
Fostering emergency responder and university researcher collaboration

Workshop Summary Report

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Executive Summary

The Gulf of Mexico Sea Grant Oil Spill Science Outreach Team hosted five workshops, one in each Gulf state, in order to bring emergency responders and researchers together to network and learn about each other's roles in oil spill research and response. The two groups also identified barriers in collaboration and looked for ways to work together during future spills. Throughout these workshops, organizers asked those in attendance questions to get a better understanding of how to strengthen these relationships. Topics discussed included the role for academia in response, response contributions to research, challenges and barriers to collaboration, and solutions to challenges. It became apparent at the conclusion of the workshop series that attendees shared similar suggestions and ideas across the five workshops.

Role for Academia in Oil Spill Response

In response to the question of what role academia can play in oil spill response, responders suggested that researchers should attend local Area Committee Meetings held by the regional United States Coast Guard Sector. Area Committee Meetings are meetings for public input on all relevant processes and issues related to oil and hazardous substance spill prevention, preparedness, planning, and response. This interaction would offer an opportunity for scientists to share their research and results. Responders indicated that attending meetings would need to be a continuous effort by the scientists so that a trusted relationship could grow prior to a spill. Responders also mentioned that scientists could help communicate and share scientific findings related to oil spills with responders and the public to maintain transparency.

Response Sector Contributions to Research

In terms of how oil spill response efforts can contribute to research opportunities, the most common recommendation was for responders to share data with scientists, particularly about subjects where there is a known knowledge gap. Access to this information would provide an opportunity for scientists to plan projects that help fill those gaps for improved response efforts. Another suggestion was for oil and gas companies and government agencies to invite scientists to trainings and drills so that everyone is familiar with the other's protocols and obtain the certifications needed to be part of response efforts.

Challenges and Barriers to Collaboration

When asked about the greatest barriers for researcher/responder collaborations, attendees across all five Gulf states mentioned a lack of funding as a challenge. Financial resources are not always available between major spills to conduct needed research. Not only is funding necessary for research, but also for conducting trainings, workshops, and events that would bring these two groups together to forge relationships. Lack of communication was suggested as another challenge. Researchers and responders work on different timelines and have different priorities which can hinder communication and make understanding each other's perspectives difficult.

Solutions to Challenges

Workshop participants also discussed solutions to the challenges. Suggestions in four out of the five workshops included making oceanographic surveys and other data available so that all interested groups can access the information. The sharing of published scientific results by researchers with industry members, state and local agency employees, and elected officials would help formulate next steps. And lastly, holding meetings where local researchers and responders can come together would help open the lines of communication. Both groups would have an opportunity to share research and data, as well as create a list of ideas and problems that need to be resolved for future planning.

The level of participation and information shared at these workshops demonstrated that both responders and researchers share an interest in finding ways to collaborate. The information in this report provides a pathway to next steps that would ensure the communication and collaboration continues.



Responder Marla Steinhoff of NOAA and researcher Ed Overton of Louisiana State University exchange ideas during a break at the “Responding to oil spills: Coastal wetlands” habitat meeting in Biloxi, Mississippi. Photo by Mississippi-Alabama Sea Grant Consortium.

Background

In 2014, the Gulf of Mexico Research Initiative (GoMRI) supported a new oil spill science outreach program administered by the four Sea Grant college programs based in the Gulf of Mexico. The program's purpose is to increase the use of oil spill science by people whose livelihoods depend on a healthy Gulf. During the initial stages of the outreach program, the team—which includes four outreach professionals, a communicator, and a manager—held individual and small group meetings with targeted audiences across the Gulf of Mexico. Fishers, natural resource managers, tourism officials, emergency responders, researchers, and many more participated. Participants shared questions and concerns they had after the Deepwater Horizon (DWH) oil spill of 2010. Some of the questions and concerns shared during the individual and small group meetings in 2014 include the following:

- What are the 'dos and don'ts' of response equipment and practices?
- How effective were the response techniques used during the oil spill?
- What lessons were learned from the spill and how are plans being improved?
- What techniques were learned during DWH that can be applied to future oil spills?
- How does the emergency response framework work? Who is in charge when a spill occurs? How do individuals and agencies know how to respond when a spill occurs?
- How can research be used to make changes to Area Contingency Plans?
- How do we communicate, share, and partner on oil spill issues between agencies, organizations, entities, etc.?
- Can groups synthesize data for planning and response in a timely manner?

To learn more about the input collected in the 2014 meetings, read the Sea Grant publication [Summary of target audience input on oil spill science topics](#).

These meetings and other events uncovered a need for increased collaboration between oil spill responders and academic researchers. To meet this need, the team conducted workshops to bring researchers and responders together to discuss the issue. The information in this report summarizes the input collected during five workshops, one held in each Gulf of Mexico state.

Workshop Development and Description

The goals of the responder/researcher workshops were to share knowledge among those in attendance and gather input on how to foster relationships between the two groups. The idea to host these workshops across the Gulf of Mexico came from an initial workshop held in Texas. The participation and feedback received there provided the foundation for subsequent workshops in the other Gulf states. Table 1 identifies the location, date, and number of participants for each workshop.

TABLE 1. Workshop title, location, date, and number of participants for “Fostering emergency responder and university researcher collaboration” workshops.

Workshop Title	Location	Date	Number in Attendance
“Bridging the gap between oil spill researchers and responders”	Port Aransas, Texas	April 14, 2015	35
“Exploring the intersection between oil spill science and response”	New Orleans, Louisiana	February 6, 2017	58
“Responding to oil spills: Coastal wetlands habitat”	Biloxi, Mississippi	October 26, 2017	56
“Responding to oil spills: Nearshore & beach habitats”	Mobile, Alabama	November 13, 2017	35
“How does science guide oil spill response? Collaborating before, during, and after a spill”	St. Petersburg, Florida	April 24, 2019	30



Attendees at the “Responding to oil spills: Coastal wetlands habitat” meeting in Biloxi, Mississippi participate in an input session to provide feedback about collaborations between researchers and responders. Photo by Mississippi-Alabama Sea Grant Consortium.

All workshops were conducted similarly. The first half of the workshops focused on sharing knowledge. Responders spoke about response plans and how those plans go into action when responding to a spill. University researchers spoke about their and others’ oil spill-related work and shared results.

The second half of the workshops focused on splitting those in attendance into breakout groups to gather input. This allowed the Sea Grant team to ask specific questions to capture needs, challenges, and possible solutions. It also gave participants an opportunity to express their opinions, ask questions of those in their groups or in the room, and share ideas on how collaboration between researchers and responders could improve for future spills.

To keep input consistent across the region, the same questions were asked at most of the workshops. The one exception was the first meeting in Texas. Similar questions were asked, but not specifically in the order listed below:

1. How are research findings useful to oil spill responders and what role can academia play in response?
2. How can response efforts contribute to research opportunities?
3. What are the greatest challenges or barriers for these types of collaboration?
4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?



Responders gather to answer questions from those in attendance during “How did science guide oil spill response? Collaborating before, during, and after a spill” in St. Petersburg, Florida. Photo by Louisiana Sea Grant College Program.

Results

After conducting the workshops, many similarities became apparent. This section summarizes the most common responses to each question across all workshops. Each table lists broad topics mentioned at state workshops. The appendix at the end of this report contains detailed notes from each workshop.

Discussion Surrounding Question 1, “How Are Research Findings Useful to Oil Spill Responders and What Role Can Academia Play in Response?”

Throughout most of the workshops it was highly recommended that university researchers should participate in their local Area Committees if they are interested in getting involved with response (Table 2). Researchers could present their locally relevant and applicable science to the members of the Area Committee. Regular attendance at these events would help to create trusted connections and relationships needed when a spill occurs. Attending these meetings would also help researchers learn about ways to include their science in Area Contingency Plans and comment on the current plans out for public review. Area Contingency Plans are prepared documents implemented by agencies to address the removal of oil and hazardous substances within a defined geographic area.

Helping responders have a better understanding of how oil impacts the environment was another popular suggestion. This knowledge would help responders make better decisions when responding to oil spills. Updated research findings provide new science that can be included in response plans. For example, new information about biological processes in a particular area could be used to change response processes and plans for that region. Research findings should be shared prior to a spill happening, not during a response. When sharing science, researchers should be able to synthesize science and communicate to the general public so that everyone can understand the research and results. Any science that supports or improves existing tools used to respond to oil spills would benefit the response community.

Other suggestions that were mentioned at two or more workshops are shown below.

- Researchers who would like to be involved with response should participate in other meetings such as the Regional Response Team (RRT) meetings. These meetings are similar to Area Committee Meetings but are held on a regional level.
- Scientists could share their science with a larger audience and could also provide any baseline data and lessons learned they may have for long-term monitoring.
- An Academia Advisory Committee should be developed within Incident/Unified Command System (ICS). ICS is a management system designed to enable effective and efficient domestic incident management by integrating a combination of facilities, equipment, personnel procedures, and communications operating within a common organizational structure. Having additional scientists within ICS would ensure that the latest science is being incorporated where applicable.
- Researchers should also build relationships with their federal and state Scientific Support Coordinators (SSCs). SSCs serve as responders’ advisors for scientific issues. Their role includes communicating with the scientific community as well as requests for assistance from Federal and state agencies regarding scientific studies. This interaction would allow the SSCs to become familiar with regional researchers and their work.

TABLE 2. Participant responses about how research findings are useful to oil spill responders and what role academia can play in response. “✓” indicates in which state workshop participants mentioned the topic.

Topics Mentioned	TX	LA	MS	AL	FL
Participate in Area Committee Meetings.	✓		✓	✓	✓
Help communicate/share science, maintain transparency.	✓	✓	✓		✓
Attend Regional Response Team meetings.			✓	✓	✓
Provide lessons learned.			✓	✓	✓
Provide baseline data from long-term monitoring.			✓	✓	✓
Participate in Joint Information Center, Incident/Unified Command.	✓	✓			
Participate in trainings and get certifications needed to help response.	✓				✓
Develop an Academia Advisory Committee within the Environmental Unit of Incident/Unified Command.		✓	✓		
Know/connect with NOAA SSCs.			✓	✓	
Include research results in Contingency Plans.			✓		
Get broader attendance at conferences such as IOSC and Clean Gulf.			✓		
Help shape response tactics, for example, in situ burning, monitoring techniques.			✓		
Justify or improve existing and new tools.				✓	
Provide solutions to policymakers.		✓			
Provide list of scientists and areas of expertise.				✓	
Translate science into tools for responders.			✓		
Provide short- and long-term impacts from past spills.			✓		
Fill gaps in knowledge.		✓			
Share publications and get data out quickly.	✓				

Discussion Surrounding Question 2, “How Can Response Efforts Contribute to Research Opportunities?”

Attendees most commonly recommended that responders share data and knowledge gaps with researchers (Table 3). Responders and response agencies can share available land and oceanographic surveys and oil spill questions with researchers to help identify information gaps. This input would give researchers ideas for future projects.

Another option is to get academia involved in training exercises and other courses that will give researchers the required safety certifications to study oil spills. Researchers should participate in available trainings to get certifications needed (ex. HAZWOPER, Incident Command System Courses) to help response as well as to have a better understanding of the Incident/Unified Command System (ICS) and operational structure.

Responders could also help researchers by providing opportunities, such as hosting spill drills to test technology and conduct experiments. Researchers could use these occasions, for example, to find ways to improve cleanup efficiency that could ultimately save money in cleanup efforts. The response community can provide scientists with opportunities to research long-term, indirect, and cascading impacts. Scientists could request access to spills of opportunity prior to large-scale spill events. Responders and researchers can also establish cooperative agreements or work with citizen science groups and fishing industry members to collect field samples.

TABLE 3. Specific topics mentioned on how response efforts could contribute to research opportunities. “✓” indicates in what states attendees mentioned each topic.

Topics Mentioned	TX	LA	MS	AL	FL
Share data/knowledge gaps.	✓	✓	✓	✓	
Provide response training for scientists.	✓		✓	✓	
Provide opportunities to test technology and conduct experiments.			✓	✓	
Get researchers involved in oil spill exercises.		✓	✓		
Provide access to real field samples.				✓	✓
Teach U.S. Coast Guard to gather water samples or conduct testing.			✓		✓
Share the process of getting research into response so it is understood by scientists.		✓			
Share agency or industry resources with scientists.			✓		
Seek to understand academic research needs.	✓				
Use state or federal funds to fund a science representative for each state.	✓				
Request proposals from scientists on specific topics that need more understanding and allow science to be done on spills of opportunity.			✓		
Help responders improve clean-up efficiency.				✓	
Connect medical professionals with responders to keep them safe.				✓	

Discussion Surrounding Question 3, “What are the Greatest Challenges or Barriers for Collaboration Between Response and University Researchers?”

Two of the greatest challenges to responder/researcher collaborations are finding funding between spills to conduct research and communication or lack thereof (Table 4). Agencies and researchers may lack the time, funding, or motivation to publish this information after a spill is over.

Researchers and responders have different priorities and work on different timelines, which can make communication difficult between the two. In the initial stages of a spill, responders must report, contain, and clean the spill as quickly as possible. Most

researchers work on longer time scales to understand a spill’s impacts. These long-term studies are helpful to responders because they provide information that is needed when creating or updating Area Contingency Plans. Another challenge is the lack of case studies that review specific oil spill incidents and lessons learned.

Researchers would like to be able to collect data during a spill, but may lack the safety credentials to go out during a response. Conducting research may also be difficult due to the challenging logistics of sampling on-site during an active response. During an oil spill, responders’ primary concerns are to protect people, property, and the environment. There is also liability in bringing people on board who are not trained; responders must keep everyone’s safety in mind.

TABLE 4. Specific topics mentioned about the challenges and barriers for researcher/ responder collaborations. “✓” indicates what states each topic was mentioned.

Topics Mentioned	TX	LA	MS	AL	FL
Lack of funding cited as a problem.	✓	✓	✓	✓	✓
Lack of communication can cause issues between researchers and responders.	✓	✓	✓	✓	
Scientists can lack safety credentials to go out and conduct research during a response.	✓	✓			✓
Different time scales between response and researchers can cause conflict.		✓	✓	✓	
Local researchers are not involved in response decisions.		✓		✓	✓
No information transferred between the groups causes information gap.		✓		✓	
No real field samples are available for researchers to analyze.	✓			✓	
Both groups need to overcome bias and preconceived notions about responders and academic researchers.		✓			✓
Researchers do not understand the constraints emergency responders have during spill response.	✓				✓
Flexibility needed to plan for response.		✓			
Both groups need to talk to the general public and synthesize science for the public.		✓			
No formal role for researchers exists within Incident/Unified Command.		✓			
Time of year can be an issue if academic sessions influence engagement.		✓			
More published studies that review case studies and lessons learned are needed.			✓		

Discussion Surrounding Question 4, “What Are Some of the Solutions to Tackle these Challenges? Are There Any Tools or Strategies that You Feel Would Be Useful to Help Bridge this Gap?”

The top three recommendations to help tackle some of the challenges mentioned were to make data and surveys available, share science, and host local researcher/responder science meetings (Table 5). Academic and agency researchers could compile data sources and sets and make them available for use.

Scientists should share research results with industry and state agencies to get new ideas incorporated into response efforts. They could work directly with SSCs, join technical committees, as well as participate in Spills of Opportunity. Response plans should be written with researchers ahead of time, describing the value of the research and the importance of the scientists’ involvement. At the very least, researchers can comment on response plans when they are released for public review but would need to be notified of the comment opportunity.

Having local researcher/responder science meetings would help open the lines of communication between these groups. These meetings would allow both groups to share their research and data, so everyone is aware of each other’s work. It would also give them the opportunity to create lists of research ideas and problems that need to be solved for future planning. Researchers participating in local Area Committee Meetings would be a great platform to start such collaborations.

Responders could also provide more easily accessible and free educational courses for scientists who would like to get the certifications they need to participate in response. Hosting a spill drill specifically for researchers would help them foster a better understanding of what types of scientific information could help response efforts.

TABLE 5. Specific topics mentioned about some of the solutions to tackle collaboration challenges. “✓” indicates in what states attendees mentioned each topic.

Topics Mentioned	TX	LA	MS	AL	FL
Make data and surveys available.	✓	✓	✓	✓	
Share science with industry, state and local agencies, and elected officials so next steps can be formulated.	✓	✓	✓	✓	
Hold local researcher/responder science meetings.	✓	✓		✓	✓
Increase free educational response courses offered to get scientists certified.	✓	✓	✓		
Participate in Area Committee Meetings.	✓	✓	✓		
Give researchers a list of ideas/response problems that need to be solved.			✓	✓	
Have scientists synthesize and communicate science directly to response officials.	✓			✓	
Connect researchers with those making response decisions.			✓	✓	

Train scientists to become part of Incident/Unified Command.			✓	✓	
Work directly with SSCs.		✓		✓	
Allow researchers to participate in spill drills.	✓			✓	
Create a “whom to call” list of researchers and responders.	✓				✓
Collaborate to make everyone aware of others’ work.				✓	
Get source oil samples to researchers.				✓	
Allow researchers to become part of technical committees.				✓	
Pre-stage structured science projects.		✓			
Put researchers into local and regional response plans.			✓		

Conclusion

These workshops provided a place for great conversations to occur between emergency responders and university researchers. The questions allowed both groups to get a better understanding of the challenges that occur at a regional and state-wide level. They also sparked discussion on suggestions for possible future solutions to these challenges. As the Sea Grant team conducted more workshops throughout the Gulf, trends with suggestions and comments became apparent across most, if not all, of the states in the region. Once such suggestion was that Area Committee Meetings are a great place for responders and researchers to interact and network with each other. Scientists who attended these meetings would have a chance to share their science and get the opportunity to develop relationships with responders prior to a spill. Another common recommendation was for responders to share data knowledge gaps with scientists. This would allow scientists an opportunity to plan projects that would help fill the gaps for improved response efforts.

When attendees discussed the questions of the greatest challenges and solutions, they also made similar comments across the Gulf region. The lack of funding between major spills was on the top of the list for challenges faced. The financial resources needed to conduct research, trainings, workshops, and events that bring these groups together are not always available. The most common solution shared was to make oceanographic surveys and other data available so that all who are interested can have access to the information. Sharing such information with all those interested would help formulate next steps to be better prepared for the next spill.

This document serves as a resource for each state and the Gulf of Mexico region and provides information on how these groups can collaborate and work together in the future. The information gathered from participants is a steppingstone in improving these relationships. Ideally, to keep these connections growing, these two groups need to make sure that communication and collaboration continues.

Appendix

Below are the notes from each state workshop, arranged geographically from east to west.

Florida—The input session in this state was held as one large group.

1. How are research findings useful to oil spill responders?
 - Responders want their actions to be “correct”/defensible, need scientific data to back them up.
 - Sometimes there is conflicting science/data.
 - What is the best way to convey complex messaging of data?
 - Translate these complexities into digestible/useable manner for responders.
 - Literature reviews and synthesis of particular topics to distill key pieces (e.g., like job aids through NOAA).
 - What science out there is readably applicable to improve response in near term?
 - There are state commissioned reports, for example, but not well done.
 - Science needs to be shared during planning phases at the Regional Response Team level so that it can then be worked into things like Scientific Support Coordinator toolkits.
 - What role can academia play in response and how can they get involved?
 - Participate in local Area Committee Meetings and Regional Response Team meetings.
 - Relay knowledge of presence/absence of endangered species to NOAA, the Area Committee, and the Regional Response Team so that it is included in response plans.
 - Integrate industry insight into GoMRI synthesis efforts.
 - Output and synthesis efforts should be keyword searchable.
 - Sea Grant publications are great, for longer (but still brief) synthesis reports on oil spill science.
 - International Petroleum Industry Environmental Conservation Association (IPIECA) bulletins are another great resource.
 - Collaboration needs to move from during crisis to before a crisis happens. This allows more time to inject scientific inquiry.

2. How can response efforts contribute to research opportunities?
 - Responders can collect data during an active spill.
 - Need to have pre-established connections to be able to have responder house the scientific collection/monitoring equipment.

- Researchers would need to ensure equipment is kept up-to-date and useable.
3. What are the greatest challenges or barriers for these types of collaboration?
- There isn't money to fund collaborative works.
 - Culture clash among sectors.
 - Academia can tend to have defensiveness toward others about their work and not think outside of academia for opportunities.
 - Optics, perception by the public.
 - Legal issues are a priority—protect the company and survive the incident.
 - Industry may not be able to share everything in order to promote their own well-being.
 - Similarly, with responders, the number one concern is safety so there's lots of red tape to allow a researcher on-scene.
 - Looking to have folks working through past challenges provides a lot of insight.
 - Need to look for opportunities to get access to site/samples, and of course, establish connections ahead of time when possible.
 - Ask questions that are scientifically relevant to responders.
 - Academia work with other sectors to modify research protocols to be useful later for that sector.
 - Researchers working with Natural Resource Damage Assessment (NRDA) folks could be helpful too.
4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?
- Hosting more meetings, where collaboration is encouraged. Examples include Sea Grant meetings, Gulf of Mexico Oil Spill and Ecosystems Sciences Conference, etc.
 - Report that address top priorities.
 - A “who to call list” ahead of an incident (Ann Hayward Walker may be doing this?).
 - Create relationships PRE-spill. Those involved need to be able to bring their own assets (equipment, etc.) to the spill so as not to drain response resources. Also, those who want to be involved need HAZMAT training to be able to participate.
 - During active spill incident/unified command isn't going to be welcoming to new requests during early response (too busy responding).
 - Need to revamp process and get together experts from all sectors involved to outline key priorities/needs of response.

- Needs to be done at state-level to really address unique needs of each state.

Alabama—Attendees were split into two groups for the input session. Below are the responses for each group.

Group 1

1. How are research findings useful to oil spill responders and what role can academia play in response?
 - During the Santa Barbara spill, scientist helped with finger printing of the oil.
 - They were not part of incident/unified command but were available to answer questions as needed.
 - Researchers need to get to know their area Scientific Support Coordinators (SSC), go to Regional Response Team (RRT) and Area Committee (AC) meetings.
 - Have a list of scientists and their expertise to call on when needed.
 - Researchers involved from the beginning of planning.
 - What should be available to be activated right away?
2. How can response efforts contribute to research opportunities?
 - National Academy of Sciences has written a synthesis publication about dispersants.
 - Bureau of Ocean Energy Management (BOEM) has done research on in-situ burning.
 - Nearshore oil and fate.
 - What can scientist do to save 1-day of clean up?
 - Improving efficiency of response can save money.
 - Research on responder health would be helpful. Medical folks can interact with responders to keep them safe during a response.
3. What are the greatest challenges or barriers for these types of collaboration?
 - Not aware of what kind of science is needed.
 - Local researchers are not involved in local decisions.
 - Too many data gaps/no access to data (BOEM, Navy). There is no information being transferred between groups.
 - Responsible party does not collaborate or let scientists help.
 - The difference in time scales between responders and researchers.
 - Communication between groups is challenging.

4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?
 - Responders could have a list of ideas/problems that need to be solved.
 - Having a synthesis of past experiences, this could include exit interviews and asking what they would change.
 - Science needs to be shared so next steps can be planned or formulated.
 - More opportunities to collaborate so everyone is aware of one another's work.
 - Those interested in getting involved with response need to get involved with those who are making the decisions.
 - Obtaining source samples for researchers would be helpful.
 - Making oceanographic data and surveys available for all to have access to.
 - Having more local researcher/responder science meetings would help foster future collaborations.
 - Scientists need to take appropriate courses/trainings to become part of the Incident Command System (ICS).
 - Primary of response needs to be made clear (economical, preserving environment).
 - Continue to have discussions after a spill to continue networking and collaborating.

Group 2

1. How are research findings useful to oil spill responders and what role can academia play in response?
 - Improve/justify existing and new tools.
 - Vet new processes, provide info about biological processes, which could be used to change response processes.
 - Have a better understanding of oil and the environment and, therefore, make better decisions.
 - Have credible info to justify decisions.
 - Provide new science that can be included in response and restoration efforts and technologies.
 - Provide baseline data from long-term monitoring programs.
2. How can response efforts contribute to research opportunities?
 - Provide opportunities to test technology and conduct experiments (spills of opportunity).
 - Provide access to real-field samples.
 - Provide a list of research and monitoring gaps and needs.
3. What are the greatest challenges or barriers for these types of collaboration?
 - Actually getting science and new ideas to be used in response efforts.

- There's a disconnect between groups.
 - Researchers lack real field samples.
 - Not learning from the past or getting data to responders and practitioners.
 - Researchers don't know what science could help response efforts.
 - Lack of funding.
4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?
- Work directly with Scientific Support Coordinators.
 - Become a part of technical committees in your area.
 - Participate in Spills of Opportunities.
 - Create industry-specific training.
 - Use GoMRI and other entities to connect.
 - Invite researchers to response activities and responders to research activities.
 - Provide economic incentive to Responsible Party, could save money by using best science.
 - Have researchers participate in spill drills or create a spill drill specifically for researchers.
 - Create a Science Committee that is part of spill drill and response efforts.
 - Have a list of 5 questions that responders try to answer during every spill.
 - Establish co-op agreements between responders and researchers.
 - Work with citizen science groups and fishing industry to collect samples.
 - Compile lessons learned and publish them so other audiences can read them, or they can be incorporated into training.
 - Use existing datasets to help responders and practitioners.
 - Center of Excellence can be a source for funding.

Mississippi—Attendees were split into three groups for the input session. Below are the responses for each group.

Group 1

1. How are research findings useful to oil spill responders?
 - Share science outside of response (before or after spills) vs. during response.
 - Provide lessons learned, short and long-term impacts from past spills.
 - Create criteria of what response techniques work best based on past spills and conditions.
 - Include research results in Contingency Plans, this way the information is in a place where it can be used, despite staff turnover.

2. How can response efforts contribute to research opportunities?
 - Invite researchers to the “response table” so they hear needs and incorporate new science into response planning.
 - Compile list of questions and needs that responders must provide to research community.
 - Allow opportunities to research long-term, indirect, and cascading impacts.
3. What are the greatest challenges or barriers for these types of collaboration?
 - Lack of communication of needs between researchers and responders.
 - Lack of published studies that review case studies and lessons learned.
 - Agency and researchers may lack the time, effort, funding or motivation to publish this information.
 - Lack of funding opportunity to study long-term, indirect, and cascading impacts.
4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?
 - Put research into laws, local and regional response plans, and agency and industry contingency plans.
 - Researchers can comment on plans when released for public review (need to be notified of the comment opportunity).
 - Response community could provide more transparency and accessibility to response plans, reports, and information.
 - There was a lot of discussion about how researchers are required to share their data; response should do the same.
 - Share agency data.
 - Compile data sources and data sets that are available for use.
 - Publish relevant studies.
 - Connect researchers with other stakeholders, not just responders.
 - Share science with industry (potential responsible party), they are looking to save money during response efforts, having the best science can help with this.
 - Share science with state agencies which can be used in response efforts.
 - Connect science to economic development to make relevant to local agencies and elected officials.
 - Researchers could attend and present at Area Committee and Regional Response Team meetings.
 - Share list of questions responders have so researchers could present on these topics.
 - Information must be applicable and at an understandable level.

- No one knew how to find out about upcoming Area Committee Meetings. Many times, these invites are through word of mouth.
- Educating researchers about response efforts.
 - Participate in Incident Command training.
 - Provide grants to attend training.
 - Compile list of available online training opportunities.
 - Create a preliminary course about response that can be offered at colleges.

Side note

This group also talked about how different the questions that responders and researchers would ask after a spill are. For example, researchers are interested in what habitats are impacted, how bad the impacts are, and what species are affected. Responders, on the other hand, are interested in reporting the spill and containing it, activating Incident/Unified Command, whom to contact and what to do to keep people safe. Also, a few responders mentioned that researchers kept saying ‘the spill,’ when they respond to spills nearly every day. It was clear that there were different perspectives on oil spills. Bringing these perspectives together may help bridge the gap between these two groups.

Group 2

1. How are research findings useful to oil spill responder and what role can academia play in response and how can they get involved?
 - Knowledge of deep water and deep-water spills greatly expanded post-Deepwater Horizon.
 - Discouraging how many hoops to jump through to do in-situ burning despite previous use and science to support use.
 - Translating science into tools for responders is needed.
 - Big challenge:
 - How does scientific information from academics/researchers get to practitioners?
 - Organizations like Louisiana’s Oil Spill Coordinator’s Office (LOSCO) used to fulfill this role. Need more connections between groups like LOSCO and academia/researchers.
 - Need more academic participation at Area Committee Meetings.
 - Get academics to join Area Committee subcommittees.
 - Get broader attendance at meeting like the International Oil Spill Conference and Clean Gulf.
 - Need better/more organized way for scientists to get info to responders.
 - Need liaisons between scientists and responders (explanation of role of NOAA Scientific Support Coordinators given for those unfamiliar with them).
2. How can response efforts contribute to research opportunities?

- Open lines of communication, pre-established connections, vocalization of needs (of researchers) to make most of opportunities.
 - Use NOAA Scientific Support Coordinators as a connection point.
 - Want to see more Scientific Support Coordinators at the state level (something similar to the model of Louisiana’s Oil Spill Coordinator’s Office in Louisiana or the Oil Spill Program run by Dr. Don Davis at Louisiana State University (which ended in 2010).
 - Request for proposals for science to be done on spills of opportunity.
 - So much funding occurs years after events happen, what if researchers submitted proposals (of work to do on spills of opportunity) prior to events?
 - May get negative blowback from oil companies and other responsible parties.
 - Get academics/researchers involved in training exercises by oil companies and others.
 - What does response community want to know scientifically? This is important information to know.
 - Examples:
 - Response in wetlands, impacts of dispersants, herders.
 - Does the habitat have “valuable” fauna, cultural features?
 - How does this change response?
 - Sensitivity index, like those available via Environmental Response Management Application (ERMA), are useful as long as they are kept up to date.
3. What are the greatest challenges or barriers for these types of collaboration?
- Getting information that a spill has occurred is challenging.
 - Maybe an e-bulletin board, listserv, mailing list (by topical area), alerting scientists of a spill so they can participate (scientifically).
 - There would have to be a specific point person to manage this and respond to emails/questions, causing logistics to be tricky.
 - This could lead to faster research input.
 - This would need to include information on spill, habitat, locations, descriptions, etc.
4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?
- Following up on idea presented in Question #3: Maybe Sea Grant could share the email addresses with those who agree to it??
 - Get questions from responders to researchers.
 - How? (Common issue: “If only we had info XYZ...”)
 - Sea Grant and/or Emergency Restoration could provide/create legacy of knowledge—lessons learned for each generation of

responders to use to get everyone up to speed on state of the science (needed due to high turnover rate of responders).

- Products in order of usefulness/user-friendliness:
 - Video>Trainings>Booklets.

Group 3

1. How are research findings useful to oil spill responders? What role can academia play in response?
 - Help shape response tactics.
 - In-situ burning:
 - Monitoring techniques—how does particulate size change downwind during in-situ burning.
 - Help define public threat (NOAA, Bureau of Safety and Environmental Enforcement).
 - More on different options for response based on heterogeneous species.
 - Baseline data.
 - Develop Academia Advisory Committee within Environmental Unit and Natural Resource Damage Assessment.
 - Attend Area Committee Meetings and Regional Response Team meetings.
 - Build trust and relationships, which can lead to funding agreements.
 - Need to be able to explain things in laymen's terms.
 - Understanding of different timeframes is needed.
 - Connect with NOAA Scientific Support Coordinators.
2. How can response efforts contribute to research opportunities?
 - Integration between Area Committees-Regional Response Team and large funding entities.
 - Get funders to go to Area Committee and Regional Response Team meetings.
 - Teach United States Coast Guard to do science.
 - Present research to state entities.
 - Many helpful resources:
 - Clean Gulf—have research needs, plenty of folks to network with.
 - Marine Spill Response Corporation could be a funding source for scientists to get involved with response.
 - Clean Gulf Associates.
 - International Tankers Owners Pollution Federation.
3. What are the greatest challenges or barriers for these types of collaboration? What are some solutions to tackle these challenges?
 - TIME—researchers and responders work on different timelines.
 - Funding—making sure there is funding between spills to continue research.

- Cultural barriers between groups, revenue killer.
 - Language barrier—communication is key.
 - Scientific Support Coordinators as communicators with responders.
4. Are there any tools or strategies that you feel would be useful to help bridge this gap?
- Researchers speak at Area Committee Meetings.
 - United States Coast Guard Homeport.
 - NOAA one pagers.
 - Resource sheet that has shortcuts to oil resources.

Louisiana—Attendees were split into four groups for the input session. Below are the responses for each group.

Group 1

1. How are research findings useful to oil spill responders and what role can academia play in response?
 - Add technical specialists into environmental unit.
 - Injury assessment natural environment studies.
 - Joint information center:
 - Present science and make connections, can't always wait for journal article to be published.
 - Maintain transparency.
 - Illness assessment:
 - Lack of doing this (due to funding, etc.) leaves room for mistrust.
 - Sociocultural impacts.
2. How can response efforts contribute to research opportunities?
3. What are the greatest challenges or barriers for these types of collaboration?
 - Localized knowledge—MINE IT!
 - Need more two-way communication, lack of communication causes conflict.
 - Responders have difficulties dealing with states.
 - Area committees have more buy-in from states in area contingency plan.
 - Information streamlining and using academic information in appropriate situation.
 - People from environmental unit embedded in response.
 - Need flexibility in planning for response.
 - Every situation is different.

- Don't necessarily need funding—just access to do the needed science.
 - An issue is scientists don't necessarily have credentials to go out and sample. Need to have appropriate training to go out on a spill (ex. HAZWOPPER).
4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?
- Texas/Louisiana—Money is available for opportunistic studies of spills in Texas and Louisiana, but not east.
 - Flow between academia, Scientific Support Coordinator, Emergency Responders needs to be better. Having more get-togethers with Scientific Support Coordinators and academics, such as the Gulf of Mexico Oil Spill & Ecosystem Sciences conference.
 - Better understanding of people from extreme ends of the spectrum.
 - Increase FREE educational courses offered and make accessible.
 - Science of Spills
 - SOCs
 - SOND
 - Petition with EPA to do real controlled spills in environment testing.
 - In now—mesocosms.
 - In open water...can't get permitting.
 - Tools and strategies.
 - Don't want to wait until incident.
 - Attend Area Committee Meetings and become active.
 - Community action groups.
 - Challenging to keep folks active.
 - Working with schools, Boy Scouts of America, Girl Scouts of America, faith-based groups.
 - Resources are limited.
 - Oilspillprevention.org—API based tool to share info.

Group 2

1. How are research findings useful to oil spill responders and what role can academia play in response?
- Less litigations, more publications and data out quickly.
 - DIVER platform, include data.
 - Getting information out more publicly.
 - More networking and opportunities to hear all sides of the story.
 - Interaction between general public and industry.
 - Industry faces restrictions with public affairs.
 - Teachers are a trusted source for communication.
 - Develop better understanding of what command system does.

2. How can response efforts contribute to research opportunities?
 - Fill knowledge gaps; help researchers understand what science is needed.
3. What are the greatest challenges or barriers for these types of collaboration?
 - Communication—more public and private.
 - Communicating science to the public who wants answers now.
 - Gaps, opportunities through research.
 - Conferences, regional response team, outreach, visit labs.
 - Open to explore and learn from others.
 - Overcoming bias, coming in with preconceived notions.
 - Synthesizing state of science.
 - Challenging to talk to the general public.
 - Knowledge gaps, synthesizing for public.
 - Laws and litigation.
4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?
 - Make fact sheets, such as American Petroleum Institute (API), publicly available.
 - Video—helpful way to deliver.
 - Maps—impact maps (state of the Gulf).
 - Overcoming misinformation—having tools backed by industry, NOAA, academia.

Group 3

1. How are research findings useful to oil spill responders and what role can academia play in response?
 - Researchers understand structure responders understand research needs.
 - Need liaison who will talk to both worlds and “sell” to command and lay foundation.
 - Fill gaps in knowledge.
2. How can response efforts contribute to research opportunities?
 - Get researchers involved in oil spill exercises.
3. What are the greatest challenges or barriers for these types of collaboration?
 - No formal ‘role’ for researcher in Incident/Unified Command, need another position in addition to SSC.
 - Researcher—who do I call to get involved?

- Florida example—collected names and expertise of researchers that were available.
 - Florida academic response group—not accessed.
 - Florida Institute of Oceanography—took on role to update contacts.
 - USCG can reach out to those listed for best management practices.
 - Funding part of Incident Command team—Fed and state law—can't use money for response research.
 - “set asides”—longer term recovery might not work with small spills—liability (NOAA money).
 - Time of year of spill will affect academic engagement due to classes or sessions they may have.
 - HAZARDS— “self-deploy” for data collection in spill zones and different set of priorities for researchers.
 - Improve relationships, understand chain of command and contacts.
4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?
- State specific case studies as an idea
 - Local researchers need to have relationships with Scientific Support Coordinators at the federal and state level.
 - State—bigger role—oil spill program Scientific Support Coordinator at the state level (TX, FL, CA).
 - State Scientific Support Coordinator advocates for state research.
 - Federal government compile best management practices for states.
 - Example: Texas auto buoy system for current data and oil spills.
 - RESTORE ACT for money (for other state monitoring).
 - Memorandum of Understanding—FIO coordinated this in Florida; they reached out to the United States Coast Guard to accomplish this.
 - Data management—data sharing plans.

Group 4

1. How are research findings useful to oil spill responders and what role can academia play in response?
 - Policymaking
 - Translating science often, transparency, reaching out regularly—is there a disconnect? What avenues work regarding communications?
 - Unchartered waters in regard to negotiating with new admin.
 - Provide solutions to policymakers.
 - Focus on delivering “this is how we make things better.”
 - Oil spill response is not on their radar.

- Attention is constantly re-directing.
 - Prepare information ahead of time.
2. How can response efforts contribute to research opportunities?
- American Petroleum Institute and Ohmsett are both great resources.
 - System for bumping up research through chain.
 - Share process of getting research into response so it is understood by scientists.
3. What are the greatest challenges or barriers for these types of collaboration?
- Large enough (legal) oil samples for scientific purposes (dispersants and dilutants).
 - Government has to pay for oil, cost prohibitive (shipping).
 - Volume/size system is not set up (large vs small quantities).
 - Have to know who to ask, this is the key to getting it.
 - Safety and integrity issues, this can be a long process.
 - Intentionally spill oil for experiments (Norway, etc., do it but permits in US keep us from doing that).
 - Liability concerns regarding dispersants for research; vendors are reluctant, (NALCO) legislation/regulations need to change.
 - Band-aid/short term solution:
 - National dispersant bank for researchers (Woods Hole).
 - Long term: get congress involved.
 - Vendors involved leads to vetting research before legislation.
 - Vendors threatened by potential research results.
4. What are some of the solutions to tackle these challenges? Are there any tools or strategies that you feel would be useful to help bridge this gap?
- Establish relationships in advance of spill event.
 - Area Committee Meetings are one meeting place.
 - Pre-stage science projects (structured) worked out ahead of time, ready to deploy.
 - National Science Foundation or National Academy of Sciences are potential groups to oversee pre-spill monitoring research.
 - Bureau of Ocean Energy Management has environmental studies programs.
 - Hands-on demo of complex science concepts for stakeholders (ocean acidification in Alaska via Washington Sea Grant).
 - Oil spill game—cleanup methods while considering tradeoffs. impacts/consequences strategy games.
 - Increase atmospheric science into spill response.

- System/method in place to involve Scientific Support Coordinators.

Texas—The first workshop in Texas was conducted in April 2015. Being the first workshop held, the input session was different than the other four workshops conducted; however, similar questions and topics were discussed.

1. What are the greatest challenges or barriers for researcher/responder collaboration?
 - Getting out to collect data.
 - Trying to figure everything out on site is hard because the focus has to be on primary issues.
 - There is a liability of bringing people on board who are not trained.
 - Researchers need to understand constraints of emergency responders are under.
 - Funding for academia to do research.
 - Use state/federal funds to fund a science representative for each state.
 - Write research plan into Area Contingency Plans.
 - Difficult to insert yourself during a crisis.
 - Researchers should collaborate together for spills.
 - Have training.
 - Can be free if you work for university of state agency.
 - Federal Emergency Management Agency Incident Command System courses.
 - A plan needs to be written with researchers ahead of time, one that describes the value of the research.
 - A proposal that claims importance of what the scientist's involvement is and what it means.
2. How do non-academia folks get involved?
 - Volunteering—TX has wildlife groups where they can help.
 - Taking courses to get appropriate training.
 - Get involved with state officials.
 - Bioremediation—not allowed in marine environment.
3. What role can academia play in response?
 - Spill response—get scientists prepared during spill drills and Area Committee Meetings.
 - Participate in Joint Information Center and Unified Command.
 - Participate in Area Committee Meetings to present science.
 - Participate in trainings and get certifications needed to help in response.
 - Help to communicate with the media to get appropriate information out, however not all scientists are good at communicating science.

- Informing the public during Deepwater Horizon was not handled well.
- Share publications with NOAA's Office of Response & Restoration so that they can be incorporated into overall US Coast Guard spill record.
- Response needs to share their observations of gaps in data or knowledge so that scientists can work to fill those gaps.
- Be trained to respond if you want to get one the ground—2 trainings Incident Command System and Federal Emergency Management Agency and in some cases these trainings could be free.

4. How clean is clean?

- Incident/site specific.
- Data not always available to public.
- Health concerns usually EP and public health officials are responsible.
- No overarching database that contains information.
- Texas is doing tar ball analysis.
- United States Coast Guard has 51% of unified command.
- “Federalize it”—no responsible party for spill.
 - Doing something unsafe.

Panel Session—Below are notes taken during the panel session of the workshop. The panel session consisted of all speakers sitting at the front of the room and allowed participants in the room to ask the panelists questions. Below are the suggestions that attendees made during the session.

- Knowing appropriate people to contact.
- Face-to-face meetings very helpful.
- Have understanding of what is needed by academia.
- Need to have an understanding of command structure.
- Incorporating a scientific response to plans.
- Academia participate in Area Contingency Plans meetings and subgroups.

Below are the notes taken from a discussion on dispersants and technology.

Dispersants

- Dispersants have to be heavily tested (standard EPA testing) before they are put on the product list.
 - All chemicals must be thoroughly vetted and approved before being listed on the schedule.
- Offshore/open area—can use dispersants,
- Dispersants used 12-13 times in U.S. history.
- Penalties if dispersants are used without approval.

Technology

- Who is evaluating new technology for clean up? If booms aren't working why does response keep using it?
- No laws or regulations mandating the use of booms or other mechanical tools.