

About the Gulf of Mexico Research Initiative

The Gulf of Mexico Research Initiative is a 10-year, \$500 million independent research program established by an agreement between BP and the Gulf of Mexico Alliance to study the effects of the Deepwater Horizon incident and the potential associated impact of this and similar incidents on the environment and public health.

Would you like to know more about the GoMRI-funded research?

Check out our Research page on the website:

<http://research.gulfresearchinitiative.org/research-awards/>

Upcoming Events:

Request for Proposals (RFP)-V Release

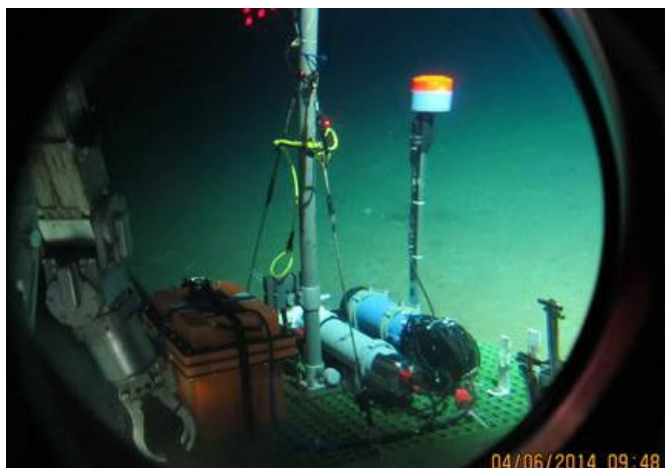
November 2014
For more info, see page 5

2014 American Public Health Association Annual Meeting & Expo

November 15-19, 2014
New Orleans, Louisiana

2015 Gulf of Mexico Oil Spill & Ecosystem Science Conference

February 16-19, 2015
Houston, Texas



The mini-Lander is essentially a frame with a drop weight and an instrument package (in this case, methane, O₂, pCO₂, T, salinity, and pH sensors). Positioned near a feature (a gas vent in this case) and left in place from a few days to a few months, it continuously measures those parameters. This one was deployed for only 2 days but yielded excellent data. The mini-Lander was designed by Howard Mendlovitz, a chemical engineer working in the lab of ECOGIG PI Dr. Chris Martens. Photo Credit: ECOGIG and WHOI.

ECOGIG Researchers Return to Macondo Wellhead Site During 2014 Cruise Season

Scientists from the Ecosystem Impacts of Oil & Gas Inputs to the Gulf Consortium (ECOGIG) had a very busy cruise season, with an exciting return to the Macondo wellhead as one of their many expeditions. The 2014 cruise season started off aboard the R/V Pelican in March to service and recover instrumentation measuring deepwater hydrocarbon cycling, and concluded in July aboard the E/V Nautilus with an expedition focused on deep sea corals and how they have been impacted by the Deepwater Horizon oil spill. The cruise to return to the Macondo wellhead site took place aboard the R/V Atlantis in March and April, and saw the return of the deepsea submersible Alvin to service, after being out of commission recently for improvements including upgrades to the interior ergonomics and updates to the command-and-control system. The research cruise aboard the Atlantis lasted for more than three weeks and included 17 dives with Alvin for up-close encounters with natural hydrocarbon seeps, oil-saturated methane hydrates, brine lakes, and sponge gardens. The general purpose of this cruise was to revisit the wellhead site and a natural hydrocarbon seep to collect water and sediment samples, to measure hydrocarbon concentrations and degradation rates, and to conduct detailed microbial population surveys. The expedition was led by Chief Scientist Dr. Samantha (Mandy) Joye, a co-Principal Investigator in ECOGIG, who is based at the University of Georgia.

“We visited three sites near the Macondo Wellhead, MC118, MC252 and MC253. Each site offered a unique opportunity to understand how seafloor communities –

Image on left: An amazing abundance of ice worms, 1-2" long polychaete worms, living in and on the surface of these methane hydrate mound chimneys. These were photographed by Ian McDonald with the "Beast Cam" on the bottom of the Gulf of Mexico during an ALVIN dive, April 2014. An unexpected feature of this particular chimney land is the bunch of oily-hydrate "grapes" (about 8" in length), never seen before. The high abundance of ice worms in this area tells us there are a lot of microorganisms here. These worms were first discovered in 1997, by Penn State Professor of Biology Dr. Charles Fisher and his research team. Photo Credit: ECOGIG and WHOI.

continued on next page...

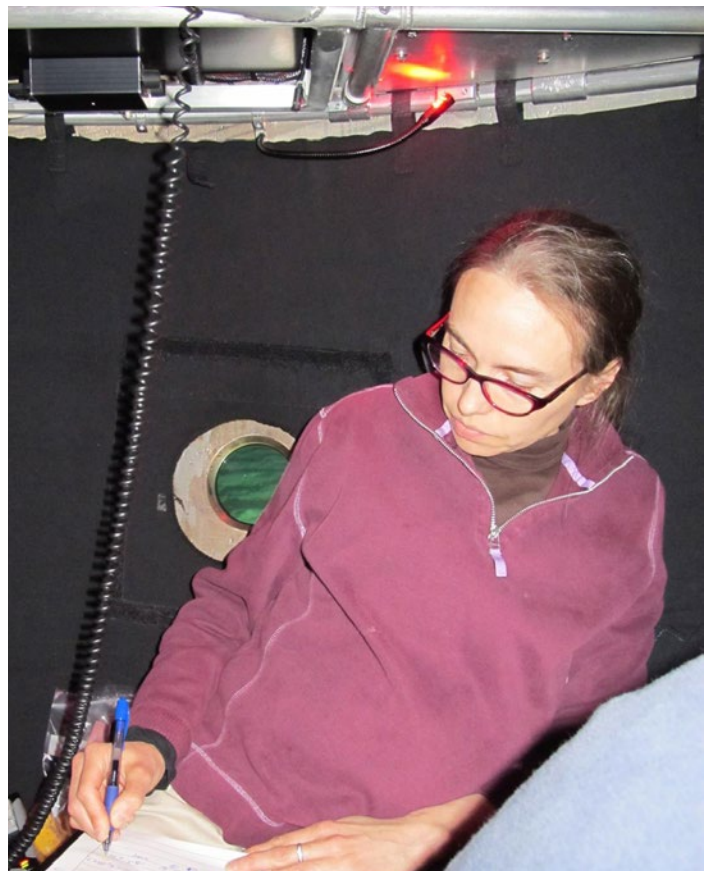
...continued from previous page

from macrofauna to the microorganisms living in sediments – are recovering from the Macondo discharge. While we saw increased diversity of large organisms in the vicinity of the wellhead, we saw some things at MC118 and MC253 that still have us scratching our heads. It will take some time to process all the samples so that we can tell a 2010 vs. 2014 story at MC118, and before we can quantify the differences at the MC252 and MC253 sites. All in all, we obtained a treasure trove of samples that will keep various graduate students and post docs busy for quite some time. I'm very excited to see and ponder the data as it's coming across my desk," Joye said.

Researchers employed a diverse array of methods for data collection, including a multibeam echosounder to identify sites of oil and gas seepage, CTDs, core samples, methane sensors, and many more, and captured some amazing images from a high definition camera attached to Alvin at their various research sites. During the Atlantis cruise, ECOGIG scientists tested out newly developed "mini-lander" technology. These mini-landers were equipped with a suite of sensors to measure conductivity, oxygen, temperature, pCO₂, and methane concentration. By positioning the mini-lander system at a distance from an active gas vent, and then adjacent to it, researchers were able to document for the first time the impact of localized venting on methane concentration fields.

Researchers returned to a site they initially visited in December 2010 that was impacted by the oil spill. Of note, the site that was devoid of sea life and macrofauna on that initial visit was now occupied by a variety of organisms, including fish, shrimp, eels, sea cucumbers, and brittle sea stars, just to name a few. "It is difficult to say with certainty whether this site has returned to "pre-DWH" conditions, because we don't have data from this site before 2010 but it's clearly much more active biologically in 2014 compared to 2010," Joye noted. Scientists encountered a "mysterious caramel brown layer" on the 2010 dive and found that it still remains nearly four years later. Additional research is needed to understand what comprises this layer and how it differs from the normal

In the hydrocarbon-rich Green Canyon 600 region, spots where sulfide- and methane-rich subsurface fluids reach the seafloor are marked by highly conspicuous sulfur-oxidizing bacteria and elemental sulfur particles that form a white surface coating on the seafloor sediments. The sulfidic seep sediments are collected using push cores, and are returned to the surface in Alvin's sampling basket.



Mandy Joye takes notes during Alvin dive 4687. Recording observations as well as times and positions is crucial, so events can later be tracked in the dive's video record. Photo Credit: Antonia Juhasz.

marine sediment layer underneath it. "The caramel layer is rich in hydrocarbons and is quite unique compared to similar samples we obtained from other sites near the wellhead in 2010. We will be quantifying the concentrations of various hydrocarbons in the layer now (2014) to compare the data to 2010. This information will help us elucidate whether the sediments are now more "habitable" compared to 2010," Joye said.

Researchers also visited Green Canyon 600 (GC600), the "most prolific natural hydrocarbon seep in the Gulf" according to Dr. Joye, and encountered a diversity of organisms adapted to thrive in that extreme environment. One particularly interesting finding was that of black hydrates – methane hydrates that have been colored black by continuous exposure to oil – which was even a surprise discovery to Dr. Joye. A high definition camera held by Alvin - called the "Beast Cam"- provided spectacular *in situ* images of oil chimneys and allowed researchers to see for the first time just how diverse these structures can be in color and shape. Oil chimneys also provide homes to ice worms, as do the gas hydrate mounds.

One of the research aims of the cruise was to conduct microbial surveys, which scientists did via core samples of microbial mats. Microbial mats form on the deep sea floor in the Gulf at gas seepages where microbes convert chemicals into biomass from the seeps, via chemosynthesis. The microbial mats encountered on this cruise were thin

SAVE THE DATE!**February 16-19, 2015***The Westin Galleria Hotel, Houston, TX*

The deadline to submit an abstract is October 3rd

<http://gulfofmexicoconference.org/>

white layers that revealed a very rough surface upon close inspection. The mat samples were probed with delicate microelectrodes, which are highly sensitive chemical sensors employed to quantify concentrations of oxygen and hydrogen sulfide, as well as pH, over sub-millimeter scale profiles in the mats. Mat samples were also collected to determine the concentrations of methane and higher alkanes (like propane) and dissolved inorganic carbon. Microbial mats are effectively “bull’s eyes” – they mark spots of active seepage. But GC600 is home to more than microbial mats; its macrofaunal community is dominated by clams and mussels that host chemosynthetic bacteria residing in their gills. These bacteria oxidize methane, hydrogen sulfide, and potentially other compounds. Their presence at GC600 speaks to the persistent nature of oil and gas seepage at this site, because such sizeable populations of larger animals require a constant source of reduced carbon. At GC600 that reduced carbon is in the form of oil and gas.

Dr. Joye and her research crew will conduct follow up cruises to the wellhead site, which will provide scientists with a better understanding of the long-term impacts of the spill and how the ecosystem recovers and changes over time.

ECOGIG’s mission is to understand the environmental signatures and impacts of natural seepage versus that of abrupt, large hydrocarbon inputs on coupled benthic-pelagic processes in deepwater ecosystems in the Gulf of Mexico, and to chart the long-term effects and mechanisms of ecosystem recovery from the 2010 Macondo well blowout.

More in-depth stories about the researchers’ experiences can be found in their cruise blogs on the ECOGIG website: <http://ecogig.org/blog-title/atlantisalvin-march-30-april-22-2014>.

Some of the many research highlights can be seen on ECOGIG’s YouTube channel: <https://www.youtube.com/channel/UCArX8cTbXrjK3c7VbkUig2A/videos>.

Oil Spill Research Vessel Invites Young Guests On Board

A lucky group of almost 200 Boys and Girls Club members had the opportunity to get aboard the E/V Nautilus in Gulfport, MS, to meet ECOGIG and other scientific researchers and see up close and personal the technology that the scientists use to study the deep sea environment. Read more about their experiences [here](#).

GoMRI Newsmakers

Congratulations to the following member of the GoMRI community!

Congratulations go out to Dr. Howard Stone, a professor in Mechanical and Aerospace Engineering at Princeton University, for his election into the National Academy of Sciences (NAS). Stone joins GoMRI Research Board Chair Rita Colwell as an NAS member. An invitation to join the ranks of the NAS is one of the highest distinctions that an American scientist or engineer can receive.

Dr. Stone, a specialist in fluid mechanics and a member of the *GoMRI-funded Consortium for the Molecular Engineering of Dispersant Systems (C-MEDS)*, is collaboratively working on the ultrafast dynamics of surfactant adsorption to interfaces that could ultimately lead to improvements in oil spill cleanup and degradation. In particular, Dr. Stone's group is studying the dynamics of bursting at an oil-covered interface and producing nanometer-diameter sized oil droplets dispersed in the water column.

GoMRI Presents Award at Intel International Science and Engineering Fair, May 11-15

During the Los Angeles event's two days of judging, GoMRI award judges looked at 19 oil spill related projects without their students present, and then returned to interview 10 of the students in person.

The winner was Swapnav Deka of Plano East Senior High School, Plano, TX. His work was performed at a lab at the University of Texas, where he studied the oil-eating bacteria, *Alcanivorax borkumensis*, which is widely found in the Gulf of Mexico region. Swapnav used a series of tests to determine the previously unidentified hydrocarbon transporters in *A. borkumensis* which allow the transport of oil into the interior of the bacteria cells for breakdown. He also performed a rudimentary cost analysis of bio-engineering bacteria to become more effective at biodegrading oil by over-expressing these transporters. His research and presentation were quite impressive.

The competition for this year's award was fierce, with a wide variety of oil spill related science projects to see from all over the world. There were quite a few projects on bioremediation by algae and bacteria, one project on the ideal size of dispersant droplets, and several others related to oil spill mitigation and clean up technology. It was a great event and choosing a winner was tough. Congratulations Swapnav!



Dr. David Divins of the Consortium for Ocean Leadership presents Special Awards to the winning projects at 2014 Intel International Science and Engineering Fair. Photo Credit: Consortium for Ocean Leadership.

Note from the Research Board Chair

Dr. Rita Colwell, University of Maryland and Johns Hopkins University

Reliable data are the cornerstone of science and critical for accurate research results. This holds true for petroleum compounds and their analyses. To promote the best possible science on hydrocarbons, GoMRI has partnered with the National Institute of Standards and Technology (NIST) in the Hydrocarbon Intercalibration Experiment (HIE).

HIE developed out of a GoMRI-sponsored workshop in January 2014, at which experts from various disciplines met to discuss current methods for hydrocarbon analysis, emerging new techniques, best practices for evaluating data quality, and improvement of methods for future applications. Workshop presenters described good laboratory practices and guidelines for analysis of crude oil constituents and detection of crude oil chemicals in sediment and tissues of animals and plants. To assure the highest quality data, presenters and workshop participants concluded there was a need and opportunity for participating laboratories to join in analyzing a set of certified standards and comparing results. Workshop participants strongly supported the notion of a comparison exercise. GoMRI followed up by launching the HIE partnership with NIST to advance laboratory QA/QC practices and undertake inter-laboratory comparisons and cross-calibrations.

Participants in the HIE were supplied with weathered crude oil and reference Macondo oil to analyze during late summer and fall 2014. Data resulting from the HIE will be submitted for compilation during the winter of 2014. The HIE results will be collated by Dr. Chris Reddy, Woods Hole Oceanographic Institution, for presentation and discussion of the results, practices, and lessons learned. Because discussion of these findings will be both useful and interesting, you are urged to attend the workshop to discuss results at the [2015 Gulf of Mexico Oil Spill and Ecosystem Science Conference](#) in Houston, Texas, scheduled for February 16, 2015.

The HIE is yet another example of the valuable and strong collaboration within the GoMRI community of researchers and beyond, with others who share a deep interest in hydrocarbon analysis. GoMRI is focused on fostering the highest quality research, informing science-based policy and management, and building intellectual capacity by fostering research connectivity.

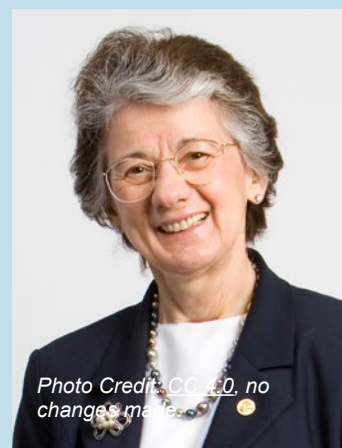


Photo Credit: CC BY, no changes made

Request for Proposals (RFP)-V will be released in mid-November

The GoMRI Request for Proposals for Individual Investigators or Small Collaborative Teams for 2016-2018 will be released in mid-November 2014. The purpose of the RFP is to select the research activities for GoMRI Years 6-8 (1 January 2016 – 31 December 2018) involving individual investigators or collaborative efforts comprising a principal investigator and up to three co-principal investigators. The total funds available for distribution through the 2016-2018 GoMRI Individual Investigators RFP will be approximately \$9 million per year.

The 2016-2018 GoMRI Individual Investigators RFP will include the five GoMRI Research Themes. Proposals may address one theme only. Letters of intent will be required in mid-January 2015 to qualify for submission of a full proposal in response to the 2016-2018 GoMRI Individual Investigators RFP in June 2015.

[For more details, please see the GoMRI website.](#)

RFP



Check out this video from the recent Nautilus expedition, where ECOGIG researchers use an ROV to deploy a dye pack that will help them measure coral growth. Unstained coral will show new growth when the scientists return to measure it next year.

The video can be seen [here](#) and a blog post about the experiment can be found [here](#).

Graduate Students Recognized as GoMRI Scholars for Oil Spill Research

The Gulf of Mexico Research Initiative (GoMRI) announces their Scholars Program to recognize the graduate students whose vital research contribute to improve understanding about the damage, response, and recovery following the Deepwater Horizon oil spill. One of the GoMRI Legacy Goals is to build intellectual capacity and improve fundamental understanding of the dynamics of petroleum pollution and related stressors for future events. Research Board Chair Rita Colwell said that “the GoMRI Scholars Program is a very important honor which provides a unique recognition of and builds community for the next generation of ocean science professionals with particular emphasis in the Gulf of Mexico.”

Candidates for this program must be graduate students who have participated in a GoMRI-funded project for at least one year, whose work is primarily funded by GoMRI, and who are working on a dissertation or thesis based on GoMRI-funded science. On a semi-annual basis, the Principal Investigators of GoMRI-funded projects nominate students who meet these criteria.

Following confirmation, each scholar will receive a letter of congratulations declaring the title GoMRI Scholar along with a certificate from Dr. Colwell. In addition, special events of interest to GoMRI Scholars will be incorporated into the annual Gulf of Mexico Oil Spill and Ecosystem Sciences conference. GoMRI will collect information about these scholars and their careers and accomplishments for longitudinal studies and program impacts.

As of March 2014, Directors for the eight Research Consortia have selected 137 students as GoMRI Scholars. Principle Investigators for the nineteen Investigator Grants are in the process of selecting their scholars.

Learn more about the scholars’ research and career paths on the GoMRI website:

[Grad Student Saha Makes Strides towards an Eco-friendly Dispersant Alternative](#)

[Grad Student Vozzo Assesses Oil Impacts on Louisiana Oysters](#)

[Grad Student Frasier is Learning What Dolphins Can Tell Us](#)

[Grad Student Snyder Cites Integrated Sciences as Key to Success](#)

[Grad Student Worthen Improves Oil Production and Cleanup Using Nanoparticles](#)

[Grad Student Harper Seeks to Improve Marine and Human Health with Science-Informed Policy](#)

Keep up with the Consortia Blogroll!

Several of the Consortia have been updating blogs. Check them out!

Measure. Model. Mitigate: [CARTHE](#)

Marsh Edge-U-Cation: [CWC](#)

A Day in the Life of a DROPPster: [DROPPS](#)

GoMRI Researcher Interview with Dr. Joseph Neigel

Dr. Joseph Neigel from University of Louisiana at Lafayette answered a few questions about his RFP-II project, *The Environmental Effects of an Oil Spill on Blue Crabs in the Gulf of Mexico and the Dynamics of Recovery: Integrating Oceanography and Molecular Ecology*, below.

1. Tell us a bit about your research. What are the goals of your project?

Together with my colleagues at Tulane, we are investigating how the blue crab, *Callinectes sapidus*, was affected by the Deepwater Horizon Oil spill, and more generally, how species like the blue crab respond to environmental change. This is a complex problem because along with the direct effects of a historically unprecedented oil spill there were the indirect effects of an unprecedented fisheries closure.

2. What has your research found with respect to oil spill impacts on blue crab larval dispersal and rates of larval settlement?

Perhaps surprisingly, we did not see a big change in blue crab settlement during 2010, the year of the spill. Indeed, some of the fisheries data that we have examined suggest that the following year was one of unusually high levels of recruitment to the juvenile stage. This may have been a consequence of the fisheries closures.

We do not yet know how patterns of dispersal were affected, this will require the larger population genetic data set that we are presently assembling. We are particularly interested in testing the hypothesis that loss of larvae from the oil spill was offset by larvae arriving from more distant sources. Our initial genetic analysis did show a shift in genetic structure that occurred between 2010 and 2011. It remains to be seen whether this is an unusual occurrence or how it might relate to the oil spill.

3. How have you used population genetics to look at connectivity among blue crab populations in the northern Gulf?

What we have found using nuclear gene sequences is that genetic connectivity is high among northern Gulf populations of blue crabs. This makes sense in terms of the life-cycle of blue crabs, which includes offshore spawning followed by a planktonic stage of a month or two. It also matches earlier studies that were conducted with other types of genetic markers. However, we also have evidence that the environment acts as a filter on recruitment, favoring some genotypes over others depending on local environmental conditions. This could mean that although larvae arrive from many different sources, only larvae with genotypes that are suited to the local environment are successful.

4. What are some of the most significant or exciting findings so far in your work?

Some of the most exciting findings come from the work of Bree Yednock, who was first a graduate student and then later a post-doc on the project. She showed that genetic variation in blue crab stress-response genes is adaptive, and she identified the genes that are regulated in response to oil exposure that we are now studying. Some of these oil-response genes are similar to human genes that are involved in metabolism of pharmaceuticals and other foreign chemical compounds.

5. What are the broader implications of your research and how might your findings inform the management of blue crab fisheries?

We know very little about how marine species adapt to environmental change and the role that genetic variation plays in this process. We are finding that genetic variation could be very important for the blue crab, which lives in coastal marshes where it must tolerate a broad range of environmental conditions. Maintaining genetic variation depends on a large and diverse breeding stock, which is vulnerable to a range of threats including loss of critical habitats, overfishing, excessive bycatch, oil spills, and other forms of pollution. The blue crab is nearly an ideal model for addressing these questions because so much prior work has been done on its biology and management. What we learn will have broader implications for many other species about which we know less.

6. Can you tell us more about your research collaboration with fellow GoMRI researchers?

I have some great collaborators. My Co-PI is Caz Taylor at Tulane. Her lab is using a particle-tracking model that is based on oceanographic data to predict blue crab larval dispersal trajectories. This complements our genetic analysis

continued on next page...

...continued from previous page

of dispersal and helps us determine where larvae that were exposed to oil and dispersant eventually settled. The Taylor lab is also looking at the sub-lethal effects of exposure to oil, dispersants, and other chemicals on blue crab larvae and juveniles, which ties in with our gene expression studies. We are also working with Ed Chesney at LUMCON, who is funded by a separate [GoMRI RFP-II grant](#). Ed and his post-doc, Tara Duffy, are interested in how oil exposure affects fish and invertebrate larvae. We are helping look at this from a biochemical perspective by characterizing the transcriptomes (expressed genes) of larval Bay Anchovy exposed to oil and dispersant.

7. If funding were not an issue, what would add to your project?

Our ongoing research will fill in some important pieces of the puzzle, but there are others that we urgently need if we are to have a complete picture of how blue crab populations function. I say urgently, because what we learn now about healthy blue crab populations will be our only baseline for understanding changes in the future. In the early 1980's as a graduate student, I was studying two of the most common corals in the Caribbean: Elkhorn and Staghorn coral. At the time, we had no inkling that they were about to begin a steep decline that would lead to them being listed as threatened under the Endangered Species Act. This was a lesson that I will never forget. For blue crabs, I would focus on three things: 1) We need to know more about what is happening offshore, to females that are spawning and to larvae from the time they are released to the time they settle as post-larvae. Although every stage of the blue crab life cycle is vulnerable, spawning females and larvae are especially so. We also need to integrate laboratory work with extensive field work, including plankton sampling and tracking of female crabs. 2) With the blue crab transcriptome now available, along with the tools made possible with it, we have the opportunity to gain a better understanding of how blue crabs respond not only to oil and dispersant, but also to other chemicals. Fertilizer, pesticides, detergents, and other chemical pollutants constantly flow into the Gulf, and we need to better understand how blue crabs and other species are affected. 3) We know that pathogen outbreaks can have sudden and severe impacts on marine species, but we seldom pay much attention until after an outbreak occurs. I would like to work at better characterization of pathogens carried by blue crabs in the Gulf, along with experimental investigations of what causes pathogens that are normally tolerated to suddenly cause disease outbreaks.

Science Corner

Published science highlights from the GoMRI program

[Study Makes Storm Surge Predictions at Less Cost without Sacrificing Accuracy](#)

Kyle T. Mandli and Clint N. Dawson
Ocean Modelling, 2014, 75, 36–50

[Study Shows Oil Promoted Formation of a Different Kind of Marine Snow](#)

Uta Passow, Kai Ziervogel, Vernon Asper, and Arne Diercks
Environmental Research Letters 2012: 7 035301

[Study: Dispersant Increases Oil Compounds Entering Atmosphere via Bursting Bubbles](#)

Franz S. Ehrenhauser, Paria Avij, Xin Shu, Victoria Dugas, Isaiah Woodson, Thilanga Liyana-Arachchi, Zenghui Zhang, Francisco R. Hung, and Kalliat T. Valsaraj
Environ. Sci.: Processes Impacts, 2014, 16, 65-73

[Study Evaluates Synthetic Aperture Radar as Oil Spill Detection Tool](#)

M.J. Caruso, M. Migliaccio, J.T. Hargrove, O. Garcia-Pineda, and H.C. Graber
Oceanography, 2013, 26 (2): 112-123

[Study Identifies Potential Oil Degradation Signal in Coastal Waters](#)

Xinping Hu, Wei-Jun Cai, Nancy N. Rabalais, and Jianhong Xue
Deep Sea Research II: Topical Studies in Oceanography, 2014: 1-8

To see all GoMRI publications, please visit the [GoMRI Publication Database](#).



GoMRI has partnered with the Smithsonian Institution to help share GoMRI research findings with the broad public audience that visits the [Ocean Portal](#) for information on all things ocean-related. The Ocean Portal has highlighted various GoMRI research topics, from how drifters are being used to better understand ocean currents and refine models that will help in future oil spill response efforts, to how small organisms like benthic foraminifera were

impacted by the spill.

The Ocean Portal also described some of the misconceptions that persist about the spill and its impacts, and used GoMRI research findings to clear them up. That article can be found on [Smithsonian Magazine online](#). The Portal will soon be publishing an interactive infographic, allowing site visitors the opportunity see information presented in a visually compelling way to understand the event as it first occurred, how different parts of the Gulf were impacted, and what is going on now, more than four years after the spill occurred. Check out the [Ocean Portal's GoMRI content](#).

Researchers use small boats to deploy drifters at select locations. Photo Credit: Tamay Özgökmen, University of Miami.



Frequently Asked Questions by Dr. Chuck Wilson

Dr. Chuck Wilson, Chief Scientific Officer for the Gulf of Mexico Research Initiative (GoMRI), answers a few of the most frequently asked questions about the program.

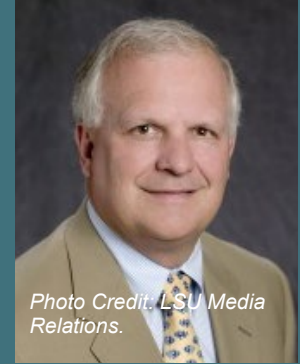


Photo Credit: LSU Media Relations.

Question: How will the partnership with Sea Grant help spread the word about GoMRI research?

Answer: The GoMRI Research Board is delighted to partner with Florida, Mississippi/Alabama, Louisiana and Texas Sea Grant College Programs to enhance GoMRI's outreach efforts. The GoMRI research consortia have robust outreach programs, and have already integrated GoMRI research findings into their communities through a varied and successful assortment of efforts, including workshops, career events, Teacher at Sea programs, podcasts, educational videos, community lectures, and hands-on lab and outdoor activities, just to name a few.

The new partnership with the four Gulf Sea Grant College Programs will supplement and strengthen current GoMRI outreach efforts, filling in geographic or target audience gaps that may exist. Not only will Sea Grant carry science facts and new findings out to target audiences, but GoMRI will benefit from Sea Grant's unique ability to collect and assimilate oil spill science priorities, attitudes, and opinions from stakeholders so we can respond to community needs.

For example, the four Sea Grant oil spill science outreach specialists, who are part of the Sea Grant network in the Gulf, will reach out to resource managers, emergency responders and people from industries that rely on a healthy Gulf of Mexico to facilitate stronger ties between GoMRI and its stakeholders and improve two-way communication. Such efforts allow these groups to share concerns and lessons learned, and help the community be better prepared to communicate and respond in the event of future spills.

Question: What are the particular strengths that Sea Grant brings to this partnership?

Answer: Sea Grant programs are located in every coastal state including the Great Lakes region and have a long standing reputation of success in forming relationships and partnerships with stakeholders in coastal regions. In this partnership with GoMRI, Sea Grant will focus on people who live, work and play in the Gulf region. This includes fishermen, people from the tourism industry, local business leaders, staff from environmental organizations, elected officials, emergency responders, and natural resource managers, among others. Sea Grant will also reach out to their extended network of 33 state-based Sea Grant extension programs and personnel to arm them with oil spill science information to better serve the communities that they work with directly. Building on existing relationships that Sea Grant has in the Gulf of Mexico region and beyond will help GoMRI achieve its legacy goal of promoting better understanding, confidence, and public trust, and helping to inform the best science-based policy and management.

The GoMRI research community is producing a vast expanse of scientific findings, as evidenced by the more than 330 journal publications and 1600 presentations to date. With the help of the Sea Grant oil spill science outreach specialists, that information can be translated into resources that can easily be understood by the public. Sea Grant specialists and extension agents will engage in two-way communication with stakeholders to identify where information gaps exist that can be filled by GoMRI research findings.

In addition to educating key target audiences about GoMRI research findings, the partnership will also create an integrated network of knowledgeable, experienced, and effective oil spill science communicators who can transfer their knowledge and processes to other regions should an oil spill occur elsewhere in the US. This will prepare the US-wide Sea Grant network to continue to serve its mission as a credible and trusted resource in disaster response.

Question: What are some of the products that will be developed to help the public better understand research results and the work that GoMRI scientists are doing?

Answer: The oil spill outreach program will allow Sea Grant specialists to find out what types of information stakeholders want and develop tailor-made products for them. The outreach specialists will produce a variety of materials, such as fact sheets and bulletins, focused on meeting information needs. The specialists will also gather input from community workshop participants and work with researchers to share oil spill research results at science seminars that will be facilitated by the specialists. The program's outreach materials and events will offer information about numerous published GoMRI research findings on such topics as dispersants, fisheries issues, and tar balls.

Teens Explore Oil Spill Impacts on Wetlands through Science and Art

Each summer, parents send their children to camp, trying to match their interests while broadening their horizons. This year, the parents of ten Louisiana students hit the jackpot: the Coastal Waters Consortium (CWC) inaugural Art and Science Camp. This camp challenged participants, engaging both their analytical and creative talents to learn about a locally-relevant and nationally-important subject matter—oiled marsh lands.

Murt Conover, the Senior Marine Educator for CWC, funded by the Gulf of Mexico Research Initiative (GoMRI), had been thinking about a combined discipline workshop such as this for years. The idea for the camp moved from dream to reality after a local artist, Karen Alice Clanton, approached Conover with questions regarding the Deepwater Horizon oil spill following her attendance at a CWC-hosted Coastal Roots workshop. Clanton, whose work focuses heavily on the Louisiana coast, and Conover soon developed a partnership, organizing a summer camp that emphasized the importance of both art and science as tools for communicating environmental concerns.

The camp took place June 8-11 in Cocodrie, Louisiana, and introduced teenagers to art and science – not as rivals but as allied subjects. The students (ranging from 8th to 12th grade) came from varying backgrounds, some with a noted interest in science and others in art. Students spent their days performing research and experiments about coastal wetlands and then translating what they learned into pieces of art.

The students were extremely enthusiastic about the camp, exceeding Conover's expectations. One student remarked, "I came for the science, but I really learned a lot about art." Meanwhile, another student who had attended the camp strictly to create art found that she loved working in the field and expressed that she was now considering pursuing wetlands biology once she entered college.

What began as an experiment to educate students on coastal wetlands through art and science soon became a life-changing experience. The impact of the camp on students and teachers set the stage for future CWC Art and Science camps, opening the door to not only education, but expression.

To learn more about the campers' experiences and see photos of the students in action, check out the full story on GoMRI's website here: <http://gulfresearchinitiative.org/teens-explore-oil-spill-impacts-wetlands-science-art/>.



Student April Olivier's acrylic painting, "Window of Time." April created this during the CWC Art and Science Camp saying, "in my artwork, I depicted the deterioration of the marsh and land loss over time." Provided by Murt Conover.



Deep-C summer intern and University of West Florida student Katie Vaccaro throws out a drift card on her Gulf research cruise with Dr. Richard Snyder. Photo Credit: Deep-C

Education Spotlight:

CWC provided scholarships for two high school students to participate in LEAD Camp (LUMCON'S Estuarine Awareness and Discovery), a week-long science camp that provides both lab and field-based learning experiences, exposing students to Louisiana's coastal habitat and broadening their understanding of potential oil spill impacts to the environment.

Deep-C hosted nine students as part of their Internship program for the summer 2014 semester. Students were matched with GoMRI researchers at a variety of institutions around the Gulf, based on their research interests. Read all about the interns' experiences in their posts on the Deep-C blog, [Voices from the Field](#).