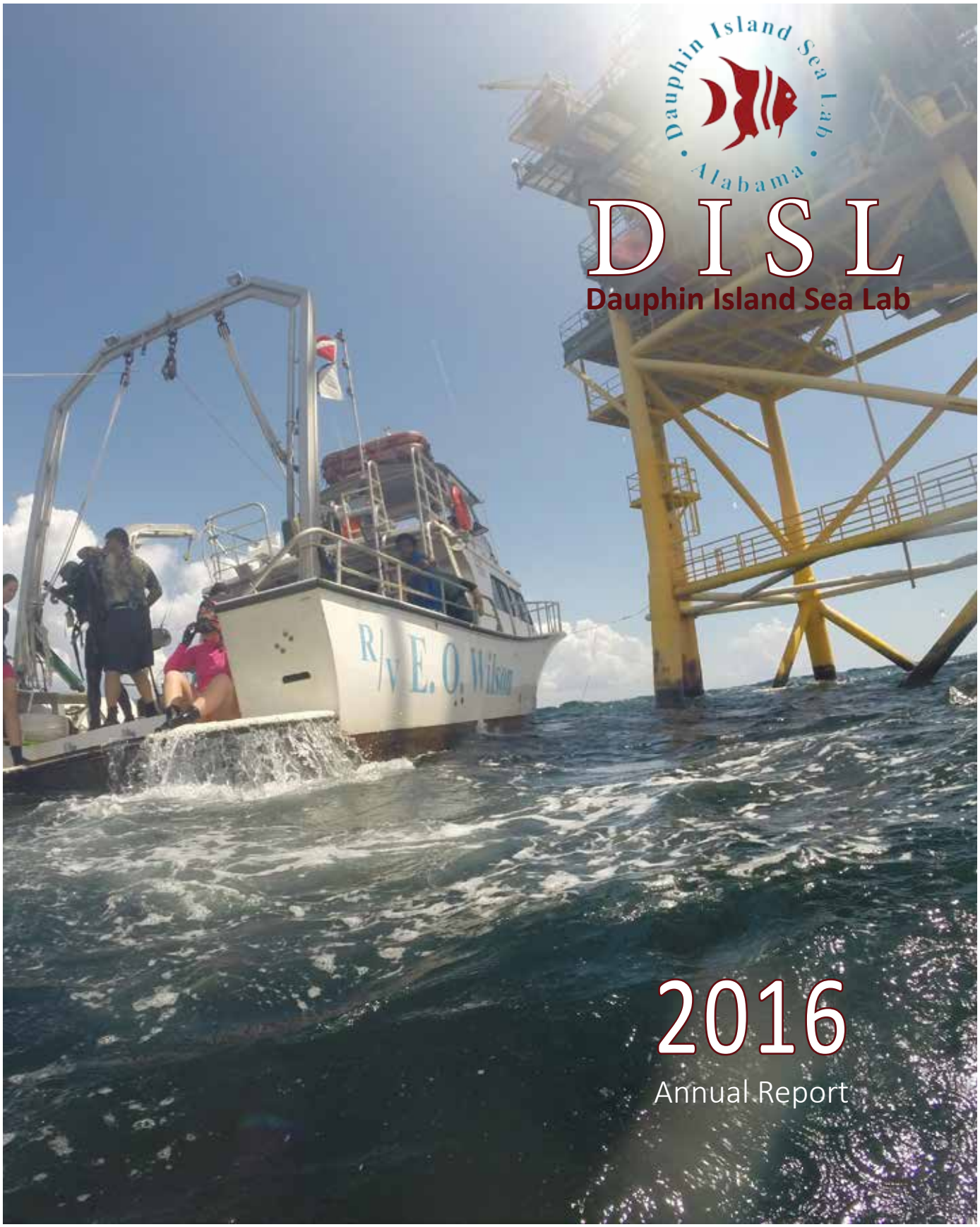


Dauphin Island Sea Lab
Alabama

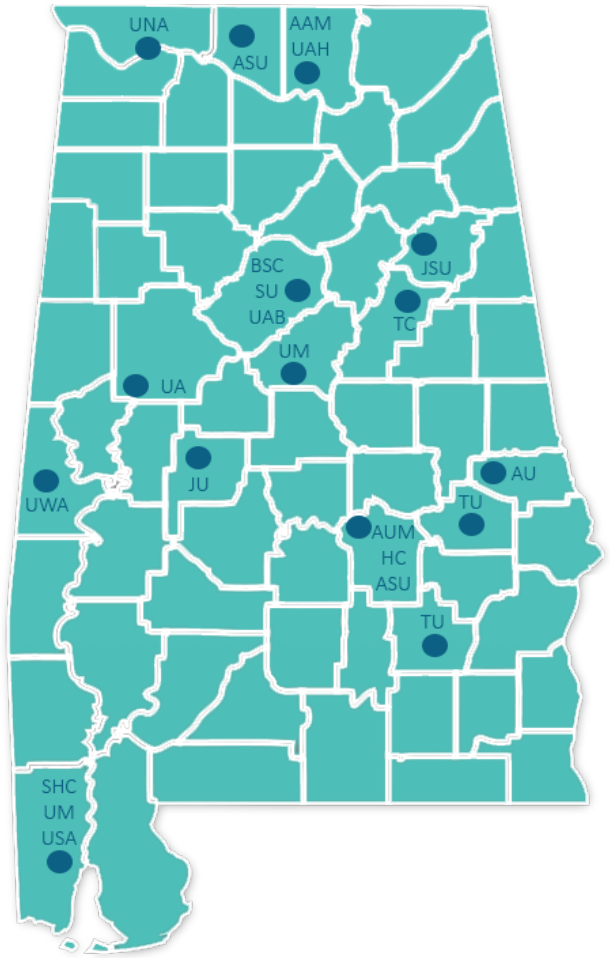
DISL

Dauphin Island Sea Lab

2016

Annual Report

Alabama Marine Environmental Sciences Consortium



MISSION

The Dauphin Island Sea Lab (DISL) is Alabama's marine research and educational institute.

Founded in 1971 by the Alabama Legislature to maximize the marine sciences capabilities of several Alabama insitutions 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.

CONSORTIUM MEMBER INSTITUTIONS

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

**Schools with Graduate Degree Programs*

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Dauphin Island Sea Lab
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F: (251) 861-4646
www.disl.org

Letter from the Executive Director

In reading the wealth of materials submitted by each of our departments for this year's annual report, it seems clear to me that we had a very good year! No matter which metric you choose, it is very clear that our educators, investigators and staff have excelled in the fields of marine education, research and community service. Across the board, we all did a great job making sure the DISL mission assigned us by the legislature was achieved in 2016. Moreover, you accomplished all this despite the sustained cuts to our state appropriation.

This past year over 1,600 credit hours were delivered by the University Programs faculty to undergraduate and graduate students in residence on the DISL campus. Importantly, students from 17 of our 22-member MESC schools enrolled in our summer classes. The college faculty and students also published the results of 65 studies in journals within their respective fields of study. In addition to all of these achievements, the DISL faculty also managed 71 grants this past year. Lastly, the numbers of college faculty serving as research agency panelists, officers in national and international scientific organizations, and as editors for some of the leading journals in the marine sciences tell me that your contributions to science bring great cachet to our facilities and programs.

DISL faculty and students published the results of 65 studies in journals within their respective fields of study.

The Discovery Hall Programs (DHP) Educators similarly had an excellent year. Over 750 classes, with over 9,000 students, participated in educational programs offered by our teachers. BayMobile took the show on the road and provided another 8,800 students with a glimpse of what our state's remarkable natural resources look like. For many of these children, it was their first exposure to the wonders of life in the Gulf of Mexico. Just as is the case with the researchers, the DISL educators also brought much deserved praise and recognition to our facility this past year.

Neither of these programs could have succeeded without the excellent support provided by the maintenance staff, vessel operators, computer wizards, cafeteria staff and the finance department. Being a measure-once-and-cut-twice kind of guy, I continue to be amazed by the restoration of the south portion of the DISL campus. I also want to call your attention to the fact that the cafeteria staff served meals to some 45,000 satisfied customers, and that our vessels logged in an estimated 5,924 hours on the water. I also note that our IT staff has successfully extending campus-wide

Wi-Fi coverage as well as aiding in the design and installation of hi tech exhibits in our Estuarium addition. They also played a contributing roll in aiding the Public Relations Department in constructing our outstanding new DISL website. The Finance Department also deserves much praise for its performance last year. You may also not know this, but once again, our annual state audit failed to produce any findings of fault in our accounting practices. I would like to tell you about the results of our second economic impact analysis conducted by a retired member of the University of South Alabama Business Faculty. I will not bore you with all the details, but you should simply know that we turn each dollar appropriation into a $19.29 impact in coastal Alabama.

The Mobile Bay National Estuary Program (MBNEP) plays a critical role in determining our success in this area of endeavor. This past year the staff of the MBNEP provided an incredible number of city, county and state employees with the resources, and in some cases, funding opportunities, to apply the latest scientific findings to grow and maintain their communities in ecologically resilient ways. Notably, the MBNEP continues to find a way to fill some of the monitoring gaps created by state budget shortfalls. Their staff continued to implement the stakeholder-driven Comprehensive Conservation and Management Plan (CCMP), a plan that balances the efforts needed to pursue the wise stewardship of our state's remarkable natural resources in a growing coastal economy. These contributions are of great importance to our region's citizens! In other performance metrics we track, over 82,000 people visited the Estuarium, where they learned about the value of our state's coastal resources.

I would be remiss if I did not also call to your attention to the excellent contributions of the Dauphin Island Sea Lab Foundation both to our programs and infrastructure! If you have not attended a foundation event, you have missed some great events.

There is much, much more to be found in this report, but you get the idea.

Congratulations on a job well done this year!

John F. Valentine
Executive Director

Office of the Executive Director

Dr. John Valentine, Executive Director

Shelley Stephens, Executive Assistant to Executive Director

Dr. John Dindo, Director, Institutional Advancement

David England, Director, Finance & Administration

Dr. Kenneth Heck, Director, University Programs

Dr. Tina Miller-Way, Director, Outreach & Education

Angela Levins, Director, Public Relations

Lori Angelo, Meetings & Events

Administration and Facilities

DISL CAMPUS AND RESOURCES

The current DISL campus spans 35 acres on each side of Bienville Boulevard, with the portion on the northern side known as the North Campus and the portion to the south of Bienville Boulevard referred to as the South Campus. The campus consists of 39 buildings includinng instructional buildings; family-style houses for visiting scientists and faculty; and research laboratory buildings.

Located on the South Campus, the Marine Mammal Research Center, opened in 2015, houses Alabama's first research center focused on data collection and research of the state's marine mammals. As part of the Marine Mammal Stranding Network, DISL serves as the regional network partner for the Alabama coastal waters for dolphin and whale strandings. Additionally, the Alabama Marine Mammal Stranding Network at DISL works closely with the US Fish and Wildlife Service to respond to manatee strandings in Alabama and Mississippi.

The DISL also hosts Auburn's 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 DISL one of the largest solar-power producing entities in the State.

Faculty and students conduct experimental work on living marine organisms using modular sea-water systems, kriesels, and other state-of-the-art instruments to conduct biogeochemical, marine ecological, and oceanographic research.

The Dauphin Island Sea Lab spans 27.2 acres with 39 buildings for instruction, research, and housing for overnight programs, visiting scientists and DISL graduate students.

Business and Finance Office

Marian Alderman, Accounts Payable
Ashley Foster, Bursar/Accounts Payable
Cindy Grimes, Receptionist
Beth Klein, Scheduling Coordinator
Angie McKinnell, Grants & Contracts
Angela Rattler, Human Resources & Payroll
Daphne Wood, Grants & Contracts

Cafeteria Staff

Darren Harbison, Executive Chef & Manager

Sarah Anderson
Gillian Bosarge
Linda Gazzier
Joshua Lockhart
Karen Saunders
Faye Bentley
Renee Cain
Will Lilley
Rose Nelson
Althea Speitel

Information Technology

In 2016, the DISL Information Technology department (IT) completed the expansion of campus-wide Wi-Fi infrastructure to better serve the needs of faculty, students, and visitors while at DISL. The DISL IT Department also played an integral role in the design and implementation of technology components in the new 2,000 square foot addition to the DISL Estuarium. The new addition opened in the first quarter of 2017.

Information Technology Staff

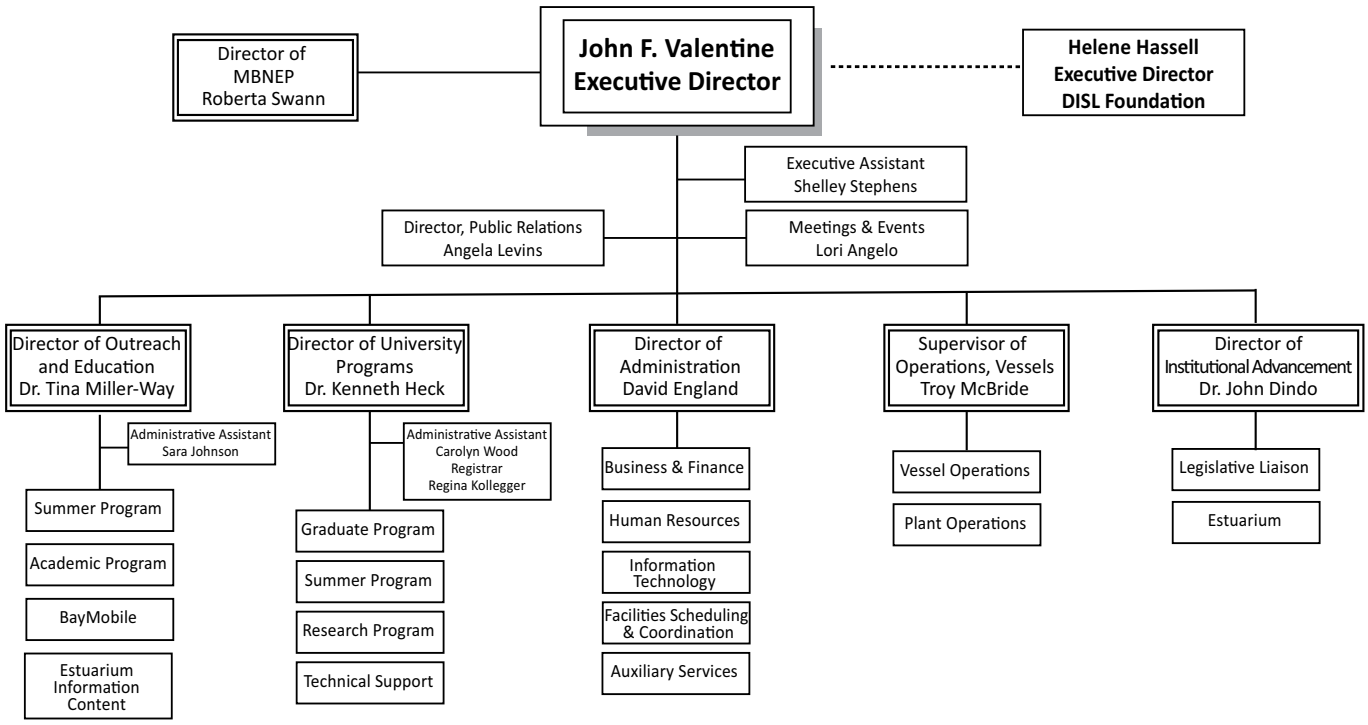
Melissa Mills, IT Manager
Sam Hardwick, PC & Network Support Specialist
Shane Johnson, Systems Administrator

Public Relations

A number of events showcased the DISL programs, faculty and students during 2016. Discovery Hall Programs (DHP) teamed with Alabama Public Television for two episodes of "Gulf Detectives." These electronic field trips were broadcast live from the DISL. Episode 1 aired in March and explored the Mobile Bay watershed from the Mobile-Tensaw Delta. More than 10,000 students from Alabama and classes from as far away as India tuned in for the live event. Participation increased to more than 60,000 for Episode 2: Animals of the Northern Gulf of Mexico in October. Both episodes are available for download on the Alabama Public Television website.

Along with the BayMobile's yearly trips across the state, DHP hosted two outreach events at the Estuarium in 2016. Love Our Gulf in June coincided with World Oceans Day sponsored by The Ocean Project. Along with learning how to protect our

DAUPHIN ISLAND SEA LAB
Organizational Chart



Renovation of the cafeteria was completed in 2016 and it now has a more modern look. The renovation has been well received by students.

oceans, visitors were invited to add their artwork to DHP's new bus. In September, National Estuaries Day focused on the importance of our estuaries. Graduate students, faculty and the Mobile Bay National Estuary Program participated in this outreach effort.

Discovery Day brought more than 2,000 visitors to the DISL for the annual open house.

The Manatee Sighting Network's rescue of Magnolia the Manatee stayed in the spotlight during 2016. The March airing of "Sea Rescue" brought viewers along for the rescue. Then in November, Mobile area author Simone Lipscomb published a children's book, "Magnolia Manatee's Long Journey Home." The book can be found in the Estuarium gift shop.

Dr. Marcus Drymon's research on tiger sharks consumption of land birds found a national spotlight on National Geographic Wild's "Blitzkrieg Sharks" in May and June. The show focused on how sharks seemed to be broadening their diet beyond traditional marine prey, and sinking their teeth into creatures of the sky.

Dr. Drymon also grabbed worldwide headlines while investigating the discovery of more than 50 bull sharks discarded on a Mobile Bay shoreline in late June. The juvenile sharks appeared to be an accidental gillnet catch. Dr. Drymon determined the sharks were just a few weeks old, which offers strong evidence that Mobile Bay is likely a nursery for the species.

Our Graduate Student Association continued their tradition of hosting the Alabama Coastal Cleanup on Dauphin Island. The group collected more than a ton of trash with the help of 473 volunteers. Team Spadefish made a splash at the American Cancer Society's Relay for Life raising $7,300 and winning the Spirit of Relay Trophy.

ExxonMobil's Summer Intern Program offered a strong helping hand with Mississippi State University's Claire Derby.

Angela Levins, Director, Public Relations
Robert Dixon, Estuarium Manager

Facilities and Vessel Operations

In 2016, DISL staff were very busy remodeling, retrofitting, and upgrading many aging campus facilities. Remodeling of the cafeteria interior dining area now has a more modern appearance inside, which has been well received by campus visitors. The Beagle Dormitory now includes modern bathrooms and the entire interior space was painted, including individual rooms, doors, and hallways.

The DISL maintenance staff completed renovations on three of the three-bedroom houses, and began renovations on two more in the fall with completion estimated for spring 2017. Once complete, this will leave only five houses needing renovations. Renovation of these houses has been extensive; requiring demolition of all interior walls, rewiring and replumbing the entire house, installing new HVAC systems, and reconfiguring the living and dining areas. By using the in-house expertise of

the maintenance department, DISL realized a cost savings of approximately $30,000 per house. In addition to the campus renovation projects, the DISL facilities staff kept the remaining campus functioning at full capacity, including a fleet of vehicles utilized for educational field trips and research field work.

With 39 buildings making up the DISL campus and academic groups participating in day and overnight programs, the DISL housekeeping staff does an excellent job of keeping the facilities clean and ready for the next group.

In late 2016, the engines for the *R/V Alabama Discovery* were rebuilt in order to continue serving graduate and other academic programs. The *R/V Alabama Discovery* saw 212 reservations in 2016 for a total usage of nearly 1,300 hours. Following the usage of the *R/V Alabama Discovery*, the *R/V E.O. Wilson* and the *Pelagia* were the most frequently used vessels for research conducted at the DISL. For the year 2016, the 16 DISL-owned vessels accounted for a total of 597 reservations and a total of 5,924 hours used. The average use of a DISL vessel was for nearly 10 hours.

A previously owned Carolina Skiff in excellent condition was acquired by DISL for use during a 2016 summer in-shore research project. This vessel has now been added to the DISL fleet and accessible to all faculty and graduate students.

Facilities and Vessel Operations Staff

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

Facilities Staff

Ricky Gibbs, Supervisor

Tommie Blocker	Willfred Gazzier
Robbie Coleman	Joey Johnson
Tom Pritchett	Jody Schultz

Housekeeping Staff

Angela Williams, Supervisor
Cindy Johnson, Assistant Supervisor

Beverly Elmore	Tammy Ladnier
Beverly Sneed	Shirley Zane

Vessel Staff

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

2016 Vessel Hours at Sea

Vessel Name	Reservation Count	Hours Used
Boston Whaler	13	196.1
Breakwater	16	208
Coquina	47	513
Great Blue	17	140.3
Oyster	34	415.5
Pelagia	65	649.8
Pelican	3	28
Pontoon	14	120.8
Spinner	32	324
R/V Mullet	48	617.6
R/V Thalassia	44	617
R/V Alabama Discovery	212	1,299.5
R/V E.O. Wilson	52	795.2
	Small Vessels	3,829.9
	Large Vessels	2,094.7
	Total	5,924.6

Technical Support

The Technical Support (TS) Analytical Facility billed a total of $29,850 for services in 2016, of which $13,574 was for sample charges to Contracts and Grants and $16,016 to outside parties. The recently acquired (2014) laser ablation/inductively coupled plasma mass spectrometer accounted for $13,485 of the total billed. The department anticipates that as investigators are awarded new grant monies for projects aquiring instrument analyses will generate more in sample charges in the coming years.

In August, Dive Safety Officer and Field Technician Grant Lockridge entered the University of South Alabama's Ph.D. program with DISL faculty member Dr. Alison Robertson serving as his advisor. Grant maintains his full-time work schedule with DISL, also published two peer-reviewed papers. In addition to his academic work, Grant designed and deployed a new mooring to support Dr. Aijun Song's, from the University of Alabama, acoustic communication research.

Grant worked with Dr. Kelly Dorgan to develop a system for measuring sound speed and attenuation through sediments and worked with Dr. Behzad Mortazavi and to develop a device to circulate water through closed cores.

Graduate students Kayla DaCosta and Anika Knight processing samples with the laser ablation platform and inductively coupled plasma mass spectrometer.

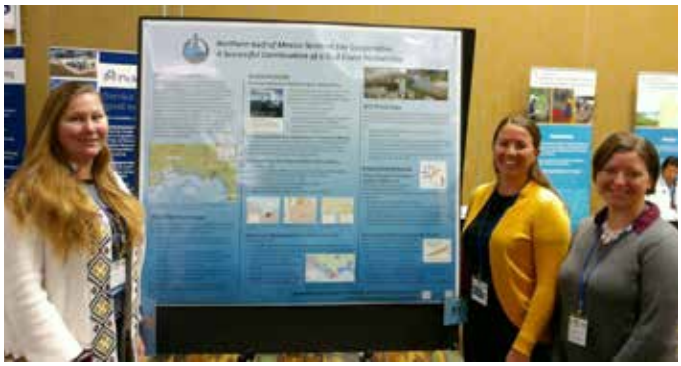
TS staff also assisted Dr. Paul Harnik, from Franklin and Marshall College, in surveying south of DI for fossilized bivalves that he is using to assess prehistoric distributions.

TS is currently developing methods, with Dr. Just Cebrian and Dr. Erin Cox, to quantify primary production on artificial reefs as part of a National Fish and Wildlife Foundation project. They also conducted a search for Rutgers University's lost glider.

ARCOS

The Alabama Real-time Coastal Observing System (ARCOS) collects meteorological data every minute and hydrographic data every thirty minutes continuously from seven stations across Mobile Bay. By maintaining reliable and quality data for real-time telemetry, the weather stations provide data to over 7,000 individuals monthly, through www.mymobilebay.com. This does not include the many additional users who collect data through National Data Buoy Center or Gulf of Mexico Coastal Ocean Observing System, where these data are also displayed.

In her capacity as Program Manager for ARCOS, Renee Collini has maintained real-time functions of the weather stations, funding, and partner engagement. Collini helped bring on board Hunter King, the newest Marine Technician. Hired as an intern for the summer, Hunter displayed a knack for the job and fit in nicely with the team. He was transitioned into a full-time employee in December, 2016 and is now the point person for weather station field operations. Collini continues to work with partners such YSI, Baldwin County School System, Mobile Bar Pilots, National Weather Service, National Oceanic and Atmosphere Administration (NOAA) Restoration Center, NOAA National Marine Fisheries Service, Alabama Marine Resources Division, DISL Faculty, HMS Ferries, Alabama Department of Public Health, and Alabama Department of Environmental Management to encourage funding for the weather stations. They were successful, in partnership with



Top: Casey Fulford, Renee Collini, and Christina Mohrman, Northern Gulf of Mexico Sentinel Site Cooperative Staff, presenting at the Mississippi-Alabama Bays and Bayous Symposium in November. Bottom: NGOM SSC intern, Casey Fulford, facilitating a session of the Alabama "Climate Selection Decision Support Tree Workshop" held across the northern Gulf of Mexico.

the Data Management Center, in obtaining a small amount of funds for Data Management for www.mymobilebay.com and supplies from the Gulf of Mexico Coastal Ocean Observing System. Additionally, Collini continues to represent DISL while working 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.

Northern Gulf of Mexico Sentinel Site Cooperative

The Northern Gulf of Mexico Sentinel Site Cooperative (NGOM SSC) has grown substantially in 2016. Working with a diverse array of partners from researchers to state and federal government officials, Renee Collini, Coordinator for the NGOM SSC, has helped to successfully obtained over $1.6 million for sea level rise and climate change research and resilience activities. These funds have transitioned Collini into a full-time position, brought on board Casey Fulford, an intern for NGOM SSC, and Christina Mohrman, a Project Coordinator.

In 2016, NGOM SSC staff held three workshops, two webinars, attended four conferences, presented on NGOM SSC over 10 times, coordinated four project teams, partnered on four funding submissions, and published Keeping Pace: A short guide to navigating sea level rise models. As part of these efforts, Fullford conducted a Gulf-wide inventory of continuously operating reference stations (CORS), that is now online and informing researchers of available vertical land motion data and opportunities for improving geospatial sampling. Mohrman has taken point on an exciting new project, an on-line, interactive, decision support tree helping stakeholders select climate change tools. In addition to conducting a series of workshops across the Gulf to get stakeholder input, Mohrman is cataloging climate change tools and models and working with a talented web and graphic design firm to develop the on-line tree.

The team also continues to engage and update stakeholders and partners through twitter (@NGOM_SSC) and a newsletter that comes out three times a year, Cooperative Ternary, that contains information on funding, research, activities, meetings, tools, and new datasets specific to sea level rise in the northern Gulf of Mexico.

Technical Support Staff

Laura Linn, Coordinator Technical Support Services/Analytical Technician
Yantzee Hintz, Field Technician
Grant Lockridge, Dive Safety Officer, Field Technician
Renee Collini, Northern Gulf of Mexico Sentinel Site Cooperative Coordinator, ARCOS Program Manager
Hunter King, Marine Field Technician

Yantzee Hintz and Hunter King working to repair damage done to the Middle Bay Lighthouse station that displays near real time data at 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.

Data Management

Data Management at DISL is responsible for processing, documenting, and archiving scientific data generated from research projects conducted at DISL. Data Management designs and develops customized data processing systems to facilitate data entry, data analysis, archival and retrieval, so that valuable datasets are made readily available to decision makers, researchers, and the general public. In 2016, Data Management has accomplished the following:

Environmental Monitoring

Data management has managed the environmental monitoring data collected from seven stations in Mobile Bay since 2003. Near real time data is published on www.mymobilebay.com 24/7. Data is transmitted to NDBC and GCOOS within thirty minutes of collection. In 2016, GCOOS renewed another 5-year contract with DISL Data Management, titled "Continued Development of Gulf of Mexico Coastal Ocean Observing Systems." Funding from this project will cover the purchase of new servers, computers, and other monitoring equipment.

Data Management continues to improve the functionality of programs that process the monitoring data. The program that provided marine data using the Sensor Observation Services (SOS) format was rewritten to accommodate the operating system of a new server. Another series of new programs were created to replace a legacy system that transmitted raw monitoring data to the SQL database.

Data Management for Alabama Center for Ecological Resilience (ACER)

DISL Data Management is in charge of the overall Data Management of ACER. In 2016, 16 submissions were made to the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC), with a total of 25 datasets.

ACER Data Management activities:

- Check the quality and integrity of scientific datasets, to ensure that good quality data can be easily accessed and shared;
- Communicate with researchers and GRIIDC to ensure compliance with all GRIIDC requirements, ensure that datasets generated by ACER are submitted within one year of data collection, or before publication of results, which ever comes first;
- Update and reinforce best data management practice, and improve datasets already submitted;
- Register ACER data in the DISL metadata catalog to improve data visibility.

Scientific Data Processing

Data Management supported scientific data processing by developing and maintaining customized on-line databases. These databases allow researchers to

enter data, check data quality, generate reports, and download data to their personal PCs. We continued to update our databases, in response to changes in research methods, procedures, and to fulfill requirements from the funding agencies. An example of these databases is: Fisheries Lab Online Database.

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 Reservations, the Research Experiences for Undergradutes (REU) Online Application, DISL Fellowship Applications, Analytical Service Requests, Fuel Usage, and Faculty Evaluations.

In 2016, the REU Online Application went through major updates. Secured login for applicants was added. Electronic recommendation letters and transcripts could be uploaded securely to the DISL REU administration. Applicants could review their application status on-line. These updates reduced paperwork and improve the efficiency of the REU application process.

Metadata

DISL Data Management hosted two metadata training workshops in 2016, one for the overall DISL research community in March and one for the summer REU students in June. In addition to continually documenting and archiving individual science datasets collected by DISL researchers, the data management specialist began work on documenting a large number of legacy datasets from the Mobile Bay National Estuary Program, which will be eventually all be available through NOAA's National Center for Environmental Information. With the transition completed from using the Federal Geographic Data Committe's Content Standard for Digital Geospatial Metadata to using the International Organization for Standardization's (ISO) 19115-2, all new metadata records at DISL are written to the ISO standard and all workshops will be for ISO.

Data Management Policy

DISL Data Management also completed extensive revisions and updates for the Data Management Center website. In particular, all of the metadata pages were rewritten and the DISL Data Management policy was updated to reflect current standards of dataset documentation and sharing.

Participation in National Science Foundation EarthCube Program

Data management specialist Mimi Tzeng has been an active participant of the National Science Foundation (NSF) EarthCube program since 2012, as a member of several Governance groups (Science Committee, Engagement Team, Liaison Team). She has also been an active participant in NSF EarthCube OntoSoft's Geoscience Papers of the Future (GPF) Initiative since 2015, which seeks to train geoscientists in best practices for documenting and sharing datasets and software (computational methods used to process datasets and models) and work flows (fully detailed data processing steps), to facilitate science reproducibility. Tzeng is a regular co-instructor for GPF training webinars and workshops and offers training in software documentation during DISL's annual metadata training workshops. As a result of collaborating with the GPF Initiative, Tzeng co-authored two peer-reviewed publications in Earth and Science in 2016.

Data Management Center Staff

Lei Hu, Data Manager

Mimi Tzeng, Data Management Specialist

Discovery Hall Programs

In 2016, Discovery Hall Programs reached more than 36,000 students, teachers and the public through their activities. The mission of DHP is education and outreach for K-12 students, K-12 teachers, other educators and the public. We believe strongly in the value of an experiential and place-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. During the school year, we serve as a field trip facility for K-12 students. Through our BayMobile program, we travel to Title I schools throughout the state bringing the 'sea to the school'. During the summer, we offer engaging and educational camps for children. Throughout the year, we offer professional learning opportunities to formal and informal educators, and attend a variety of environmentally-themed and educational events throughout the state. Activities in 2016 for each of these efforts are described more fully below.

Academic Year programs

During the school year, DHP offers 12 field-based classes for school-age students. Learning about ecology and coastal habitats by studying the salt marsh, understanding estuaries by taking a boat trip on DISL's Alabama Discovery or learning about marine animals and plants through our hands-on touch lab and squid dissection continue to be our most popular classes. For older students, our offerings in underwater robotics and physical oceanography bring together marine science, math and technology in STEM-rich classes.

In 2016, 215 groups of approximately 8200 students participated in DHP's field classes. More than 1000 adults – teachers, chaperones and parents, enjoyed

Discovery Hall Programs serve the students and teachers of Alabama

- In 2016, Discovery Hall taught more than 750 classes to more than 9000 K-12 students and their parents and chaperones visiting the Dauphin Island Sea Lab: 83% of these came from schools in Alabama and more than 60% came from public schools.
- DHP's traveling marine science classroom, the BayMobile, visited 34 schools in 15 counties and taught more than 8800 students about Alabama's marine life, its coastal habitats and human impacts on the ocean and coast.
- Through the statewide ALSDE ACCESS program, DHP faculty conducted 7 virtual field trips for students in Alabama classrooms.
- DHP shared up-to-date science and possible classroom activities with 50 teachers from 18 counties across Alabama through its teacher workshops.
- The Dauphin Island Sea Lab and DHP also serve as the lead education partner for Bryant High School's Signature Academy and as a partner in Education for Dauphin Island Elementary.

the same experiences! More than half of these groups were here for just a day, but our excellent housing and renowned cafeteria crews allowed ~40% of these groups to spend 2 or more days at DISL. In total, DHP faculty taught more than 770 classes to school age students in 2016. Slightly more than 83% of these students were from Alabama and approximately 60% came from public schools. Student groups were from 9 states and 26 counties in Alabama.

Reaching out across Alabama and beyond

DHP conducts and participates in a variety of outreach events throughout the year with a traveling marine science classroom named the BayMobile. With support from ExxonMobil, the BayMobile travels to Title I schools across the state reaching students who are unable to visit the Sea Lab in person. In 2016, the BayMobile taught classes at 34 Alabama schools reaching approximately 8885 K-12 students with information and excitement about coastal environments in their home state.

The BayMobile also travels to a number of environmentally themed festivals and community events throughout the year. In 2016, DHP attended 29 events on 40 days reaching more than 16,000 members of the public at these events. DHP was also able to lend support to both the regional and national Ocean Sciences Bowl competitions held in Mississippi in 2016.

DHP continued their collaboration with ACCESS – Alabama Connecting Classrooms, Educators and Students Statewide in 2016. DHP hosted 7 monthly programs and although data is incomplete (due to a glitch in the ACCESS office), these programs reached more than 1000 K-12 students in Alabama.

Outreach programs are also offered through the Estuarium, DISL's public aquarium. In 2016, 23 Boardwalk Talks are biweekly informal conversations between personnel at DISL and our visitors: in 2016, 23 Boardwalk Talks reached approximately 800 individuals. Summer Excursions are a program of short field trips for the general public; in 2016, 14 Summer Excursions were held and more than 300 individuals learned more about coastal Alabama and the ocean through direct, hands-on experiences.

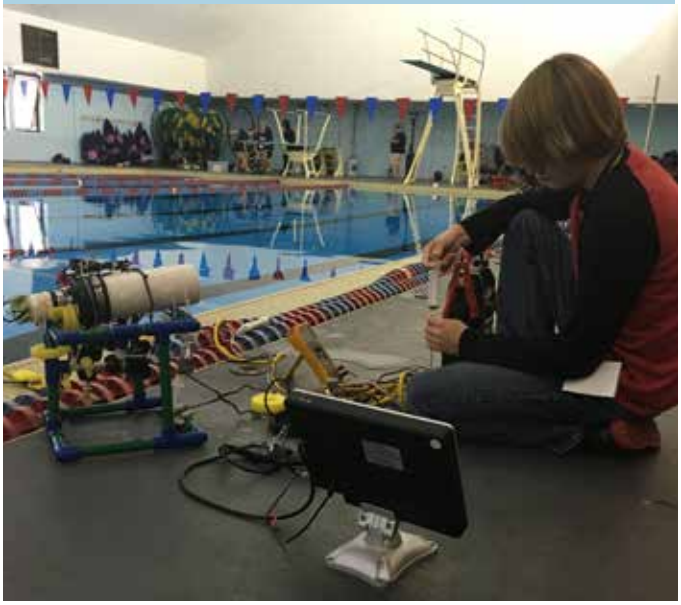
The annual student ROV (remotely operated vehicle) competition has become a signature event for Discovery Hall Programs and an integral part of our ROV program. For this program, students design and build their own unique underwater robot for a prescribed set of missions. DISL-DHP is an official regional competition site for the international MATE (Marine Advanced Technology Education) program with regional winners eligible to attend the international competition. In 2016, DHP offered 3 levels of competition based on design and mission difficulty. Students not only fly their ROV through the missions but also give both oral and poster presentation about their ROV design and construction to a panel of judges. For 2016, 16 teams and approximately 120 individuals participated in the 3 day event. The winner, Limestone County Career Technical Center from Athens, AL won the Ranger level competition and went on to represent the Northern Gulf Coast region at the International Competition in June 2016.

Meterologist Alan Seales hosted Alabama Public Television's Gulf Detectives for middle school students highlighting Alabama's coast; more than 16,000 Alabama school students participated in the programs while nationally almost 75,000 students saw the programs.

STEM Activities

- Discovery Hall Programs has integrated STEM (science, technology, engineering and mathematics) throughout their programs. For example, DHP's ROV (remotely operated vehicle, underwater robot) program includes a hands-on design and construction class, an annual student-built ROV competition and a teacher workshop as well as frequent outreach events. In the class, students work in groups to design, build and test a simple pipe and motor ROV, learning physical science concepts, ocean exploration and technologies used in marine science and industry – and teamwork!

- Other STEM classes include one focusing on wave characteristics – measuring, calculating and graphing and another on plankton – making models, determining sinking rates and observing live plankton. In Tracking Shorelines, students use GPS receivers to map Dauphin Island shorelines, upload tracks to Google Earth and discuss variability and changes seen over time.



A student makes last minute adjustments to his team's ROV prior to DHP's signature competition event. DISL-DHP is an official regional competition site for the international MATE (Marine Advanced Technology Education) program.

In 2015, DHP was approached by Alabama Public TV to develop a live interactive webcast for middle school students highlighting Alabama's coast. The program, Gulf Detectives, consisted of 2 episodes that took place in the spring and fall of 2016. These individual webcasts consisted of prerecorded 'in the field' segments interspersed with live interviews of DISL scientists. Through an online portal, students were able to ask questions during these segments. The first episode highlighted coastal habitats while the second focused on marine animals. More than 16,000 Alabama school students participated in the programs while nationally almost 75,000 students saw the programs. Since the programs aired, archived video streams have been watched more than 700 times.

Summer Programs

During the summer, DHP offers a variety of day camps and overnight camps for school age children. We see a high percentage of campers who return year after year indicating their enjoyment of the Sea Lab environment – the ocean, the atmosphere and the people. In 2016, all of our overnight camps, BayVoyager, Gulf Island Journey and Barrier Island Explorer, filled to capacity giving 198 children a chance to experience and learn about the ocean firsthand. In 2016, our day camps, BioBlitz, Survivor: Dauphin Island, and Oceans Alive gave 158 children an outdoor experience. Campers came from 18 states and 23 counties in Alabama. We owe a debt of gratitude to the many counselors led by Mr. Marty Dunn, who live with, care for and mentor these children while they are at the Sea Lab.

During the summer, Discovery Hall Programs offers an immersive and residential class in marine science for high school students. This unique program is one of the few in the US in which students can learn marine science at a marine science field laboratory taking advantage of the resources such as boats, sampling gear and laboratory equipment, as well as proximity to ocean habitats. The Alabama State Department of Education has approved and awards science credit for the 4 week class. In 2016, 26

students from 6 states participated. We continued our collaboration with Dr. Ishara Ramkissoon (University of South Alabama) increasing the number of under-represented students participating in the class through financial support by the Emerging Scholars in Environmental Health Sciences Academy.

Two additional scholarships supported by the Mississippi-Alabama Sea Grant Consortium went to students who earned awards at the Alabama State Science Fair, and a scholarship was awarded to a student who was sponsored by Dr. Krause (DISL) through National Science Foundation funds. She conducted a research project on diatoms that continued after the class and resulted in work she presented at the Gulf of Mexico Oil Spill and Ecosystem Science Conference for professional scientists. Some of the students in the high school program got a taste of science communication by participating in the filming of a documentary on geologic time by acting as time and event markers across the distance of the playground field at Dauphin Island Elementary.

Professional development for K-12 teachers and informal educators

Discovery Hall Programs offered 5 workshops for teachers and informal educators at DISL in 2016. Research has shown that a teacher's level of comfort with science content is critical to effectively teaching that information to students. These workshops include significant time spent in hands-on and field activities as well as opportunities for educators to hear from the experts – the scientists. We thank the agencies that sponsored these workshops so that they could all be offered at no cost to participants. In 2016, we taught the following workshops: Fins, Fishes and Fisheries and Climate Change in the Gulf of Mexico, sponsored by Mississippi-Alabama Sea Grant Consortium; Technology in Marine Science: ROVs, sponsored by the Deep-C Consortium; How Do We Explore and Exploring the Deep Ocean with NOAA, supported by NOAA'S Office of Ocean Exploration and Research. Approximately

The DHP Marine Science high school course spanned four weeks and included 26 students from six states. Students are approved and awarded for class credits for attending.

80 educators participated in these workshops and several earned graduate credit through our partnership with the University of West Alabama. DISL also served as the terminus and host for Legacy's Mountains to the Gulf teacher workshop sharing our knowledge of the Mobile Bay and environs with teachers who had just traversed the entire watershed!

Professional & Service Activity

Discovery Hall Programs faculty continue to contribute to the field of marine science and environmental education. DHP members gave presentations at annual meetings of the Alabama Science Teachers Association (J. Cook, Keeping Track of Shorelines; R. McDonald, Engineering Underwater Robots Helps Students Think Like Scientists); the Environmental Education Association of Alabama (H. Wilson, Productive Plankton); Bays and Bayous (G. Graeber, Fins, Fishes, and Fisheries: A Fish Tale in Teaching Education; R. McDonald, Science Communication through Blogging; J. Latour, Climate Change) and the National Marine Educators Association (G. Graeber, Fins, Fishes, and Fisheries: A Fish Tale in

Workforce Development

- In 2016, DHP hosted a 12 month internship for a recent graduate interested in science education. With the variety of programs offered, working with DHP gives interns a broad-based and hands-on introduction to the field of environmental education. Chris Flight, a recent graduate of Eckerd College, joined us as an intern in Feb. 2016 and joined us in a full-time capacity in late fall.

- With support from Mississippi-Alabama Sea Grant Consortium, DHP offered internships and work experience to high school and undergraduate students during the summer. Madison Campbell (Baker High School) and Dani Lacy (Wittenberg University) assisted us in 2016. Both worked hard, contributed energy and enthusiasm and enriched the experience of our summer visitors.

Teaching Education). DHP faculty also served as judges at local, regional and the state level science fairs, robotics events, and served on organizing committees for the Bays and Bayous Symposium.

DHP faculty also completed a little training of our own: Tina Miller-Way and JoAnn Moody participated in the semester-long NSF-sponsored training in climate change education, the National Network for Climate Change Interpreters (NNOCCI).

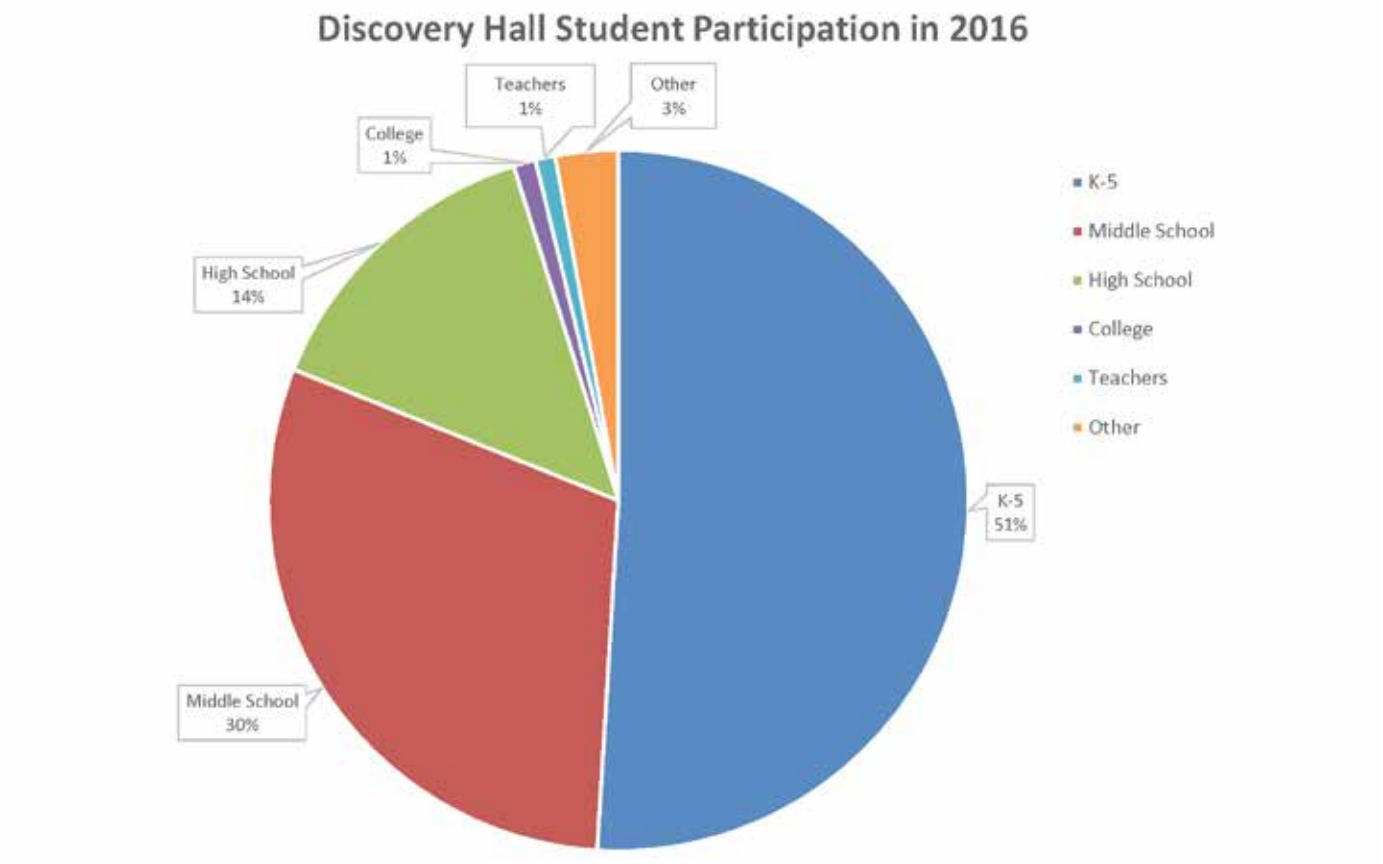
Discovery Hall Programs were sad to lose the expertise of Joan Nichols and Hazel Wilson in 2016. Joan Nichols resigned to focus on her growing family. Hazel Wilson retired after 25 yrs of service to DISL. We all wish her well on her well-deserved retirement.

Discovery Hall Personnel

Tina Miller-Way, Chair, Ph.D.
(1995, Louisiana State University)
Sara Johnson, Administrative Assistant, BS
(2004, Pennsylvania State University)
Jenny Cook, Marine Educator III, MS
(1991, University of South Alabama)
Chris Flight, Marine Educator I, BS
(2015, Eckerd College)
Greg Graeber, Marine Educator III, ME
(2008, University of South Alabama)
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).

Hazel Wilson retired after 25 years of service as a DISL Educator in Discovery Hall Programs.

Marine Educators Chris Flight, left, and Rachel McDonald, right, joined the DHP staff in 2016, where both completed internships.



Dauphin Island Sea Lab's Discovery Hall Program Totals

Year	K-5	Middle School	High School	College	Teachers	Other	Total
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**
2016	4,248	2,511	1,173	85	76	242	**8,335**
Total	**141,331**	**57,765**	**41,998**	**9,419**	**4,618**	**8,021**	**263,152**

The Estuarium

The Estuarium continues to be a vital part of the Dauphin Island Sea Lab's link to community outreach as a public aquarium. In 2016, the Estuarium surpassed the 2015 record by hosting 83,658 visitors.

While exterior construction of the 2,000 square foot addition to the Estuarium was completed in 2015, the interior buildout and placement of exhibits were coordinated during 2016. Once completed in early 2017, the addition will house new aquariums and other technology-based installations highlighting marine ecosystems. Sponsorships of exhibitry are still available; please contact Dr. John Dindo at jdindo@disl.org for more information.

Discovery Day

The DISL Estuarium hosted the annual Discovery Day on Saturday, April 9. The well-publicized event drew over 2,000 visitors to the DISL campus and Estuarium. This annual event is designed to open DISL research laboratories to the public and showcase the marine and ecological research conducted by faculty and graduate students in addition to increasing awareness of the Estuarium. Through hands on activities and interactive art, visitors learn about the local marine life and ecosystem. The goal is to encouarage awareness and promote conservation efforts of the coastal environment. In addition to the educational outreach by DISL DHP and University Programs UP), community partners with similar missions are frequent exhibitors.

The Dauphin Island Sea Lab annual Discovery Day saw over 2,000 visitors to the DISL campus, including research laboratories, the R/V Alabama Discovery, and the Estuarium. This annual event serves as a primary outreach event to our community.

Graduate student Haley Nicholson discussed her research on the impact of climate change and human influence on future oyster harvests during a 2016 DISL Estuarium "Boardwalk Talk."

Volunteer Docents

Like so many museums and aquariums across the country, the Estuarium could not provide visitors with an outstanding experience if it were not for our team of volunteer docents. Across 2016 there were 90 docents who volunteered in the Estuarium and other campus-wide events ranging from explaining the Mobile Bay ecosystem to visitors to greening up our campus. Of these volunteers, 18 were seasonal volunteers from Alabama, Arizona, Indiana, Kentucky, Michigan, Missori, Ohio, New York, and Wisconsin. An additional 36 volunteers live in Mobile and Baldwin counties demonstrating the tremendous support of the local community for DISL. This team of dedicated volunteers provided DISL with 3,383 hours of service.

Boardwalk Talks and Summer Excursions

In 2016 the Estuarium hosted 23 Boardwalk Talks, describing research being conducted at DISL, with an attendance of 771 participants. Among the most heavily attended talks were Bill Walton's "Oyster Farming in Alabama," Meagan Schrandt's "Does biodiversity play a role in oyster reef community response to oiling...and clean up activities," Anika Knight's "Using bivalves to identify human contaminants," and Greg Graeber's "Sharks of the Mobile Bay estuary."

The Boardwalk Talks are excellent ways for participants to interact in an informal atmosphere with DISL scientists and educators on a number of research related topics. The Estuarium also hosted 17 Summer Excursions for both the public and private groups with approximately 388 participants.

Estuarium Staff

Robert Dixon, Estuarium Manager
Brian Jones, Senior Aquarist
Tiffany Christiansen, Aquarist
Mendel Graeber, Estuarium Educator
Joe Ingraham, Aquarist
Edwin Torres, Aquarist

Giftshop Staff

Jeanna Layne, Manager/Buyer/Event Coordinator
Jamelle Roy, Docent Coordinator/Reorders
Amy Hannah, Inventory/Stocking

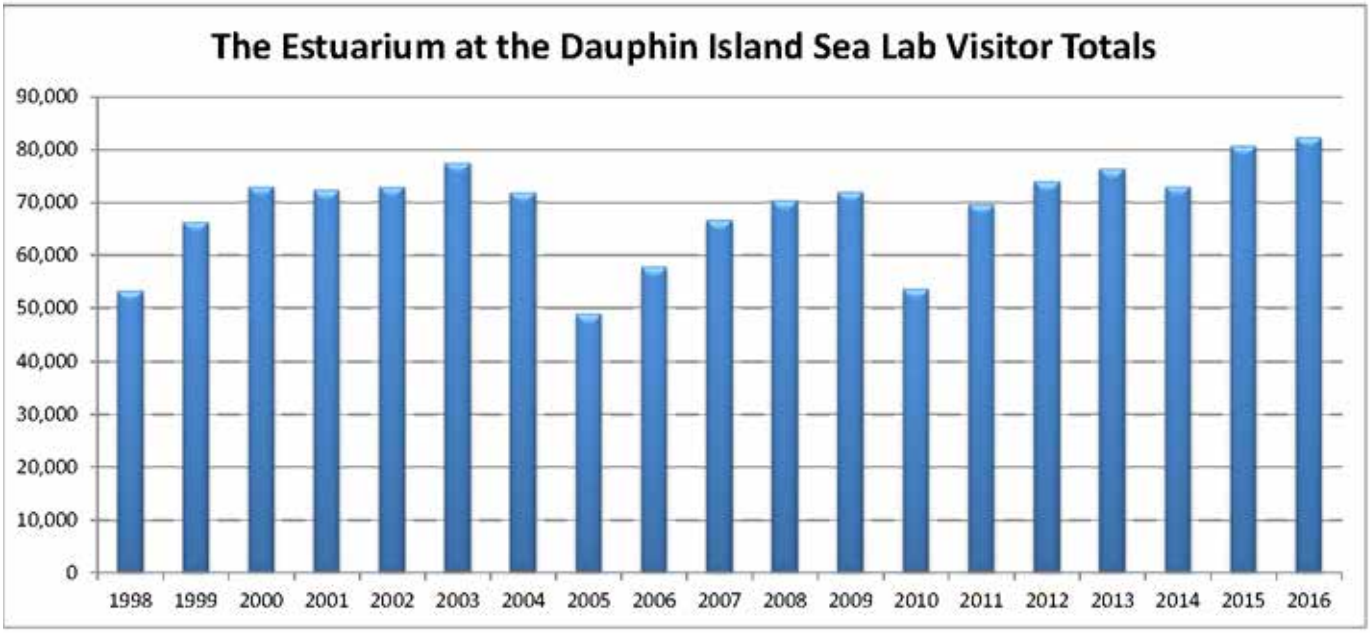
Giftshop Staff - Part Time

Susi Callister
Emily Esbensen
Mary C. Ladnier
Fan Murray
Amber Deggans
Katlyn Gibbs
Cathy Miller
Janice Watanabe

Aquarist Tiffany Christiansen explains to Estuarium visitors about the species of rays and fish in the Ray Tank. The Ray Tank is a favorite of visitors because with two fingers they can actually touch the rays.

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**
2016	40,291	24,121	13,851	4,114	**82,377**
Total	**674,198**	**366,365**	**207,400**	**60,438**	**1,312,420**



University Programs

University Programs (UP) oversees summer undergraduate and year-round graduate (M.S. and Ph.D.) education, as well as faculty research.While DISL is not a degree-granting institution, it does serve as a focal point of marine science in the state of Alabama through the Marine Environmental Sciences Consortium.

Faculty Research

The Alabama Center for Ecological Resilience (ACER) at the DISL, a consortium made up of scientists from nine research institutions, and led by Dr. John Valentine, continued 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.

The ACER Oyster group performed many of its experiments at the DISL mesocosm. Here one of the ACER interms collects measurements of juvenile oysters,

Dr. Jeffrey Krause and his lab finished the first of two research cruises for the Coastal Louisiana Silicon Cycling project funded by the National Science Foundation. The goal was to study how the element silicon is cycled in the water and sediments within the plume to understand how changes in the Mississippi River affect plankton "downstream" on the Louisiana Shelf. Krause's second cruise is set for May 2017.

Funding for research remained high during the reporting year, and extramural funding for the DISL faculty totaled $4,552,798. A full listing of UP faculty peer-reviewed publications and grants can be found on pages 39-42.

Graduate Field Research

One of the unique opportunities graduate students at DISL have is to refine their research skills in habitats and settings beyond the Gulf Coast.

As part of the Field Marine Science-Finland two week course, Dr. Ken Heck took 11 students to the Huso Biological Station located in the Finnish Aland Islands. Together with Dr. Johanna Mattila of the Swedish University of Agriculture Science, students designed and implemented research projects.

Dr. Ron Kiene led an international team of scientists on a research cruise to the subarctic North Pacific Ocean to study the cycling of the climate-active gas, dimethylsulfide (DMS). DISL research technician Kaitlin Esson, Ph.D. student Ali Rellinger, and MS student Tara Williams assisted Kiene, Chief Scientist for the cruise, with everything from diassembling Kiene's lab, logistics, and conducting the oceanographic research alongside the nine other researchers.

DISL graduate students had the opportunity to work alongside a nine-member international team of scientists to research DMS in the subarctic North Pacific Ocean with Dr. Ron Kiene.

Summer Sessions

During the 2016 Summer UP session, 17 of the 22 MESC member institutions were represented and resulted in over 1,100 credit hours of instruction. The graduate program delivered 543 semester hours during the summer and academic year. Together, UP conducted over 1,700 hours for undergraduates and graduates. Students enrolled in the summer session could choose from 29 courses offered in either a 2- or 4-credit hour format by 24 DISL and MESC faculty.

During the second session, Dr. Kelly Dorgan's Marine Ecology class teamed with Grant Lockridge's Scientific Diving class to give their students a realistic experience of how scientists collaborate to collect data. While Dorgan's students gained experience in adapting to changes in the field, Lockridge's class was able to lend a helping hand to the Estuarium's aquarists in collecting specimens for displays.

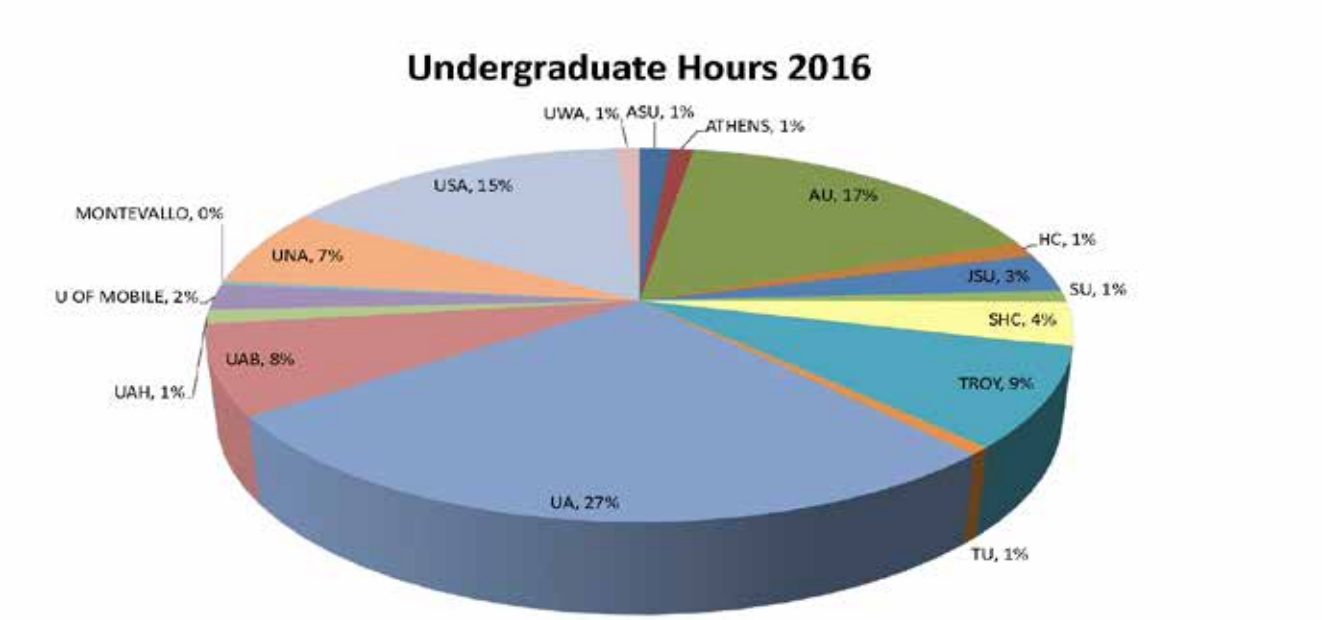
The University of Alabama at Birmingham marked its 20th year of conducting their Introduction to Neurobiology course at the DISL campus. Designed as a three-week intensive review course for new graduate students, Dr. Kent Keyser believes "students who took this class before going into UAB's graduate school perform better in their their first year. They also have [an established] cohort when they get to UAB." Holding the course at the DISL campus provides a change of scenery for students with labs utilizing marine specimens.

Alabama Marine Mammal Stranding Network

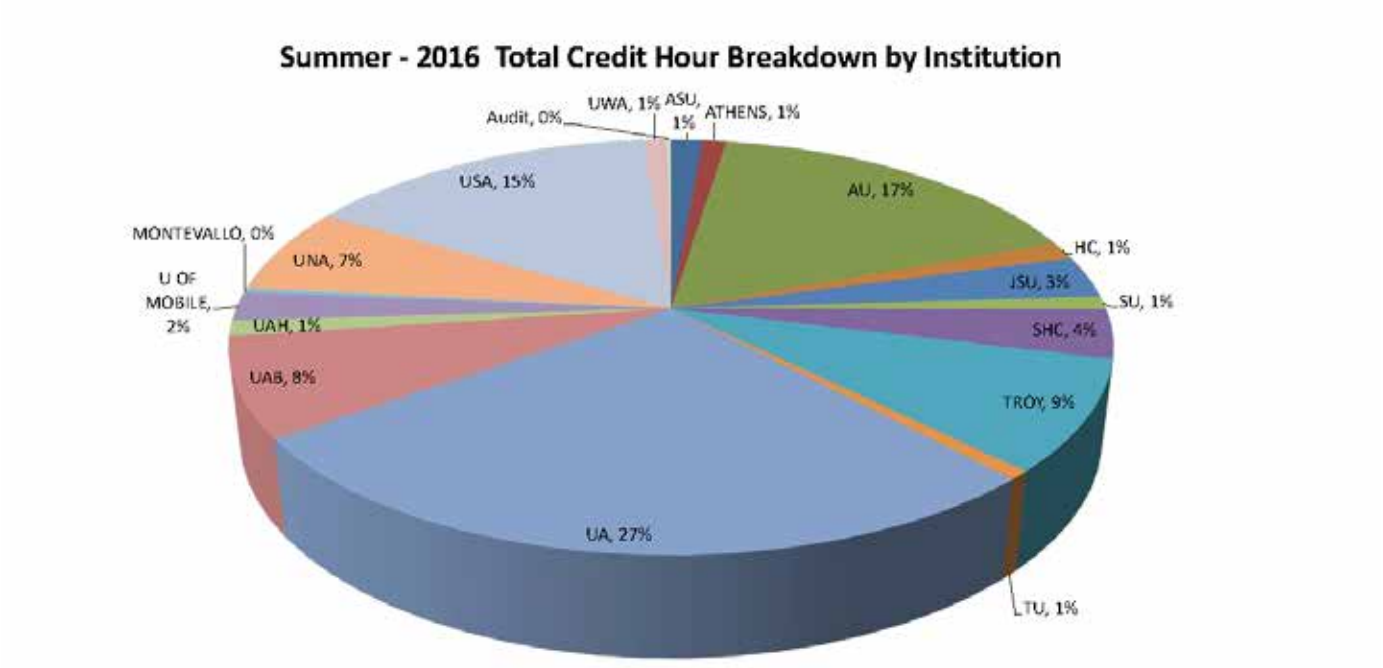
The Alabama Marine Mammal Stranding Network (ALMMSN) housed on the DISL campus responded to two unique stranding reports from local fishermen trawling south of Mobile Bay. The first report resulted in a 6-feet long upper jaw bone of a great sperm whale, which can grow up to 70-feet in length and are a species of special concern in the Gulf of Mexico in addtion to being a U.S. endangered species. The second report resulted in almost 9-feet long bone thought to be a rib bone. After consulting with other large whale experts, the ALMMSN determined it to be a jaw bone of a Bryde's whale, the only known baleen whale in the Gulf of Mexico.

New Faculty

Dr. John Lehrter joined the DISL faculty in 2016 as a Senior Marine Scientist. Lehrter spent 12 years with the U.S. Environmental Protection Agency's Office of Research and Development developing numerical ecosystem models, remote sensing applications, and observation-based understanding of coastal ecosystems. He earned his M.S. and Ph.D. a the University of Alabama while being stationed at DISL for his thesis.



In the summer 2016 sessions, 17 of the 22 MESC member institutions had enrollments in the 29 courses offered during the three terms offered. These courses combined classroom lecture, hands-on lab, and in-field learning opportunities for students.



In the summer 2016 sessions, there were XXXX credit hours earned by 17 of the 22 MESC member institutions. The chart above shows the percentage of credit hours earned by each of these member institutions. This reflects undergraduate hours only.

Research Experience for Undergraduates

Funded by the National Science Foundation Ocean Sciences Research Experience for Undergraduates (REU) and the Dauphin Island Sea Lab, the focus of the REU Program is to provide participants with opportunities to explore independent research project under the mentorship of DISL faculty.

2016 REU Participants

Jenine Brideau, Piedmont College; Mentor - Dr. Brian Dzwonkowski; *Impacts of Discharge on Dissolved Oxygen in Mobile Bay.*

Angela Garelick, California State University - Channel Islands; Mentor - Dr. Ruth Carmichael; *Aerial Thermographic Detection of Manatee Refugia in the Northcentral Gulf of Mexico.*

Bethany Hunt, Skidmore College; Mentor - Dr. Alison Robertson; *Bioaccumulation and Depuration of Caribbean Ciguatoxins in the Zebrafish, Danio Rerio*

Jessica Jiminez, California State University - Monterey Bay; Mentor - Drs. Mark Albins/Marcus Drymon; *Spatial Distribution and Abiotic Covariates of Common Fishes in Mobile Bay*

Haley Lescinsky, Williams College; Mentor - Dr. Kelly Dorgan; *Sediment Response to Diurnal Oxygen Changes*

Charlotte Shade, University of Dayton; Mentor - Dr. Bill Walton; *Understanding Polydora Websteri Infestation in Cassostrea Virginica: Applications for Off-Bottom Oyster Farming*

Elizabeth Thompson, Harding University; Mentor - Dr. Ruth Carmichael; *Use of Shipping Channels and Fairways by the West Indian Manatee in the northcentral Gulf of Mexico*

Brittany Aepernick, Bowling Green State University; Mentor - Dr. Jeffrey Krause; *The Influence of Juncus-rhizosphere Dissolved Organic Matter on Coastal Plankton Communities*

The ALMMSN responded to a stranding report which resulted in the above 9-foot long jaw bone of a Bryde's whale.

After 15 years, the DISL said a fond farewell to retiring UP Registrar Sally Brennan; l. to r., Ken Heck, Sally Brennan, and new UP Registrar Regina Kollegger.

A Fond Farewell

After 15 years as the UP Registrar, Sally Brennan passed the baton when she retired in February 2016. Sally was instrumental in assisting students with registration for summer courses, as well as maintaining lines of communication with the UP Committee members across the state. Known for her comedic and motherly personality to the students, Sally will be greatly missed. The DISL welcomed Regina Kollegger as the new UP Registrar on the heels of Sally's retirement.

University Programs Staff

Dr. Kenneth Heck, Jr., Director
Regina Kollegger, University Programs Registrar
Carolyn Wood, Program Secretary

Dauphin Island Sea Lab Foundation

The Dauphin Island Sea Lab Foundation (DISLF) 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 Sea Lab and its environmental issues. The Foundation is also continuing to build the George C. Crozier Endowment as well as the DISLF 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.

Cocktails with the Critters

The primary fundraising event for DISLF is "Cocktails with the Critters" (CWC) which is 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 2016, its twelfth year, there were over 500 in attendance.

The Marine Environmental Awards Luncheon

On Tuesday, November 1, the Dauphin Island Sea Lab Foundation hosted its fifth Marine Environmental Awards luncheon. 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 scientist and explorer, Dr. Sylvia Earle. There were two awards given; one to an individual, Sam St. John and to an organization, The Alabama Coastal Foundation. A luncheon was held to showcase the awards and the recipients. There were 300 reservations.

Known to many as "Her Deepness," Dr. Sylvia Earle served as keynote speaker for the 2016 Marine Environmental Awards Luncheon sponsored by the DISL Foundation.

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.

Grants 2016

- Regions $5,000 to underwrite the Awards Luncheon
- Glaze Foundation: $5000 for general purposes
- WKRG $20,000 in in-kind publicity for Cocktails with the Critters (CWC)
- Regions Banks $5,000 for CWC
- Martin Foundation $10,000 for Blackfish Research

Mr. Sam St. John (top) and the Alabama Coastal Foundation (above) were the 2016 recipients of the DISL Foundation's MEAL awards.

Other Income

•The US Attorney's office in Mobile, AL, contacted DISLF to inform us that they were prosecuting an environmental case in Federal Court in Mobile and the government was authorized to designate a local community group to receive a portion of the fine imposed. At the sentencing phase for DSD Shipping, the fine was set at $2 million, and the DISLF was awarded $500,000 of the imposed fine.

• BP Settlement-DISLF received a settlement from the BP oil spill. Net Amount: $70,878.81.

Projects Funded at the Sea Lab by DISLF

$72,000 Estuarium Addition-From Friends of the Sea Lab Income

Dauphin Island Sea Lab Foundation

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Chuck Stapleton
Marty Stapleton

Dauphin Island Sea Lab Foundation
P.O. Box 82151
Mobile, Alabama 36689
251.605.6624
www.sealabfoundation.org

Mobile Bay National Estuary Program

The mission of the Mobile Bay National Estuary Program (MBNEP) is to promote wise stewardship of the water quality characteristics and living resource base of the Mobile Bay estuarine system. The MBNEP is a non-regulatory program that implements the CCMP by 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 engages these groups in determining how to best treat the Bay, our associated coastal waters, and the surrounding watersheds to ensure their protection and conservation for our lifetimes and beyond.

Estuary Status and Trends

Coastal Monitoring Program

Towards developing an understanding of what biological integrity looks like in coastal Alabama and determining what monitoring and research is necessary to track environmental condition over time and how we reduce stressors and communicate resulting biological changes, the Science Advisory Committee (SAC) has been charged with developing a monitoring program that coincides with citizen values. The SAC will work with state and federal agencies to answer the above questions and partner with the Alabama Department of Environmental Management (ADEM) to build a Biological Condition framework for coastal Alabama with assistance from US EPA Headquarters and the Gulf Breeze Ecology Lab.

D'Olive Bay Monitoring

Monitoring to track reductions in stressors related to upstream restoration has been established through local, state, and federal partnerships and is ongoing. Data collected in the D'Olive Creek Watershed will help pinpoint the most cost effective metrics to measure for shifts in function and ecosystem service deliver in other watersheds.

Watershed Sediment Studies

The MBNEP has partnered with Geological Survey of Alabama to characterize land use, erosion, and sedimentation in coastal watersheds to identify sources of sediment and to establish baseline data and sedimentation rating curves useful in watershed planning. GSA utilizes modeling techniques to determine bed and suspended sediment loads and identifies point sources of sediment, including man-made and natural drainage ways. Monitoring is based on precipitation and resulting stream discharge and includes basic field acquired physical and water-quality parameters. These data are used to determine impacts of land-use change and to focus resources in areas of greatest need for remedial action.

The protocol of performing sediment loading analyses to inform watershed management planning efforts has been adopted by the MBNEP PIC and incorporated into the CCMP five-year Ecosystem Restoration and Protection Strategy. With

Left. A "before" picture of D'Olive Tributary; right, an "after" picture of the same tributary after restoration of the 2,000-foot reach. This project was designed to withstand the 500-year flood of record.

watershed management planning completed for Fowl River and underway for the Mississippi Sound Complex and Fish River watersheds, sediment analyses for Fowl River was completed and is underway for the Bayou La Batre/West Fowl River complex and for Fish River.

Data Development

Habitat/SAV Mapping/Soil Survey

Currently, SAV and Habitat mapping data is being collected, with Soil Surveys updates to follow. Acquired data will be brought into a TNC Tool (See Ecosystem Restoration and Protection below) to provide a platform for serving up-to-data data for use in watershed planning. Goals include enhancing the tool with the most current data and potentially linking to EPA datasets and developing a program to refresh EPA data on a regular basis so any watershed comparisons would be conducted with the most up-to-date information.

Mapping of SAV Distribution is Alabama Coastal Waters

Funded by the National Fish and Wildlife Foundation Gulf Environmental Benefits Fund, 2015 Submerged Aquatic Vegetation (SAV) Mapping for Alabama coastal waters was completed by Barry A. Vittor and Associates and published in July, 2016. Overall, SAV acreage in coastal AL waters expanded by 73.8 percent and increased in all sampling locations from 2008-09 coverage.

High Resolution Habitat Maps of Mobile and Baldwin Counties

High resolution habitat mapping is currently being undertaken by Radiance Technologies, Inc., with funding by the NFWF GEBF, to provide important baseline data to enhance restoration and conservation planning. This mapping effort will help the MBNEP determine types, conditions, and extent of wetland and upland habitats throughout Baldwin and Mobile counties.

Ecosystem Restoration and Protection

Habitat Restoration Plan/Tool

The Nature Conservancy, with guidance from the MBNEP, the SAC, and Project Implementation Committee (PIC), is developing a Watershed Comparison Tool coupling data from habitat and SAV maps, as well as digital information and recommendations from completed watershed plans and other sources to determine where restoration and conservation activities, focusing on streams/rivers and riparian buffers, wetlands, and intertidal marshes and flats (the three most stressed coastal habitats identified by the SAC) will have the greatest impact on remedying harm to the marine resources affected by the Deepwater Horizon oil spill. A Habitat Restoration Plan will include an inventory of restoration and conservation opportunities to guide

future Gulf Environmental Benefit Fund (GEBF) and other funding source requests.

Watershed Restoration

D'Olive Watershed: Stabilization of actively-eroding areas

In a continuing effort to "stop the bleeding" as recommended in the D'Olive Creek Watershed Management Plan (WMP), restoration of severely-eroded areas of Joe's Branch, D'Olive Creek, and Tiawasee Creek continued with funding from the NFWF GEBF (and a CIAP Grant secured by the City of Daphne.)

Improvement of Spanish Fort Retention Ponds

With ADEM CWA Section 319 funding, MBNEP partnered with the University of South Alabama Engineering Department, who developed designs for improving existing detention ponds across Highway 31 and upstream of the Joe's Brand step pool stormwater conveyance. Improvements included demolition and replacement of existing effluent flume, construction of a concrete splash pad with dissipation blocks, construction of baffle dikes, and planting with native vegetation.

Comprehensive Restoration of D'Olive Creek Subwatershed

One large scale project was substantially completed in 2016, one has been advanced to construction, and two others remain in design phases. Restoration of this 2,000-foot reach, the largest of the D'Olive Watershed projects, was substantially completed in August, with only final stages of Malbis Dirt pit stabilization and winter planting remaining. This project was designed with withstand the 500-year flood of record.

Tiawasee Creek Restoration

This project, co-funded through a CIAP grant to the City of Daphne, was substantially completed in April, 2016.

D'Olive Watershed Restoration Workshop

In order to share restoration technologies and experiences among practitioners and scientists to optimize future restoration efforts for efficiency and effectiveness, Dr. Greg Jennings and MBNEP hosted a D'Olive Watershed Restoration Technology Workshop February 16 and 17, 2015. The meeting was attended by all engineering firms approved for D'Olive restoration design and both contractors having performed restoration activities. Increased competence and capacity among practitioners to complete successful restoration projects and increased networking among technical experts were realized during this highly successful event.

Fowl River Watershed Restoration – Mon Louis Island Shoreline Habitat Improvements

Fowl River WMP (with earlier NFWF GEBF Fowl River Restoration funding) was completed and published by Goodwyn Mills and Cawood (GMC) in May 2016. Mobile County adopted a Resolution of Support for this WMP and committed to supporting implementation of the WMP.

With sediment analyses and watershed management plans completed and a permit received from the U. S. Army Corps of Engineers in March, NFWF GEBF-funded restoration of the erosion-impacted northern tip of Mon Louis Island began in early July. A temporary access channel was dug on the shoreward side of the 1995 shoreline footprint, with material side cast. A 1,400-foot continuous rock breakwater was constructed from south to north as the access channel was refilled. With breakwater construction completed in early September, dredge activities commenced. Sandy material was hydraulically pumped from the Fowl River Open Water Disposal Area behind the breakwater to an elevation of +3.5 NAVD88 to create suitable substrate for marsh creation over a one-week period. In mid-September, dredges moved to the Fowl River navigation channel where maintenance dredging of the neglected and shallow channel was undertaken with funding through a State Deepwater Horizon Impact Grant to refill the FROWDA borrow pit.

Final grading, planting, and tidal creek creation will be undertaken in FY 2016-2017.

Mississippi Sound Complex - Bayou La Batre WMP Undertaken by Dewberry, managed by the Mobile County Soil and Water Conservation District, and nearing completion, the scope of this planning effort was expanded to include West Fowl River and Dauphin Island, since a USACOE Barrier Island Study provided efficiencies and opportunities. Completion of this expanded study of the Mississippi Sound Complex will await RESTORE funding. Cost savings realized through the expanded scopes of several planning efforts have allowed additional sediment analyses to include Bayou La Batre, West Fowl River, Fish River, and Tensaw-Apalachee watersheds.

Bon Secour River Complex WMP

With a contract awarded to Volkert, Inc. and managed by the City of Foley, this planning process began in summer 2015 and includes the Bon Secour River, Skunk Bayou, and Oyster Bay watersheds. It is expected to be completed at the conclusion of 2016.

Weeks Bay Complex WMP

Awarded to Thompson Engineering and managed by the Baldwin County Soil and Conservation District, planning began in January 2016 and includes Upper, Middle, and Lower Fish River and Magnolia River watersheds. It expected to be completed in the first quarter of 2017.

Dog River WMP

Awarded to GMC, due to their efforts updating the City of Mobile's Comprehensive Plan and efficiencies related to outreach, this plan, which includes Lower Dog River, Upper Dog River, Halls Mill Creek, and Garrows Bend watersheds, is in progress and expected to be completed at the conclusion of 2016.

Three Mile Creek WMP Implementation

With 2014 publication of the Three Mile Creek Watershed Management Plan, implementation began. Funding was secured from the National Parks Service for beginning a Creekside Greenway and sought through RESTORE for restoration of the primary sediment source affecting the Langan Park Lakes, Twelve Mile Creek, and for development of an Invasive Species Control/Elimination Plan for the watershed.

Lower Three Mile Creek Watershed Community Adaptation Planning

Facing heightened risks related to storm surge, sea level rise, and more frequent storm events, the NEP conducted intensive community adaptation planning at churches across the lower Three Mile Creek Watershed to determine where environmental protection is needed and what parts of the community can be accommodated, to undertake future resiliency planning for critical infrastructure, and to identify areas that may need to be vacated as waters rise. The planning effort culminated in a November 2015 Ideas Festival.

Martin Luther King Jr. Avenue Redevelopment Corporation Leadership Academy

Effective community planning depends upon leaders who recognize the need for change. The MLK Jr. Avenue Redevelopment Corporation partnered with the NEP to conduct a grass roots, capacity-building, training program for residents of the community. The Leadership Academy included ten two-hour sessions, and more than a dozen participants received training that included environmental education, adaptation planning, communications, conflict resolution, and other important leadership skills. Leadership Academy graduates were recognized by the Mobile City Council who adopted and endorsed the TMC WMP upon their recommendation.

Prichard Drainage Study: Toulmins Spring Branch and Gum Tree Branch

MBNEP funded a study authorized by the Mobile County Commission and undertaken by Neel-Schaffer, Inc. to preliminarily plan and design drainage improvements within the City of Prichard in the Gum Tree Branch Sub-watershed of the

Left. A "before" picture of the northern tip of Mon Luis Island; right, an "after" picture of the same area after restoration. Sandy material was used to backfill the breakwater and planting of marsh vegetation will occur in 2017.

Eight Mile Creek Watershed and the Toulmins Spring Branch Sub-watershed of the Three Mile Creek Watershed to include environmentally appropriate techniques through the use of low impact development (LID) technology. The study was published in May, 2016.

Technical Assistance and Capacity Building

Coastal Marine Planning

With guidance from the Alabama Working Waterfronts Coalition and a resource manager-based steering committee, a web-based Coastal Marine Planning (CMP) GIS decision support tool was developed to inform coastal stakeholders of potential conflicts of coastal resources. The Geological Survey of Alabama (GSA) also completed an update to the Alabama Comprehensive GIS Inventory of Coastal Resources. Additionally, a comprehensive remote sensing survey of cultural resources was completed in Portersville Bay and Mississippi Sound for priority areas of proposed off-bottom oyster farms and to support ongoing shoreline restoration efforts.

Volunteer Ecosystem Monitoring Program

MBNEP has worked to increase the capacity of Alabama Water Watch (AWW) through hosting multiple trainings to certify volunteer monitors to sample and report water chemistry and bacteriological data in coastal watersheds, providing test kits and chemicals to volunteer monitors, and providing technical support to newly certified volunteer monitors. MBNEP hosted four trainings during FY 15-16. Additionally, the MBNEP has supported the development of the "Water Rangers" online data portal to provide additional resources for volunteer monitors to report local water quality issues.

Alabama Clean Water Partnership

The Alabama Clean Water Partnership (ACWP) Coastal Basin has supported comprehensive watershed planning and implementation throughout the coastal area through quarterly basin steering committee meetings, watershed-based meetings, and regular updates to the MBNEP Management Conference. ACWP has also worked to increase the understanding of the impacts of stormwater and nonpoint source pollution on local water quality through regular activities including: three rain barrel workshops, one low impact development workshop, installation of pet waste stations and signage, and presentations to local municipal and elected officials.

Education and Public Involvement

The MLK Jr. Avenue Redevelopment Corporation partnered with the NEP to conduct a grass roots, capacity-building, training program for residents of the community. Leadership Academy graduates were recognized by the Mobile City Council who adopted and endorsed the TMC WMP upon their recommendation.

Management Conference Support

Education and involvement of the business community are key to MBNEP in reaching goals and objectives of the CCMP. Engaging and informing key stakeholders of past efforts and future projects have been accomplished in various ways:

- MBNEP has hosted quarterly Government Networks Committee breakfasts and other meetings to share scientific data, identify areas of concern, and introduce specific projects (e.g., introduction of the restoration of northern MLI and dredging the navigation channel for Mon Louis Island residents and Lake Forest Lake Restoration for residents and stakeholders) and priorities tailored to the individual groups.
- MBNEP has conducted tours of critical areas of concern, including the lower Three Mile Creek Watershed, Bayou La Batre, Dog River, Fowl River, Weeks Bay, and the D'Olive Creek Watershed, to educate the private sector on the value of our coastal resources and their economic impact on our community.

Semi-Annual Newsletter

The Current Connection - 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.

Educational/ Informative Signage

To educate the community about watersheds, ecosystem characteristics, and project components, MBNEP has developed and funded educational/ informative signage at public locations adjacent to project sites, including:

- Fowl River Watershed signage. MBNEP developed and funded signs to inform commuters that they are in the Fowl River Watershed.
- Educational Signage for the City of Daphne's Gator Alley demonstration. MBNEP used ADEM CWA Section 319 funding to develop and produce educational signage related to D'Olive Watershed stormwater impacts and restoration. MBNEP employed the protocol of developing three signs: Where you are in the Watershed, Project description, and Ecosystem Services. The signs were installed by the City at the MBNEP-supported, Gator Alley demonstration that displays restoration technology, LID practices, and native vegetation.
- No ATV signage. With recreational ATV users degrading streambanks and restoration projects throughout the D'Olive Watershed, MBNEP developed and produced No ATV signs in partnership with the City of Daphne, who installed them at critical sites.

Video Productions

Having contracted with local video producer and drone pilot, Ben Brenner, MBNEP has developed and employed video productions to increase public awareness of environmental issues and knowledge

of those issues and stressors impacting estuarine resources.

Video productions included:
- The Path Towards Restoration, developed for the 2015 Annual Breakfast and used in several conference presentations, it detailed MBNEP accomplishments over the previous calendar year.
- Understanding Your Watershed/Watersheds 101 presented principles of watersheds and stormwater runoff. This outstanding video was used in a Mobile County Public School System educational campaign and is available to educators via the MBNEP web site.
- D'Olive Watershed Restoration Video was developed for the Lake Forest Lake Restoration outreach event and modified for use at the Alabama Water Resources Conference, Bays and Bayous Symposium, and Restore America's Estuaries conference.
- Gator Alley Video documented the opening and features of the City of Daphne's' Gator Alley attraction.
- Restoration Status Reports – Drone footage has been used to share restoration project progress with Management Conference Committees, elected officials, and other interested stakeholders.
- Mobile County Public School System Watershed Video Contest – In partnership with the MCPSS and Goodwyn Mills and Cawood, MBNEP used existing videos (Watersheds 101 and Redfish Tale) to develop an online video quiz for students at the four Dog River Watershed high schools and their eight feeder middle schools to educate them about the impacts of stormwater and non-point source pollution, including trash, on our waters. One winner from each school received a CCWF gift basket and gift card. MCPSS shifted their annual Academy Awards Video Production contenst to the issue of stormwater-carried trash and local water bodies, which Baker High School students won with a Dog River video presentation.

Special Events

To educate the public about the things most valued about living in coastal Alabama and increase public awareness of environmental issues and knowledge of those issues and stressors impacting estuarine resources, MBNEP supported or participated in community events that include Dauphin Island Sea Lab Discovery Day, Alabama Coastal Foundation's Coastal Kids Quiz, Mobile County Health Department's (Three Mile) Creek Fest, Wolf Bay Watershed Watch's Stan Mahoney Youth Fishing Tournament, and the John L. Borom Alabama Coastal BirdFest.

Promotional Materials

MBNEP continues to provide promotional materials at special events, including t-shirts, coozies, trash bags for boats, stickers, etc.

Create a Clean Water Future Campaign

MBNEP's Business Resources Committee is focusing on encouraging incorporation of the Create a Clean Water Future branding broadly in local business practices to have those businesses become identifiable with that brand. The CCWF campaign has expanded with development of a web site that provides direction and opportunities for a broad range of stakeholders to integrate wise stewardship of estuarine resources into living and business practices.

Mobile Bay National Estuary Program Staff

Roberta Swann, Director

Tiffany England, Business & Grants Manager
Rick Frederick, Resource Development Manager
Paul Lammers, Restoration Program Manager
Tom Herder, Watershed Protection Coordinator
Jason Kudulis, Monitoring & Science Coordinator
Christian Miller, Watershed Management Coordinator
Kelly Barfoot, Community Outreach Coordinator
Bethany Dickey, Administrative Assistant

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Resident Faculty Research

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.

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.

Ron Kiene prepares filter towers for collection of dissolved DMSP samples on the R/V Oceanus.

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.

John Lehrter, Ph.D. Senior Marine Scientist I, DISL and Associate Professor, Department of Marine Sciences, University of South Alabama . Understanding the biogeochemical cycling of nutrients, organic matter, and oxygen in coastal systems and how these cycles are related to water quality issues such as eutrophication, hypoxia, coastal acidification, and water clarity; aimed at solving complex coastal resource management issues through applications of field and lab studies, satellite oceanography, and numerical ecosystem modeling.

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.

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.

***Will Patterson, Ph.D.** Senior Marine Science 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.

Tina Miller-Way visited with NPR's Peter O'Dowd to explain how DHP uses the Deepwater Horizon Oil Spill as a teaching tool for students to retrieve oil samples identify its source as part of the ROV competition.

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.

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. 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 all aspects marine invertebrate fisheries, restoration and aquaculture.

Post-Doctoral Fellows

Debra Moore (Ruth Carmichael)
Erin Cox (Just Cebrian)
Mark Albins (Marcus Drymon/Sean Powers)
Sarra Hinshaw (Behzad Mortazavi)
Kelly Boyle (Sean Powers)
Meagan Schrandt (Sean Powers)
Lucy Novaveska (Alison Robertson)
Marcus Beck, Brad Blackwell and Jessica Lisa (John Lehrter – While at EPA)

Faculty Activity

Peer Reviewed Publications

Adams, N.G., **A. Robertson**, L. M. Grattan, S. Pendleton, S. Roberts, J. K. Tracy and V. L. Trainer. 2016. Assessment of sodium channel mutations in Makah tribal members of the U.S. Pacific Northwest as a potential mechanism of resistance to paralytic shellfish poisoning. Harmful Algae 57, Part B:26-34.

Ajemian, M. J., M. D. Kenworthy, J. L. Sanchez Lizaso and **J. Cebrian**. 2016. Aggregation dynamics and foraging behavior of striped red mullet *Mullus surmuletus* in the Western Mediterranean Sea. Journal of Fish Biology doi:10.1111/jfb.12932.

Ajemian, M.A. and **S. P. Powers.** 2016. Seasonality and ontogenetic habitat partitioning of Cownose Rays in the northern Gulf of Mexico. Estuaries and Coast 39:1234-1248.

Aven, A., **R. H. Carmichael**, E. Hieb and M. Ross. 2016. West Indian manatee movements reveal novel occupancy and distribution patterns in the northern Gulf of Mexico. Peer J. Pre-print, Published online - open access.

Barletta, R.E., **J. W. Krause**, T. Goodie and H. El Sabae. 2015. The direct measurement of intracellular pigments in phytoplankton using resonance Raman spectroscopy. Marine Chemistry 176:164-173. doi:10.1016/j.marchem.2015.09.005.

Caffrey, J. M., J. T. Hollibaugh and **B. Mortazavi**. 2016. Living oysters and their shells as sites of nitrification and denitrification. Marine Pollution Bulletin 112(1-2):86-90. doi: 10.1016/j.marpolbul.2016.08.038.

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Colegrove, K., S. Venn-Watson, J. Litz, M. J. Kinsel, K. A.Terio, E. Fougeres, R. Ewing, D. A. Pabst, W. A. McLellan, S. Raverty, J. Saliki, S. Fire, G. Rappucci, S. Bowen-Stevens, L. Noble, A. Costidis, M. Barbieri, C. Field, S. Smith, **R. H. Carmichael**, C. Chevis, W. Hatchett, D. Shannon, M. Tumlin, G. Lovewell, W. McFee and T. Rowles. 2016. Fetal distress and *in utero* Brucella pneumonia in perinatal bottlenose dolphins (*Tursiops truncatus*) during the Northern Gulf of Mexico unusual mortality event: 2010 through 2013. Dis. Aquat. Org. 119:1-16.

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Costa, P.R., **A. Robertson** and M. A. Quilliam. 2015. Toxin Profile of *Gymnodinium catenatum* (Dinophyceae) from the Portuguese Coast, as Determined by Liquid Chromatography Tandem Mass Spectrometry. Mar. Drugs. 13:2046-2062.

Darrow, E. S., **R. H. Carmichael**, C. F. T. Andrus and H. E. Jackson. 2016. Organic stable isotopes in ancient oyster shell trace pre-colonial nitrogen sources. Geochim Cosmochim Ac. http://dx.doi.org/10.1016/j.gca.2016.12.023

Darrow, E. S., **R. H. Carmichael**, K. R. Calci and W. Burkhardt III. 2016. Land-use related changes to sedimentary organic matter in tidal creeks of the northern Gulf of Mexico. Limnol. Oceanogr. 10.1002/lno.10453

Davis, W. T., **J. M. Drymon** and **S. P. Powers**. 2015. Spatial and dietary overlap leads to competition between red snapper (*Lutjanus campechanus*) and vermilion snapper (*Rhomboplites aurorubens*). PLoS One 10(12): e0144051. DOI: 10.1371/journal.pone.0144051

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Hyndes, G. A., **K. L. Heck**, Jr., E. S. Harvey, G. A. Kendrick, P. S. Lavery, K. McMahon, R. Orth, A. Pearce, M. Vanderklift, A. Vergés, T. Wernberg, S. Whiting and S. Wilson. 2016. Accelerating tropicalization and the transformation of temperate seagrass meadows. Bioscience 66:937-948.

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Grants in Force

RUTH CARMICHAEL

Alabama Division of Wildlife and Freshwater Fisheries, Mapping of manatee thermal refugia in Alabama waters: Enhanced data collection and analyses (Carmichael PI; $22,500) Collaborators: ADCNR, USFWS (D. Ingram), Pilot (R. Kellogg), Sea to Shore Alliance (M. Ross), 2016-2017.

U.S. Fish and Wildlife Service, support for aerial surveys to map thermal refugia in Alabama waters (Carmichael PI; $9,000) Collaborators: U.S. Fish & Wildlife Service (USFWS; D. Ingram), 2016.

Alabama Division of Wildlife and Freshwater Fisheries, Preliminary aerial mapping of manatee thermal refugia in Alabama waters (Carmichael PI; $22,500) Collaborators: ADCNR, USFWS (D. Ingram), Sea to Shore Alliance (M. Ross, J. Powell), 2015-2016.

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, Univ. of Southern Mississippi/ Gulf Coast Research Laboratory, Univ. 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, USFWS (D. Ingram), Marine Mammal Commission, The Ocean Conservancy, 2015-2020.

WHOI Sea Grant, A history of mercury impacts to Waquoit Bay clams (C. Lamborg, WHOI/UCSC PI $102,955; $34,200 Carmichael portion of award) Collaborators: WHOI/UCSC (C. Lamborg), MA DMR (J. Logan), 2015-2016.

JUST CEBRIAN

NOAA-Science Collaborative, End-user derived research to improve the effectiveness, sustainability and prevalence of coastal restoration projects, $489,571, 09/15-08/18, (co-PI with Eric Sparks).

EPA-Wetlands Program, Reducing runoff pollution in coastal waters through marsh restoration: a decision support tool for stakeholders, $371,275, 04/16-03/19, (PI with Eric Sparks as a co-PI).

NFWF-State of Alabama (Department of Marine Resources) Artificial Reef Program, Monitoring structural integrity and ecological benefits of inshore and offshore constructed reefs, $331,736, 06/16-05/19, (co-PI with Sean Powers and Chris Warn).

EPA-Development of Measures and Models of the Relative Contribution to Production and Delivery of the Ecosystem Service of Nutrient Sequestration of Estuarine Habitat Component, Carbon and nitrogen cycling in the northeastern Gulf of Mexico: functional equivalency between primary producers, $94,997, 05/16-04/19.

USACOE, Evaluating the capacity of natural and natural-based features (NNBF) to reduce coastal storm hazards, $34,982, 10/16-09/18, (co-PI with Bret Webb).

KELLY DORGAN

GOMRI, Alabama Center for Ecological Resilience (ACER), Subproject: benthic infauna, $693,294 (of $6.3M) over 3 years, Dorgan, K.M., S, Bell, S. Berke, (Lead PI. J. Valentine, DISL), 1 January 2015 – 31 December 2017

Office of Naval Research, Impacts of infaunal organisms on acoustic wave propagation through sediments, $148,445, Dorgan, K.M., 1 June 2015 – 31 December 2017

National Academy of Sciences, Gulf Research Program Early Career Research Fellowship, Dorgan, K.M., $75,000, 1 September 2015 – 31 August 2017

University of South Alabama Center for Environmental Resiliency, Characterization of hypoxia vulnerabilities in the Mobile Bay Estuary, Dzwonkowski, B., Dorgan, K.M., $ 19,959, 1 October 2015 – 30 November 2016

Mississippi-Alabama SeaGrant, Maximizing the Return on Investment of Oyster Aquaculture by Managing Mud Blister Worm Infestation, Dorgan, K.M., Walton, W. (Auburn University), $149,541, 1 February 2016 – 31 January 2018

Volkswagon Stiftung, The Ocean's Seafloor – One Bio-Geo-System Symposium, Schloss Herrenhausen, Hannover, Germany, Oct. 12-14, 2016, Kopf, A. (Lead: University of Bremen), Wever, T., Jenkins, C., Dorgan, K.M., $49,000 Euros

MARCUS DRYMON

Mississippi-Alabama SeaGrant Consortium, An experimental design to estimate absolute abundance of red snapper in the US Gulf of Mexico, Stunz GW, Powers SP, Rooker J, Stokes L, Drymon JM, $99,595, 2016.

Mississippi-Alabama SeaGrant Consortium, Change-in-ratio-methods for estimating recreational exploitation rate and absolute abundance of Mexico Red Snapper, Powers SP, Hoenig JM, Drymon JM, Carleton LM, Walter JH, Lauretta M., $99,920, 2016.
National Fish and Wildlife Foundation/ADCNR-MRD, Expanded fisheries monitoring in Alabama: red snapper tagging, Drymon JM, Powers SP, $300,000, 2016.

National Fish and Wildlife Foundation/ADCNR-MRD, Expanded fisheries monitoring in Alabama: vertical longline, Drymon JM, Powers SP, $232,000, 2016.

National Fish and Wildlife Foundation/ADCNR-MRD, Expanded fisheries monitoring in Alabama: bottom longline, Drymon JM, Powers SP, $115,000, 2016.

National Fish and Wildlife Foundation/ADCNR-MRD, Expanded fisheries monitoring in Alabama: habitat mapping, Powers SP, Drymon JM, $306,500, 2016.

National Fish and Wildlife Foundation/ADCNR-MRD, Expanded fisheries monitoring in Alabama: fish movement, Powers SP, Drymon JM, $105,400, 2016.

National Fish and Wildlife Foundation/ADCNR-MRD, Expanded fisheries monitoring in Alabama: data management Powers SP, Drymon JM, $88,400, 2016.

National Fish and Wildlife Foundation/ADCNR-MRD, Expanded fisheries monitoring in Alabama: trawl, Powers SP, Drymon JM, $59,000, 2016.

Alabama Department of Conservation and Natural Resources, Assessing reef fish and shark populations in coastal Alabama via fishery independent surveys, Powers SP, Drymon JM, $143,800, 2016.

NOAA Saltonstall-Kennedy (S-K) Program, Stock structure and life history of the bonnethead (Sphyrna tiburo) in US waters: two large coastal sharks using high throughput next-generation sequencing, Frazier B, Portnoy SD, Gold JR (Drymon collaborator), $12,157 (Drymon portion), 2016.

National Fish and Wildlife Foundation/ADCNR-MRD, Monitoring structural integrity and ecological benefits of inshore and offshore constructed reefs, Powers SP and Drymon JM, $1,098,250, 2016-2018.

Gulf of Mexico Research Initiative, The Alabama Center for Ecological Resilience (ACER), Valentine et al. (Drymon JM), $223,112 (Drymon portion), 2015-2017.

BRIAN DZWONKOWSKI

National Aeronautics and Space Administration, Research Opportunities in Space and Earth Sciences (ROSES), SUSMAP: SMAP observations to trace the lifecycle of hydrologic extreme events, J.T. Reager (PI), C. David, J. Vazquez, and B. Dzwonkowski (USA co-I), $44,813, (09/27/2016-09/26/2019)

University of South Alabama, Center for Environmental Resiliency, Characterization of hypoxia vulnerabilities in the Mobile Bay Estuary, B. Dzwonkowski (PI at USA) and K. Dorgan, $19,959, (11/01/2015-10/31/2016).
NOAA National Ocean Service, U.S. Integrated Ocean Observing

System (IOOS), Gulf of Mexico Coastal Ocean Observing System Regional Association, Maintaining and Enhancing the Alabama Real-Time Coastal Observing System, Renee Collini (PI), Lei Hu (PI), and B. Dzwonkowski (No cost collaboration), $150,000, (04/01/2016-03/31/2020).

KEN HECK

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

Florida Fish and Wildlife Commission, Submerged Aquatic Vegetation Restoration and conservation within Baldwin County, Alabama, $100,000, 10/2015-09/2016

Mississippi-Alabama SeaGrant, Predicting the Establishment Potential of Invasive Tiger Shrimp: the Role of Competition and Predation, $143,660, 2014-2016

Gulf of Mexico Research Initiative, Impacts of the Deepwater Horizon Accident on Wetlands Resiliency, $225,000, 2014-2017

NOAA, Data Management in Support of NOAA's Integrated Ecosystem Assessment for the GOM, $161,000, 10/2015 – 9/2016

Mobile Bay National Estuary Program, Continued Monitoring of D'Olive Creek, $314,725, 2014 – 2016

National Academy of Sciences Gulf Research Program, Living Shorelines: Synthesizing the Result of a Decade of Implementation in Coastal Alabama, $469,000, 01/01/2015-12/31/2017

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, February 1, 2015 January 30, 2018.

Center for Environmental Resiliency, University of South Alabama, Wetland resiliency: watershed fate of mercaptan odorant after a spill event, $19, 933, April 1, 2014-March 31, 2016.

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

NOAA-EcoHAB. CIGUAHAB: Ciguatera Investigations in the Greater Caribbean Region: Ecophysiology, Population Connectivity, Forecasting, and Toxigenesis. Collaborative project with FDA, WHOI and several Universities, Michael Parsons, Lead PI, USA budget portion $149,110 for research costs + $19,857 for boat time; total $168,967, September 1, 2011-August 31, 2016.

JEFF KRAUSE

National Science Foundation: Arctic Natural Sciences, Collaborative Research: What controls the transfer of diatom organic matter to age-0 pollack prey in the Bering Sea ecosystem?, $91,357, Collaborative co-PI Lomas, M.W.; Bigelow Laboratory for Ocean Sciences

North Pacific Research Board, Microzooplankton biomass and grazing rates on the Arctic Program Cruises, $29,431, Part of Collaborative Research Project with Lead PI Lomas, M.W. (Bigelow Laboratory for Ocean Sciences)

National Science Foundation: Chemical Oceanography, The biotic and abiotic controls on the Silicon cycle in the northern Gulf of Mexico, $478,066

Gulf of Mexico Research Initiative, Alabama Center for Ecological Resilience (ACER): Impacts of the DwH accident on phytoplankton-microzooplankton resiliency, $707,466 (includes subward to Rutgers University - Thamatrakoln, K.)

Gulf of Mexico Research Initiative, CONsortium for oil spill exposure pathways in COastal River-Dominated Ecosystems (CONCORDE): Spatial variability in primary producer abundance in production on the Mississippi-Alabama shelf, $47,100

National Science Foundation: Biological Oceanography, Group-Specific Diatom Silica Production in a Coastal Upwelling System, $453,487

BEHZAD MORTAZAVI

NSF-CBET, Collaborative Research: Engineering salt marsh restoration to maximize denitrification - elevation and species in interactions, $181,418, 09/01/14 to 08/31/2017

Gulf of Mexico Research Initiative, Consortium: Alabama Center for Ecological Resiliency, $625,000, 01/01/15 to 12/31/2017

SEAN POWERS

MS/AL Seagrant, Change-in-Ratio Methods for Estimating Recreational Exploitation Rate and Absolute Abundance of Gulf of Mexico Red Snapper, S. Powers, J. Drymon, J. Hoenig, L. Carlton, $100,000, 2016-2017.

NFWF, Gulf Environmental Benefit Fund (via subcontract from Alabama Marine Resource Division), Monitoring Structural Integrity and Ecological Benefits of Inshore and Offshore Constructed Reefs, S. Powers and J.M. Drymon, $1,098,000, 2016-2018.

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

NFWF, Gulf Environmental Benefit Fund (via subcontract from

Alabama Marine Resource Division), An Ecosystem Based fisheries monitoring and assessment for coastal Alabama. $4,219,000, 2014-2019.

U.S. Fish and Wildlife, Sport Fish Restoration Fund via Alabama Department of Conservation and Natural Resources, Marine Resources Division, Reef fish research in the Alabama Artificial Reef Permit Zone, R. Shipp and S.P. Powers, PIs, $60,000, 2015-2016.

Gulf of Mexico Research Initiative (GOMRI RFP IV), Alabama Center for Ecological Resilience (ACER, J. Valentine PI), Oyster subcomponent: Resilience of oyster reefs and other suspension feeders to oil spills and response activities, S. Powers, Lead component PI, $496,460, 2015-2018.

NMFS Saltonstall Kennedy Fisheries Program, Assessing the current status of red drum (Sciaenops ocellatus) in the northern Gulf of Mexico: a multistate cooperative effort, $399,500, 2014-2017.

ALISON ROBERTSON

NSF EPSCoR, RII Track-2 FEC: Bridging the gap between genomes and phenomes to understand the toxigenesis of ciguatera in coral reef food webs, Robertson, A. (lead), Kiene, R, Smith, TB.; Lehrter, J.,Habtes, S. Brandt, $3,996,877 , 01 Jul 2017 – 30 Jun 2018

Gulf of Mexico Research Initiative, Alabama Center for Ecological Resilience (ACER) (Subproject: Benthic Microbes), Robertson, A, Parsons, M., Urakawa, H. (Lead PI. J Valentine, DISL), $404, 000 (of $6.3M), 1 January 2015 – 31 December 2017

NOAA Bluefin Tuna Research Program Evaluation of natal origin and migratory pathways of Atlantic bluefin tuna (Thunnus thynnus) using chemical tracers and biomarkers, Logan, J. Robertson, A. (Co-PI), Wozniak, A., $123,025, 1 Sept 2016 – 31 Aug 2017

Office of Research and Economic Development, University of South Alabama, High Throughput next generation CometChip platform for assessment of fish and human genome damage following exposure to harmful algal toxins, Robertson, A., and Sobol, RW, $25,000, 1 April 2016 – 31 Mar 2017

Department of Commerce, National Oceanic and Atmospheric Administration (NOAA); Office of National Marine Sanctuaries, Prevalence of ciguatoxins in coastal fishes in Nihoa, Hawaii, $16,500, 01 May 2016 – 30 April 2018

Department of Commerce, National Oceanic and Atmospheric Administration, CIGUAHAB: Ciguatera Investigations in the Greater Caribbean Region: Ecophysiology, Population Connectivity, Forecasting, and Toxigenesis, Parsons, Robertson, A., Anderson, Richlen, Kiene, Erdner, Smith, $746,000 (of 4.03M total), 01 Sept 2012– 30 August 2017

JOHN VALENTINE

Gulf of Mexico Research Initiative, Alabama Center for Ecological Resilience (ACER), Co PIs: 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. Sobecky, K. Thamatrakoln. $6,497,054. 2015-2017.

BILL WALTON

Gulf States Marine Fisheries Commission Oyster Aquaculture Competition, Increasing oyster production in the Gulf of Mexico: Adopting high-density larval culture at the Auburn University Shellfish Lab, Walton, WC (PI) and FS Rikard (co-PI), $73,575, 1/1/17-12/31/17.

Alabama Department of Conservation and Natural Resources Marine Resources Division, Restoration and enhancement of oyster reefs in Alabama: Remote setting of oysters, Walton, WC (PI) and FS Rikard (co-PI), $171,475, 4/1/16-3/31/18.

Mississippi-Alabama Sea Grant Consortium, Maximizing the return on investment of oyster aquaculture by managing mud blister worm infestation, Dorgan, KM (PI) and WC Walton (co-PI), $149,540, 2/1/16-3/1/18.

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

Environmental Protection Agency Gulf of Mexico Programs Cooperative Agreements, Half-Shell High School: Development of a sustainable seafood community workforce using off-bottom oyster farming, Stewart, J (PI) & WC Walton (co-PI), $260,440 ($47,068 in sub-contract), 3/1/16-2/28/18.

National Sea Grant, Sea Grant symposium for OysterSouth: A submission to the 2016 aquaculture Sea Grant conferences and workshops competition, $19,598, 8/1/16-7/31/17.

University of Southern Mississippi, Oyster aquaculture extension work, $92,000, 4/1/16-3/31/17.

Marine Environmental Science Consortium Members

The Alabama Marine Environmental Sciences Consortium (MESC) is comprised of 22 public and private colleges and universities. The Presidents of each school make up the MESC Board of Directors.

The MESC has an Executive Committee which 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 consist 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 DISL, and are responsible for advising the DISL 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.

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Federal Awards and Grants

Federal Grantor/ Pass-Through Grantor/ Program Title	Federal CFDA Number	Pass-Through Grantor's Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
Research and Development Cluster				
U. S. Department of Commerce				
Direct Program				
Passed Through Woods Hole Oceanographic Inst.				
Sea Grant Support	11.417	C119844		20,160.32
Passed Through University of South Alabama				
Sea Grant Support	11.417	R/SFA-03		14,322.38
Passed Through University of Southern Mississippi				
Sea Grant Support	11.417	USM-GR05007-R/SFA-01		35,529.10
Sea Grant Support	11.417	USM-GR05007-R/SFA-05		26,201.55
Sea Grant Support	11.417	USM-GR05007-A/0-40		40,719.90
Sea Grant Support	11.417	USM-GR05007-E/0-84		30,186.17
Sub-Total Sea Grant Support				132,636.72
Passed Through Mississippi State University				
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	11.432	191001-363405-02/TO 0010	44,507.00	37,311.61
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	11.432	191001-363405-02/TO 008	50,500.00	34,615.83
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	11.432	191001-363405-02/TO 009	690,592.00	692,926.56
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	11.432	191001-363405-02/TO 007		55,011.85
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	11.432	191001-363405-02/TO 006		9,960.14
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	11.432	191001-363405-02/TO 003		1,843.59
Sub-Total National Oceanic and Atmospheric				831,669.58
Coastal Zone Management	11.419	15900.340560.02		18,471.91
Total U. S. Department of Commerce				1,017,260.91

Federal Grantor/ Pass-Through Grantor/ Program Title	Federal CFDA Number	Grantor's Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
U. S. Department of Defense				
Passed Through Florida Atlantic University				
Basic and Applied Scientific Research	12.300	D01-W9126G-14-2-0028		9,566.10
U. S. Department of the Treasury				
Passed Through University of South Alabama				
Resources and Ecosystems Sustainablitly	21.015	RCEGR02002-01-00		18,613.54
U. S. Department of the Interior				
Direct Program				
Coastal Program	15.63	F11AC01390		9,076.47
Endangered Species Conservation? Recovery Implementation Funds	15.657	F15AC00119		2,541.78
Basic and Applied Scientific Research	12.300	N00014-15-1-2602		73,610.47
Cooperative Research/National Park System	15.945	P16AC01787		12,764.14
Sub-Total Dept of Interior Direct Programs				97,992.86
Passed Through Alabama Department of Conservation and Natural Resources				
Cooperative Endangered Species Conservative Fund	15.615	N/A		21,688.40
Passed Through University of Southern Mississippi				
Assistance to State Water Resources Research Institutes	15.805	USM-GR05314/GR05321-01		411.62
Total Assistance to State Water Resources Research Institutes				
Total U. S. Department of the Interior				120,092.88
National Science Foundation				
Direct Programs				
Geosciences	47.05	OCE-1335012	36,219.00	10,934.11
Geosciences	47.050	1558957	109,101.00	69,616.51
Geosciences	47.050			123,149.48
Sub-Total NSF Direct Programs				203,700.10
Passed Through University of California Santa Barbara				
Geosciences	47.050	KK1333		27,939.11
Passed Through University of South Alabama				
Geosciences	47.050	OCE-1342699		15,004.92
Geosciences	47.050	1436576		47,399.74
Sub-Total Geosciences				62,404.66
Engineering Grants	47.041	CBET-1438235		2,424.79
Passed Through Auburn University				
Assistance to State Water Resources Research Institutes	15.805	16-WRC-362436-DISL	40,000.00	1,404.48
Total National Science Foundation				297,873.14

Marine Environmental Sciences Consortium
Dauphin Island, Alabama

Exhibit #8

Federal Grantor/ Pass-Through Grantor/ Program Title	Federal CFDA Number	Pass-Through Grantor's Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
Environmental Protection Agency				
Direct Program				
Office of Research and Development	66.511	83638001		1,970.51
U. S. Department of Health and Human Services				
Direct Program				
Food and Drug Administration - Research	93.103			186,626.23
Passed Through City of Bayou La Batre				
Habitat Conservation	44.463			32,306.00
Total Environmental Protection Agency				220,902.74
Total Research and Development Cluster (M)				**1,684,309.31**
Other Federal Awards				
U. S. Department of Commerce				
Direct Programs				
Ocean Explorer	11.011			8,806.41
Passed Through Texas A&M Research Foundation				
Integrated Ocean Observing System (IOOS)	11.012	S120009		43,849.12
Passed Through Alabama Department of Conservation and Natural Resources				
Coastal Zone Management Administration Awards	11.419	DISL-CZM-306-16-1		26,656.40
Coastal Zone Management Administration Awards	11.419	DISL-CZM-306-15-1		40,628.68
Coastal Zone Management Administration Awards	11.419	MBNEP-CZM-309-15-1		83,678.39
Coastal Zone Management Administration Awards	11.419	MBNEP-CZM-306-16-1		3,999.99
Coastal Zone Management Administration Awards	11.419	MBNEP-CZM-309-16-2		59,303.45
Sub-Total Coastal Zone Management Administration Awards				187,610.51
Passed Through Mississippi State University				
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	11.432	191001-363405-02/TO 0011	163,464.00	39,598.95
Passed Through University of South Alabama				
Unallied Management Projects	11.454	NA15NMF4540103		149,282.40
Total U. S. Department of Commerce				429,147.39
U. S. Department of the Interior				
Direct Programs				
Cooperative Research and Training Programs – Resources of the National Park System	15.945	P11AC91269		36,891.33
Cooperative Research and Training Programs – Resources of the National Park System	15.945	P16AC01787		12,764.14
Conservation and Natural Resources				
Coastal Impact Assistance Program	15.668	AL2-26		69,684.00
Total U.S. Department of the Interior				119,339.47
National Science Foundation				
Direct Program				
Education and Human Resources	47.076	HRD-1311030		15,982.79
Passed Through Monterey Peninsula College				
Education and Human Resources	47.076	PR 42156		4,832.80
Total National Science Foundation				20,815.59
Environmental Protection Agency				
Direct Programs				
Regional Wetland Program Development Grants	66.461	00D40115	142,201.00	70,347.78
National Estuary Program	66.456			658,830.35
Sub-Total Environmental Protection Agency Direct Programs				729,178.13
Passed Through Gulf of Mexico Alliance				
Gulf of Mexico Program	66.475	121609-00		2,901.92
Passed Through University of Southern Mississippi				
Gulf of Mexico Program	66.475	MX-95453310-0		8,444.73
Total Environmental Protection Agency				740,524.78
Total Other Federal Awards				**1,309,827.23**
Total Federal Awards				**2,994,136.54**

(M) = Major Program
(N) = Non-Monetary Federal Assistance
N.A. = Not Available

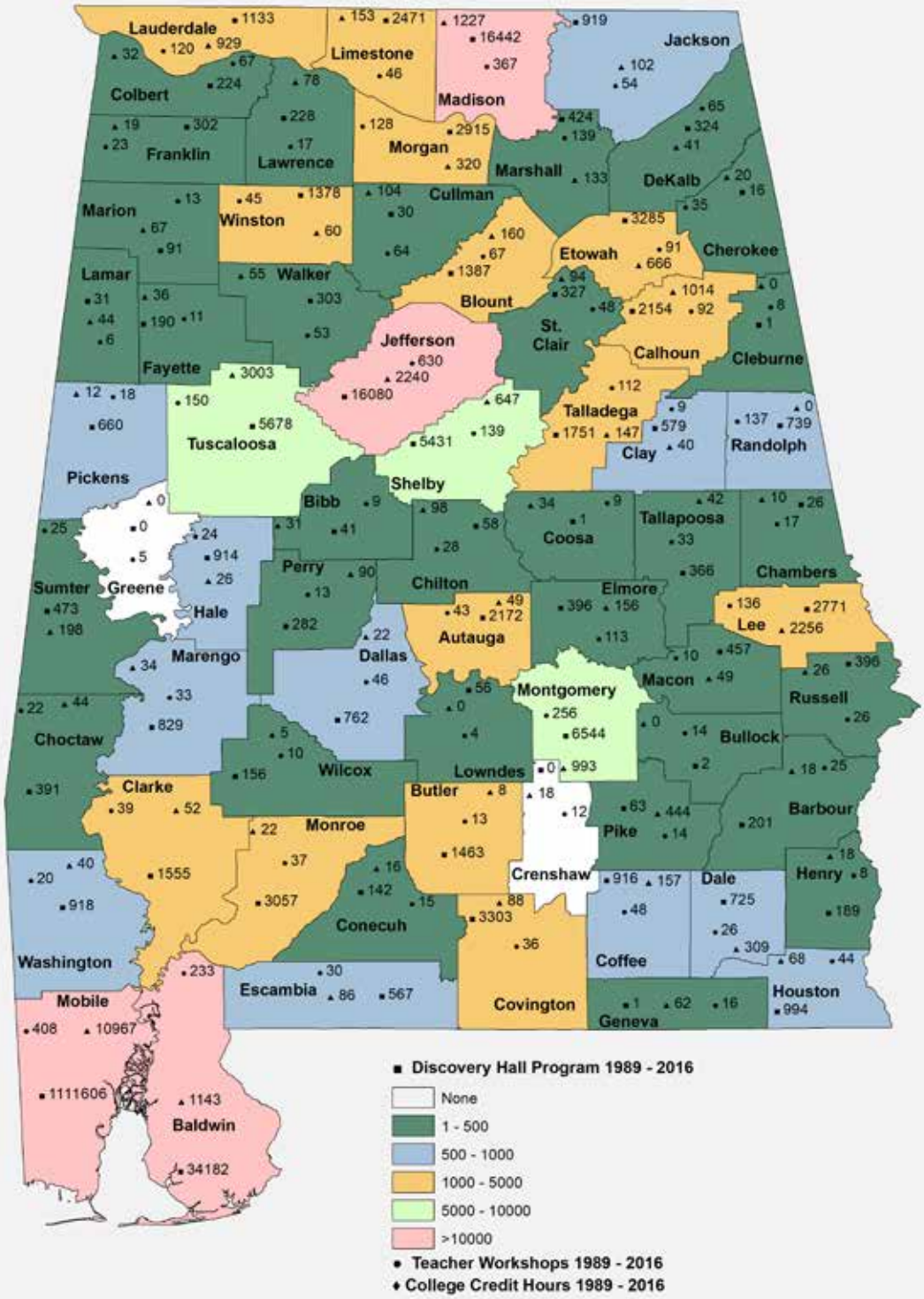
The accompanying Notes to the Schedule of Expenditures of Federal Awards are an integral part of this schedule.

Balance Sheet

Marine Environmental Sciences Consortium
Dauphin Island Sea Lab
Statement of Net Position
For the Year Ended September 30, 2016

ASSETS		
Current Assets		
Cash	$	1,528,640
Accounts Receivable		4,042,400
Lease Improvement Receivable		496,914
Inventories		147,090
Total Current Assets		**6,215,044**
Noncurrent Assets		
Capital Assets:		
Land		658,757
Buildings		13,649,056
Improvements Other Than Buildings		433,744
Equipment		2,939,910
Vessels		1,075,392
Library Holdings		126,694
Construction in Progress		2,245,455
Less: Accumulated Depreciation		(7,589,958)
Total Capital Assets, net of Depreciation		13,539,050
Total Noncurrent Assets		**13,539,050**
Total Assets		**19,754,095**
Deferred Outflow of Resources		
Pension		1,039,000
Total Deferred Outflow of Resources	$	1,039,000
LIABILITIES		
Current Liabilities		
Accounts Payable	$	1,169,068
Lease Obligations		190,000
Compensated Absences		29,123
Unearned Revenue		1,545,709
Deposits Held for Others		139,500
Total Current Liabilities		**3,073,399**
Noncurrent Liabilities		
Compensated Absences		456,264
Capital Lease Obligations		1,540,000
Net Pension		6,692,000
Total Noncurrent Liabilities		**8,688,264**
Total Liabilities		**11,761,664**
Deferred Inflow of Resources		
Pension		282,000
Total Deferred Inflow of Resources		282,000
NET POSITION		
Net Investments in Capital Assets		**11,809,050**
Restricted for		
Expendable		
Capital Projects		28,334
Research & Scholarships		267,251
Instruction		392,941
Public Outreach		444,966
Unrestricted		(4,193,112)
Total Net Position	$	**8,749,431**

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



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