GULF OF MEXICO RESEARCH INITIATIVE

FALL ISSUE 2019

NEWSLETTER

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:

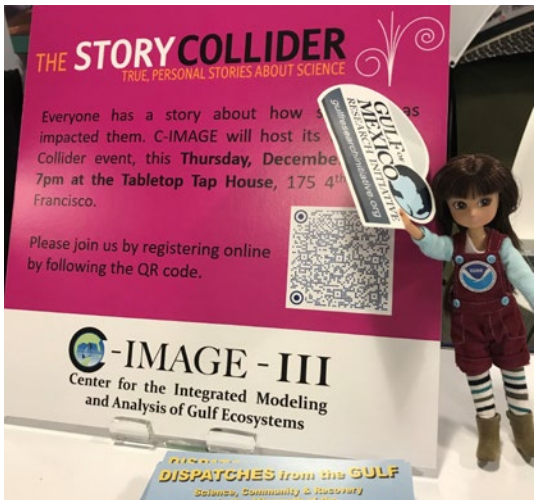
2020 Gulf of Mexico Oil Spill and Ecosystem Science (GoMOSES) Conference
February 3-6, 2020
Tampa, Florida

American Association for the Advancement of Science (AAAS) 2020 Annual Meeting
February 13-16, 2020
Seattle, Washington

Ocean Sciences Meeting 2020
February 16-21, 2020
San Diego, California

Dispatches from the Gulf 3 *Screening*
April 20, 2020
Washington, District of Columbia
Visit page 9 for more information

International Oil Spill Conference (IOSC) 2020
May 11-14, 2020
New Orleans, Louisiana



GoMRI Attends the Centennial AGU Fall Meeting

Members of the Gulf of Mexico Research Initiative (GoMRI) management team and the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC) attended the 2019 Centennial celebration of the American Geophysical Union (AGU) at its annual Fall Meeting. GoMRI and GRIIDC co-hosted an exhibit booth and representatives spent four days interacting with conference attendees and sharing information. Many promotional materials were distributed to help remind attendees where they can find more information on GoMRI and the data legacy of GRIIDC. Visitors to the booth were especially interested in the GoMRI Synthesis efforts and outcomes, as well as the availability of terabytes of data through GRIIDC.

Many GoMRI scientists were in attendance and it was great to see familiar faces as they stopped by the booth! The C-IMAGE consortium hosted a Story Collider event on Thursday, December 12 to share true, personal stories about science (you can read more about that event on page 2).

The 2019 AGU Fall Meeting marked the Centennial of AGU and brought together ~27,000 Earth and space scientists. More information on the AGU Fall Meeting is available here, including information on future meetings.

Photo Captions: (Above) Callan Yanoff (left, GoMRI Management Team) and Rosalie Rossi (right, GRIIDC Program Manager) at the GoMRI/GRIIDC booth at the 2019 AGU Fall Meeting in San Francisco, California. (Left) NOAA's #Lottie represents #WomenInSTEM and encourages everyone to attend the C-IMAGE Story Collider event. Photo Credits: Leigh Zimmermann.

C-IMAGE and Story Collider Collaboration at AGU

Contributing Author: Ari Daniel

On the evening of Thursday, December 12, C-IMAGE welcomed Story Collider to the annual AGU Fall Meeting in San Francisco. Story Collider is an organization dedicated to telling and sharing true, personal stories about science on stage across the country and around the world, and in a weekly podcast. The theme of the AGU show was disaster response, and it showcased five different storytellers at the Tabletop Tap House.

Laura Guertin, professor of Earth science at Penn State Brandywine, kicked things off with a story about how she came to use quilting as a way of depicting resilience and hope in the Gulf of Mexico. Samantha (Mandy) Joye, a microbiologist, deep ocean explorer, and educator at the University of Georgia, treated the audience to a journey through important moments and turning points in her career as a researcher. Simeon Pesch, a process engineer at the Hamburg University of Technology, spoke about a life-altering and perspective-changing trip that he took to Ghana where he visited the Agbogbloshie waste dumping site, one of the top 10 most polluted places on the planet. After breaking for intermission, Paula Buchanan, a doctoral student in emergency management, talked about what it was like to experience Hurricane Katrina from a distance after having made New Orleans her second home. The evening concluded with a poignant story by Jessica Moerman, a paleoclimatologist and AAAS Science and Technology Policy Fellow, about the legacy of her grandfather's Tennessee cabin in her family and her life.

The show was well received by a full room of over 75 people, and it was hosted by Senior Producers for Story Collider, Ari Daniel and Shane Hanlon. Special thanks to Liesl Hotaling and Sherryl Gilbert for their help in organizing the event.

Photo Captions: (Top Right) Story Collider hosts Ari Daniel and Shane Hanlon welcome the crowd! (Middle Right) Mandy Joye describes her life as a deep ocean explorer. (Bottom Right) Simeon Pesch tells his story about a trip that changed his life. (Above) The storytellers wait for their turns at the microphone. Photo Credits: Lauren Lipuma, AGU.

When an oil slick spreads on the surface of the water, scientists have an array of special equipment to track it. The Gulf of Mexico Sea Grant Oil Spill Science Outreach team recently released a new publication titled *In the air and on the water: Technology used to investigate oil spills*. The bulletin outlines various technologies available at and above the water's surface — even including satellites in space — to study oil in the marine environment and serves as a follow up to 2018's *Underwater vehicles used to study oil spills*. Read all of the Gulf of Mexico Sea Grant Oil Spill Science Outreach Program publications here.

Sea Grant
Texas • Louisiana • Florida
Mississippi-Alabama

The team hosted a seminar, *Shining light on Deepwater Horizon impacts to the Florida Panhandle*, at the Pensacola Library on December 4, 2019. Speakers covered a variety of topics including degradation of buried oil on Pensacola beaches, lasting effects of the oil spill, seafood safety, and impacts of oil on sea turtles and dolphins. Presenters included Markus Huettel from Florida State University, Richard Snyder from the Virginia Institute of Marine Science, Cheryl Lassitter from the National Oceanic and Atmospheric Administration, Alissa Deming from Dauphin Island Sea Lab, and Dianne Ingram from the U.S. Fish and Wildlife Service. You can view the speaker slide presentations, as well as a video of the Question and Answer session, here.

Sea Grant partners have recently co-hosted a series of regional workshops, along with the Gulf Research Program (GRP) of the National Academies of Sciences, Engineering, and Medicine and GoMRI, to focus on three areas pertaining to oil spills: public health, social disruption, and economic impacts. You can read about the rationale of the project here. Reports from the regional workshops can be found here.

OCEAN PORTAL
FIND YOUR BLUE

The National Museum of Natural History routinely offers exhibit visitors a chance to talk informally to different types of experts and explore different types of objects during its *Expert Is In* programs. On October 8, 2019, several members of the GoMRI research community chatted with visitors to the museum's Ocean Hall about their research and discoveries. A huge thank you to Erik Cordes, Mandy Joye, Rosanna Milligan, Steve Murawski, Ernst Peebles, and Tracy Sutton for making time to connect with visitors of all ages!

Two additional education and outreach events are currently being planned with our partners at the Smithsonian Ocean Portal and the National Museum of Natural History as part of our collaborative series to share GoMRI science with museum visitors in the final year of the program. A Nerd Nite DC event is tentatively planned for March 6, 2020, and *Dispatches from the Gulf 3* will be screened on April 20, 2020 to commemorate the 10th anniversary of the Deepwater Horizon oil spill. We look forward to sharing final details on these events once they are available and we would love to see you there!

Photo Captions: (Left) Dr. Erik Cordes assists young visitors to the National Museum of Natural History's Ocean Hall as they build a deep sea tube worm. (Right) Dr. Ernst Peebles and Dr. Steve Murawski answer visitor questions about otolith research at the National Museum of Natural History's Ocean Hall. Photo Credits: Jennifer Renteria, Smithsonian.

GULF OF MEXICO RESEARCH INITIATIVE
SYNTHESIS & LEGACY

Contributing Author: Callan Yanoff

The Gulf of Mexico Research Initiative's (GoMRI) Synthesis and Legacy efforts have shifted from hosting scientific workshops to focusing on the subsequent products, legacy pieces, and outreach activities. These elements have become vehicles to broadly distribute the results of the Synthesis workshops and highlight the importance of investing in collaborative science.

As the sunsetting of GoMRI and its 10 years of investment in research nears, the GoMRI community closed out the decade productively, with 2018 and 2019 chock full of Synthesis and Legacy workshops at various locations around the country. October of 2019 proved to be a busy month for the Synthesis team, with two consecutive workshops bringing researchers together to increase understanding across the following GoMRI Synthesis Core Areas:

Vulnerability and Resilience of Species and Ecosystems to Large-Scale Contamination Events: Lessons from Deepwater Horizon (Core Area 3 Workshop II) took place October 9-11 in Washington, D.C. This workshop aimed to prepare a high-level quantitative synthesis of longitudinal (time series) information indexing the population and ecosystem trajectories of marine species and ecosystems impacted by the Deepwater Horizon (DWH) accident. The workshop also evaluated life history and associated scale effects that are implicated in the decline and potential recovery of ecosystem components, including life span, fractions of populations impacted by the spill, population connectivity among potential source populations, and sensitivity of various life stages to oil contaminants. Correlations among time series were assessed and compared with ecotype-specific food webs to evaluate species interactions potentially affected by the spill. Vulnerability and susceptibility of various impacted resources were a major focus. More information on this workshop, including the goals, a participant list, and the agenda is available here.

Participants in the Vulnerability and Resilience of Species and Ecosystems to Large-Scale Contamination Events: Lessons from Deepwater Horizon (Core Area 3) *workshop held in Washington, D.C., from October 9-11. Photo Credit: Abby Ackerman/Consortium for Ocean Leadership.*

Operational Oil Spill Modeling (Core Area 7) was held October 15-17 in Washington, D.C. The main objective of this workshop was to examine operational aspects of oil spill modeling, review the state of knowledge that predated GoMRI, as well as the new knowledge or technical solutions developed in the past 10 years. All required modeling components of an "integrated oil spill system" were addressed, such as ocean circulation models, wave forecast models, numerical weathering and oil fate predictions, and transport modeling. The workshop focused on short timescale mechanisms that are relevant for operational oil spill modeling and how these mechanisms are, can be, or cannot be implemented in operational oil spill prediction systems. More information on this workshop, including the goals, a participant list, and the agenda is available here.

Participants in the Operational Oil Spill Modeling (Core Area 7) *workshop held in Washington, D.C., from October 15-17. Photo Credit: Abby Ackerman/ Consortium for Ocean Leadership.*

To begin a string of active GoMRI participation in conferences, GoMRI had a strong Synthesis presence at the 2019 AGU Fall Meeting in San Francisco, California, from December 9-13, with many Core Area leaders presenting posters. In conjunction with the Fall Meeting, GoMRI and C-IMAGE collaborated to host a Story-Collider event on December 12 (read more on page 2), detailing personal stories about natural disasters and the way we cope. GoMRI will have

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a presence at many upcoming conferences across the country to share results of the Synthesis efforts through sessions, posters, and events, including:

National Council for Science and the Environment (NCSE) Annual Conference

This conference took place from January 6-9, 2020, Washington, D.C.

A general synthesis session was submitted by the GoMRI Research Board, with an overarching title of *10 Years Since DWH – Lessons Learned from the Gulf of Mexico Research Initiative.*

American Association for the Advancement of Science (AAAS) Annual Meeting

February 13-16, 2020, Seattle, Washington

Advances in Understanding Oil Spills and Mitigating Impact and Consequences, a GoMRI Research Board-motivated session, was submitted and accepted. This session will aim to build interest in GoMRI synthesis results.

Ocean Sciences Meeting 2020

February 16-21, 2020, San Diego, California

Core Area 6 leadership will be hosting a session entitled *Microbial Genomics to Improve Predictive Understanding of Disturbance in the Global Ocean System.*

International Oil Spill Conference (IOSC) 2020

May 11-14, 2020, New Orleans, Louisiana

GoMRI leadership has collaborated with IOSC to create a GoMRI Special Session to integrate synthesized GoMRI science into IOSC 2020.

Please visit the Synthesis and Legacy website for more information on upcoming conferences. Please continuously visit the Synthesis and Legacy Products page, as there are many products currently in development.

GoMRI researchers and participants of the 2019 AGU Fall Meeting from December 9-13 in San Francisco, California. Photo Credit: Sherryl Gilbert/C-IMAGE.

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 Promotes Open Data at Coastal Estuarine Federation Conference

Got Cruise Data?

GRIIDC Attends COMPASS Science Communication Workshop

A New World of Sharing Scientific Data

GRIIDC Attends 2019 MBRACE All Hands Meeting

The Gulf of Mexico Oil Spill & Ecosystem Science Conference was featured on an Ocean Conservancy Ocean Currents Blog post! Follow the Gulf of Mexico Oil Spill & Ecosystem Science (#GoMOSES) conference on social media! Facebook, Twitter

Science Corner

Published Science Highlights from the GoMRI Program

Study Demonstrates High School Teaching Method for Oil Spill Science

K.M. Leftwich, J.W. Ioup, C.G. Seab
The Physics Teacher, 2019, Vol. 57(5), Article Number 336

Study Summarizes Laboratory Research on How Deepwater Horizon Oil Affects Fish

C. Pasparakis, A.J. Esbaugh, W. Burggren, M. Grosell
Comparative Biochemistry and Physiology Part C: Toxicology and Pharmacology, 2019, Vol. 224, 108558

Study Reports Advancement in Environmentally-Friendly Dispersant Technology

O.F. Ojo, A. Farinmade, J. Trout, M. Omarova, J. He, V. John, D.A. Blake, Y.M. Lvov, D. Zhang, D. Nguyen, A. Bose
ACS Applied Nano Materials, 2019, Vol. 2(6), pgs. 3490-3500

Study Identifies Phytoplankton Species as Resistant or Sensitive to Oil Spills

L. Bretherton, A. Williams, J. Genzer, J. Hillhouse, M. Kamalanathan, Z.V. Finkel, A. Quigg
Journal of Phycology, 2018, Vol. 54(3), pgs. 317-328

Study Provides Insights into How Floating Material Moves on the Ocean

J.R. Taylor
Journal of Physical Oceanography, 2018, Vol. 48, pgs. 1233-1241

Study Assessed Aging Oil Spill Material on the Seafloor and Found Recovery

K.L. Rogers, S.H. Bosman, M. Lardie-Gaylord, A. McNichol, B.E. Rosenheim, J.P. Montoya, J.P. Chanton
PLoS ONE, 2019, Vol. 14(2), Article Number: e0212433

Studies Show Beach Environment Enhanced Oil Degradation, But Still May Take 30 Years

I. Bociu, B. Shin, W.B. Wells, J.E. Kostka, K.T. Konstantinidis, M. Huettel
Scientific Reports, 2019, Vol. 9, Article Number 10071

M. Huettel, W.A. Overholt, J.E. Kostka, C. Hagan, J. Kaba, W.B. Wells, S. Dudley
Marine Pollution Bulletin, 2018, Vol. 126, pgs. 488-500

Study Quantifies Dispersant Effects on Initial Oil Slick Breakup by Waves

C. Li, J. Miller, J. Wang, S.S. Koley, J. Katz
Journal of Geophysical Research: Oceans, 2017, Vol. 122(10), pgs. 7938-7957

Study Quantifies Limitations in Using Marker Genes to Predict Microbial Capabilities

J.L. Sevigny, D. Rothenheber, K.S. Diaz, Y. Zhang, K. Agustsson, R.D. Bergeron, W.K. Thomas
BMC Genomics, 2019, Vol. 20, Article Number 268

Study IDs Oil-Degrading and Mucus-Producing Microbes Linked to Marine Oil Snow Formation

H.P. Bacosa, M. Kamalanathan, M. Chiu, S. Tsai, L. Sun, J.M. Labonté, K.A. Schwehr, D. Hala, P.H. Santschi. W. Chin, A. Quigg
PLoS ONE, 2018, Vol. 13(12), Article Number: e0208406

Eight-Year Study Quantifies How Oiling is a Continuing Stressor on the Marsh Ecosystem

R.E. Turner, N.N. Rabalais, E.B. Overton, B.M. Meyer, G. McClenachan, E.M. Swenson, M. Besonen, M.L. Parsons, J. Zingre
Environmental Pollution, 2019, Vol. 252(Part B), pgs. 1367-1376

Study Explains How Oil Spill Can Initiate Harmful Algal Blooms

R. Almeda, S. Cosgrove, E.J. Buskey
Environmental Science and Technology, 2018, Vol. 52(10), pgs. 5718-5724

To see all GoMRI publications, please visit the GoMRI Publication Database.

GoMRI Newsmakers

Dr. Margaret Leinen, GoMRI Research Board vice chair and director of Scripps Institution of Oceanography, recently received the 2019 American Geophysical Union's Ambassador Award. The Ambassador Award honors a member's outstanding contributions and achievements that extend beyond those recognized by traditional scientific discipline awards. The contributions and achievements include promoting discovery in Earth and space science, inspiring scientists to help improve lives around the world, leading scientific collaboration and innovation, and promoting a global talent pool. Congratulations Dr. Leinen!

Members of the GoMRI-funded LADC-GEMM Consortium were awarded the 2019 Rollie Lamberson Research Award, which recognizes the most outstanding published paper of natural resource modeling in the previous two years. The winning paper is titled *Sensitivity analysis of the recovery time for a population under the impact of an environmental disturbance*, authored by University of Louisiana at Lafayette scientists Azmy S. Ackleh, Ross Chiquet, Tingting Tang (now with San Diego State University), Amy Veprauskas, and Woods Hole Oceanographic Institution scientist Hal Caswell. Congratulations LADC-GEMM!

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: McKenna Redding

What Grad Student Keller's Marriage of Polymers and Nanoparticles Causes Oil to Break Up

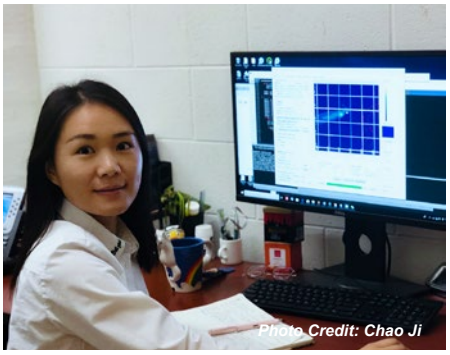
Photo Credit: Chao Ji

Grad Student Ji Helps Improve Tool to Locate Oil Beneath the Ocean Surface

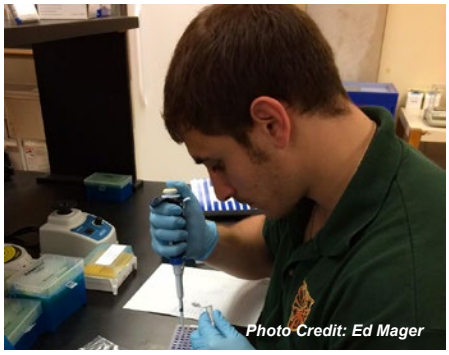
Photo Credit: Ed Mager

Grad Student Bonatesta Examines How Oil Exposure Affects Fish Kidneys


Photo Credit: Larissa Montas

Grad Student Montas Assesses Oil Spill Health Risk to Children During Beach Play


Photo Credit: Claudia Husseneder

Grad Student Rayle Examines Changing Meiofauna Biodiversity in Oiled Marshes Using Bioinformatics


Photo Credit: Matthew Kurpiel

How Grad Student Kurpiel Uses Radium to Monitor Spilled Oil

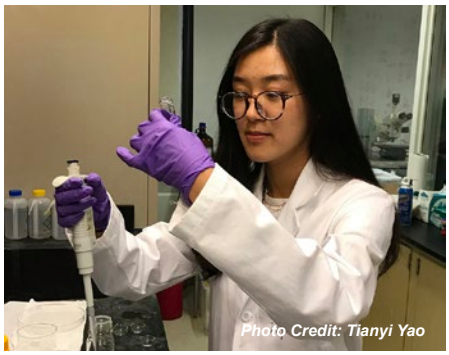
Photo Credit: Tianyi Yao

Grad Student Deng Investigates How Marine Microbes Move When Oil is Present

Photo Credit: Bar Guzi

How Grad Student Bodner Uses Theoretical Math to Add Turbulence to Transport Predictions


Photo Credit: Steve Simpson

Grad Student Sevigny Improves Meiofauna Genomic Analysis to Inform Oil Spill Recovery

Photo: CC 4.0, no changes made.

Note from the Research Board Chair

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

The Gulf of Mexico Research Initiative (GoMRI) Research Board looks forward with enthusiasm to a series of events in 2020 that will share synthesis of the results of this amazing research community. Many of the events will comprise sessions at scientific conferences throughout the year; I hope you will join us if you are attending any of these meetings, conferences, and symposia where GoMRI will be presenting.

The first, *10 years since DWH – Lessons learned from the Gulf of Mexico Research Initiative*, on January 8, was under the auspices of the National Council for Science and the Environment (NCSE) at its Annual Conference in Washington, D.C. As moderator for the excellent panel of speakers representing academia, coastal communities, government, and industry, I was delighted to introduce Antonietta Quigg, Steve Sempier, Lisa DiPinto, and Paul Schuler, all of whom made the session a success!

The next event will be at the Annual Meeting of the American Association for the Advancement of Science (AAAS) in Seattle, Washington the afternoon of February 14 from 3:30 – 5:00pm and is titled *Advances in Understanding Oil Spills and Mitigating Impact and Consequences.* The session will include breakthrough discoveries of GoMRI scientists and engineers in sub-mesoscale ocean circulation, fate of oil chemicals individually and with dispersants, biodegradation, interactions of oil with marine snow, oil deposition to deep ecosystems, enhanced insight into long-term effects of petroleum on marshlands, recovery of fisheries, variations in marine mammal populations, and in ecosystem modeling. The session will illustrate how these scientific discoveries will carry forward to the next generation by the cadre of GoMRI students and through development of new technologies, including biodegradable ocean-surface drifters, genomic tools, and methods for analytical chemistry and human health applications. I look forward to participating in this session with several members of the GoMRI Research Board, including Margaret Leinen, Ken Halanych, David Halpern, and John Farrington.

GoMRI will be well represented in three dedicated sessions at the International Oil Spill Conference (IOSC) in New Orleans, Louisiana, May 11-14, 2020. The goal at this conference will be to integrate a synthesis of GoMRI science in the presentations at IOSC that will cover *physical oceanography and response*, *refinement of fates*, and *ecology and human health*. Leaders from the GoMRI community will share scientific findings and results.

In addition to the conferences listed above, the GoMRI community will be sharing their research and integrated results at other conferences, e.g., Ocean Sciences Meeting 2020. You can learn more about the GoMRI Synthesis and Legacy workshops and events here. I look forward to 2020 as the year of sharing GoMRI's discoveries!

Photo Credit: LSU Media Relations.

Frequently Asked Questions with Dr. Chuck Wilson

Dr. Chuck Wilson, chief scientific officer for the Gulf of Mexico Research Initiative (GoMRI), answered a few frequently asked questions.

Question: How excited are you for the GoMRI Symposium on February 3?
Answer: So excited!

Question: Can you tell us a little more about the GoMRI Symposium?
Answer: The GoMRI Symposium will be held on Monday, February 3 at the Tampa Marriott, ahead of the 2020 Gulf of Mexico Oil Spill & Ecosystem Science (GoMOSES) Conference. The day-long event will be focused on the results of the ongoing GoMRI Synthesis efforts and will serve as the launch to a series of events throughout 2020 to share Synthesis results with a variety of audiences. (Please see the Note from the Research Board Chair on page 8 for more information about these events!)

The Symposium will be a mix of speakers, panels, and audience engagement. The panels will cover a variety of topics, including perspectives from members of the user community, GoMRI Scholars, and GoMRI Outreach professionals. I am personally very excited to be in the room when the results of the GoMRI Synthesis Core Areas come together for the first time!

Question: Anything else we should be looking out for at the 2020 GoMOSES Conference?
Answer: There are 11 sessions at GoMOSES that are focused on Synthesis and sharing the results of the Core Area efforts! One session that I am particularly looking forward to, because it is related to one of GoMRI's best legacies, is Session 008: *Taking Stock: Capacity Building and the Successes of Advanced Academic Scholarship, Professional Training, and Interdisciplinary Mentoring Through the Gulf of Mexico Research Initiative*. You can find the full session schedule here.

DISPATCHES *From the Gulf*

Sherryl Gilbert and Liesl Hotaling from C-IMAGE co-chaired a special session at the Mexican Geophysical Union meeting (RAUGM) at the end of October 2019 focused on ecosystem resiliency in the Gulf. C-IMAGE coordinated a screening of Dispatches from the Gulf 3 as part of their participation in RAUGM.

Dispatches from the Gulf 3 will be screened at the National Museum of Natural History in Washington, D.C. on April 20 to recognize the 10th anniversary of the Deepwater Horizon oil spill. Thank you to our colleagues at both Screenscope, Inc. and the Smithsonian Ocean Portal for coordinating this event!

C-IMAGE and Screenscope, Inc. partnered to host a screening of Dispatches from the Gulf 3 during the Mexican Geophysical Union meeting in October 2019. Photo Credit: Sherryl Gilbert, C-IMAGE.