

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:

Gulf of Mexico Oil Spill and Ecosystem Science (GoMOSES) Conference

February 4-7, 2019

New Orleans, Louisiana

[Register Now!](#)

Synthesis and Legacy Workshops

Core Area 1: Plume and Circulation Observations and Modeling

January 15-17, 2019

Tallahassee, Florida

Core Area 4: Allostatic Load

February 4-5, 2019

New Orleans, Louisiana

Core Area 6: Defining the Gulf of Mexico Microbiome

April 9-10, 2019

Washington, District of Columbia

Core Area 2: Fate of Oil and Weathering: Biological and Physical-Chemical Degradation

June 12-14, 2019

Washington, District of Columbia

GoMRI Attends the 2018 Clean Gulf Conference in New Orleans, Louisiana

Members of the Gulf of Mexico Research Initiative (GoMRI) management team, the Gulf of Mexico Sea Grant Oil Spill Science Outreach team, and the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC) attended the [2018 Clean Gulf Conference](#) in New Orleans, Louisiana from November 13-15, 2018. GoMRI, Sea Grant, and GRIIDC partnered on a booth in the Exhibit Hall, which was open to conference attendees on November 14 and November 15.

The goal of the annual Clean Gulf Conference is to bring together members of industry and the government to improve “prevention, preparedness, and response of oil and hazardous materials spills in inland, offshore, and marine environments.” The sessions focus on sharing lessons learned and best practices, and exhibitors share their products and services related to oil spill response and prevention. Approximately 2,000 attendees participate in the Clean Gulf Conference each year. This year’s schedule of events, including links to the individual sessions, is available [here](#).

At the booth, GoMRI, Sea Grant, and GRIIDC team members spoke with visitors about the program and shared promotional materials, including the Gulf of Mexico Sea Grant Oil Spill Science Outreach Program publications; GRIIDC pens, fliers, notepads, and screen cleaners; and GoMRI notebooks and stickers. The booth saw many visitors who were interested in learning more about the outcomes of the GoMRI research investment, especially the data from GoMRI through GRIIDC.



Photo Caption: (from left to right) Emily Maung-Douglass from the Gulf of Mexico Sea Grant Oil Spill Science Outreach team, Katie Fillingham from the Gulf of Mexico Research Initiative (GoMRI) management team, Rosalie Rossi from the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC), and Jessie Swanseen from the GoMRI management team exhibit at the 2018 Clean Gulf Conference in New Orleans, Louisiana from November 14-15, 2018. Photo Credit: Katie Fillingham.



Photo Caption: Researchers examined benthic foraminifera (a *Cibicides pachyderma* is pictured here) to understand changes to the water column during the marine oil snow event after Deepwater Horizon. Read more [here](#) and on page 6 of this issue. Image Credit: Lauren Reilly.

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and the publications produced by the Gulf of Mexico Sea Grant Oil Spill Science Outreach team. Visitors were also interested to learn more about GoMRI's Synthesis and Legacy activities and the outcomes of those efforts, as well as the upcoming 2019 Gulf of Mexico Oil Spill and Ecosystem Science conference in February in New Orleans, Louisiana. More information on the Clean Gulf Conference is available [here](#), and information on Clean Gulf's other upcoming regional meetings, including dates and locations for the 2019 Clean Waterways Conference and the 2019 Clean Pacific Conference, is available [here](#) and [here](#).



Photo Caption: Katie Fillingham from the GoMRI management team interacts with a visitor to the booth in the Exhibit Hall at the 2018 Clean Gulf Conference. Photo Credit: Katie Fillingham.



Smithsonian Ocean Portal recently released a new article in partnership with the Alabama Center for Ecological Resilience (ACER) called *How to Survive an Oil Spill: Oyster Edition*. Approximately 8.3 million oysters died after the Deepwater Horizon oil spill. Both dispersant and the input of fresh water into the coastal areas, that was meant to keep the oil away from shore, contributed to the loss. The Ocean Portal article highlights research by ACER scientist Dr. Sean Powers, who is conducting experiments in the field and in his lab that are focused on understanding how salt, genetic diversity, and dispersant impact oyster health and their resiliency in the event of future oil spills. Check it out [here](#).

Sea Grant

Texas • Louisiana • Florida
Mississippi-Alabama

The Gulf of Mexico Sea Grant Oil Spill Science Outreach team recently released a new eight-page publication called *Oysters and Oil Spills*. The publication describes how oysters grow and reproduce in the ocean and discusses how oil spills may impact their populations. In particular, the publication summarizes the findings from many studies to understand if oil bioaccumulated in shellfish, including oysters, following the Deepwater Horizon oil spill. These studies indicated that there was no evidence of bioaccumulation in shellfish and that they were safe to eat. The article concludes with information on oyster reef restoration efforts in the Gulf of Mexico. All of the Gulf of Mexico Sea Grant Oil Spill Science Outreach Program publications are available [here](#).



Image Credit: Gulf of Mexico Sea Grant Oil Spill Science Outreach Program.

As a part of their yearlong collaborative project with the National Academies of Sciences, Engineering, and Medicine Gulf Research Program (GRP) and the Gulf of Mexico Research Initiative, the Gulf of Mexico Sea Grant Oil Spill Science Outreach team hosted the first in a series of workshops to discuss "regional priority setting for health, social, and economic disruption from spills" from December 4-5, 2018 at the Houma-Terrebonne Civic Center in Houma, Louisiana. The goals of this kick-off workshop were to provide recommendations for public health protocols to be included in existing response and regulatory frameworks, identify pilot project ideas and research and outreach priorities, and identify resources available to address local and regional public health and disaster issues. A summary of the workshop is available [here](#), and an overview of the workshop series, including a link to a pre-workshop report, is available [here](#). For additional information on all of the Gulf of Mexico Sea Grant Oil Spill Science Outreach Program seminars and workshops, please visit their website [here](#).

GoMRI Newsmakers

Dr. Christopher Reddy from the Woods Hole Oceanographic Institution has been selected as a [recipient](#) of the 2018 [Ambassador Award](#) by the American Geophysical Union (AGU). [Dr. Reddy](#) was a co-principal investigator with the [Deepsea to Coast Connectivity in the Eastern Gulf of Mexico](#) (Deep-C) consortium, is a co-principal investigator with the [Center for the Integrated Modeling and Analysis of Gulf Ecosystems](#) (C-IMAGE), and is a co-principal investigator on the RFP-V project “[The State-of-the-Art Unraveling of the Biotic and Abiotic Chemical Evolution of Macondo Oil: 2010-2018](#).” The Ambassador Award is given annually to scientists who have made outstanding contributions in the areas of societal impact, service to the Earth and space community, scientific leadership, and promotion of talent and career pool. Dr. Reddy received his award during the Honors Tribute at the 2018 AGU Fall Meeting in Washington, District of Columbia. [GoMRI congratulates](#) Dr. Reddy on receiving this award!

The Gulf of Mexico Sea Grant Oil Spill Science Outreach team, one of GoMRI’s external outreach partners, has been awarded the National Superior Outreach Programming Award by the Sea Grant Extension Assembly for their efforts to synthesize and disseminate oil spill science with target audiences. The team includes extension specialists Chris Hale (Texas Sea Grant), Emily Maung-Douglass (Louisiana Sea Grant), Monica Wilson (Florida Sea Grant), Larissa Graham (formerly Mississippi-Alabama Sea Grant Consortium), Missy Partyka (Mississippi-Alabama Sea Grant Consortium), team communicator Tara Skelton (Mississippi-Alabama Sea Grant Consortium), team manager Steve Sempier (Mississippi-Alabama Sea Grant Consortium), and principal investigator LaDon Swann (Mississippi-Alabama Sea Grant Consortium). The Sea Grant Extension Assembly presents this award once every two years to “recognize outstanding success in outreach programming,” and it represents Sea Grant’s highest honor. The team received the award during a ceremony in Portland, Oregon in September 2018. The GoMRI community [congratulates](#) them on receiving this exceptional award and recognition. More information on the Gulf of Mexico Sea Grant Oil Spill Science Program can be found [here](#) and on page 2 of this issue.



Photo Caption: Members of the Gulf of Mexico Sea Grant Oil Spill Science Outreach team, from left to right: Steve Sempier, Chris Hale, Missy Partyka, Tara Skelton, and Monica Wilson. Not pictured: Emily Maung-Douglass, Larissa Graham, and LaDonn Swann. Photo Credit: Tara Skelton.

Keep up with the GoMRI-Funded Consortia on Social Media

[ACER](#): [Facebook](#), [Instagram](#)

[ADDOMEx](#): [Facebook](#), [Twitter](#), [Instagram](#)

[CARMMHA](#): [Facebook](#)

[CARTHE](#): [Facebook](#), [Twitter](#)

[C-IMAGE](#): [Facebook](#), [Twitter](#)

[CONCORDE](#): [Facebook](#), [Twitter](#), [Instagram](#)

[CRGC](#): [Facebook](#)

[CSOMIO](#): [Facebook](#), [Twitter](#)

[CWC](#): [Facebook](#), [Instagram](#)

[DEEPEND](#): [Facebook](#), [Twitter](#), [Instagram](#)

[DROPPS](#): [Facebook](#), [Twitter](#)

[ECOGIG](#): [Facebook](#), [Twitter](#), [Instagram](#)

[LADC-GEMM](#): [Facebook](#)

[RECOVER](#): [Facebook](#), [Twitter](#)

Check out the Gulf of Mexico Research Initiative Information and Data Cooperative’s (GRIIDC) recent stories:

[GRIIDC Staff Learn Scientific Computing with Python!](#)

[GRIIDC Hosts Advisory Committee Meeting in Austin](#)

GoMRI Researcher Interview with Dr. Nick Shay

Dr. Lynn (Nick) Shay from the Rosenstiel School of Marine and Atmospheric Science at the University of Miami answered a few questions about his RFP-V project, [*Three-Dimensional Gulf Circulation and Biogeochemical Processes Unveiled by State-of-the-Art Profiling Float Technology and Data Assimilative Ocean Models*](#), and his work as a co-principal investigator with the [*Deepsea to Coast Connectivity in the Eastern Gulf of Mexico*](#) (Deep-C) consortium.

1. Tell us a bit about your RFP-V research project, “Three-Dimensional Gulf Circulation and Biogeochemical Processes Unveiled by State-of-the-Art Profiling Float Technology and Data Assimilative Ocean Models.” What are the goals of your project?

The goal of the project is to build an end-to-end product using profiling floats and an assimilative physical/biochemical model that could be used in the event of another subsurface spill in the Gulf of Mexico. A significant fraction of the effort has been the development and deployment of the technology where the floats measure the temperature, salinity and current as well as dissolved oxygen, chlorophyll, backscatter and colored dissolved organic matter (CDOM) to as deep as 2000 meters (m). Of particular importance to the project is that the float measures current and shear quite well owing to the electromagnetic subsystems that were designed by engineers at the University of Washington’s Applied Physics Laboratory and integrated into the Autonomous Profiling Explorer (APEX) floats at Teledyne-Webb.

2. You were also a co-principal investigator with the RFP-I-funded consortium Deepsea to Coast Connectivity in the Eastern Gulf of Mexico (Deep-C). Could you tell us a bit about your involvement with this consortium?

Our involvement focused on tropical storms/hurricanes moving over the northern Gulf region close to the area of the BP oil spill and the DeSoto Canyon. In this case we extensively sampled the ocean using profilers deployed from the NOAA WP-3D aircraft to acquire temperature, salinity and currents prior, during and subsequent to Hurricane Isaac in 2012. These profilers went as deep as 1500 m (4500 feet) beneath the surface. In addition, we deployed several atmospheric sondes to measure the temperature, humidity and wind fields of Isaac.

3. What is your background and how did you get involved with this kind of work?

My background is in physical oceanography and fluid dynamics. As a graduate student (too many years ago), I worked in the Department of Meteorology while obtaining my degree in the Department of Oceanography at the US Naval Postgraduate School. There are clearly linkages between the two fluids that are amplified across the air-sea interface over a broad spectrum of time and space scales.

4. What are some of the most significant or exciting findings so far in your GoMRI-funded research?

It is one of first long-term deployments of the Autonomous Profiling Explorer floats with electromagnetic subsystems (APEX-EM) spanning about 18 months. The simultaneous measurement of the physical and biochemical properties using this new technology has allowed us to assess the oceanic responses to the passage of cold atmospheric fronts and hurricanes over the northern Gulf. For example, we could change missions of the floats using Iridium remote sensing allowing the float to sample faster over a smaller depth range (as we did in Hurricane Michael) or sampling slower in time to depth. The team observed significant changes in the dissolved oxygen and chlorophyll concentrations just beneath the depth of the surface mixed layer during frontal passage as well as during Hurricane Nate (2017). Our team believes this will be a game changer given the strong ocean currents and shears that primarily drive mixing events are linked to the changes in the biochemical concentrations. In addition to providing long time/space series of current and shear, the Lagrangian floats are uniquely capable of sensing deep ocean properties of the Loop Current and the shedding of warm eddies, which has relevance to the [*Loop Current study*](#) sponsored by the National Academies of Sciences, Engineering, and Medicine. Finally, the coupled physical/biochemical model is showing promise in assimilating these data as we move towards that end-to-end product as noted above.



Photo Caption: An APEX-EM Float with an Optode Dissolved Oxygen Sensor at the top along with an Iridium antenna manufactured by Teledyne-Webb. The fins allow the profiler to rotate with depth to measure the two-dimensional currents. Photo Credit: Nick Shay.

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5. Can you talk a bit more about the assimilative model and how it can be used by responders in the event of future oil spills?

Having an evaluated end-to-end model with data assimilation will allow responders to target specific areas in the Gulf to aid in mitigating the possible effects of another subsurface spill. The assimilation scheme will be able to ingest various data types (physical, biochemical) to predict where the oil (or hydrocarbons) are heading. Recall the subsurface spill in 2010 from the well head had various layers or “clouds” of hydrocarbons in the water column that were being moved around by the subsurface ocean currents as well as surface signatures sensed by satellite missions.

6. If funding were not an issue, what would you add to your GoMRI-funded project?

Given the oceanographic linkages between the Caribbean Sea and the Gulf of Mexico via the Yucatan Straits and the fact that the region is known as “Hurricane Alley,” I would deploy more of these floats to map the shallow and deep water pathways associated with the background circulation and estimate upper ocean heat content relative to 26°C (78°F) water to assess the variability in the biochemical properties starting in the eastern part of the Caribbean Sea basin. It is well established that storms moving over this large basin often intensify to severe hurricane status and can make their way into the Gulf. In this context, profiling floats offer a relatively inexpensive way to cover a large part of the basin. Such long-term measurements are critical for coupled forecast models to accurately predict intensity and structure change of hurricanes which affect our hemisphere (e.g., Hurricane Michael). These measurements would be invaluable to map out the current field to depth in these basins.

GoMRI Scholars in Action

GoMRI recognizes the graduate students whose vital research contributes to improving understanding about the damage, response, and recovery from the Deepwater Horizon oil spill. Candidates for the GoMRI Scholars program must be graduate students who have participated in a GoMRI-funded project for at least one year, whose research is primarily funded by GoMRI, and who are working on a dissertation or thesis based on GoMRI-funded science.

[Learn more about the scholars' research and career paths on the GoMRI website!](#)

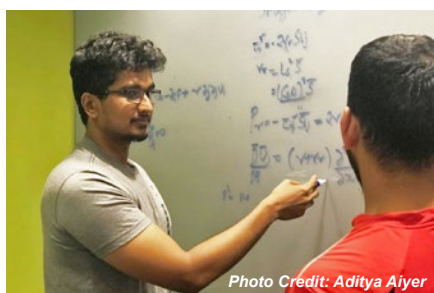


Photo Credit: Aditya Ayer

[Grad Student Ayer Shows How Oil Droplets Evolve Under Deep-Water Conditions](#)



Photo Credit: Smruthi Karthikeyan

[Grad Student Karthikeyan Uses Genetics to Understand Microbial Oil Degradation in Beach Sands](#)



Photo Credit: Kathryn Keating

[Grad Student Keating Surveys Children and Families for Long-Term Oil Spill Impacts](#)



Photo Credit: Laura Bretherton

[Grad Student Setta Studies Microbial Interactions to Inform Oil Spill Response Strategies](#)

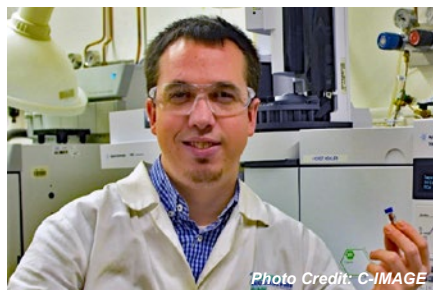


Photo Credit: C-IMAGE

[Grad Student Viamonte Puts Pressure on Microbial Oil Degradation](#)



Photo Credit: Luna Hiron

[Grad Student Hiron Investigates Loop Current Flows to Improve Oil Transport Models](#)

GoMRI and MTS Release Special Issue of *MTS Journal*

The Gulf of Mexico Research Initiative (GoMRI) and the Marine Technology Society (MTS) have partnered to produce a special issue of the *Marine Technology Society Journal*. The special issue was developed through an initial collaboration between the GoMRI and MTS communities at a TechSurge event in February 2018, called *Advancing Oil Spill Technology: Beyond the Horizon*. The goal of the TechSurge was to bring the two communities together to share research results and discuss how they could work together to be better prepared for future oil spill events; areas of focus included modeling and prediction, mitigation, technologies for detection, and ecosystem health. The TechSurge was featured in the [winter 2018 issue](#) of the GoMRI Quarterly Newsletter. Following the event, the *MTS Journal* announced a call for papers inviting the oil spill science community to [submit abstracts](#) to contribute to the special issue, which is also called *Advancing Oil Spill Technology: Beyond the Horizon*. Dana Yoerger, GoMRI Research Board member; Steve Murawski, Director of the Center for the Integrated Modeling and Analysis of the Gulf Ecosystem (C-IMAGE); Sherryl Gilbert, C-IMAGE Program Coordinator; and Liesl Hotaling, Vice President of Education at the Marine Technology Society, served as guest editors. The special issue is available to Marine Technology Society members [here](#).

“The Deepwater Horizon accident, tragic as it was, became a motivating force for technological innovation first to understand the facts and consequences of that accident, later to consider more widely the challenges of working at the frontiers of the marine oil and gas industries. The apparatus, techniques, and analyses described in this special issue of the *Marine Technology Society Journal* are but a taste of the many new innovations that will hopefully help prevent future deep oil and gas accidents and provide responders with more timely situational awareness of future accidents.”

Steve Murawski, Guest Editor and Director of the Center for the Integrated Modeling and Analysis of the Gulf Ecosystem (C-IMAGE)

Science Corner

Published Science Highlights from the GoMRI Program

[Study Describes Foodweb Dynamics of Predatory Deep-Sea Fishes in the Gulf of Mexico](#)

T.M. Richards, E.E. Gipson, A. Cook, T.T. Sutton, R.J.D. Wells
ICES Journal of Marine Science, 2018, fsy074

[Study Shows Oil Impacts in Deep-Sea Coral Colonies Seven Years After Deepwater Horizon](#)

F. Girard, C.R. Fisher
Biological Conservation, 2018, Vol. 225, pgs. 117-127

[Study Develops Numerical Model for Marine Oil Snow Aggregate Formation and Sinking](#)

A.L. Dissanayake, A.B. Burd, K.L. Daly, S. Francis, U. Passow
Journal of Geophysical Research: Oceans, 2018, Vol. 123(8), pgs. 5388-5405

[Study Finds Benthic Foraminifera Recorded Deepwater Horizon Marine Oil Snow Event](#)

P.T. Schwing, J.P. Chanton, I.C. Romero, D.J. Hollander, E.A. Goddard, G.R. Brooks, R.A. Larson
Environmental Pollution, 2018, Vol. 237, pgs. 424-429

[Study Gives First Comprehensive Gulf-Wide Fish Surveys in U.S., Mexican, and Cuban Waters](#)

S.A. Murawski, E.B. Peebles, A. Gracia, J.W. Tunnell Jr., M. Armenteros
Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science, 2018, Vol. 10(3), pgs. 325-346

[Study Is First to Examine How Oil and Gas Tumbling Inside Pipe Affects Released Oil Estimations](#)

M.C. Boufadel, F. Gao, L. Zhao, T. Ozgokmen, R. Miller, T. King, B. Robinson, K. Lee, I. Leifer
Geophysical Research Letters, 2018, Vol. 45(5), pgs. 2396-2403

[Study Shows Oil Exposure Not Likely to Reduce Fish's Ability to Compensate for Hypoxia](#)

Y.K. Pan, A.J. Khursigara, J.L. Johansen, A.J. Esbaugh
Chemosphere, 2018, Vol. 200, pgs. 143-150

[Study Documents How Riverine Fronts Influence Oil Transport Pathways](#)

Y. Androulidakis, V. Kourafalou, T. Ozgokmen, O. Garcia-Pineda, B. Lund, M. Le Henaff, C. Hu, B.K. Haus, G. Novelli, C. Guigand, H. Kang, L. Hole, J. Horstmann
Journal of Geophysical Research: Oceans, 2018, Vol. 123(5), pgs. 3259-3285

[Study Finds Sunlight Reduced Dispersant's Effectiveness During Deepwater Horizon](#)

C.P. Ward, C.J. Armstrong, R.N. Conmy, D.P. French-McCay, C.M. Reddy
Environmental Science and Technology Letters, 2018, Vol. 5(5), pgs. 226-231

[Study Finds Hurricane Isaac Prolonged Oil Spill Impacts on Some Marsh Insects and Spiders](#)

W. Bam, L.M. Hooper-Bui, R.M. Strecker, P.L. Adhikari, E.B. Overton
PLoS ONE, 2018, Vol. 13(6), e0199467

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



The Ecosystem Impacts of Oil and Gas Inputs into the Gulf (ECOGIG) consortium has released a new video series in partnership with filmmaker and *Sherman's Lagoon* creator Jim Toomey called *The Adventures of Zack and Molly* (the #DeepSeaDuo). The three-part series follows Zack and his new roommate Molly, a Dumbo Octopus, as they explore the deep ocean in the Gulf of Mexico. Throughout the series, Molly teaches Zack about her home, including the unique ecosystems that exist there and how they are being impacted by human activities. The videos are available through the ECOGIG website [here](#), which also includes a learning guide for educators, the series' trailer, and recent and upcoming film festival screening dates. The series has already won Best Animation (Jim Toomey) at the Wildlife Conservation Film Festival and Award of Excellence: Nature/Environment/Wildlife (Jim Toomey) at the Best Shorts Competition. Be sure to check it out!

The [Consortium for Advanced Research on the Transport of Hydrocarbon in the Environment \(CARTHE\)](#) was featured in an episode of Xploration Awesome Planet titled *Threatened Places*, which premiered on November 10, 2018. In the episode, host Philippe Cousteau Jr. (Jacques Cousteau's grandson!) visits the Gulf of Mexico to learn how CARTHE scientists are studying ocean pollution transport and designing new equipment to better measure ocean currents. Xploration Awesome Planet is a part of [Xploration Station](#), which also includes Xploration Earth 2050, Xploration Outer Space, Xploration Nature Knows Best, Xploration DIY Sci, and Xploration Animal Science. Xploration Station has been nominated for multiple Daytime Emmys, including twice for Xploration Awesome Planet for Best Travel/Adventure Series and Best Host: Philippe Cousteau Jr. Check out all episodes of Xploration Awesome Planet [here](#) and the episode highlighting CARTHE [here](#). The episode is also available on Amazon Prime [here](#).

Don't forget to check out GoMRI's YouTube Channel [here](#).



Image Credits: ECOGIG and Jim Toomey.



Dispatches from the Gulf 2 was screened at several events over the last few months. The Corpus Christi Museum of Science hosted a screening of the film on September 21, 2018, followed by a panel discussion which included Dr. Edward Buskey and Dr. Zhanfei Liu, principal investigator

and co-principal investigator of the GoMRI-funded Dispersion Research on Oil: Physics and Plankton Studies (DROPPS) consortium, and Dr. Andrew Esbaugh from the Relationships of Effects of Cardiac Outcomes in Fish for Validation of Ecological Risk (RECOVER) consortium. *Dispatches from the Gulf 2* was also screened at the Ojai Film Festival on November 2, 2018 and November 11, 2018 in Ojai, California. Finally, Bill Mills, *Dispatches from the Gulf* cinematographer, and Susan Snyder from the Center for the Integrated Modeling and Analysis of Gulf Ecosystems (C-IMAGE) participated in a session at the St. Petersburg Science Festival in St. Petersburg, Florida on October 20, 2018, where they shared clips of the documentaries and discussed their experiences filming them.

Screenscope Films and GoMRI are pleased to announce that production of *Dispatches from the Gulf 3* is underway, with anticipated release in early 2019. In addition to the film, Screenscope will launch a series of new short videos to complement the third film, which will be shared on the GoMRI Twitter page using the hashtag #50shorts once they are available. For more information and announcements about the upcoming release, follow along on the *Dispatches from the Gulf* website [here](#).

Guest Frequently Asked Questions

Dr. Larry McKinney, Executive Director of the Harte Research Institute for Gulf of Mexico Studies and Chair of the Gulf of Mexico Oil Spill and Ecosystem Science (GoMOSES) conference Executive Committee (ExComm), answered a few questions about the role of the ExComm, the 2019 GoMOSES conference, and plans for the future.

Question: What is the Executive Committee's role in planning the GoMOSES conference?

Answer: The Executive Committee's (ExComm) role in planning GoMOSES is to provide the excellent and experienced conference planning team both actual support and, probably more importantly, moral support in planning the largest and most complex annual science meeting focused on the Gulf of Mexico. The ExComm, as we call ourselves, is made up of representatives from the Gulf science community who positively contribute to making GoMOSES as impactful as possible. While the initial members were appointed by the GoMRI Research Board, the ExComm has grown and evolved to meet the changing needs and goals of GoMOSES. Nearly all the ExComm members are seasoned hands in putting workshops and conferences together, so no matter the challenge, someone on the committee has probably successfully dealt with it before. After so many years of successful GoMOSES meetings, the mechanics of putting it together are well established. There are always new challenges in execution, and that is where the ExComm helps the planning team. Hurricanes are accommodated and obdurate hotels are endured with the help of the ExComm. Making sure GoMOSES has an interesting schedule of presentations and posters that reflect the complex and diverse nature of Gulf research is an annual challenge, and I think this is where the ExComm members really shine in reviewing proposals and helping session organizers (also on my list of heroes) to work their magic making GoMOSES seem as smooth and organized as it is every year. GoMOSES may seem like the swan serenely sailing along the lake. The ExComm and staff are beneath the surface madly paddling to make it so.

Question: How does this year's theme reflect the evolution of the conference in recent years?

Answer: This year's conference theme, *Changing Focus: From Oil Spill Response to Restoration*, is an effort to reflect the accelerating shift of nearly a decade of Gulf research related to Deepwater Horizon. It is also an effort to encourage the Gulf's science community to both look to improving science support of restoration and to engage synthesis efforts to better focus on future research priorities. It is an extraordinary time for the Gulf. Never has so much restoration funding been aligned with a greater need in the Gulf of Mexico. And, never has there been a greater need for support from the Gulf's science community. That community, led by GoMRI, has stepped up. Think about it for just a moment. We have expended more on science and learned more about the Gulf of Mexico over the last ten years than in all times before. That may seem a bold statement but it is not difficult to back up. The challenge now is bringing all of that science to bear in making sure that the billions of restoration dollars that will be expended in the Gulf over the next ten to fifteen years make a meaningful impact. What better way to move forward than to look back at learn lessons from history, in this case Exxon Valdez. They have been there and done that. Additionally, it is important that we assess all that we have learned in the Gulf since April 20, 2010. There will be many research programs carrying on after GoMRI, and they will build upon a sound foundation. This is an opportunity that hopefully comes only once from such a source, and we must make the most of it. We have an opportunity to show the country and world that funding science and restoration is a sound investment. The GoMOSES opening plenary is an effort to focus our attention on that daunting but achievable challenge.

Question: What are the ExComm's goals and plans for GoMOSES after GoMRI ends in 2020?

Answer: GoMOSES has become the go-to science meeting for the Gulf of Mexico. The opportunity for 900 to 1,000 Gulf scientists to come together did not exist before the GoMRI program. Now GoMOSES, in addition to topical science sessions of broad appeal, has become the meeting place of opportunity. The Monday before the conference is filled with diverse workshops, and side meetings of just about every Gulf-centric organization abound throughout the week. What comes after GoMOSES and GoMRI, that continues the synergy and sustains this energy, is a topic of great focus within the ExComm. There are three key Gulfwide meetings acknowledged as "must attend." GoMOSES is one, and the GOMA All Hands and the Harte Research Institute's State of the Gulf Summit are the other two. All three share some common ground but are distinct in their own right. As other Gulf science programs hit their stride, especially the National Academies of Sciences, Engineering, and Medicine Gulf Research Program, RESTORE Centers of Excellence, and the NOAA RESTORE Science Program, all are

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considering how to better coordinate and work together. Some future form of GoMOSES is a part of answering that question. The ExComm has fostered an effort to develop a GoMOSES successor. The GoMRI Research Board is intent on supporting such an ongoing effort, if it can sustain what GoMOSES initiated and has so successfully sustained. The Gulf of Mexico Restoration and Ecosystem Sciences Symposium (GoMRESS) is the ExComm's evolving vision of what that might look like. This year and next will be the last official GoMOSES meetings, and the ExComm is working towards a sustainable successor. By the time we meet in Tampa for the 2020 GoMOSES, our goal is to have GoMRESS ready to roll out.

Education Spotlight

Members of the [Consortium for Advanced Research on Marine Mammal Health Assessment](#) (CARMMHA), including Mandy Tumlin, Jaimie Thompson, Ashley Barratclough, Alissa Deming, Brittany Novick, and Celeste Parry, participated in the Girl Scouts Believe in G.I.R.L. (Go-Getter, Innovator, Risk-Taker, Leader; B.I.G.) event, hosted by the Girl Scouts Louisiana East Council at the University of New Orleans in New Orleans, Louisiana on September 29, 2018. The event featured more than 40 displays and demonstrations highlighting STEM opportunities for girls, as well as life skills, entrepreneurship, the outdoors, arts, and more geared towards girls of all ages, from kindergarten through high school. The United States Coast Guard, the Louisiana State University Museum of Natural Science, the Association for Women and Science, and many others organizations participated. The CARMMHA team hosted several workshops during the event that included information about marine mammals and simulated performing health assessments on them. Check out the CARMMHA Facebook page for more information [here](#). To learn more about the Girl Scouts Louisiana East Council and the B.I.G. event, visit their website [here](#).

Members of the [Consortium for Oil Spill Exposure Pathways in Coastal River-Dominated Ecosystems](#) (CONCORDE), including Inia Soto (now with the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC) at Texas A&M University - Corpus Christi), Kemal Cambazoglu, Jessie Kastler, Sabrina Parra, and Bob Arnone, published an article in the November 2018 issue of the National Science Teachers Association journal *The Science Teacher* called *Virtual Oceanography: Studying river plumes using data visualization tools, ocean model data, and satellite imagery*. The article features a classroom activity geared toward high school students, focused on using satellite-derived chlorophyll-a imagery and model-derived salinity data to construct a virtual cruise, including determining the scientific objectives, charting the cruise track under a specified budget and time frame, drawing scientific conclusions based on the data provided and the selected cruise track, and writing a cruise report. The activity also includes opportunities for students to learn about and utilize ArcGIS Earth to chart their cruise path and analyze mapped geographic information. The overall goal of the activity is to encourage students to engage in active learning by challenging them to think through all the steps involved in the scientific process, from determining the research plan, to collecting data, to analyzing the results. John Dupuis, who attended a CONCORDE teacher workshop during the [AUV Jubilee](#), piloted the activity with 80 environmental science students at St. Thomas More High School in Lafayette, Louisiana. The journal is offering this article as a free download, which can be accessed by signing up for a free account with the National Science Teachers Association [here](#).

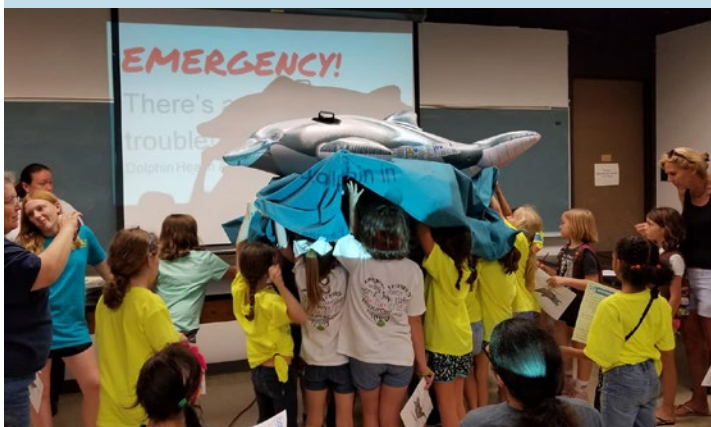


Photo Captions: CARMMHA hosts workshops about marine mammals at the Girl Scouts B.I.G. event in New Orleans, Louisiana on September 29, 2018. Photo Credits: CARMMHA.



Photo Credit: CC 4.0, no changes made.

Note from the Research Board Chair

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

As the challenges of our time become ever more complex, there is a detectable shift occurring in the scientific community toward **convergence research**. Convergence, simply interpreted, is the idea that complex scientific problems require integration of multiple disciplines, including physical sciences, mathematics, engineering, and social sciences, if those challenging problems are to be solved.

In 2018, the National Science Foundation (NSF) released a [Dear Colleague Letter](#) focused on convergence research, identifying it as one of [NSF's 10 Big Ideas for Future NSF Investment](#) and defining convergence research as “research driven by a specific and compelling problem,” requiring “deep integration across disciplines.” The Gulf of Mexico Research Initiative (GoMRI) exemplifies convergence research, according to the NSF definition. GoMRI was initiated in

response to a specific and compelling problem and was designed to determine the effects of the largest oil spill event in the United States – Deepwater Horizon. GoMRI scientists are drawn from a wide variety of backgrounds and began working together after the spill to evaluate and understand impacts of the event and prepare response to future spills. Discoveries achieved by scientists working in the program have proven invaluable, notably because they are comprehensive, robust, and based on multidisciplinary science. The GoMRI program supports researchers not only in physical, biological, and chemical oceanography, but also in social sciences, veterinary medicine, engineering, environmental modeling, and public health, inter alia. GoMRI researchers collaborate across institutions and with first responders, federal agency scientists, policy experts, and external outreach partners. The primary focus is on the study and sharing of research discoveries made in the Gulf of Mexico and in geographically relevant areas around the world. GoMRI-funded consortia provide a critical model showing how researchers across different institutions work together effectively to address key scientific questions linked to an important societal need.

In 2014, the National Academies of Sciences, Engineering, and Medicine published a consensus report titled [Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond](#). The report highlights the importance of convergence research to address complex challenges and, perhaps more importantly, provides examples of organizations carrying out convergence research. Some of the lessons learned are shared. Clearly, GoMRI provides a model for a scientific program encouraging convergence as a strategy. It is our hope that GoMRI will serve as a success story that highlights both the importance and the value of this emerging trend for science.



Contributing Author: Callan Yanoff

The Gulf of Mexico Research Initiative's (GoMRI) Synthesis and Legacy efforts are well underway, with several Synthesis workshops already having occurred throughout the country. The range of topics discussed has been quite varied, from one workshop focused on research related to toxicology of oil in fish, birds, turtles, and mammals, to another exploring the feasibility of developing a human health observing system in the Gulf of Mexico. Each of these workshops has brought together a wide breadth of expertise, across sectors, to try and capture what was

known at the time of Deepwater Horizon, what has been learned since, what still needs to be explored, and how GoMRI can best apply what they have learned.

This was the first wave in a series of workshops, presentations, and subsequent publications, with many more being planned to bring together members of the GoMRI consortia, individual investigators, and others from the community to continue capturing GoMRI's scientific discoveries and results. Over the next several months, additional Synthesis

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workshops will be held on the following topics:

- **Plume and Circulation Observations and Modeling (Core Area 1)** will be held from January 15-17, 2019 in Tallahassee, Florida. This three-day, cross-GoMRI workshop will include four breakout sessions, focused on the following Core Area 1 subtopics: large-scale observations and modeling; small-scale, near-surface, sub-mesoscale observations and modeling; coastal, riverine, and near-shore processes and modeling; and buoyant/rising plume modeling.
- **Allostatic Load (Core Area 4)** will be held in New Orleans, Louisiana from February 4-5, 2019, during the Gulf of Mexico Oil Spill and Ecosystem Science conference. This workshop is following-up on the Human Health Observing System workshop held in Washington, District of Columbia (D.C.) from November 14-16, 2018. Among the ideas and concepts discussed in the prior workshop was the notion of allostatic load (AL). A definition of allostatic load - one among several similar definitions put forth since its introduction in 1993 - is as follows: the price the body pays for being forced to adapt to adverse psychosocial or physical situations. Workshop discussions will address practical measurement of exposure and its relationship to AL, beginning with conceptual issues and shifting to strategies for operationalizing AL.
- **Defining the Gulf of Mexico Microbiome (Core Area 6)** is to be held April 9-10, 2019 in Washington, D.C. in partnership with the American Academy of Microbiology (AAM) and the American Geophysical Union (AGU). This effort is centered around a colloquium on the frontiers of marine microbiology and metagenomics applied to oil spills, to provide a quantitative understanding of the ecological response of biological communities to oiling as well as the role of biodegradation in the fate of petroleum hydrocarbons released from oil discharge. Discussion will also include how novel findings can be used to improve planning, preparedness, response, and recovery in future oil spills.

For more information about GoMRI's Synthesis and Legacy effort, including dates of upcoming workshops, please visit [here](#) and [here](#).



Photo Captions: (top) Participants in the Gulf of Mexico Marine Mammal Research (Core Area 3) workshop held in Washington, D.C., from October 31-November 2, 2018. (bottom) Participants in the Development of an Operational Community Health Observing System for the Gulf of Mexico States (Core Area 4) workshop held in Washington, D.C. from November 14-16, 2018. Photo Credits: Abby Ackerman.