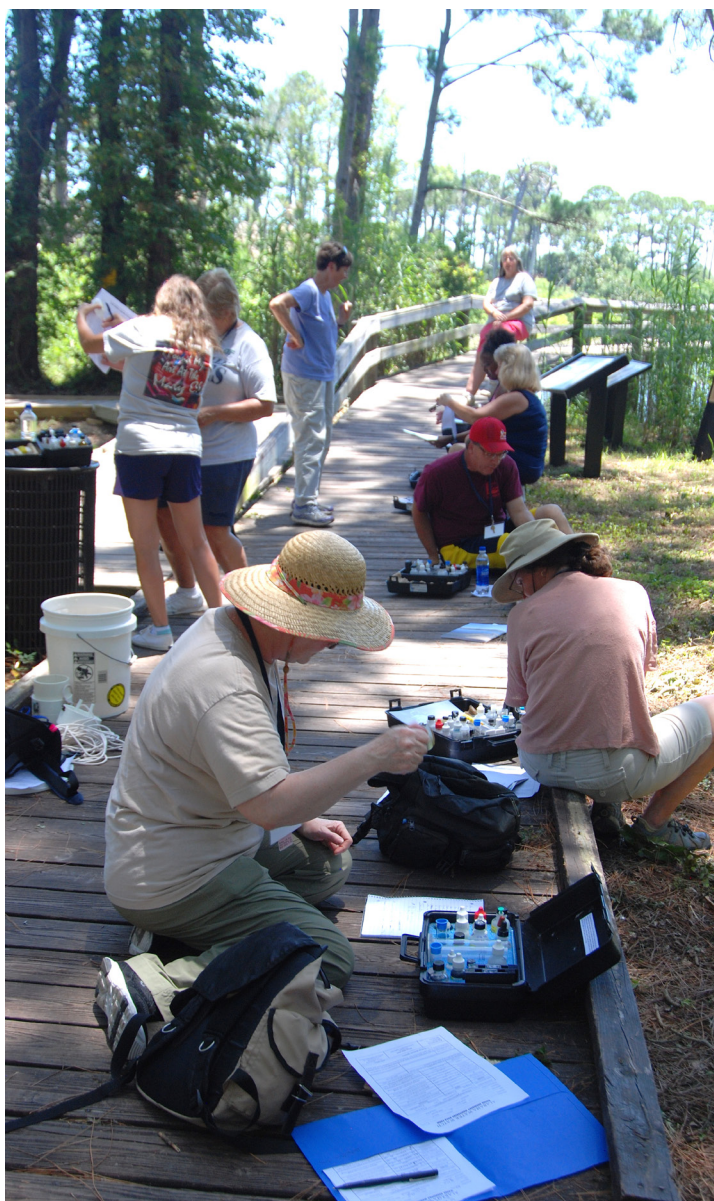
Professional development for K-12 teachers and informal educators

In 2015, DHP offered six opportunities for teachers and informal educators to improve their knowledge and gain experience in a number of marine science topics. The 2015 workshops included Fins, Fishes and Fisheries, Watershed Education using Bivalves, Technology in Marine Science: ROVs, Why Do We Explore and How Do We Explore. Each of these workshops was offered at no cost to educators through sponsorship by Mississippi-Alabama Sea Grant Consortium, the Gulf of Mexico Bay Watershed Education & Training program, the Deep-C Consortium, and NOAA's Office of Ocean Exploration and Research, respectively. DHP summer workshops typically last four (or more) days and include lectures by expert scientists and time for exploration of hands-on activities, but also include significant time outside in the field doing and experiencing marine science: 2015 was no exception. Approximately 120 teachers participated in our 2015 workshops.

Professional and service activity

Discovery Hall Programs faculty continue to contribute to the field of marine science

and environmental education by presenting at annual meetings of the National Science Teachers Association, the Alabama Science Teachers Association, the National Marine Educators Association, the Environmental Education Association of Alabama, the Gulf Regional Sea Grant meeting, Underwater Intervention (Marine Technology Society) and the Alabama Math and Science Technology Initiative Science Festival, as well as their Regional In-Service Training Conference. DHP faculty also served as judges at local, regional and the state level science fairs, and assisted with Alabama Master Naturalist Training sessions.



Learning to use Alabama Water Watch water quality kits during the WEB workshop

DHP Personnel

The quality of our programs derives in large part from the quality of our instructional faculty. The current Discovery Hall Programs team includes:

Tina Miller-Way, Chair; MS, Ph.D. (1995, Louisiana State University)

Jenny Cook, Marine Educator III, MS (1991, University of South Alabama)

Greg Graeber, Marine Educator III, ME (2008, University of South Alabama)

Sara Johnson - Administrative Assistant; BS (2004, Pennsylvania State University)

Jennifer Latour, Marine Educator I, BS (2004, Thomas University)

Rachel McDonald, ROV Program Coordinator, Outreach Specialist, MS (2014 University of South Alabama)

JoAnn Moody, Marine Educator I, MAT (2005, University of West Alabama)

Joan Nichols, Marine Educator III, BA (1999, University of Alabama - Huntsville)

Hazel Wilson, Marine Educator III, BS (1981, Memphis State University).

Dauphin Island Sea Lab's Discovery Hall Program Totals

| Year | K-5 | Middle School | High School | College | Teachers | Other | Total |
|--------------|----------------|---------------|---------------|--------------|--------------|--------------|----------------|
| | | School | School | | | | |
| 1990 | 7,382 | 1,364 | 905 | 473 | 185 | 397 | 10,706 |
| 1991 | 2,296 | 745 | 329 | 127 | 254 | 620 | 4,371 |
| 1992 | 6,103 | 2,005 | 1,187 | 671 | 254 | 351 | 10,571 |
| 1993 | 7,128 | 1,784 | 2,123 | 765 | 238 | 529 | 12,567 |
| 1994 | 7,634 | 2,083 | 1,533 | 603 | 356 | 478 | 12,687 |
| 1995 | 5,981 | 1,763 | 1,137 | 634 | 213 | 336 | 10,064 |
| 1996 | 6,915 | 2,318 | 1,411 | 456 | 300 | 126 | 11,526 |
| 1997 | 6,312 | 1,630 | 1,170 | 648 | 269 | 284 | 10,313 |
| 1998 | 6,233 | 2,079 | 1,484 | 364 | 230 | 352 | 10,742 |
| 1999 | 4,232 | 2,055 | 1,397 | 479 | 225 | 301 | 8,689 |
| 2000 | 6,567 | 2,141 | 1,746 | 476 | 199 | 368 | 11,497 |
| 2001 | 6,239 | 1,918 | 2,485 | 540 | 177 | 277 | 11,636 |
| 2002 | 4,196 | 2,924 | 1,865 | 460 | 175 | 430 | 10,050 |
| 2003 | 4,605 | 2,845 | 2,215 | 278 | 230 | 293 | 10,466 |
| 2004 | 4,737 | 1,385 | 1,435 | 262 | 150 | 188 | 8,157 |
| 2005 | 3,897 | 1,102 | 1,592 | 316 | 167 | 98 | 7,172 |
| 2006 | 6,576 | 2,326 | 2,877 | 566 | 117 | 374 | 12,836 |
| 2007 | 3,064 | 1,440 | 1,591 | 432 | 86 | 111 | 6,724 |
| 2008 | 3,268 | 2,621 | 1,551 | 46 | 138 | 173 | 7,797 |
| 2009 | 4,349 | 2,839 | 1,532 | 50 | 69 | 166 | 9,005 |
| 2010 | 6,296 | 2,662 | 1,130 | 101 | 66 | 95 | 10,350 |
| 2011 | 5,133 | 3,077 | 1,827 | 127 | 70 | 92 | 10,326 |
| 2012 | 5,218 | 2,765 | 1,991 | 109 | 85 | 290 | 10,458 |
| 2013 | 4,489 | 2,973 | 1,928 | 71 | 117 | 308 | 9,886 |
| 2014 | 4,505 | 2,415 | 1,408 | 170 | 93 | 429 | 9,020 |
| 2015 | 3,728 | 1,995 | 976 | 110 | 79 | 313 | 7,201 |
| Total | 137,083 | 55,254 | 40,825 | 9,334 | 4,542 | 7,779 | 254,817 |



The Estuarium

251.861.7500

Toll Free: 866.403.4409

www.sealabestuarium.org

The Estuarium continues to be a much-visited local attraction, posting an attendance of 80,719 during the 2015 calendar year, an all time high.

Construction has been completed on the 2,000 square foot addition to the Estuarium as a changing exhibit hall, housing new aquariums and technology displays. Sponsorships of exhibitry is still available; please contact Dr. John DIndo at jdindo@disl.org for more information.



The outdoor Ray Tank continues to delight visitors to the Estuarium. Credit: Brian Jones.

The Estuarium continued its efforts to green its facilities by installing an energy efficient, reflective roof coating that significantly reduced the need for air conditioning and energy consumption. At the same time, the gutters around the Estuarium roof were replaced with a corrosion resistant aluminum version. Additionally, the Estuarium is also converting its interior lighting to LED fixtures, drastically reducing energy consumption as well as maintenance costs.

The Estuarium also displayed the 72 winning pieces of artwork from the 2015 Alabama Department of Conservation and Natural Resources yearly calendar contest.

The Estuarium parking lot continues to be a favored site for the United States Coast Guard blood drive, having set up the twice this year and hoping to have even more next year.

The Estuarium is still a popular destination with Travel Writers and media groups, resulting in numerous write ups and blog entries. In early 2015, the Estuarium was awarded the prestigious TripAdvisor Certificate of Excellence.

Outreach programs are also offered through the Estuarium, DISL's public aquarium. *Boardwalk Talks* are a series of informal talks between visitors and Sea Lab scientists, aquarists, technicians or other experts. In 2015, DISL hosted 21 *Boardwalk*

Talks that were attended by approximately 600 individuals. Some of the most well-attended talks included: *Turtles of Alabama* with Joan Nichols; *How do Backyard Birds End Up in Tiger Shark Stomachs* with Dr. Marcus Drymon; *Share the Beach* with Barbara Gibbs; and *Research at the Rodeo* with Crystal Hightower.

Summer Excursions are field trips to the beach and forest, or the salt marsh; they are a great way for families, visitors to the island and other special groups to learn a bit of coastal ecology and appreciate the importance of our coastal habitats. In 2015, there were 14 such field trips that hosted 316 participants.

Like all museums and aquariums around the nation, the Estuarium could not function at the level that it does today without the dedicated involvement of our docent volunteer force. Currently, we have over 85 docents who volunteer their time in the Estuarium or around the campus in other capacities. Their tasks range from helping to explain the Mobile Bay ecosystem to visitors to greening up our campus. Our stalwart crew of docents provided over 2988 hours of service in 2015. There is no question they are a tremendous resource for us.

If you are interested in volunteering at the Estuarium, please contact Ms. Jamelle Roy at jroy@disl.org.

Estuarium Personnel

Robert Dixon, Estuarium Manager
Brian Jones, Senior Aquarist
Tiffany Christiansen, Aquarist
Caleb Dobbs, ExxonMobil Summer Intern Aquarist
Mendel Graeber, Estuarium Educator
Joe Ingraham, Aquarist
Edwin Torres, Aquarist

Gift Shop - full time

Jeana Layne - Manager/Buyer/Receiving/Events
Amy Gray (formerly Hannah) - Inventory/Clerk
Jamelle Roy - Reorders/Clerk; Docent Coordinator

Gift Shop - part time

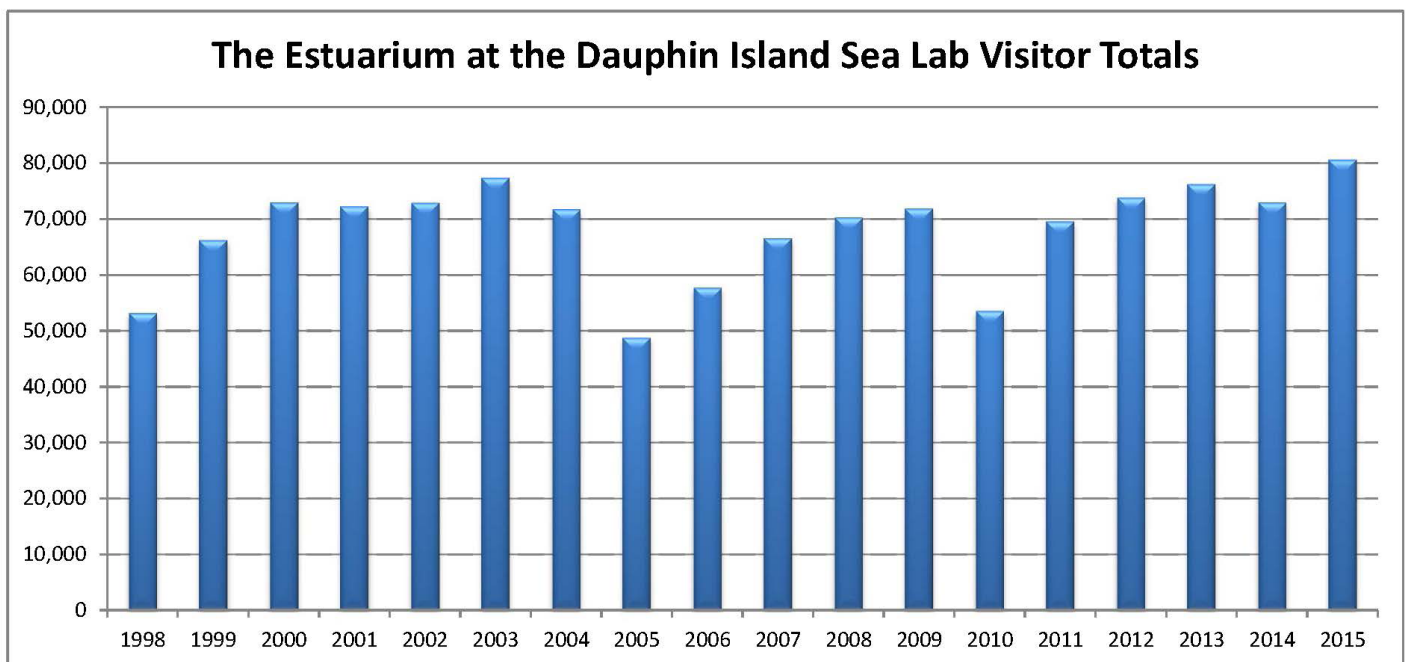
Lauren Angelo
Susanne Callister
Carol Ann Goodwin
Mary Catherine Miller
Mary Catherine Ladnier
Jessica R. Layne
Joann Riordan
Janice Watanabe



Summer Excursions offer family adventure in the Salt Marsh or on the Beach.

The Estuarium at the Dauphin Island Sea Lab Visitor Totals

| Year | Students | Adults | Seniors | Members Passes Employees, Comps | Total |
|--------------|----------------|----------------|----------------|------------------------------------|------------------|
| 1998 | 26,661 | 16,468 | 7,774 | 2,343 | 53,246 |
| 1999 | 34,557 | 18,842 | 10,427 | 2,455 | 66,281 |
| 2000 | 38,223 | 20,283 | 11,887 | 2,662 | 73,055 |
| 2001 | 36,213 | 21,305 | 12,112 | 2,718 | 72,348 |
| 2002 | 35,327 | 21,966 | 12,638 | 3,056 | 72,987 |
| 2003 | 38,622 | 23,200 | 12,435 | 3,218 | 77,475 |
| 2004 | 34,458 | 21,300 | 12,742 | 3,356 | 71,856 |
| 2005 | 26,501 | 13,050 | 6,728 | 2,533 | 48,812 |
| 2006 | 31,059 | 15,745 | 8,030 | 2,940 | 57,774 |
| 2007 | 34,152 | 18,689 | 10,586 | 3,220 | 66,647 |
| 2008 | 37,027 | 19,075 | 10,138 | 4,116 | 70,356 |
| 2009 | 37,931 | 18,677 | 10,532 | 2,798 | 71,947 |
| 2010 | 29,209 | 11,399 | 8,069 | 2,926 | 53,613 |
| 2011 | 37,094 | 18,756 | 10,799 | 2,994 | 69,643 |
| 2012 | 40,263 | 19,375 | 10,946 | 3,326 | 73,910 |
| 2013 | 39,287 | 21,344 | 12,050 | 3,633 | 76,314 |
| 2014 | 37,459 | 19,838 | 11,847 | 3,916 | 73,060 |
| 2015 | 39,864 | 22,932 | 13,809 | 4,114 | 80,719 |
| Total | 410,731 | 228,600 | 126,029 | 35,415 | 1,230,043 |





University Programs

University Programs (UP) oversees summer undergraduate and year round graduate (M.S. and Ph.D.) education, as well as faculty research.

UP Faculty peer-reviewed publications and grants can be found on pp. 38-43.

Seventeen (17) of the 22 member institutions sent students to the DISL for the 2015 Summer Program, during which UP delivered 1,056 undergraduate hours. The graduate programs produced 600 semester hours during the summer and academic year. Altogether, UP conducted 1,656 hours for undergraduates and graduates.

Eight graduate students, including four Ph.D. graduates, who conducted their research at the DISL received their degrees from their home institutions during the reporting period of October 1, 2014 to September 30, 2015 (Table 1).

The DISL welcomed eight undergraduates as part of its National Science Foundation Research for Undergraduates Program during the summer of 2015 (Table 2).

Of particular note during the reporting year was the opening of the Marine Mammal Research Center, under the direction of Dr. Ruth Carmichael and her team.

Dr. Kelly Dorgan was named a recipient of the prestigious National Academy of Sciences Gulf Research Program Early-Career Research Fellowship in 2015. Dr. Dorgan is one of five scientists to receive this national honor; the award is for \$76,000 over two years.

The Alabama Center for Ecological Resilience (ACER) at the DISL, a consortium made up of scientists from nine different research institutions and led by Dr. John Valentine, has recently begun carrying out multi-investigator field and laboratory studies. ACER is funded by the Gulf of Mexico Research Initiative (GoMRI), an independent research program whose mission is to investigate the impacts of oil on the ecosystems of the Gulf of Mexico in a broad context of improving understanding of the environmental stresses and public health implications of such events.

Funding for research remained high during the reporting year, and extramural funding for the DISL faculty totalled \$3,128,141.45

During the reporting period, the faculty produced 80 peer-reviewed publications.

Table 1. 2014-2015 Graduates:

Condon, Elizabeth. Biogeochemical and microbial indicators of land-use change in a Northern Gulf of Mexico estuary. Ph.D. (USA).

Kroetz, Andrea. Movement and trophic dynamics of two estuarine mesopredators: Bonnetheads (*Sphyrna tiburo*) and Red Drum (*Sciaenops ocellatus*). Ph.D. (USA).

Marquez, Israel. The consequences of mesoscale eddies on the coupling of Si and organic matter export in the Sargasso Sea. M.S. (USA).

Norberg, Michael. The ecology of Tomtate, *Haemulon aurolineatum*, in the northern Gulf of Mexico and effects of the Deepwater Horizon Oil Spill. Ph.D. (USA).

Scheffel, Whitney. Impacts of black mangrove (*Avicennia germinans*) expansion on faunal communities in the northern Gulf of Mexico. M.S. (USA).

Schrandt, Meagan. Connectivity and habitat use of two coastal pelagic species, Spanish Mackerel (*Scomberomorus maculatus*) and Florida Pompano (*Trachinotus carolinus*). Ph.D. (USA).

Spearman, Trey. Effects of Large-Scale Habitat Modification on Fish And Invertebrate Communities within Alabama's Reef Permit Zone. M.S. (USA).

Stone, Laura. Biotelemetry Based Estimates of Greater Amberjack (*Seriola Dumerilii*) Post-Release Mortality in the Northcentral Gulf of Mexico. M.S. (USA).

Table 2. 2015 REU Participants

Sean Carter, Colorado College, Dr. Ruth Carmichael – Mentor. American horseshoe crab (*Limulus polyphemus*): population ecology in the northern Gulf of Mexico.

Sara Cole, Eckerd College, Dr. Kelly Dorgan – Mentor. Oyster infestation: adult and larval abundance of mudblister worms (*Polydora websteri*) in Mobile Bay oyster farms

Diana Cordero, Barry University, Dr. Ron Kiene – Mentor. Naturally-occurring DMSP analogs as potential precursors of dimethylsulfide (DMS) and methanethiol (MeSH) in coastal seawater

Jessica Gwinn, Texas A & M University College Station, Dr. Alison Robertson – Mentor. Understanding trophic transfer of gambiertoxins in herbivorous reef fish from St. Thomas, Virgin Islands

Arsalan Kouser, Clemson University, Dr. Bill Walton – Mentor. The Need for More Refined Science Communication.

Charisma Lauritzen, University of Portland, Dr. Jeff Krause – Mentor. Effects of Silicic Acid: Phosphate Ratios on Silicon Accumulation in *Synechococcus*.

Madison McBarnes, Kalamazoo College, Dr. Just Gebrian – Mentor. Temporal variability in marine debris accumulation rates on Dauphin Island, AL

Molly Thistle, Palm Beach Atlantic University, Dr. Will Patterson – Mentor. Assessing facultative herbivory in a marine omnivore with compound-specific stable isotope analysis.

University Programs Personnel

Dr. Kenneth L. Heck, Jr. - Director

Sally Brennan - University Programs Registrar,
retired Jan. 2016

Regina Kollegger - University Programs Registrar,

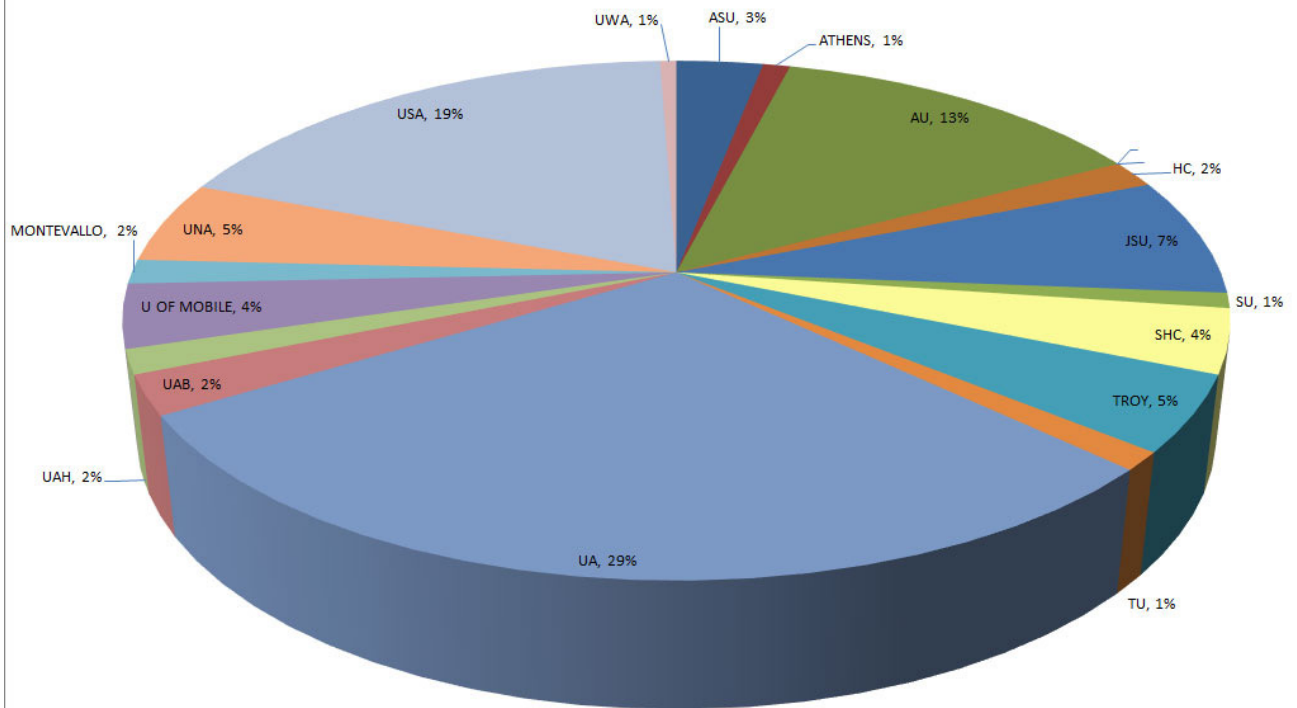
as of Jan. 2016

Carolyn Wood - Department Secretary

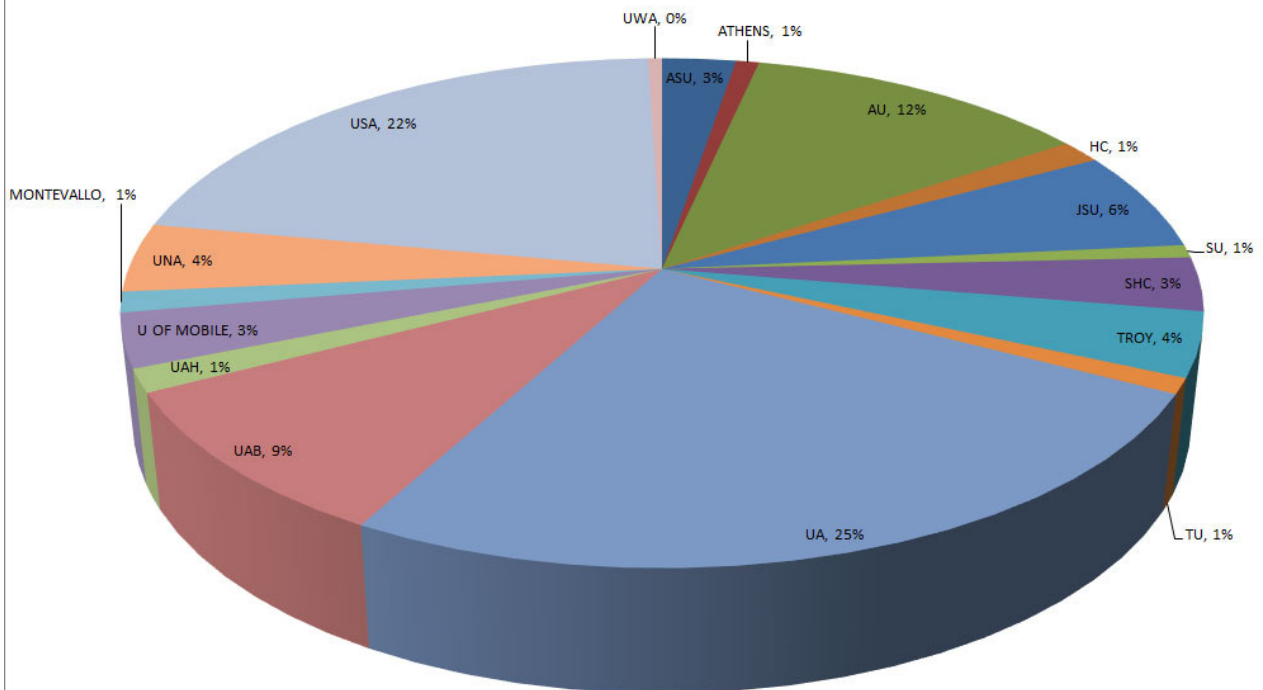


May 22, 2015 - Cutting the ribbon at the MMRC Grand Opening are DISL Exec. Dir. Dr. John Valentine; ALMMSN Director Dr. Ruth Carmichael; Patti Powell, ADCNR State Lands Director; and Eliska Morgan, Exec. Director of the Alabama Gulf Coast Recovery Council.

Undergraduate Hours 2015



Summer - 2015 Total Credit Hour Breakdown by Institution





Dauphin Island Sea Lab Foundation

PO Box 82151, Mobile, AL 36689

251-605-6624

www.sealabfoundation.org

The Dauphin Island Sea Lab Foundation supports the Dauphin Island Sea Lab in its mission to provide wise stewardship of the marine environment through education and research. The Foundation provides funds to sustain the activities of the Sea Lab and promotes awareness of the DISL and its environmental issues. The Foundation is also building the George C. Crozier Endowment for the Dauphin Island Sea Lab.

The Foundation, established in 2004, is overseen by a governing board, which currently has 29 members. An advisory board to the governing board was established in 2011 and consists of 28 non-voting members. Executive Director, Helene Hassell, has served as director since 2010.

The Foundation raises funds and promotes the Sea Lab through various means, including



The increasingly popular Marine Environmental Awards Luncheon hosted famed photographer David Doubilet and honored two top-notch awardees in 2015. Top – David Doubilet with Shark. Credit Jennifer Hayes. Bottom left – Andrew Saunders. Bottom right – John L. Borom Alabama Coastal Birdfest.

Cocktails with the Critters (CWC) and the Marine Environmental Awards Luncheon (MEAL).

Cocktails with the Critters

The primary event is Cocktails with the Critters held each year the first Thursday in May. It is an exciting band party with a wildly successful silent auction. Income for CWC is realized through sponsorships, ticket sales and the silent auction. The event has grown in popularity over the years. In 2015, its tenth year, there were 450 in attendance.

The Marine Environmental Awards Luncheon

In 2015, the Dauphin Island Sea Lab Foundation hosted its fourth Marine Environmental Awards luncheon on October 27 with 250 in attendance. The awards were originally devised by Dr. George Crozier to recognize individuals in the community who had a positive impact on the sustainability of the marine environment. The speaker was world-renowned *National Geographic* photographer and explorer, David Doubilet. There were two awards given; one to an individual, Andrew Saunders and to an organization, The John Borom Alabama Coastal Birdfest. It is an honor for members of the Gulf Coast community to be selected for these awards by the Sea Lab.

The Friends of the Sea Lab

The Friends of the Sea Lab (FOSL), formerly the Friends of the Estuarium, was established in 2010 and is administered by the Foundation. Letters are sent out each year and the members of the Friends receive certain benefits based upon their level of sponsorship. Currently there are 170 Friends.

The Foundation also seeks grants to fund special projects at the Sea Lab. In 2015, the Foundation was able to assist with the following projects:

- Hearin Chandler - \$20,000 to produce a new film in the Estuarium and to purchase new AV equipment
- PNC - \$10,000 to underwrite the Awards Luncheon
- Glaze Foundation - \$7500 for general purposes
- WKRG - \$20,000 in-kind publicity for Cocktails with the Critters
- Regions Banks - \$10,000 for Cocktails with the Critters

Personnel

Executive Director: Helene Hassell

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Scott Browning, Treasurer

Margaret Van Loock,
Secretary

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Marty Stapleton
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Garrett Williamson
Bill Zundel

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George Crozier, PhD
E.O. Wilson, PhD

DISL Representative

John Valentine, Ph.D.



Mobile Bay National Estuary Program

118 North Royal Street, #601, Mobile, AL 36602

251-431-6409

www.mobilebaynep.com

The mission of the Mobile Bay National Estuary Program (MBNEP) is to promote wise stewardship of the water quality and living resources of Alabama's estuarine systems. Funded in part by the U.S. EPA and administratively sponsored by the DISL, MBNEP is a non-regulatory program, bringing together citizens; local, state, and federal government agencies; businesses and industries; conservation and environmental organizations; and academic institutions to meet the environmental challenges that face the unique and imperiled resources that characterize our coastal estuaries. The MBNEP is part of the Sea Lab's Coastal Policy Program.

The past year has been transformative for the MBNEP and its Management Conference committees. Implementing three National Fish and Wildlife Foundation Gulf Environmental Benefit Fund (GEBF) grants, the MBNEP joined partners on both sides of the bay to continue laying the foundation for coastal restoration through watershed planning and implementation. These grants were added to ten currently active grants including awards from the EPA, Alabama Department of Conservation and Natural Resources, Alabama Clean Water Partnership, the U.S. Fish and Wildlife Service, and the Alabama Department of Environmental Management. In addition, non-federal match funding was received from the State of Alabama, Alabama Department of Conservation and Natural Resources and several Mobile and Baldwin County municipalities. These diverse sources of funding grew the MBNEP budget to over \$11.5 million dollars in the past year to support projects affecting water quality and living resources of coastal Alabama, including significant activity in the D'Olive and Fowl River watersheds.



THE CCMP

In its third year, MBNEP continues implementation of a Comprehensive Conservation and Management Plan for Protecting Alabama's estuaries and Coast 2013-2018 (CCMP). This road map to protection of Alabama's coastal resources was produced to support what people along the coast value most:

- Access to the water and open spaces (for recreation and vistas)
 - Beaches and Shorelines (Protection, economy, beauty)
 - Fish (Fish and wildlife habitats, abundance, livelihood)
 - Heritage and Culture (Protecting the legacy)
 - Environmental Health/ Resiliency (Protecting)
 - Water quality (drinking water quality and quantity, rivers, creeks, and bay- fishable, swimmable, drinkable).

The CCMP is organized by five sections:

- Status and trends
- Ecosystem restoration
- Technical assistance and capacity building
- Community stewardship
- Program implementation

What follows is an overview of accomplishments achieved by over 100 community leaders, academics, businesses, government entities, and grassroots and environmental groups in their efforts to implement the strategies of the CCMP.

STATUS AND TRENDS: ENVIRONMENTAL MONITORING FOR THE COAST

The Science Advisory Committee (SAC) focused their activities on assessing improved delivery of ecosystem services related to implementation measures recommended through coastal watershed management planning and maintaining existing levels of coastal monitoring by evaluating funding and organizational capacity to manage historical, ongoing, and future coastal and estuarine data.



Tiawasee Creek Restoration

Real Time Monitoring - The MBNEP provided funding to DISL to support operation and maintenance of real-time monitoring sites at Meaher Park, Dauphin Island, Weeks Bay, and Middle Bay lighthouse. These monitoring stations provide real-time data that can be viewed at www.mymobilebay.com, a website also containing links to the Mobile River, Fort Morgan, and the Farewell Buoy as part of the Physical Oceanographic Real-Time System of the National Ocean Service (with data more pertinent to shipping interests) as well as data from Weeks Bay and Grand Bay through the NOAA Weather Service Hydrometeorological Automated Data System. Staff support for this program has been integrated into the SAC Coordinator responsibilities.

Measuring Changes in Biological Condition - With a goal of measuring changes in ecosystem function resulting from watershed management and restoration activities, the SAC continued a multi-year focus on the development of a conceptual framework for measuring biological conditions. This framework includes tracking conditions of wetlands and intertidal marshes and flats using

the relative proportion of acreage having “good,” “fair,” and “poor” biological condition within an assessment area, accounting for wetlands lost or gained. Conditions will be assessed using landscape development indices (LDIs), wetland rapid assessment procedures (WRAP), and hydrogeomorphic models (HGMs). For coastal streams, conditions will be assessed using macroinvertebrate indices of biological integrity (MIBI). While MIBIs have as yet not been calibrated for Alabama streams, Mississippi DEQ and Florida DEP have both developed indices which may be applicable in Alabama.

This framework is being tested in the D’Olive watershed where a significant amount of restoration is occurring in addition to passage and enforcement of enhanced sub-division regulations. The condition of freshwater wetlands and distribution of submerged aquatic vegetation (SAV) in D’Olive Bay are providing assays of downstream condition related to restoration of these upstream streams and wetlands.

Coastal Alabama Restoration Program - In late 2014, MBNEP received a grant from the second round of National Fish and Wildlife Foundation (NFWF) Gulf Environmental Benefit Fund (GEBF) to produce high-resolution maps of habitats in Alabama's two coastal counties, map the distribution of submerged aquatic vegetation in Alabama's coastal and estuarine waters, develop watershed management plans for priority intertidal watersheds, and develop a habitat restoration plan coupling data from maps with recommendations from WMPs to prioritize restoration and conservation activities. In 2015, Barry A. Vittor and Associates followed up on 2002 and 2008-2009 efforts and gathered aerial imagery to map the distribution of SAV in the Mobile-Tensaw Delta, Mobile Bay, Mississippi Sound, and Perdido Key area of southern Baldwin County. Radiance Technologies was contracted to update the inventory of priority wetland and upland coastal habitats through high-resolution mapping. These priority habitats identified by the Coastal Habitats Coordinating Team consist of intertidal marshes and flats, freshwater wetlands, riparian buffers, pine savanna, longleaf pine, maritime forest, beaches and dunes. High resolution habitat mapping will provide important baseline data for a GIS support tool to enhance restoration and conservation planning through protection of critical ecosystem services, particularly water quality enhancement and fisheries production.

Habitat Restoration Plan/Watershed Comparison Tool - MBNEP is funding The Nature Conservancy to develop an online decision support mapping tool that will allow the user to utilize a wealth of information about water resources and watersheds, as well as robust analyses and modeling to allow the MBNEP and its Project Implementation Committee (PIC) to prioritize and monitor implementation of the management recommendations and determine where restoration efforts should be employed. This tool will be used to prepare a

habitat restoration plan coupling data from habitat and SAV maps, as well as digital information and recommendations from completed watershed plans, to determine where restoration and conservation activities will have the greatest impact on restoration. Each state or partner (including Alabama/MBNEP) determines what products would be most useful in guiding TNC developers in generation of applications.

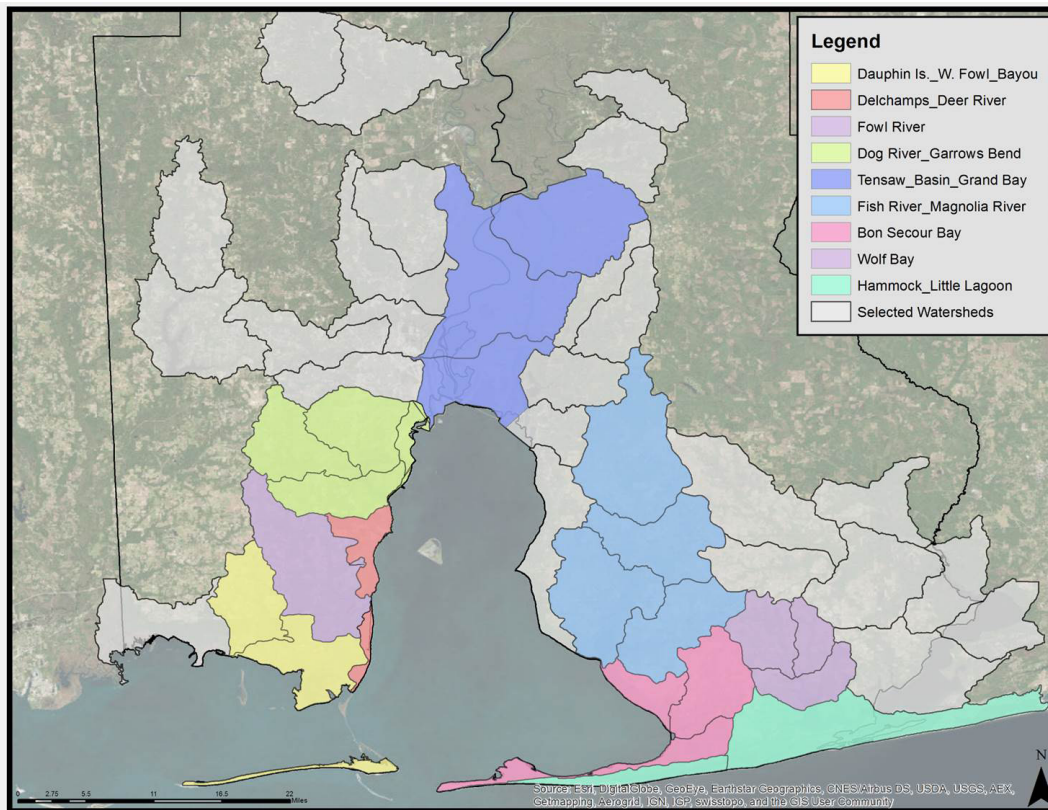
ECOSYSTEM RESTORATION AND PROTECTION AT A WATERSHED SCALE

D'Olive Creek Watershed Restoration – At the end of 2013, MBNEP was awarded a \$6.85M NFWF GEBF grant to continue restoration of substantially-degraded tributaries in the D'Olive and Tiawasee creeks and Joe's Branch sub-watersheds to “stop the bleeding” and mitigate 303(d)-listed impairments (siltation) resulting from stormwater runoff. Engineering and design activities were put to the test after the “500-year” storm event in April of 2014 which devastated local streambeds. MBNEP requested an amendment to NFWF, and in August \$11.4M was approved to complete proposed restoration projects.

Restoration project implementation continues and although the initial restoration project of a tributary to Joe's Branch performed very well, targeted restoration areas experienced significantly more erosion. As a result, additional engineering was



Historic northern Mon Louis Island Shoreline Profile



Watershed Management Planning

required for Joe's Branch, pushing back restoration to April 2015. JB Phase II was substantially completed in August 2015, and GSA monitoring indicated a 90-99% downstream reduction in sediment loads. Design is complete and construction contracts awarded for restoration of three additional stream reaches and two stormwater management facilities to complete Joe's Branch Restoration activities. Engineering and design for restoration of Tiawasee Creek, managed by the City of Daphne and funded jointly through CIAP and the MBNEP NFWF GEBF grant were completed and a construction contract was awarded prior to the end of 2015. With design completed for D'Olive Creek tributary D4-D6, downstream of I-10, construction will be bid to begin when ALDOT work at the I-10 culverts is completed later in 2016. Designs for restoration of tributary DA3 has been initiated with construction expected in late 2016.

Mon Louis Island/Fowl River Watershed - At the end of 2013, MBNEP was awarded a \$2.05M grant from the GEBF to undertake a sediment loading analysis to identify areas of erosion concern, prepare a comprehensive management plan for Fowl River watershed and stabilize the tip of Mon Louis Island at the mouth of the river, creating up to 7 acres of marsh. The sediment analysis was completed, and a draft watershed management plan

was conducted at the mouth of the river and within the channel. Based on findings of poor quality, project development depended on finding a suitable and financially feasible sediment source. With \$800,000 available from a State Deepwater Horizon Impact Grant facilitated by Senator Bill Hightower, a plan was developed to borrow suitable material from the nearby Fowl River Open Water Disposal Area (FROWDA) to create over four acres of marsh to restore the tip to its 1995 footprint, followed by DWHI grant-funded dredging of the shallow Fowl River navigation channel to replace material borrowed from the FROWDA. An amendment to the NFWF GEBF grant of \$2.85M was sought and approved by NFWF, and permitting requirement submission was completed in late 2015. Permit receipt is pending.

Three Mile Creek Watershed - Implementation of the Three Mile Creek Watershed Management Plan is underway. In August, 2014, MBNEP assisted the City of Mobile in preparation of an Outdoor Recreation Legacy Program Grant proposal for submission to the National Parks Service/U.S. Department of the Interior for the construction of the first leg of a bicycle trail/greenway extending from Martin Luther King Jr. Avenue to Tricentennial Park with LED lighting, impervious surface, and a circuit/fitness course. In August, 2015, the City won a

was delivered for comment.

The proposed restoration strategy included dredging the Fowl River channel and beneficially using that material to support the project. As part of the initial design, an Alternatives Evaluation was prepared, comparing different designs, materials, and footprints for the restoration, with creation of a rock sill as the preferred alternative.

Concurrently, an investigation of sediment quality

\$486K award to implement this project, slated for construction in 2016.

Two MBNEP projects related to Three Mile Creek were approved for awards from the RESTORE Bucket 2 Funded Priority List in December, 2015: Stream restoration/stabilization in TMC tributary Twelve Mile Creek upstream of Langan Park to reduce delivery of sediment there and a TMC Invasive Species Control Plan for development and implementation.

Coastal Watershed Management Planning -

Watershed management plans funded in the first and second rounds of NFWF GEBFs are progressing. The Fowl River WMP, developed by Goodwyn Mills Cawood and managed by the Mobile County Soil and Water Conservation District, was released in draft for comment in December 2015. GMC was contracted by the City of Mobile to develop their comprehensive plan, so as a matter of economy and efficiency they were also contracted to develop the WMP for the Dog River Complex (that includes Upper and Lower Dog River, Halls Mill

Creek, and Garrow's Bend), which is in progress. Dewberry is progressing through development of the WMP for Bayou Le Batre. Their scope may be amended to include Dauphin Island, West Fowl River, and Delchamps Bayou due to geographical similarity and proximity, common drainage, and since the team developing the Alabama Barrier Island Restoration Study requested the MBNEP to partner in supplementing their data with stakeholder engagement necessary to both efforts. The Bon Secour River Complex planning effort (BSR, Skunk Bayou, and Oyster Bay) is being managed by the City of Foley and developed by Volkert. The Fish River Complex (Upper, Middle, and Lower Fish River, Perrone Branch, and Magnolia River Watersheds) is being managed by the Baldwin County Soil and Water Conservation District and developed by Thompson Engineering. The Wolf Bay Complex (Graham Bayou, Sandy and Mifflin Creek, and Perdido Pass/Frontal Gulf of Mexico Watersheds) and Tensaw-Apalachee Complex (Tensaw-Apalachee, Grand Bay (AL), and The Basin Watersheds) will be the last of the NFWF-funded watersheds undertaken. In December, 2015, funding



Community meeting for Toulmins Spring Branch

was approved from the RESTORE Bucket 2 Funded Priority List to develop WMPs for the remaining 19 tidally-influenced watersheds in coastal Alabama.

EDUCATION, OUTREACH, AND CAPACITY BUILDING

Alabama Current Connection is a joint semi-annual newsletter published by ADCNR, State Lands Division, Coastal Section and the MBNEP to highlight current projects, Management Conference activities and initiatives, and other issues of interest/concern to local residents. Two newsletters were published for distribution as hard copies as well as in electronic (PDF) format.



Joe's Branch Phase II Restoration

Clean Water Future Campaign -

Create a Clean Water Future is a public service messaging and marketing campaign to help Alabamians learn more about stormwater runoff and its impacts; increase demand for stormwater management programs; and provide tools that empower Alabama residents to reduce polluted runoff in our waterways. Participation in this campaign provides municipalities, businesses, or other organizations with a unified mechanism for raising the issue of stormwater management throughout coastal Alabama. MBNEP is charging the Business Resource Committee to connect with lead implementers of the CCWF campaign. The BRC will recruit private sector entities to “jump start” the campaign as prescribed in a marketing plan developed in 2015.

Toulmins Spring Branch Community Adaptation

– In 2015 with funding from the New York Community Trust, MBNEP joined forces with the MLK Avenue Redevelopment Corporation to establish a Community Resiliency Leadership Academy to teach potentially-affected residents of the MLK area and along TSB how to participate in decisions about proposed activities that will affect their environment and/or health and how a community’s contribution can influence local government management decisions. Leadership Academy members met weekly with training in leadership and team building; identification of resources, needs, and adoption of vision; group dynamics; and community organizing and education in environmental topics like climate change, watershed dynamics, and field work to gain an appreciation for local habitat assets and problems. Upon course completion, Academy members

were recognized by the City of Mobile Mayor and City Council. The program will be ongoing, with graduates providing direction and support to the next “class” of willing community leaders.

Concurrently, in coordination with a proposed project by The Nature Conservancy to develop best management practices in the headwaters of TSB, MBNEP conducted a TSB Community Resiliency Project to involve residents in planning for how their vulnerable community will adapt to impacts of climate change. Project goals were 1) to engage community members in understanding and adapting to the risks posed by an increased incidence of coastal storms and rising sea levels and 2) to build local capacity for improving community resiliency while protecting natural resources and enhancing ecosystem services. Volunteers for the University of South Alabama Center for Academic Service Learning and Civic Engagement were trained to assist in neighborhood canvassing to encourage participation, and three community meetings were conducted with participants completing questionnaires and viewing presentations by MBNEP staff on watershed education and potential project implementation. Following the three community meetings, MBNEP held an Ideas Festival where residents participated in a mapping workshop to identify critical structure assets and locations of known flooding and stormwater related problems. MBNEP solicited feedback from participants through handheld voting devices regarding the resiliency of the community to flooding and potential impacts of sea level rise.

Video Productions - In 2015, MBNEP produced two well-received videos. *Understanding Your Watershed* was created as a primer for elected officials and others to learn about watersheds, stormwater, and nonpoint source pollution and is widely used in outreach efforts. *The Path Towards Coastal Restoration* was prepared for the MBNEP's annual Management Conference breakfast and describes projects and initiatives that have represented MBNEP efforts over the preceding calendar year.

Alabama Water Watch - AWW is a citizen, volunteer water quality monitoring program covering all of the major river basins in Alabama. MBNEP partnered with AWW to expand volunteer monitoring within Alabama's two coastal counties. During the past program year we have focused on increasing the volunteer monitoring capacity of local grassroots watershed groups. A workshop was held to highlight coastal water monitoring efforts, and two follow-up meetings with grassroots groups indicated a need for more training opportunities and assistance in maintaining test kits. AWW also worked to develop protocol for salinity testing via refractometer and bacterial Enterococcus assessment.

Coastal Alabama Clean Water Partnership - As host to the Coastal Basin CWP Facilitator, MBNEP supports activities to reduce the amount of non-point source pollution entering our waterways. The CACWP is part of the Alabama Rain Barrel Project, conducting workshops for citizens to "make and take" a 55-gallon rain barrel. Included in the workshop is an educational session teaching citizens how to protect water quality and conserve water resources. During the past program year, four rain barrel workshops were held in Mobile and Baldwin counties and 55 rain barrels were constructed. The CACWP also supports multiple outreach events that demonstrate best management practices for protecting coastal water quality and habitat. During the past program year these events included:

- Mobile County Forestry Field Day- over 75 landowners participated in BMP demonstrations including protecting wetlands, managing longleaf pine, farm pond management, and zero tillage farming.
- Mobile and Baldwin County Water Festivals- Over 1,000 4th grade students participated in a hands-on learning experience on topics including watershed protection, water quality, and the water cycle.

Coastal Marine Planning – MBNEP, in collaboration with the Working Waterfronts Coalition and a Steering Committee comprising area agency resource managers, is working with the Geological Survey of Alabama to create a Coastal Marine Planning (CMP) GIS-based Decision Support Tool. This involves developing a new support tool or adapting an existing one to the needs of CMP for coastal Alabama. GSA updated the Alabama Comprehensive GIS Inventory of Coastal resources by:

- Interacting with partners to prioritize coastal marine spatial planning information (CMSP) collected to date and identify data gaps, including expanding stakeholder input to assist the Steering Committee in addressing goals and objectives established in previous phases of the effort.
- Finalizing thematic data tabulated to date which was reflected in Phase III, including addressing data redundancy and metadata compliance.
- Completing a working inventory, updating the 2006 dataset, and drafting into an ArcGIS project (.MXD format) and into a published map file (.pmf format suitable for ArcReader) for DVD media
- Developing beta version of a categorical ArcReader interface for the recreation categorical theme using Adobe Flex viewer built on the ArcGIS Server platform (located at [http://www.ogb.stae.al.us/apps/Recreation/.](http://www.ogb.stae.al.us/apps/Recreation/))

Mobile Bay National Estuary Program Personnel
Roberta Swann, Director
Kelley Barfoot, Community Outreach Coordinator
Tiffany England, Business & Grants Manager
Rick Frederick, Resource Development Manager
Tom Herder, Watershed Protection Coordinator
Christian Miller, Non-Point Source Pollution Outreach
Amy Newbold, Deputy Director



Resident Research Faculty

Ruth Carmichael, Ph.D., Senior Marine Scientist II, DISL and Assistant Professor of Marine Sciences, University of South Alabama. Employing natural abundance stable isotopes to understand biological and physiological responses to environmental perturbations, assessing nutritional importance of food sources, discerning physiological state of organisms, and determining time scales of ecosystem-level change.

Just Cebrian, Ph.D., Senior Marine Scientist III, DISL and Professor of Marine Sciences, University of South Alabama. Trophic interactions and carbon budgets in marine ecosystems, nature and controls of trophic routes of primary production in marine and terrestrial ecosystems.

John Dindo, Ph.D., Senior Marine Scientist III, DISL and Associate Director for Institutional Advancement. Marine vertebrate ecology; avian breeding biology; predator-prey relationships in avian and herpetological fauna, habitat assessments; and age, size class and recruitment rates of fish on hardbottoms.

Kelly Dorgan, Ph.D., Senior Marine Scientist I, DISL and Assistant Professor of Marine Sciences, University of South Alabama. Benthic ecology; biomechanics of burrowing; biological-physical interactions; functional morphology and physiology of invertebrates.

Marcus Drymon, Ph.D., Research Senior Marine Scientist, DISL and Research Assistant Professor, University of South Alabama. Marine fisheries ecology, including assessments of species' life history, distributions and trophic ecology in coastal ecosystems.

Brian Dzwonkowski, Ph.D., Senior Marine Scientist I and Assistant Professor, University of South Alabama. Coastal circulation and across-shelf exchange processes; estuarine circulation and exchange processes; physical-biological coupling in the marine environment; and ocean observing systems.

Kenneth L. Heck, Jr., Ph.D., Chair, University Programs, DISL and Professor of Marine Sciences, University of South Alabama. Ecological studies of interactions between seagrasses and associated macrofauna, especially shrimps, crabs, and fishes; Global assessment of seagrass nursery value, and experimental investigations of herbivory, nutrient enrichment and overfishing as they impact seagrass ecosystems.



Dr. Kelly Dorgan was named a recipient of the prestigious National Academy of Sciences Gulf Research Program Early-Career Research Fellowship in 2015. Dr. Dorgan is one of five scientists to receive this national honor; the award is for \$76,000 over two years.



*In December 2015, Dr. Ken Heck was notified that he will receive \$469,000 for his project *Living shorelines: Synthesizing the results of a decade of implementation in coastal Alabama* from The Gulf Research Program of the National Academies of Sciences, Engineering, and Medicine.*

Behzad Mortazavi, Ph.D., Senior Marine Scientist II, DISL and Assistant Professor and Director of the University of Alabama M.S. Degree Program in the Marine Sciences. Focus on the transfer and cycling of bioreactive material in terrestrial and marine ecosystems, with a particular emphasis on how naturally occurring perturbation and anthropogenic activities are impacting biogeochemical cycles.

***Alice C. Ortmann**, Ph.D., Senior Marine Scientist I, DISL and Assistant Professor of Marine Sciences, University of South Alabama. Diversity and ecological roles of marine microbes including Bacteria,

Archaea and their viruses using both culture-based and molecular biology techniques.

Will Patterson, Ph.D., Senior Marine Scientist I, DISL and Associate Professor, Department of Marine Sciences, University of South Alabama. Research areas include population dynamics, trophic dynamics, and population structure of marine fishes.

Ronald P. Kiene, Ph.D., Senior Marine Scientist III, DISL and Professor of Marine Sciences, University of South Alabama. Biogeochemical cycling of organic matter in coastal and ocean systems with emphasis on compounds containing sulfur and nitrogen; cycling of climatically important trace gases in relation to phytoplankton and food web dynamics; and microbial ecology and biogeochemistry in sediments.

Jeffrey W. Krause, Ph.D., Senior Marine Scientist I, DISL and Assistant Professor, Department of Marine Sciences, University of South Alabama. Diatom ecology and physiology, cyanobacteria physiology, and coupling of the global Silicon, Carbon and Nitrogen cycles in coastal and open-ocean regions.

Sean Powers, Ph.D., Senior Marine Scientist III, DISL and Assistant Professor of Marine Sciences, University of South Alabama. Fisheries, experimental ecology, conservation and restoration of coastal shellfish and finfish populations.

Christine (Tina) Miller-Way, Ph.D., Marine Scientist and Director, Discovery Hall, DISL. Science education - curriculum development, inquiry-based marine science; Research - functional ecology of marine benthos, benthic community structure, macrofaunal effects on benthic processes and coastal hypoxia.

Alison Robertson, Ph.D., Visiting Scientist, DISL and Assistant Professor, University of South Alabama. Impacts of natural phycotoxins, pollutants, and other anthropogenic toxicants on ecosystem, wildlife, and human health in tropical and sub-tropical regions. Specifically, to understand mechanisms of trophic transfer, bioaccumulation, toxicity, and resistance of bioactive molecules in marine, freshwater, and estuarine environments with the goal of predicting, preventing, and mitigating harmful effects.

John F. Valentine, Ph.D., Executive Director DISL and Professor of Marine Sciences, University of South Alabama. Current interests focus on the role of biotic processes in controlling the flow of energy among trophic levels in marine habitats, particularly herbivory on seagrasses; the application of conservation techniques for the protection of nearshore marine ecosystems; and the use of marine protected areas to test the impacts of higher order consumers on the strength of trophic linkages between seagrass and coral reef habitat.

William C. Walton, Ph.D. Senior Marine Scientist, DISL and Associate Professor, School of Fisheries, Aquaculture & Aquatic Sciences, Auburn University. Professional interests include marine invertebrate fisheries, restoration and aquaculture.

Postdoctoral Fellows

Dr. Sarra Hinshaw (Behzad Mortazavi)

Dr. Jennifer Hill (Kenneth L. Heck, Jr.)

Dr. Meagan Schrandt (Sean P. Powers)

(*no longer at DISL)



Dr. Just Cebrian



Faculty Activity

Peer Reviewed Publications

Addis, D. T., W. F. Patterson III and M. A. Dance. 2015. The potential of unreported artificial reefs to serve as refuges from fishing mortality for Gulf of Mexico reef fishes. *North American Journal of Fisheries Management*. In Press.

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Baggett, L. P., S. P. Powers, R. D. Brumbaugh, L. Coen, B. DeAngelis, J. Greene, B. Hancock, S. Morlock, B. Allen, D. Breitburg, D. Bushek, J. H. Grabowski, R. Grizzle, T. Grosholz, M. La Peyre, M. Luckenbach, K. McGraw, M. F. Piehler, S. Westby, P.S.E. zu Ermgassen. 2015. Guidelines for evaluating performance of oyster habitat restoration. *Restoration Ecology* 23:737-745.

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S.G. Cheung [eds.], *Changing Global Perspectives on Biology, Conservation, and Management of Horseshoe Crabs*, Springer, New York.

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Brzezinski, M. A., J. W. Krause, R. M. Bundy, K. A. Barbeau, P. J. S. Franks, R. Goericke, M. R. Landry and M. R., Stukel. 2015. Enhanced silica ballasting from iron stress sustains carbon export in a frontal zone within the California Current. *Journal of Geophysical Research Oceans* 120:4654-4669.

Byron, D. A., K. L. Heck, Jr. and M. A. Kennedy. 2014. Presence of juvenile lionfish in a northern Gulf of Mexico nursery habitat. *Gulf of Mex. Sci.* 32:75-77.

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capacity of oysters and implications for bioremediation. *MEPS* 528:205-220.

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- Grigas, D., J. Lehrter, J. Cebrian, Y. Chen, B. Ehmen and M. Woodrey. 2015. Effects of Stormwater Pipe Size and Rainfall on Sediment and Nutrients Delivered to a Coastal Bayou. *Water Environment Research* 87:796-804
- Grill, S. and K. M. Dorgan. 2015. Burrowing by small polychaetes - mechanics, behavior, and muscle structure of *Capitella* sp. *Journal of Experimental Biology* 218: 1527-1537.
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Snapper in the western Gulf of Mexico. Marine and Coastal Fisheries. In Press.

Grants in Force

Ruth Carmichael

MS Water Resources Research Institute (MWRRI), Water quality in Bangs Lake—Effects of recurrent phosphate spills to a coastal estuary: Year 2 (K. Dillon PI; \$77,957; \$8,010 Carmichael portion of award) Collaborators: Grand Bay National Estuarine Research Reserve, University of Southern Mississippi/ Gulf Coast Research Laboratory, University of West Florida, MS Department of Environmental Quality. 2015-2016.

National Fish and Wildlife Foundation (NFWF), Alabama Marine Mammal Conservation and Recovery Program (Carmichael PI; \$1,281,600) Collaborators: NOAA National Marine Fisheries Service, Southeast Region Stranding Network, ADCNR, U.S. Fish & Wildlife Service (USFWS; D. Ingram), Marine Mammal Commission, The Ocean Conservancy. 2015-2020.

Gulf Coast ADVANCE, Minority student research opportunity: Determining sources, history, and status of eutrophication at Naval Station Guantanamo Bay (Carmichael PI; \$4,423) Collaborators: Army Corps of Engineers/ U.S. Department of Defense, Florida Atlantic University (B. LaPointe, M. Risk). 2015.

Alabama Division of Wildlife and Freshwater Fisheries, Monitoring manatee movements and habitat use in Alabama waters (Carmichael PI; \$30,000) Collaborators: ADCNR, U.S. Fish & Wildlife Service (USFWS; D. Ingram), Sea to Shore Alliance (M. Ross, J. Powell). 2014-2015.

US Army Corps of Engineers (USACE), Determining sources, history and status of eutrophication at Naval Station Guantanamo Bay, Cuba (PI Florida Atlantic University \$116,753; \$28,340 Carmichael portion of award) Collaborators: Florida Atlantic University (B. LaPointe, L. Herren), Naval Station Guantanamo Bay (J. Jackson, M. McCord, D. Marx, J. Montalvo), McMaster University (M. Risk). 2014-2015.

National Fish and Wildlife Foundation (NFWF), Support for the Alabama Marine Mammal Stranding Network (Carmichael PI; \$94,000) Collaborators: NOAA National Marine Fisheries Service-Pascagoula (K. Mullin, L. Noble), NFWF. 2014.

MS Water Resources Research Institute (MWRRI), Water quality in Bangs Lake: Effects of recurrent phosphate spills to a coastal estuary (K. Dillon PI; \$77,957; \$5,513 Carmichael portion of award) Collaborators: Grand Bay National Estuarine Research Reserve, University of

Southern Mississippi/ Gulf Coast Research Laboratory, University of West Florida, MS Department of Environmental Quality. 2014-2015.

MS-AL Sea Grant Consortium, A circulation and transport model for fishery management in Mobile Bay and eastern Mississippi Sound (K. Park PI; \$149,876; \$36,560 Carmichael portion of award) Collaborators: The Nature Conservancy, Alabama Marine Resources Division, U.S. Coast Guard, National Estuary Program. 2014-2016.

Just Cebrian

Regional Living Shorelines Construction Technical Bulletins for Contractors. GOMA (HCRT). Co PI with Carl Ferraro, Mike Shelton, Tom Herder and Bret Web. \$51,700.

Assessing the abundance, distribution and toxicity of microplastics in Mobile Bay, AL. USA Center for Resiliency. PI with David Battiste as Co-PI. \$20,000.

Occurrence and accumulation of marine debris on barrier islands in the Northern Gulf of Mexico. NOAA Marine Debris Program. \$44,108.

Living Shoreline Restoration for Fowl River Private Owners. The Nature Conservancy. \$14,860 (\$9,200 supplement).

Data Management in Support of NOAA's Integrated Ecosystem Assessment for the Gulf of Mexico: The Dauphin Island Sea Lab's Data Management Center. NOAA/ NCDDC. Co PI with Ken Heck. \$85,094. Expanding the Integrated Ecosystem Assessment for Northern Gulf of Mexico Estuaries. The Northern Gulf Institute. Co PI with Steve Ashby and Scott Milroy. \$100,000.

Reducing runoff pollution in coastal waters through marsh restoration: implementing decision support tools for stakeholders. USFWS. \$19,550.

Comprehensive Watershed Development Plan for Fowl River. NFWF-MBNEP. Co PI with Lee Walters and Doug Robinson. \$250,000.

Kelly Dorgan

Maximizing the Return on Investment of Oyster Aquaculture by Managing Mud Blister Worm Infestation. Dorgan, K.M., Bill Walton (Auburn University). SeaGrant. \$148,619. Feb. 2016.

Gulf Research Program Early Career Research Fellowship. Dorgan, K.M.. National Academy of Sciences. \$75,000. 9/1/2015.

Impacts of infaunal organisms on acoustic wave propagation through sediments.

Dorgan, K.M. Office of Naval Research. \$150,000. June 2015.

Marcus Drymon

Enhanced Fisheries Monitoring off Alabama's Coast: vertical longline. National Fish and Wildlife Foundation. Collaborator with S. P. Powers. \$780,000 (\$220,800 Drymon portion). 2015 – 2017.

Enhanced Fisheries Monitoring off Alabama's Coast: bottom longline. National Fish and Wildlife Foundation. Collaborator with S. P. Powers. \$780,000 (\$57,500 Drymon portion). 2015-2017.

Assessing reef fish & shark populations in Alabama via fishery-independent surveys. AL Department of Conservation and Natural Resources, Marine Resources Division. Co-PI with S. Powers. \$100,000. January 2015. Awarded (2010,11,12,13,14,15).

Alabama Center for Ecological Resilience (ACER). Gulf of Mexico Research Initiative. Collaborator. \$12,000,000 (\$157,091 Drymon portion). 2015-2017/

Using acoustic and satellite telemetry to track movement of Atlantic tarpon. Mississippi Alabama SeaGrant. \$ 19,112. 2014-2015.

Using sharks as a tool to evaluate ecosystem health in coastal Alabama. USA Center for Environmental Resiliency. \$9,000. 2014-2015.

Ecosystem based fisheries assessment of reef fishes in the northcentral Gulf of Mexico. NOAA Marine Fisheries Initiative (MARFIN). CoPI with S. P. Powers. \$322,979. 2013-2015.

Tiger sharks and the songbirds they consume: exploring a unique trophic interaction. Birmingham Audubon Society. \$1,000. 2015.

Genetic monitoring and stock structure of two large coastal sharks using high throughput next-generation sequencing. NOAA Cooperative Research Program (CRP). Collaborator with D. S. Portnoy and J. R. Gold. \$9,063 (Drymon portion). 2014-2015.

Brian Dzwonkowski

Graham, M., Arnone, B, Book, J, ... Dzwonkowski, B. (2014, November) Consortium for oil spill exposure pathways in COastal River-Dominated Ecosystems (CONCORDE), Gulf of Mexico Research Initiative RPF-IV, \$165,082 (budget at USA).

Beebe, A., Dzwonkowski, B., and Allison, D. (2015, April) Characterization of submarine groundwater discharge to Mobile Bay, University of South Alabama Research and Scholarship Development Grant Program, \$25,000.

Ken Heck

Monitoring Seagrass Resources of the Gulf Islands National Seashore. National Park Service. \$142,915. 08/2011-12/2016. Gulf Islands National Seashore

Seagrass abundance and productivity in Perdido Bay, Big Lagoon and St Joseph Bay, FL. Florida Fish and Wildlife Commission. \$100,000. 10/2015-9/2016. Perdido and St Joe Bay, FL.

Predicting the Establishment Potential of Invasive Tiger Shrimp: the Role of Competition and Predation. MS/AL Sea Grant. \$143,660. 2014-2016. North Central Gulf of Mexico.

Ron Kiene

National Science Foundation Chemical Oceanography. Collaborative Research: Resolving DMSP, DMS and DMSO dynamics in the Subarctic NE Pacific using stable and radioisotope tracers. \$473,048, 3 years. February 1, 2015 January 30, 2018. OCE-1436576.

Kiene, R.P. (2014, January). Dimensions: Collaborative Research: Bacterial taxa that control sulfur flux from the ocean to the atmosphere, National Science Foundation – Dimensions of Biodiversity, \$513,777 (USA budget). Co-PI's from other institutions: Mary Ann Moran William Whitman (UGA), Chris Scholin & James Birch (Monterey Bay Aquarium Research Institute). Total project budget \$1,977,972. 5 years. January 1, 2014- December 31, 2018.

Kiene, R. P. (2011, September). CIGUAHAB: Ciguatera Investigations in the Greater Caribbean Region: Ecophysiology, Population Connectivity, Forecasting, and Toxigenesis, NOAA-Ecology of Harmful Algal Blooms (EcoHAB), \$168,967 (USA budget). Collaborative project with FDA, WHOI and several Universities. Michael Parsons, Lead PI. September 1, 2011-August 31, 2016.

Kiene, R. P. (2010, June). Collaborative Research: Ecophysiology of DMSP and related compounds and their contribution to carbon and sulfur dynamics in Phaeocystis antarctica. National Science Foundation – Polar Programs-Antarctic Sciences Division. \$240,237. Collaboration with David Kieber, SUNY ESF. 3 years. June 1, 2010 May 31, 2013. No-cost extension through May 31, 2015.

Jeff Krause

CONsortium for oil spill exposure pathways in COastal River-Dominated Ecosystems (CONCORDE). Gulf of Mexico Research Initiative. Co PI. \$47,100. June 1, 2015 - December 31, 2017.

Group-Specific Diatom Silica Production in a Coastal Upwelling System. US National Science Foundation - Biological Oceanography. \$453,487. April 1, 2012 - March 31, 2016.

Collaborative Research: Understanding the Role of Picocyanobacteria in the Marine Silicate Cycle. US National Science Foundation - Biological Oceanography. Co PI with M. A. Brzezinski. \$256,128. January 1, 2012 - December 31, 2015.

Behzad Mortazavi

NSF-CBET. Collaborative Research: Engineering salt marsh restoration to maximize denitrification - elevation and species interactions. Mortazavi (PI) at UA and A. Ortamnn (PI at USA). \$300,000 (Mortazavi share \$182,000). Proposed dates 9/1/14 to 8/31/17.

Preliminary Proposal: Restoring the Edge: Degradation and potential for restoration of ecosystem services provided by nearshore marshes and oyster reefs, GOMRI, \$8,900,000 (\$1.09M Mortazavi share), 2014, Co-PI (with Caffrey, J. B. Mortazavi, Conrwell, J, Ebble, J., Hollibaugh, T., King, G, Power, S., Rakonicki, J and Ringwood, A.)

Collaborative Research: Engineering salt marsh restoration to maximize denitrification - elevation and species interactions, NSF-CBET, \$300,000 (Mortazavi Share: \$182,000), Mortazavi (PI) at UA and A. Ortamnn (PI at USA), 2014-2017

Geo-ecological modeling to highlight nitrogen removal capabilities and inform riverine habitat restoration, UA Research Stimulation Grant, \$96,000, 07/01/2012 to 06/30/2015, J. Edmonds (PI), B. Mortazavi, L. Davis and S. Cohen.

Geo-Ecological modeling of riverine habitat occurrence and nutrient retention, UA and Center for Freshwater Studies, \$120,753, 6/13 to 5/15, Co-PI with Edmonds, Cohen and Davis (UA)

Effects of dissolved organic nitrogen enrichment from contaminated groundwater on nutrient availability and phytoplankton communities in a coastal Alabama lagoon, NSF Graduate Research Fellowship, \$126,000, 8/13 - 7/16, to support J. Anders

Will Patterson

Co-Principal Investigator, "Integrative tracking of aquatic animals in the Gulf of Mexico (iTAG): assessing habitat use and site fidelity of resident and migratory fishes" (with Susan Lowerre-Barbieri as PI and J. Rooker, B. Mahmoudi, and C. Porch as Co-PIs). Offshore Telemetry Network, Dalhousie University. 2015. \$500,000/5 yr.

Co-Principal Investigator, "Multifaceted fisheries and ecosystem monitoring in Alabama's marine waters and the Gulf of Mexico" (with Alabama Department of Conservation and S. Powers) National Fish and Wildlife Federation. 2015. Patterson component: \$389,196/5 yr.

Principal Investigator, "Testing descender devices in the recreational Gulf of Mexico red snapper fishery: implications for slot limits and season length" NOAA Fisheries Cooperative Research Program. 2015. \$227,213/1 yr.

Co-Principal Investigator, "Efficacy of lionfish removal as a management strategy for Florida artificial reefs" (with Richard Snyder, PI). Florida Fish and Wildlife Conservation Commission. 2015. \$84,478/1 yr.

Co-Principal Investigator, "Center for Integrated Modeling and Analysis of the Gulf Ecosystem (C IMAGE)" (with Steve Murawski as PI and multiple co-PIs) Gulf of Mexico Research Initiative. 2014. \$22,000,000/3 yr; USA budget \$690,131/3 yr.

Principal Investigator, "Applying cutting edge laser ablation-inductively coupled plasma mass spectrometry to estimate population connectivity in coastal elasmobranchs." USA Resiliency Fund. 2014. \$14,400/1 yr.

Co-Principal Investigator, "Ecosystem-based fisheries management in the Gulf of Mexico reef fish complex" (with Q. Weniger, PI, and L. Perruso and S. Gosnell, Co-PIs). Lenfest Ocean Program. 2014. \$200,000/2 yr.

Principal Investigator, "Examining invasive lionfish diet and trophic position in the northern Gulf of Mexico via DNA barcoding of unidentifiable prey items" (with Alison Robertson and Alice Ortmann, Co-PIs). Mississippi-Alabama Sea Grant. 2014. \$10,000/1 yr.

Co-Principal Investigator, "REU Site: Undergraduate research experiences in coastal and nearshore marine systems of the northeastern Gulf of Mexico" (with Ruth Carmichael, PI) National Science Foundation Research Experience for Undergraduates. 2014. \$187,222/2 yr.

Co-Principal Investigator, "Assessment of Escambia East Large Area Artificial Reef Site refugia reefs: Impacts of invasive lionfish" (with Dick Snyder, PI). Florida Fish and Wildlife Conservation Commission. 2014. \$59,996/1 yr.

Principal Investigator, "Modeling the impacts of gear regulations in the northern Gulf of Mexico recreational reef fish

fishery" (graduate fellowship submitted by Steven Garner). National Marine Fisheries Service and National Sea Grant. 2013. \$77,000/2 yr.

Sean Powers

Enhanced Fisheries Monitoring off Alabama's Coast: vertical longline. National Fish and Wildlife Foundation. \$780,000 (\$220,800 Drymon portion). 2015 – 2017.
Enhanced Fisheries Monitoring off Alabama's Coast: bottom longline. National Fish and Wildlife Foundation. \$780,000 (\$57,500 Drymon portion). 2015-2017.

Assessing reef fish & shark populations in Alabama via fishery-independent surveys. AL Department of Conservation and Natural Resources, Marine Resources Division. CoPI with J. M. Drymon. \$100,000. January 2015. Awarded (2010,11,12,13,14,15).

Ecosystem based fisheries assessment of reef fishes in the northcentral Gulf of Mexico. NOAA Marine Fisheries Initiative (MARFIN). CoPI with J. M. Drymon. \$322,979. 2013-2015.

A novel method for estimating recreational boat effort from enforcement cameras. S. Powers (PI), NOAA, via subcontract from Alabama Department of Conservation and Natural Resources. 2014-2015. \$14,000.

An Ecosystem Based fisheries monitoring and assessment for coastal Alabama. S. Powers (PI) NFWF, Gulf Environmental Benefit Fund (via subcontract from Alabama Marine Resource Division). 2014-2019. \$4,219,000.

Intra- and inter estuary movement of tarpon and red drum in coastal Alabama II. U.S. Fish and Wildlife, Sport Fish Restoration Fund via Alabama Department of Conservation and Natural Resources, Marine Resources Division, (S. P. Powers, Pls). \$37,000. (U. South Al.). 2014-2015.

Assessing the current status of red drum (*Sciaenops ocellatus*) in the northern Gulf of Mexico: a multistate cooperative effort. S. Powers, PI. NMFS Saltonstall Kennedy Fisheries Program. 2014-2016. \$399,500.

Reef fish research in the Alabama Artificial Reef Permit Zone. U.S. Fish and Wildlife, Sport Fish Restoration Fund via Alabama Department of Conservation and Natural Resources, Marine Resources Division, (S. P. Powers and R. Shipp, Pls). 2014-2015. \$225,000.

SEAMAP: Alabama Reef fish surveys. NMFS via Alabama Marine Resources Division (S. Powers and M. Drymon, Pls). \$579,200. DISL. 2014-2016.

Intra- and inter estuary movement of tarpon and red drum in coastal Alabama. U.S. Fish

and Wildlife, Sport Fish Restoration Fund via Alabama Department of Conservation and Natural Resources, Marine Resources Division, (S. P. Powers, Pls). \$37,000. (U. South Al.) 2013-2014.

Assessment of decapod crustaceans as sentinel estuarine species. Collaborative with UNO and USM (S. Powers, PI). U.S. Dept. of Interior, Bureau of Ocean Energy Management \$1,200,000 (\$399,300. U. South AL). 2012-2017.

Dendritic Polymers as Biocompatible Dispersants for Oil Spill Mitigation. U.S. Environmental Protection Agency (D. Ladner, P. Ke1 [Clemson], S. Powers and A. Whelton [USA]. \$500,000 (204,000 U. South AL.). 2012-2014.

Scientific support for oyster damage assessment associated with the Deepwater Horizon Incident. NOAA, Natural Resource Damage Assessment, via Industrial Economics, Inc. \$1,200,000 (DISL). 2010-2012.

John Valentine

Alabama Center for Ecological Resilience (ACER). Gulf of Mexico Research Initiative. Co Pls: J. Cebrian, K. Dorgan, K. Heck, J. Krause, T. Miller-Way, B. Mortazavi, S. Powers and A. Robertson. Collaborators: S. Bell, S. Berke, M. Drymon, R. Hughes, C. Martin, M. Parsons, H. Urakawa, P. Sobocky, K. Thamatrakoln. \$9,995,467. 2015-2017.

Bill Walton

US Fish & Wildlife Service. Walton, WC (PI), J Carter (co-PI), O Otieno (co-PI) & D Armstrong (co-PI). Development of targeted control strategies for the maculata apple snail in Mobile Bay, Alabama. 1.25 years. \$27,798. 6/1/15-8/31/16

Mississippi-Alabama Sea Grant Consortium. Walton, WC (PI), CR Arias (co-PI) & JL Jones (co-PI). Effects of Aquaculture Practices on *Vibrio* spp. in the Eastern Oyster, *Crassostrea virginica*: Test of Fouling Control Practices. 2 yrs. \$150,000. 2/1/14-3/1/16

Coastal Impact Assessment Program Funds, Alabama Department of Conservation and Natural Resources State Lands Division. Walton, WC (PI), FS Rikard (co-PI) & DL Swann (co-PI). Investigation of the effect of "Katrina-cut" on oyster populations in Mississippi Sound, Alabama. 7/1/12-9/30/15. \$295,839.

United States Department of Agriculture, Alabama Agriculture Experiment Station, Auburn University Hatch/Multistate Research Program. Walton, WC (PI). Improving oyster quality with off-bottom oyster farming. 2014-2016. \$50,000.



- **Board of Directors**
- **Executive Committee**
- **Program Committee**

The Board of Directors is comprised of the Presidents of each of the 22 member institutions.

The Executive Committee has full power and authority in the interval between meetings of the Board of Directors to do all acts and perform all functions which the Board of Directors itself might do or perform, except that it shall have no power to amend the bylaws. Among its duties are to review and approve the annual budget; approve curricular options and other major policies and procedures; and facilitate and stimulate the development of education and research programs.

The Program Committee Members consists of one faculty member, appointed by the President, from each of the member institutions. These members serve as the primary liaison between the member institution and the Sea Lab, and are responsible for advising the Sea Lab's Executive Director in planning and implementing the education, research and service programs of the DISL.

The contact information listed is for the Program Committee Member.

**Schools with Graduate Programs

****Alabama A&M University**

President: Dr Andrew Hugine, Jr.
Program Committee: Dr. Malinda Wilson Gilmore
Malinda.gilmore@aamu.edu
Department of Physics,
Chemistry and Mathematics
4900 Meridan Street
Normal, AL 35762
Ph: (256) 372-4803

****Alabama State University**

President: Dr. Gwendolyn Elizabeth Boyd
Program Committee: Dr. B.K. Robertson
brobertson@alasu.edu
Department of Biological Sciences
915 S. Jackson Street
Montgomery, AL 36104
Ph: (334) 229-4423

Athens State University

President: Dr. Robert Glenn
Program Committee: Dr. Christopher J. Otto
ottocj@athens.edu
Department of Biology
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Athens, AL 35611
Ph: (256) 233-6554

****Auburn University**

President: Dr. Jay Gogue
Executive Committee Member
Program Committee: Dr. Tony Moss
mossant@auburn.edu
Department of Biological Sciences
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Auburn, AL 36849
Ph: (334) 844-9257

Auburn University at Montgomery

Chancellor: Dr. John G. Veres
Program Committee: Dr. John Aho
jaho@mail.aum.edu
Department of Biology
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Montgomery, AL 36124
Ph: (334) 244-3787

Birmingham Southern College

President: Dr. Edward F. Leonard, III
Program Committee: Dr. Andrew Gannon
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Birmingham, AL 35254
Ph: (205) 226-4899

Huntingdon College

President: Rev. J. Cameron West
Program Committee: Dr. Paul Gier
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Montgomery, AL 36106
Ph: (334) 833-4510

****Jacksonville State University**

President: Dr. John M Beehler
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Judson College

President: Dr. David E. Potts
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Samford University

President: Dr. Andrew Westmoreland
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Spring Hill College

President: Rev. Gregory F. Lucey, S.J.
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Talladega College

President: Dr. Billy C. Hawkins
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****Troy University**

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****Tuskegee University**

President: Dr. Brian L. Johnson
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****University of Alabama**

President: Dr. Stuart R. Bell
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****University of Alabama at Birmingham**

President: Dr. Ray L. Watts
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****University of Alabama at Huntsville**

President: Dr. Robert Altenkirch
Program Committee: Dr. Bruce Stallsmith
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University of Mobile

President: Dr. Timothy L. Smith
Program Committee: Dr. Sarah Noble (during reporting period)
Dr. Lesley Baggett (current)
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University of Montevallo

President: Dr. John Stewart, III
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University of North Alabama

President: Dr. Ken Kitts
Executive Committee Member
Program Committee: Dr. Isaac M. Sleadd
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****University of South Alabama**

President: Dr. Tony G. Waldrop
Executive Committee Chair
Program Committee: Dr. Jack O'Brien
jobrien@southalabama.edu
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Mobile, AL 36688
Ph: (251) 460-7525

University of West Alabama

President: Dr. Ken Tucker
Program Committee: Dr. Lee Stanton
lstanton@uwa.edu
University of West Alabama
Department of Biological & Environmental Sciences
Livingston, AL 35470
Ph: (205) 652-3415



Federal Awards/Grants

| Federal Grantor/ Pass-Through Grantor/ Program Title | Assistance Period | Total | Budget | | Expenditures |
|---|-----------------------|------------|------------------|-----------------------|--------------|
| | | | Federal Share | Revenue Recognized | |
| <i>Research and Development Cluster</i> | | | | | |
| U.S. Department of Commerce | | | | | |
| Direct Programs | | | | | |
| Passed Through University of Southern Mississippi | | | | | |
| Sea Grant Support Oceanic and Atmospheric Projects | 2/1/2010-1/31/2015 | 190,274.00 | 159,738.00 | 32,316.53 | 32,316.53 |
| Sea Grant Support Oceanic and Atmospheric Projects | 02/1/2014-01/31/2016 | 165,539.00 | 104,047.00 | 11,231.06 | 11,231.06 |
| Sea Grant Support Oceanic and Atmospheric Projects | 03/01/2014-02/28/2015 | 8,010.00 | 3,996.00 | 1,600.62 | 1,600.62 |
| Sea Grant Support Oceanic and Atmospheric Projects | 02/01/2014-01/31/2017 | 216,422.00 | 143,660.00 | 38,424.44 | 38,424.44 |
| Environmental Protection Agency/GOMA | 10/1/2013-06/30/2015 | 56,000.00 | 56,000.00 | 3,103.74 | 3,103.74 |
| Sea Grant Support Oceanic and Atmospheric Projects | 9/1/2014-8/31/2016 | 101,119.00 | 79,998.00 | 32,464.02 | 32,464.02 |
| U.S. Dept. of Interior/U.S. Geological Survey | 03/1/2015-02/29/2016 | 20,627.00 | 6,310.00 | 5,078.38 | 5,078.38 |
| National Oceanic and Atmospheric Administration | 02/01/2015-08/31/2016 | 34,200.00 | 34,200.00 | 9,291.40 | 9,291.40 |
| Gulf Coast Advance | 4/30/2015-3/31/2015 | 4,423.00 | 4,423.00 | 4,423.00 | 4,423.00 |
| Passed Through University of South Alabama | | | | | |
| Sea Grant Support Oceanic and Atmospheric Projects | 02/01/2014-01/31/2017 | 112,639.00 | 112,639.00 | 52,385.78 | 52,385.78 |
| National Oceanic and Atmospheric Administration | 09/1/2014-8/31/2015 | 209,250.00 | 209,250.00 | 127,949.25 | 127,949.25 |
| National Science Foundation | 01/01/2014-12/31/2018 | 110,826.00 | 110,826.00 | 9,063.35 | 9,063.35 |
| National Science Foundation | 09/2014/08/31/2017 | 104,580.00 | 104,580.00 | 11,690.06 | 11,690.06 |
| National Science Foundation | 01/01/2015-12/31/2018 | 101,217.00 | 101,217.00 | 2,641.95 | 2,641.95 |
| National Oceanic and Atmospheric Administration | 9/1/2015-8/31/2016 | 166,813.00 | 166,813.00 | 2,201.49 | 2,201.49 |
| Passed through Alabama of Conservation and Natural Resources | | | | | |
| Coastal Zone Management Administration Awards | 4/1/2013 - 3/31/2014 | 22,000.00 | 15,400.00 | 2,100.65 | 2,100.65 |
| Coastal Impact Assistance Program | 7/10/2013-9/30/2015 | 395,000.00 | 395,000.00 | 329,551.53 | 329,551.53 |
| Coastal Zone Management Administration Awards | 10/1/2013-12/31/2014 | 21,160.00 | 21,160.00 | 5,109.39 | 5,109.39 |
| Coastal Zone Management Administration Awards | 03/1/2015-03/31/2016 | 81,378.00 | 40,689.00 | 16,889.89 | 16,889.89 |
| Passed Through Mississippi State University | | | | | |
| National Oceanic and Atmospheric Administration | 4/1/2012 - 9/30/2016 | 256,517.00 | 256,517.00 | 53,420.76 | 53,420.76 |
| National Oceanic and Atmospheric Administration | 07/01/2012-6/30/2016 | 32,097.00 | 32,097.00 | 16,792.04 | 16,792.04 |
| National Oceanic and Atmospheric Administration | 6/1/2014-5/31/2016 | 156,979.00 | 156,979.00 | 79,963.59 | 79,963.59 |
| National Oceanic and Atmospheric Administration | 8/1/2014-7/31/2016 | 44,082.00 | 44,082.00 | 18,225.59 | 18,225.59 |
| National Oceanic and Atmospheric Administration | 6/1/2015-5/31/2016 | 704,404.00 | 704,404.00 | - | - |
| U. S. Department of Health and Human Services | | | | | |
| Direct Program | | | | | |
| Food and Drug Administration-Research | 9/21/2011-8/31/2016 | 790,000.00 | 790,000.00 | 149,439.26 | 149,439.26 |
| National Science Foundation | | | | | |
| Direct Programs | | | | | |
| National Science Foundation | 2/15/2013-12/31/2015 | 189,309.00 | 189,309.00 | 97,400.78 | 97,400.78 |
| National Science Foundation | 9/15/2013-8/31/2016 | 44,652.00 | 44,652.00 | 27,010.65 | 27,010.65 |
| National Science Foundation | 9/1/2014-8/31/2016 | 187,220.00 | 187,220.00 | 66,984.65 | 66,984.65 |
| Passed Through the Regents of the University of California-Santa Barbara | | | | | |
| National Science Foundation | 4/1/2013-3/31/2015 | 119,374.00 | 119,374.00 | 44,181.79 | 44,181.79 |
| Passed Through The University of Alabama in Huntsville | | | | | |
| Exp. Program to Stimulate Competitive Research | 10/01/2010-02/2014 | 239,283.00 | 239,283.00 | 11,406.20 | 11,406.20 |

| Federal Grantor/ Pass-Through Grantor/ Program Title | Assistance Period | Total | Budget | | |
|--|-----------------------|------------------------|------------------------|-----------------------|-----------------------|
| | | | Federal Share | Revenue Recognized | Expenditures |
| Other Federal Awards | | | | | |
| US Department of Commerce | | | | | |
| Direct Programs | | | | | |
| Congressionally Identified Awards and Projects | 10/01/2009-09/30/2015 | 377,264.00 | 295,247.00 | 32,351.63 | 32,351.63 |
| Congressionally Identified Awards and Projects | 8/1/2013-12/31/2014 | 201,729.00 | 99,766.00 | 32,392.90 | 32,392.90 |
| National Fish and Wildlife Foundation | 1/1/2014-12/31/2014 | 94,400.00 | 94,400.00 | 27,180.32 | 27,180.32 |
| Passed Through Gulf of Mexico Alliance (GOMA) | | | | | |
| Unallied Management Projects (M) | 01/1/2014-9/30/2015 | 33,108.00 | 33,108.00 | 26,741.61 | 26,741.61 |
| Passed Through The Florida Aquarium | | | | | |
| Congressionally Identified Awards and Projects | 7/20/2010-8/20/2011 | 122,580.00 | 76,407.00 | 1,098.24 | 1,098.24 |
| Passed Through Texas A & M Research Foundation | | | | | |
| | 06/01/2011-05/31/2016 | 136,886.00 | 136,886.00 | 23,989.65 | 23,989.65 |
| U. S. Department of the Interior | | | | | |
| Direct Program | | | | | |
| Fish and Wildlife Service | 9/1/2011 - 12/31/2015 | 97,067.00 | 97,067.00 | 10,110.75 | 10,110.75 |
| Fish and Wildlife Service | 08/01/2012-09/30/2016 | 39,550.00 | 39,550.00 | 5,676.69 | 5,676.69 |
| Fish and Wildlife Service | 10/15/2014-09/30/2016 | 40,000.00 | 30,000.00 | 30,000.00 | 30,000.00 |
| National Marine Sanctuary Foundation (NMSF) | 8/1/2015-8/1/2017 | 25,000.00 | 25,000.00 | - | - |
| Passed Through Baldwin County Commission | | | | | |
| Bureau of Ocean Energy Management U.S. Army Corp of Engineers | 8/15/2014-01/31/2016 | 28,340.00 | 28,340.00 | 16,591.70 | 16,591.70 |
| Coastal Impact Assistance Program | 6/1/2012-11/30/2015 | 200,000.00 | 200,000.00 | 79,928.72 | 79,928.72 |
| Passed Through Texas A & M University | | | | | |
| Gulf Coast Cooperative Studies Unit | | | | | |
| National Parks Service | | | | | |
| Gulf Coast Inventory and Monitoring Network | 08/31/2011-12/31/2015 | 110,917.60 | 110,917.60 | 52,822.57 | 52,822.57 |
| Passed Through Alabama Department of Conservation and Natural Resources | | | | | |
| ADCNR - Coastal Zone Management Administration Awards | 4/15/2015-09/30/2015 | 10,000.00 | 5,000.00 | 5,000.00 | 5,000.00 |
| ADCNR - Coastal Zone Management Administration Awards | 10/1/2013-3/31/2015 | 82,000.00 | 82,000.00 | 74,406.62 | 74,406.62 |
| ADCNR - Coastal Zone Management Administration Awards | 10/1/2014-3/31/2016 | 93,000.00 | 93,000.00 | 9,321.61 | 9,321.61 |
| ADCNR - Coastal Zone Management Administration Awards | 10/1/2014-9/30/2015 | 13,000.00 | 6,500.00 | 6,500.00 | 6,500.00 |
| Environmental Protection Agency | | | | | |
| Direct Programs | | | | | |
| National Estuary Program | 10/01/2010-9/30/2013 | 2,068,467.00 | 2,068,467.00 | 77,239.66 | 77,239.66 |
| National Estuary Program | 2/14/2012-9/30/2015 | 1,156,121.00 | 710,563.00 | 67,711.40 | 67,711.40 |
| National Estuary Program | 10/1/2013-09/30/2018 | 3,340,000.00 | 1,670,000.00 | 490,189.72 | 490,189.72 |
| | | \$13,154,823.60 | \$10,536,081.60 | \$2,331,595.63 | \$2,331,595.63 |



Balance Sheet

Marine Environmental Sciences Consortium
Dauphin Island Sea Lab
Statement of Net Position
For the Year Ended September 30, 2015

ASSETS

Current Assets

| | | |
|------------------------------|----|------------------|
| Cash | \$ | 1,771,704 |
| Accounts Receivable | | 2,650,820 |
| Lease Improvement Receivable | | 1,798,674 |
| Inventories | | 143,135 |
| Total Current Assets | | <u>6,364,331</u> |

Noncurrent Assets

| | | |
|---|--|-------------------|
| Capital Assets: | | |
| Land | | 658,757 |
| Buildings | | 13,618,495 |
| Improvements Other Than Buildings | | 391,481 |
| Equipment | | 2,998,240 |
| Vessels | | 1,075,392 |
| Library Holdings | | 842,322 |
| Construction in Progress | | 1,278,729 |
| Less: Accumulated Depreciation | | (8,013,404) |
| Total Capital Assets, net of Depreciation | | <u>12,850,012</u> |
| Total Noncurrent Assets | | <u>12,850,012</u> |

Total Assets 19,214,344

Deferred Outflow of Resources

| | | |
|-------------------------------------|--|----------------|
| Pension | | 569,000 |
| Total Deferred Outflow of Resources | | <u>569,000</u> |

LIABILITIES

Current Liabilities

| | | |
|---------------------------|--|------------------|
| Accounts Payable | | 53,805 |
| Lease Obligations | | 180,000 |
| Compensated Absences | | 29,192 |
| Unearned Revenue | | 1,592,595 |
| Deposits Held for Others | | 140,784 |
| Total Current Liabilities | | <u>1,996,376</u> |

Noncurrent Liabilities

| | | |
|------------------------------|--|------------------|
| Compensated Absences | | 457,337 |
| Capital Lease Obligations | | 1,730,000 |
| Net Pension | | 6,093,000 |
| Total Noncurrent Liabilities | | <u>8,280,337</u> |

Total Liabilities 10,276,713

Deferred Inflow of Resources

| | | |
|------------------------------------|--|----------------|
| Pension | | 457,000 |
| Total Deferred Inflow of Resources | | <u>457,000</u> |

NET POSITION

| | | |
|---|----|-------------------|
| Invested in Capital Assets, net of related debt | | <u>12,850,013</u> |
| Restricted for | | |
| Nonexpendable | | |
| Expendable | | |
| Capital Projects | | 28,334 |
| Research & Scholarships | | 288,217 |
| Instruction | | 339,479 |
| Public Outreach | | 876,939 |
| Unrestricted | | (5,333,350) |
| Total Net Position | \$ | <u>9,049,631</u> |

Dauphin Island Sea Lab Participation Totals, and Graduate and Undergraduate Credit Hours Earned

