

## Upcoming Events:

### 2020 Gulf of Mexico Oil Spill and Ecosystem Science (GoMOSES) Conference

February 3-6, 2020  
Tampa, Florida

*Submit a session proposal!*  
*Deadline is June 21, 2019.*

### Synthesis and Legacy Workshops

#### **Core Area 5 - Living on the Edge: Enhancing the Sustainability of Coupled Human-Environment Systems in the Gulf of Mexico Region**

July 10-12, 2019  
Mobile, Alabama

#### **Core Area 3 – Ecosystem Impacts of the Deepwater Horizon Event: Assembling the Record of Species and Community Change**

July 23-25, 2019  
St. Petersburg, Florida

#### **Core Area 3 – Vulnerability and Resilience of Species and Ecosystems to Large-Scale Contamination Events: Lessons from Deepwater Horizon**

October 9-11, 2019  
Washington, District of Columbia

#### **Core Area 7 - Operational Oil Spill Monitoring**

October 15-17, 2019  
Washington, District of Columbia

## 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/>

# C-IMAGE Leads the Publication of Two Books Focused on Oil Spills

Contributing Author: Sherryl Gilbert, C-IMAGE Assistant Director

Two text books focused on oil spill science and response have been published by Springer Nature Publishing Company. The development of the books was led by the Center for the Integrated Modeling and Analysis of the Gulf Ecosystem (C-IMAGE). Steven Murawski (C-IMAGE, University of South Florida), Cameron Ainsworth (C-IMAGE, University of South Florida), Sherryl Gilbert (C-IMAGE, University of South Florida), David Hollander (C-IMAGE, University of South Florida), Claire Paris (C-IMAGE, Relationships of Effects of Cardiac Outcomes in Fish for Validation of Ecological Risk (RECOVER), University of Miami), Michael Schlüter (C-IMAGE, Hamburg University of Technology), and Dana Wetzel (C-IMAGE, Mote Marine Laboratory) served as editors and authors. Nearly 150 additional researchers, many of whom are funded by GoMRI and involved in GoMRI-funded consortia and projects, authored articles. Together, the two books feature 63 chapters. The first book, **Deep Oil Spills – Facts, Fate, and Effects**, includes sections on *Physics and Chemistry of Deep Oil Well Blowouts; Transport and Degradation of Oil and Gas from Deep Spills; Oil Spill Records in Deep Sea Sediments; Impacts of Deep Spills on Plankton, Fishes, and Protected Resources; Toxicology of Deep Oil Spills; and Ecosystem-level Modeling of Deep Oil Spill Impacts*. The second book, **Scenarios and Responses to Future Deep Oil Spills – Fighting the Next War**, includes sections on *Geological, Chemical, Ecological, and Physical Oceanographic Settings and Baselines for Deep Oil Spills in the Gulf of Mexico; Simulations of Future Deep Spills; Comparisons of Likely Impacts from Simulated Spills; and Preparing for and Responding to the Next Deepwater Spill*.

The goals of the books are to synthesize a large part of the GoMRI-funded research that is directly related to risk reduction, oil spill preparedness, and ecosystem health assessment, and to use this new body of knowledge to project how the research and response communities might better respond to future spills. The editors included contributions from researchers beyond the GoMRI community that work for the federal government, in academia, and in private industry. Both volumes identify remaining key research questions yet to be answered and how these unknowns could impact decision making in light of production trends in the oil and gas industry.

The books are considered Gulf of Mexico Research Initiative Synthesis and Legacy products. They will be available in both hardcover and eBook formats later this summer, but they can be preordered now on the Springer website [here](#) and [here](#).

## Guest Frequently Asked Questions

*Dr. Jessica Henkel, science advisor and coordinator with the Gulf Coast Ecosystem Restoration Council, established through the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States (RESTORE) Act after the Deepwater Horizon oil spill, answered a few questions about her research in the Gulf and her work with the Council.*

**Question:** Please tell us about your graduate research. How did you get interested in this area of science, and how did you become involved in research focused on the impacts of the Deepwater Horizon oil spill? (Dr. Henkel received the James D. Watkins Student Award for Excellence in Research at the 2014 Gulf of Mexico Oil Spill and Ecosystem Science (GoMOSES) conference!)

**Answer:** My graduate research focused on how environmental changes and habitat degradation are impacting the coastal habitats of the U.S. Gulf of Mexico and the effects these changes are having on the bird populations that migrate through them. I began my Ph.D. studies in ecology and evolutionary biology at Tulane University in the spring of 2010 and was in the process of developing my first field season studying near-arctic breeding migratory shorebirds stopping over in the Gulf of Mexico when the Deepwater Horizon oil spill disaster began. Given the timing, my research focus had to shift to also incorporate looking at oil spill effects. In my dissertation research I used plasma metabolites and mark-recapture modeling to study the ecology of shorebirds in the northern Gulf of Mexico and the potential impacts of the Deepwater Horizon oil spill on those populations.

Throughout my graduate research I observed first-hand the impacts that environmental- and human-mediated disasters, such as the Deepwater Horizon oil spill, can have on coastal habitats as well as on the communities that rely on healthy ecosystems to make their living. This perspective led to my interest in advancing science policy for coastal restoration, and I have been lucky enough to be a part of that work at the Gulf Coast Ecosystem Restoration Council.

**Question:** Can you share a bit about the Gulf Coast Ecosystem Restoration Council and your role as science advisor and coordinator? What is the Council's connection with the Centers of Excellence, also established through the RESTORE Act?

**Answer:** The Gulf Coast Ecosystem Restoration Council, known as the RESTORE Council, was established as part of the 2012 Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act). The RESTORE Act calls for a regional approach to restoring the long-term health of the valuable natural ecosystem and economy of the Gulf Coast region, and dedicates 80 percent of civil and administrative penalties paid under the Clean Water Act in connection with the Deepwater Horizon oil spill to the Gulf Coast Restoration Trust Fund for ecosystem restoration, economic recovery, and tourism promotion in the Gulf Coast region. The RESTORE Council consists of the governors of the states of Alabama, Florida, Louisiana, Mississippi, and Texas; the secretaries of the U.S. Departments of Agriculture, the Army, Commerce, Homeland Security, and the Interior; and the administrator of the U.S. Environmental Protection Agency. The RESTORE Council oversees 60 percent of the funds made available to the Gulf Coast Restoration Trust Fund. The Council plays a key role in developing strategies and implementing projects that help ensure the Gulf's natural resources are sustainable and available for future generations.

I began working with the RESTORE Council in 2015 as a National Academies of Sciences, Engineering, and Medicine Gulf Research Program Science Policy Fellow, and was hired as an official member of RESTORE Council staff in 2016. As the Science Advisor and Coordinator for the RESTORE Council, I am part of an exceptional interdisciplinary team of scientists, policy advisors, grant administrators, and other specialists who work together to support the development and implementation of the RESTORE Council's restoration activities. My work involves a variety of tasks related to facilitating the development of science policy for RESTORE Council-funded activities. I work with the Council members and their agencies' technical staff across the Gulf to integrate science into every stage of the planning, funding, and implementation of Council-funded activities, including the ecological monitoring and data management. In addition, a lot of my time goes into coordinating science with other restoration and science agencies across the Gulf, to ensure that we are leveraging activities and building on one another's efforts.

In addition to establishing the RESTORE Council, the RESTORE Act also dedicates 2.5 percent of the Trust Fund to the Centers of Excellence Research Grants Program, administered by the Department of the Treasury. The

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RESTORE Council's work intersects with the Centers of Excellence and other restoration and science agencies in the Gulf through several coordination efforts in the Gulf, including the Gulf Funders Science Coordination Forum and the Council's Monitoring and Assessment Program. The Council Monitoring and Assessment Program is a Council-funded effort led by USGS and NOAA that fosters collaboration with the Gulf states, including the Centers of Excellence, as well as federal and local partners, academia, non-governmental/non-profit organizations, and business and industry.

**Question:** From your perspective as the science advisor and coordinator with the Council, what do you think the legacy of the Gulf of Mexico Research Initiative will be?

**Answer:** My work has given me first-hand experience in the application of science to restoration efforts in the Gulf of Mexico region. A better understanding of region-specific impacts related to petroleum pollution and related stressors to Gulf ecosystems can inform more effective regional approaches to restoration and tell a long-term story of recovery in the years following the spill. Through GoMRI-funded research efforts, a baseline of scientific knowledge and a robust scientific community has been established. Alongside long-term restoration efforts, this foundation of enhanced knowledge and capacity will continue to shape future monitoring, research, and response efforts for years to come.

Long-term data management and accessibility is a critical element of this scientific foundation. GoMRI's open-data sharing policies and the GRIIDC repository create an opportunity for a variety of stakeholders to access and leverage the data collected by funded projects and programs to inform policy, response efforts, and research.

Over the years, GoMRI research partnerships and the annual GoMOSES conferences have fostered collaboration through information sharing and strengthened professional ties. These relationships support better-connected research efforts and interdisciplinary problem-solving. I know I have personally benefited from these interactions as a graduate student, a science policy fellow, as well as in my current position with the RESTORE Council. Strong, diverse professional networks for scientists – region-wide and across disciplines – are especially important to the development and implementation of long-term, holistic restoration efforts that impact entire geographic regions or watersheds.

Overall, I see the legacy of the Gulf of Mexico Research Initiative as multifaceted and dynamic. It has provided easily accessible and high-quality baseline of scientific knowledge and capacity that may be used to evaluate restoration activities and inform future decision-making in the Gulf and beyond for decades to come.



*Photo Credit: CC 4.0, no changes made.*

## Note from the Research Board Chair

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

One of the lessons learned and a legacy of the Gulf of Mexico Research Initiative (GoMRI) has been the combined impact and value of supporting a large, coordinated scientific research effort. Many programs have provided, and will continue to provide, opportunities for funding research, collaboration, and coordination in the Gulf region after GoMRI ends in 2020. For example, the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012 (RESTORE Act) required Centers of Excellence Research Grants Programs be established in each of the Gulf coast states: Alabama, Florida, Louisiana, Mississippi, and Texas. Goals of the Centers of Excellence are to include supporting science, technology, and monitoring from the vantage point of inter-disciplinary science, in the areas of coastal sustainability, restoration, and protection; coastal fisheries and wildlife

ecosystem restoration and monitoring in the Gulf; offshore energy development; sustainable, resilient growth, and economic and commercial development; and observation, monitoring, and mapping of the Gulf of Mexico. (For more information about the RESTORE Council and its connection with the Centers of Excellence, please visit the [Frequently Asked Questions](#) interview with Dr. Jessica Henkel on page 2 of this issue.) The [National Academies of Sciences, Engineering, and Medicine Gulf Research Program](#) was also established with funding from the penalties from the Deepwater Horizon oil spill, endowing \$500 million over 30 years to support grants, fellowships, and other



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activities centered around research, development, education, capacity building, monitoring, and synthesis in the Gulf of Mexico region. [Sea Grant Programs](#) of the Gulf states provide opportunities to fund research regionally as well as support outreach, communicating oil spill science to target audiences and user communities.

The opening plenary of the 2019 Gulf of Mexico Oil Spill and Ecosystem Science conference featured a panel moderated by GoMRI Chief Scientific Officer Chuck Wilson, and each of the panelists represented the above three organizations: Pamela Plotkin, Texas Sea Grant College Program; Alyssa Dausman, Water Institute of the Gulf; and Evonne Tang, National Academies of Sciences, Engineering, and Medicine Gulf Research Program. They discussed *The Next Phase in Gulf Research* and spoke about coordination and continuing efforts to support study of the Gulf of Mexico after the GoMRI program ends. These organizations will provide excellent opportunities to continue scientific research and coordination of all efforts, as exemplified by GoMRI. But even more can be accomplished. The GoMRI Research Board is optimistic that the results from and the legacy of GoMRI will highlight the importance of investing in research and developing collaborative research in the Gulf of Mexico region.



The Gulf of Mexico Sea Grant Oil Spill Science Outreach team hosted two additional workshops in their collaborative series in partnership with the National Academies of Sciences, Engineering, and Medicine Gulf Research Program and the Gulf of Mexico Research Initiative (GoMRI) in recent months. *Improving Oil Spill Preparedness and Response in Santa Barbara*, which took place on April 5 in Santa Barbara, California, brought together practitioners and stakeholders to discuss social and economic impacts of oil spills and identify research needs to improve future oil spill response. They also reviewed challenges and lessons learned from the 2015 Refugio oil spill. *Preparing for Oil Spills in the Eastern Gulf: Health, Economic Resilience, and Community Well-Being* took place from May 6-7 in Mobile, Alabama, with an associated evening event on May 7 in Bayou La Batre, Alabama. The goal of this workshop was to identify the needs of the communities in the eastern Gulf in the event of future

spills, including discussing potential research and outreach priorities, protocols to include in existing response and regulatory frameworks, and determining available resources to aid in community preparedness and resilience. These workshops concluded the year-long collaborative project between Sea Grant, the Gulf Research Program, and GoMRI. More information on the series is available [here](#).

The team also hosted a Gulf of Mexico Sea Grant Oil Spill Science Outreach Program seminar, *How Does Science Guide Oil Spill Response? Collaborating Before, During, and After a Spill*, on April 24 in St. Petersburg, Florida. The goal of the workshop was to bring together members of the scientific and response communities to share research results, explain response processes and priorities, foster networking and communication, and build partnerships. The workshop included presentations from Timyn Rice from the Florida Fish and Wildlife Research Institute; Dale Walker and Eric Post from the United States Coast Guard; Paul Schuler from Oil Spill Response Limited; Isabel Romero from the University of South Florida; Abigail Renegar from Nova Southeastern University; Daniel Hahn from the National Oceanic and Atmospheric Administration (NOAA) Office of Response and Restoration Assessment and Restoration Division; Peter Wenner from the Florida Department of Environmental Protection; Scott Zengel from Research Planning, Inc.; and Brad Benggio from NOAA. More information on all of Sea Grant's seminars, including summaries from previous presentations, is available [here](#).

The team released a new fact sheet titled *Frequently Asked Questions: Dispersants Edition*. The publication describes what dispersants are and what they do, when and where they are used, and what impacts they may have on marine life. It also shares how dispersant was used during the response efforts after the Deepwater Horizon oil spill. Read the publication [here](#). All of Sea Grant's publications are available [here](#).

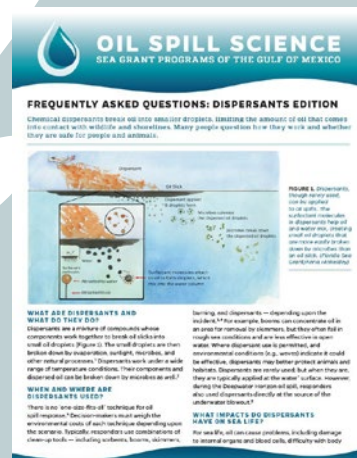


Image Credit: Gulf of Mexico Sea Grant Oil Spill Science Outreach Program.



# GULF OF MEXICO



## RESEARCH INITIATIVE

### SYNTHESIS & LEGACY

*Contributing Author: Callan Yanoff*

Synthesis and Legacy activities are fully underway as the Gulf of Mexico Research Initiative (GoMRI) continues to encapsulate and celebrate an entire decade of research. The interrelation of the eight Core Areas and their contributions to the GoMRI legacy were highlighted in the last issue of the GoMRI Quarterly Newsletter. The next set of Synthesis workshops

and activities focus on bringing together knowledge and increasing understanding across all five of the GoMRI research themes.

Throughout the month of May, the **Core Area 7B – Integrated/Linked Modeling System** group focused their efforts on hosting a webinar series with the hope of developing a conceptual modeling framework that will synthesize new knowledge gained since the Deepwater Horizon oil spill. This framework will set the foundation for a model that can be used to address broad questions posed by stakeholders in the event of a future oil spill. To answer such questions, the model must be capable of integrating natural and anthropogenic systems at various disciplines and scales. This webinar series was held to gather information from the GoMRI research community. The recordings can be viewed on the GoMRI YouTube channel [here](#) as well as on the Synthesis and Legacy [website](#).

To further document GoMRI's scientific achievements, Synthesis workshops are being held on the following topics during the summer months:

- **Fate of Oil and Weathering: Biological and Physical-chemical Degradation Workshop (Core Area 2)** was held from June 12-14, 2019 in Washington, D.C. This multi-day workshop looked to synthesize findings and identify a unifying message across many Core Area 2 subtopics, specifically: analytical chemistry; use of genomics and proteomics; use of molecular biology tools to ascertain and measure response of marine organisms other than microbes; physical fate and natural processes; standardization of water-accommodated fractions (WAFs) and chemically-enhanced water-accommodated fractions (CEWAFs) methods; photochemical reactions at sea and on shoreline; microbial degradation in all sectors of the ecosystem; and marine oil snow sedimentation and flocculent accumulation (MOSSFA).
- **Living on the Edge: Enhancing the Sustainability of Coupled Human-Environment Systems in the Gulf of Mexico Region Workshop (Core Area 5)** will be held in Mobile, Alabama from July 10-12, 2019. The primary aim of this workshop is to help identify new ways to bridge the gaps that exist between science, policy, and people in Gulf Coast communities, fostering a collective understanding of the coupled human-environment systems that make up the terrestrial and aquatic edge of the Gulf of Mexico. Another goal is to address the challenge of translating science into knowledge that informs researchers, policy makers, local leaders, and residents of the Gulf Coast.
- **Ecosystem Impacts of the Deepwater Horizon Event: Assembling the Record of Species and Community Change Workshop (Core Area 3)** will be hosted in St. Petersburg, Florida from July 23-25, 2019. This three-day workshop has a desired objective of assembling a

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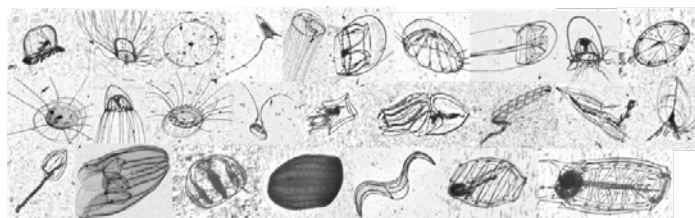


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data time series for ecosystem components monitored in regions impacted by the Deepwater Horizon oil spill. Using information from these various sources, participants will assemble information and report on the extent to which population trajectories changed before and after the event. Time series data on contaminant concentrations, histopathological conditions, and other relevant information will be reviewed.

Please visit the [Synthesis and Legacy website](#) for more information, including a list of upcoming conferences and deadlines.

*Photo Caption: Participants in the Fate of Oil and Weathering: Biological and Physical-chemical Degradation (Core Area 2) workshop held in Washington, D.C. from June 12-14, 2019. Photo Credit: Abby Ackerman.*



*Photo Caption: Images of gelatinous zooplankton (including hydromedusae, siphonophores, ctenophores, and tunicates) captured by the ISIIS in the Gulf of Mexico. Photo Credit: CONCORDE.*

Smithsonian Ocean Portal released a new article in partnership with the [Consortium for Oil Spill Exposure Pathways in Coastal River-Dominated Ecosystems \(CONCORDE\)](#) called *What the Big Picture Can Teach Us About Tiny Ocean Creatures*. The article describes how CONCORDE researchers, including Adam Greer and Luciano Chiaverano, study zooplankton using an instrument called an *In Situ* Ichthyoplankton Imaging System (ISIIS). The ISIIS is able to photograph all types of animals, such as zooplankton and jellyfish, including those that are more gelatinous and can be damaged during traditional collection methods. It can also record information about salinity, temperature, dissolved oxygen, and light levels within the water column, enabling researchers to view the ecosystem more holistically. Learn more on the Ocean Portal website [here](#).

Smithsonian Ocean Portal was recently nominated for a Webby Award! The Webbys are an international award, presented by the International Academy of Digital Arts and Sciences, recognizing excellence on the internet. The Webbys are awarded to recipients in seven major media types, including websites; video; advertising, media, and PR; apps, mobile, and voice; social; podcasts; and games. Each media type includes several [subcategories](#). Webby Award winners are selected by members of the International Academy of Digital Arts and Sciences, and the public can vote on nominees to receive the Webby People's Voice Award. The Ocean Portal was selected as one of the final five nominees in the website - general science category, along with the National Oceanic and Atmospheric Administration (NOAA) Fisheries website, the National Aeronautics and Space Administration (NASA) Solar System Web, the CRISPR-CAS9: Mechanism and Applications website, and the Yale Environment 360 website. NOAA Fisheries was selected as the winner of the Webby Award, and the NASA Solar System Web received the People's Voice Award. Visit the Webby Awards website [here](#) to see all of this year's winners. GoMRI congratulates the Ocean Portal team for receiving this nomination and recognition of their dedicated efforts!

## Education Spotlight

The [Relationships of Effects of Cardiac Outcomes in Fish for Validation of Ecological Risk](#) (RECOVER) consortium developed an exhibit in collaboration with the Education Department at the Miami Seaquarium, which is currently on display with the Tropical Fish Aquariums. The exhibit features information about the work RECOVER is doing to study the impacts of the Deepwater Horizon oil spill on mahi mahi and redfish. It also highlights mahi mahi's rapid development in the early stages of its life; it only takes two days for a mahi mahi to hatch and another two days after hatching for it to grow big enough to hunt on its own. The display includes QR codes to visit the [RECOVER website](#) and the [RECOVER Virtual Lab](#), as well as an accompanying video detailing their research with both Spanish and English subtitles. Be sure to check it out if you visit the Seaquarium and tag RECOVER on social media! For more information about the exhibit, visit RECOVER's posts on social media [here](#), [here](#), and [here](#).



*Photo Captions: Members of the RECOVER research team visit the RECOVER exhibit at the Miami Seaquarium. The exhibit provides an overview of the RECOVER consortium, video displays highlighting their research, and a visualization of mahi mahi's rapid growth in the early stages of its life. Photo Credits: RECOVER.*

Members of the [RECOVER](#) consortium and the [Deep Pelagic Nekton Dynamics of the Gulf of Mexico](#) (DEEPEND) consortium participated in the Rock the Ocean's [Tortuga Music Festival](#), hosting exhibits in the Conservation Village from April 12-14 in Fort Lauderdale, Florida. Over 30,000 people attended this year's event. [Rock the Ocean](#) is a non-profit organization whose mission is to "increase public awareness about the issues impacting the world's oceans and to support scientific research, education, and ocean conservation initiatives through benefit concerts, lifestyle apparel, brand partnerships, and entertainment industry events." They organize the Tortuga Music Festival each year in support of this mission. The associated Conservation Village features exhibits by organizations who are working on ocean-related topics, inviting festival attendees to learn about their work. A portion of the proceeds from the event goes back to the Conservation Village partners to support their continued efforts. Visit the festival website [here](#) to see a full list of this year's Conservation Village exhibitors. For photos and more information, visit the RECOVER Twitter and Instagram posts [here](#) and [here](#), and the DEEPEND Twitter and Instagram pages [here](#) and [here](#).



*Photo Caption: Members of the RECOVER and DEEPEND consortiums participated in the Rock the Ocean's Tortuga Music Festival Conservation Village in April. Photo Credit: DEEPEND via Instagram.*

Kendal Leftwich, Ph.D. candidate with the [Littoral Acoustic Demonstration Center – Gulf Ecological Monitoring and Modeling](#) (LADC-GEMM) consortium and physics teacher at Warren Easton Charter High School; Juliette Ioup, LADC-GEMM co-principal investigator; and C. Gregory Seab, Seraphia D. Leyda University Teaching Fellow and professor in the Physics Department at the University of New Orleans, co-authored an article in *The Physics Teacher* called *Introducing Scholarly Research to High School Physics Students*. The article, published in the May 2019 issue of the journal, summarizes the authors' effort to introduce and include a group of high school physics students in the research the LADC-GEMM consortium is doing to study the impacts of oil spills on marine mammals. After learning some of the preliminary findings from the LADC-GEMM consortium, students were invited to participate in ongoing LADC-GEMM research by listening to and identifying the different types of passive acoustic marine mammal signals. The students spent two to five hours per week analyzing data, were required to record findings in a lab book, and met with the research team every two weeks to discuss the project and results. Through the experience, the students gained valuable skills collecting and interpreting scientific data, working with computer programs, and working independently as well as collaboratively on a research team. The publication is available [here](#).



## 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](#)

Follow the Gulf of Mexico Oil Spill  
& Ecosystem Science (#GoMOSES)  
conference on social media!  
[Facebook](#), [Twitter](#)

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

**[GRIIDC 2018 Year in Review](#)**

**[GRIIDC Hires Lalitha Asirvadam as New  
Technical Coordinator](#)**

**[GRIIDC Attends the 2019 Gulf of Mexico Oil  
Spill and Ecosystem Science Conference in  
New Orleans](#)**

**[GRIIDC Presents Poster at AGU Meeting in  
Washington, D.C.](#)**

The Relationships of Effects of Cardiac Outcomes in Fish for Validation of Ecological Risk (RECOVER) consortium was featured in the May/June 2019 issue of *Florida Sport Fishing* (Volume 18, Issue 3). The article, titled *R.E.C.O.V.E.R.: Scientists Set a Course to Examine the Toxicity of Deepwater Horizon Crude Oil to Prized Pelagic Species* and written by RECOVER principal investigator Martin Grosell and Ph.D. student Lela Schlenker, highlights RECOVER's research on mahi mahi and plans for upcoming research cruises. See a preview of the issue, and subscribe to read the full article, [here](#).

The National Academies of Sciences, Engineering, and Medicine has released a report on *The Use of Dispersants in Marine Oil Spill Response*. The report was co-sponsored by the National Academies of Sciences, Engineering, and Medicine Gulf Research Program, the American Petroleum Institute, the Bureau of Ocean Energy Management, Clean Caribbean and Americas, the Gulf of Mexico Research Initiative (GoMRI), and the U.S. Environmental Protection Agency. The report includes numerous findings and recommendations for future research on the use of dispersants. More information on the report is available on the National Academies website [here](#) and [here](#), and on the GoMRI website [here](#). Read the report [here](#).

Dr. Robert Spies, senior scientist and former president at Applied Marine Sciences and former science director at the Alaska SeaLife Center, who also served as chief science advisor with the Exxon Valdez Oil Spill Trustee Council, has published a blog post on the Ocean Conservancy website, a follow up from his [keynote presentation](#) at the 2019 Gulf of Mexico Oil Spill and Ecosystem Science conference. The post, titled *Hard Lessons from a Disastrous Oil Spill*, highlights some lessons learned from the Exxon Valdez oil spill that can help inform recovery in the Gulf of Mexico after the Deepwater Horizon oil spill. Read the post [here](#).

## 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!](#)**

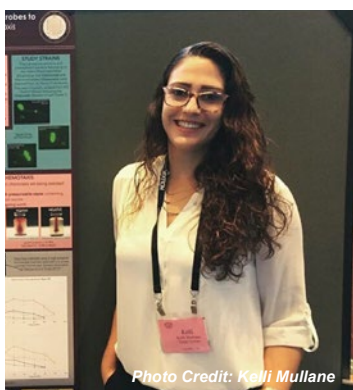


Photo Credit: Kelli Mullane

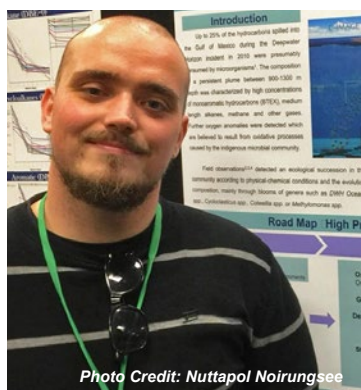


Photo Credit: Nuttapol Noirungsee



Photo Credit: Ryan Meyer



Photo Credit: Milton Levin

[Grad Student Mullane Puts Oil-Degrading Microbes Under Enormous Pressure](#)

[Grad Student Hackbusch Pressures Marine Microbes for Information](#)

[Grad Student Bociu Digs into How Long Buried Oil Persists in Sandy Beaches](#)

[Grad Student Jasperse Examines Oil Spill Effects on Marsh Fish and Dolphins](#)

## GoMRI Newsmakers

The University of South Florida St. Petersburg (USFSP) Nelson Poynter Memorial Library is hosting an art exhibit featuring photographs captured by Dante Fenolio from the [Deep Pelagic Nekton Dynamics of the Gulf of Mexico](#) (DEEPEND) consortium, and artwork by three Tampa Bay artists commissioned by the [Center for the Integrated Modeling and Analysis of the Gulf Ecosystem](#) (C-IMAGE) and the USF College of Marine Sciences, in remembrance of the 2010 Deepwater Horizon oil spill. An opening reception for the exhibit, called *Remember the Horizon: How USF Research Set a Standard After the 2010 Gulf Oil Spill*, was held on April 18 and included presentations by C-IMAGE Director Steve Murawski and researcher Bekka Larson, and DEEPEND co-principal investigators Heather Judkins and Isabel Romero. More information about the opening reception, including images of the artwork, is available on the Nelson Poynter Memorial Library Facebook page [here](#), the USFSP Library Twitter page [here](#), and the USF Twitter page [here](#). Additional information on the photographs and artwork is available on the USFSP website [here](#) and on the GoMRI website [here](#).

Dr. Samantha “Mandy” Joye, Athletic Association Professor of Arts and Sciences in the Franklin College of Art and Sciences Department of Marine Sciences at the University of Georgia and principal investigator of the Gulf of Mexico Research Initiative (GoMRI)-funded consortium [Ecosystem Impacts of Oil and Gas Inputs to the Gulf-2](#) (ECOGIG-2) has been [named Regents' Professor](#) by the Board of Regents of the University System of Georgia, effective July 1, 2019. Regents' Professorships are bestowed on faculty members “whose scholarship or creative activity is recognized nationally and internationally as innovative and pace-setting.” The GoMRI community [congratulates](#) Dr. Joye on this distinction and recognition of her many scientific contributions.

# GoMRI Researcher Interview with Dr. Melanie Beazley

Dr. Melanie Beazley from the University of Central Florida's Department of Chemistry answered a few questions about her RFP-VI project, *Biodegradation of "Hidden" High Molecular Weight Polycyclic Aromatic Hydrocarbons: Closing Critical Research Gaps*.

## 1. Please tell us about your RFP-VI project, *Biodegradation of "Hidden" High Molecular Weight Polycyclic Aromatic Hydrocarbons: Closing Critical Research Gaps*. What are the goals of the project?

The goals of our GoMRI RFP-VI research project entitled *Biodegradation of "Hidden" High Molecular Weight Polycyclic Aromatic Hydrocarbons: Closing Critical Research Gaps* are to determine how polycyclic aromatic hydrocarbons (PAHs) with molecular weights greater than ~300 g/mol are degraded by microorganisms, and identify the by-products produced from their breakdown. Very little is known about the environmental occurrence and fate of these large, complex residues of crude oil, which comprise the most toxic, carcinogenic, and mutagenic substances on EPA's list of priority pollutants. Determining how these toxic "hidden" PAHs behave in our environment is important for our overall understanding of oil spills and their aftereffects.

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

My primary background is in geochemistry and microbiology. I have a B.S. in chemistry and followed that with a M.S. in oceanography, which is when my love of studying the chemistry of the ocean began. Subsequent doctoral work in the bioremediation of uranium contamination led to post-doctoral studies in microbiology. Through my studies I have learned that to fully understand our complex and highly dynamic environment, one must consider all the forces that affect that natural system. Chemical, biological, geological, physical, and especially microbiological factors exert controls over the behavior of contaminants such as crude oil, and ultimately, how contamination affects our natural resources as well as human health. Therefore, my research combines geochemical, microbiological, and analytical strategies to understand how our natural systems work.

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

We have confirmed in our GoMRI research that large, high molecular weight PAHs including the 5- and 6-ring benzene structures of benzo[a]pyrene (BaP) and the isomers of dibenzopyrene, respectively, are degraded very slowly (on the order of months-to-years) by bacteria. We have determined that a natural consortia of bacteria that we isolated from Deepwater Horizon oil-contaminated sediment were more efficient at degrading BaP than the laboratory strain *Mycobacterium vanbaalenii*; however, only slightly and still over several months. Analytical separation of these by-products by high performance liquid chromatography (HPLC) allowed for subsequent fraction collection of the individual products, which were further analyzed by laser fluorescence, nuclear magnetic resonance (NMR), and mass spectrometry. We are continuing our consortia culture experiments with the individual isomers of dibenzopyrene as well as conducting sediment microcosms treated with the dibenzopyrenes. Metagenomics analysis by high throughput sequencing of the microcosms will allow us to determine how the overall microbial community of natural Gulf of Mexico marsh sediment changes as a result of exposure to these high molecular weight PAHs. This data will help us to understand the effects of these recalcitrant crude oil by-products that may remain in coastal sediments for years.

## 4. Why is identifying and analyzing the by-products important? What did the analysis of the individual products reveal?

We know very little about these by-products and suspect they are just as toxic as the parent compounds. Large PAH molecules are not degraded all in one step. They are enzymatically degraded in small increments that produce many different by-products. And as we are discovering, this degradation process occurs so slowly for these complex structures that it is difficult to collect the by-products in appreciable concentrations that can meet the limits of detection of our analytical methods.

## 5. Can you share a bit more about the culture experiments?

Pure culture experiments, where there is only the bacteria growing in media with the PAH, allows us to determine if and how well the PAHs are degraded in a controlled environment without interferences of other organisms or sediment particles. We then add complexity to the experiments by moving to sediment to determine how the microbial community changes as a result of the PAHs.

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

If funding were not an issue, I would expand the time and scope of our project. I would like to run our culture experiments for several years to see if we can achieve complete degradation of these complex structures as well as complete degradation of the by-products all the way to carbon dioxide. These long-term experiments would allow us to determine the complete breakdown mechanism pathways of these PAHs. Additionally, I would like to run a comprehensive transcriptomic and proteomics study of the effects of these PAHs on natural bacterial communities.



Dr. David M. Karl, Victor and Peggy Brandstrom Pavel Professor of Microbial Oceanography and co-director of the Daniel K. Inouye Center for Microbial Oceanography: Research and Education (C-MORE) at the University of Hawaii at Manoa, presented a public lecture at the American Geophysical Union (AGU) headquarters in Washington, D.C. on April 10 called *Station ALOHA: A Proving Ground for Microbial Oceanography*. The lecture followed a joint colloquium between the Gulf of Mexico Research Initiative (GoMRI), the American Society for Microbiology, and AGU on *Microbial Genomics of the Global Ocean System* in support of Core Area 6 of GoMRI's Synthesis and Legacy effort. The goal of the colloquium was to generate foundational ideas to advance marine microbiology and enhance understanding of microbial responses to major disturbances in the ocean. Over 30 of the world's

leading experts in microbial genomics and related fields participated to develop a broad research synthesis. The workshop leaders are preparing for a number of different synthesis products in addition to a workshop report, including publications in [EOS](#) and [mBio](#). [Dr. Karl](#) is also currently co-director of the Simons Collaboration on Ocean Processes and Ecology (SCOPE), a member and co-chair of the Ecosystem Ecology Section of The Faculty of 1000, a staff member at the Ecology Institute Inter-Research Science Center, and a recipient of the [Alexander Agassiz Medal](#). His presentation shared a history of the field of microbial genomics and the discoveries made over the past 30 years at Station ALOHA (A Long-Term Oligotrophic Habitat Assessment), part of the Hawaii Ocean Time-series (HOT) program. Read more about the program [here](#), and watch a recording of Dr. Karl's lecture on AGU's Facebook page [here](#).

In recognition of the ninth anniversary of the Deepwater Horizon oil spill on April 20, 2019, Steve Murawski, director of the [Center for the Integrated Modeling and Analysis of the Gulf Ecosystem \(C-IMAGE\)](#), and Ed Overton, co-principal investigator with the [Coastal Waters Consortium \(CWC\)](#) and of the RFP-V project [Toxicological Properties of Specific Aromatic Hydrocarbons Isolated from Fresh and Aged Crude Oil from the Deepwater Horizon Spill](#), were interviewed as a part of Fox News' *Whatever Happened To...?* series. They briefly summarized how Gulf fisheries and other marine life have recovered since the Deepwater Horizon oil spill and how much oil from the spill has been metabolized by the microorganisms in the Gulf. Watch the segment [here](#).

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



Photo Caption: Participants in the Microbial Genomics of the Global Ocean System colloquium, held at the AGU Headquarters in April. Photo Credit: Katie Fillingham.