Summary Statistics from the 2016 Oil Spill Science Social Network Analysis

Stephen H. Sempier, Mississippi-Alabama Sea Grant Consortium
Chris Ellis, NOAA Office for Coastal Management
LaDon Swann, Mississippi-Alabama Sea Grant Consortium

Background

Initial Effort

In 2014, the Gulf of Mexico Research Initiative, which is administered through the Gulf of Mexico Alliance, supported a new oil spill outreach program that the four Sea Grant College Programs based in the Gulf of Mexico are administering. The purpose of the program is to increase the use of oil spill science by people whose livelihoods depend on a healthy Gulf. An initial phase of this new outreach effort was to understand the current network and flow of oil spill science information among the people the Sea Grant programs serve through a social network analysis.

Social network analysis (SNA) is a tool for evaluating relationships and connectivity. Typically through a survey of respondents, the SNA maps the relationships among people to show how information flows and illustrate which people within a network are essential to network's connectivity and information flow. In addition, the SNA reveals important attributes of the network, such as insights into who the leaders and connectors are, clusters of connectivity, who is on the periphery or isolated and who is unconnected from the network entirely. The purpose of conducting an SNA was to understand how credible, relevant and timely oil spill science information flowed through a network of people from specific target groups in the Gulf of Mexico, which included:

- Commercial fishers
- Recreational fishers
- For-Hire fishers
- Elected officials
- Emergency responders
- Environmental non-profit staff members
- GoMRI outreach specialists
- Ports and harbors employees
- Public health officials
- Natural resource managers
- Sea Grant outreach specialists
- Tourism specialists
- University scientists

2016 Update

This second SNA survey was administered two years after the first. The purpose of this second survey is to examine how the social network may have changed over time. In addition, a question was added to the survey to identify oil spill science topics that are of interest to the target groups. Finally, several questions were added to the survey to inform GoMRI synthesis and legacy related activities.

Methods

The primary purpose of the 2016 Oil Spill Science Social Network Analysis was to identify the degree to which individuals from specific target groups received oil spill information over a 12-month period, from whom they received information, and what sources they used to gather oil spill science information.

Three rounds of invitations were sent to potential respondents. The contacts for round one were comprised of two groups. The first group included everyone that was identified in the

2014 SNA. This included everyone who was initially contacted in 2014 and other people that were identified in the three rounds. The second group in round one of the 2016 SNA were people that the four Sea Grant oil spill science outreach specialists identified in each target audience group. Each specialist was able to submit up to four contacts per target audience group.

The survey was administered in three rounds. When the first round of the survey closed, many of the people who completed the survey had identified one or more individuals that gave them credible, relevant and timely oil spill science-related information. The individuals named in the survey responses were contacted in round two (if they were not previously contacted in round one). This process was repeated another time so that round-three contacts were people who were named by survey respondents in round two but not contacted in rounds one or two. Round one of the survey was released on June 21, 2016, and round three closed on July 28, 2016.

Response Rate and Demographics of Respondents

The response rate for each round is included in Table 1. The response rates ranged from 36 percent to 53 percent. This is quite high for an online survey.

Table 1. Response rates for each of the three survey rounds administered for the 2016 Oil Spill Science Social Network Analysis survey.

Round	Number contacted	Number responded*	Response rate
Round 1	602	218	36%
Round 2	87	46	53%
Round 3	27	14	52%
Total	**716**	**278**	**39%**

*Number responded is indicated if the person completed at least a portion of the survey.

Most of the 278 people that completed the survey could be categorized by target group and the state they primarily worked. Eight of the 13 target groups had ten or more responses with the most responses from people associated with universities (Table 2). The Gulf of Mexico states were well represented with a range from 12 respondents indicating Mississippi as their primary location of work to 34 people noting Florida as their primary location of work. Thirty-three people indicated that they worked in multiple Gulf of Mexico states. Several people skipped this question or noted that they worked in other states, the US or internationally, which partially explains the high number in the “did not answer or not in Gulf” category.

Table 2. Summary of respondents by target group and state of primary work.

Target Group	Work in Gulf State(s)						Did not answer or not in Gulf*	Total
	AL	FL	LA	MS	TX	Multiple Gulf States		
University/College researcher	7	12	10	5	7	6	34	81
Emergency responder or manager	3	1	2	0	2	6	20	34
Natural resource manager	2	3	2	3	4	2	12	28
Environmental non-profit staff member	1	1	2	2	1	3	14	24
Outreach specialist, Sea Grant	1	3	8	0	3	6	0	21
Fisher, commercial	1	0	2	1	0	3	8	15
Fisher, for-hire	0	0	1	0	2	1	9	13
Public health official	2	0	1	1	0	0	6	10
Elected official	2	0	3	0	1	0	1	7
Fisher, recreational	0	0	1	0	1	0	5	7
Tourism specialist	1	1	0	0	0	1	2	5
Outreach specialist, GoMRI	0	1	0	0	0	1	2	4
Ports and harbors employee	0	0	1	0	0	0	1	2
Other	0	2	1	0	1	4	19	27
Total	**20**	**24**	**34**	**12**	**22**	**33**	**133**	**278**

*Some people indicated their target group but did not indicate the state they primarily worked in.

Survey Results

Received information about oil spills in past twelve months

The majority of respondents (88%) indicated that did receive information about oil spill science, tools or other resources in the past twelve months (Table 3).

Table 3. Number and percent of respondents by target group that received oil spill information in past twelve months.

Target Group	Received Oil Spill Information?		Total	Percent that received information
	Yes	No		
University/College researcher	78	3	81	96%
Emergency responder or manager	33	1	34	97%
Natural resource manager*	23	4	27	85%
Environmental non-profit staff member	23	1	24	96%
Outreach specialist, Sea Grant	20	1	21	95%
Fisher, commercial	8	7	15	53%
Fisher, for-hire	4	9	13	31%
Public health official	6	4	10	60%
Elected official	7	0	7	100%
Fisher, recreational	3	4	7	43%
Tourism specialist	5	0	5	100%
Outreach specialist, GoMRI	4	0	4	100%
Ports and harbors employee	2	0	2	100%
Other	27	0	27	100%
Total	**243**	**34**	**277**	**88%**

*One manager did not answer this question.

Familiarity of, helpfulness of and contributions by GoMRI

Approximately half of the survey respondents indicated that they were familiar with the Gulf of Mexico Research Initiative (Table 4). The other respondents indicated that they were not familiar or did not answer the question. If respondents indicated that they were familiar with GoMRI they were asked two follow-up questions. The first question was if GoMRI had helped them with their job. The greatest number of survey respondents that indicated that GoMRI helped them with their job were people from the university researcher target group (Table 5, Appendix I). The second question asked respondents to identify the three largest contributions to society GoMRI should make by the time the program ends. These results were aggregated and categorized. The number one response was providing new science discoveries followed by informing response (Table 6, Appendix II).

Table 4. Number of survey respondents that indicated that they are familiar with the Gulf of Mexico Research Initiative (GoMRI) and the work that GoMRI supports.

Target Group	Yes	No	Did not Answer	Total
University/College researcher	55	1	25	81
Emergency responder or manager	17	2	15	34
Outreach specialist, Sea Grant	15	0	6	21
Environmental non-profit staff member	13	0	11	24
Natural resource manager	8	1	19	28
Outreach specialist, GoMRI	3	0	1	4
Public health official	3	0	7	10
Elected official	2	2	3	7
Fisher, commercial	2	2	11	15
Tourism specialist	1	2	2	5
Fisher, for-hire	0	0	13	13
Fisher, recreational	0	0	7	7
Ports and harbors employee	0	1	1	2
Other	15	1	11	27
Total	**134**	**12**	**132**	**278**

Table 5. Number of survey respondents that indicated that GoMRI or GoMRI-supported efforts (e.g. research, outreach) have helped them with their job.

Target Group	Yes	No	Did not answer	Total
University/College researcher	41	11	29	81
Outreach specialist, Sea Grant	14	0	7	21
Emergency responder or manager	12	5	17	34
Environmental non-profit staff member	11	2	11	24
Natural resource manager	6	1	21	28
Outreach specialist, GoMRI	3	0	1	4
Public health official	2	1	7	10
Elected official	1	1	5	7
Tourism specialist	1	0	4	5
Fisher, commercial	0	2	13	15
Fisher, for-hire	0	1	12	13
Fisher, recreational	0	0	7	7
Ports and harbors employee	0	0	2	2
Other	10	4	13	27
Total	**101**	**28**	**149**	**278**

Table 6. Top six most frequently mentioned categories by target group to the question, “What are the three largest contributions to society GoMRI should have made by the time the program ends?”

Target Group	New science	Informing response	Informing public	Human impacts	Prepare for future	Data	Other	Total
University/College researcher	61	17	10	5	5	5	24	127
Emergency responder or manager	17	5	3	1	1	0	7	34
Outreach specialist, Sea Grant	9	3	5	3	3	1	2	26
Environmental non-profit staff member	13	5	1	0	0	0	2	21
Natural resource manager	4	1	2	1	1	0	0	9
Outreach specialist, GoMRI	3	2	0	2	0	0	1	8
Elected official	0	1	3	0	1	0	1	6
Tourism specialist	2	0	0	1	0	0	0	3
Public health official	2	0	0	0	0	0	0	2
Fisher, commercial	0	0	0	1	0	0	0	1
Fisher, for-hire	0	0	0	0	0	0	0	0
Fisher, recreational	0	0	0	0	0	0	0	0
Ports and harbors employee	0	0	0	0	0	0	0	0
Other	17	5	4	1	2	4	2	35
Total	**128**	**39**	**28**	**15**	**13**	**10**	**39**	**272**

Social Network Analysis Interpretation

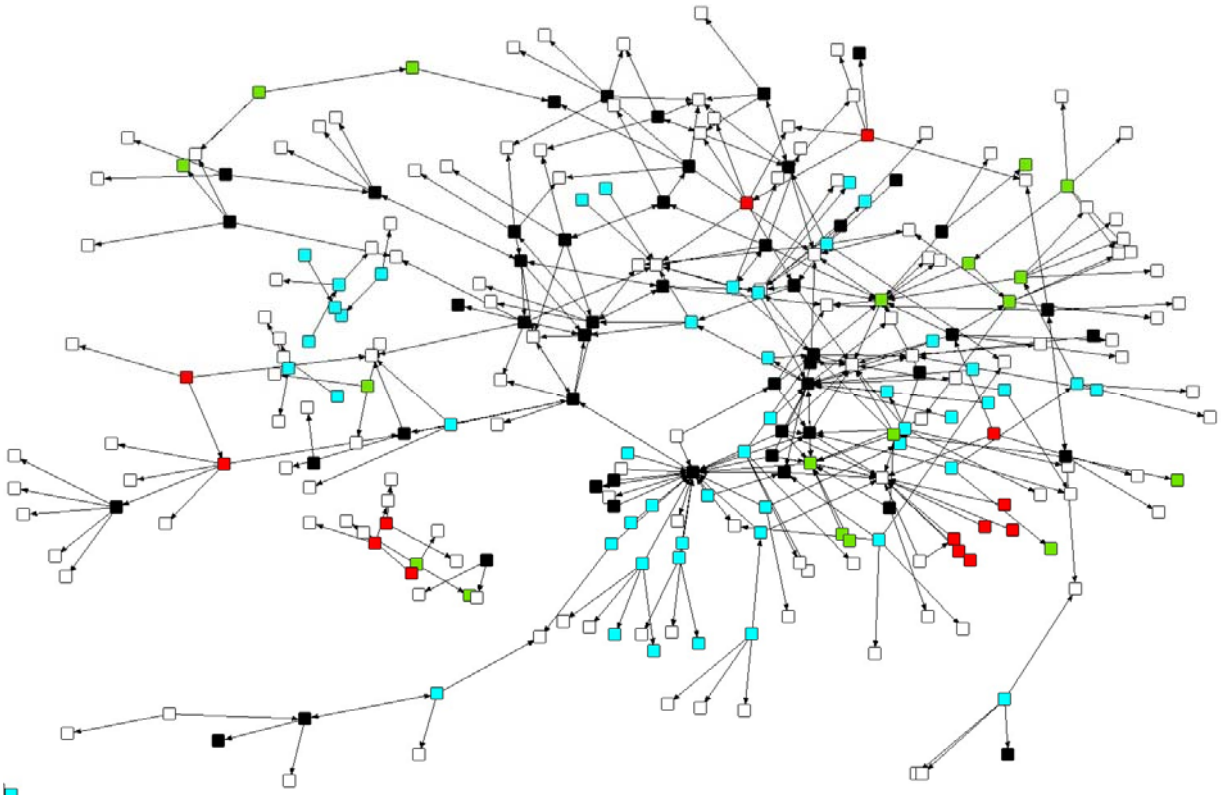
Social Network Analysis II

The visual output of a SNA is called a sociogram. Nodes (squares) and ties (lines) are the main features. Nodes represent people, and ties show relationships between them. For the data displayed in this report, generally speaking, the larger a node's size, the more important the person is to the network; nodes that are more distant indicate people that are less connected.

The sociogram in Figure 1 depicts 260 "active" nodes (i.e., nodes that have at least one connection/tie to another). There are 347 ties among the nodes within this network. Each node represents a unique individual (actor) that either 1) responded to the survey, or 2) was identified by a survey respondent as someone who provides credible, relevant and timely oil spill science information. It is easy to observe a central core network of communication, several branches extending from the central core, and a small number of subgroups that are disconnected from the greater network (Figure 1). Additionally, nodes are colored according to a respondent's self-reported state that they primarily work. There are a number of white nodes. These individuals did not indicate their state. In general, there are observable pockets of communication with a specific sub region of the Gulf (indicated by the close positioning of groups of similarly colored nodes). However, there is a moderate degree of color distribution, as well, which indicates a certain level of communication taking place across Gulf regions.

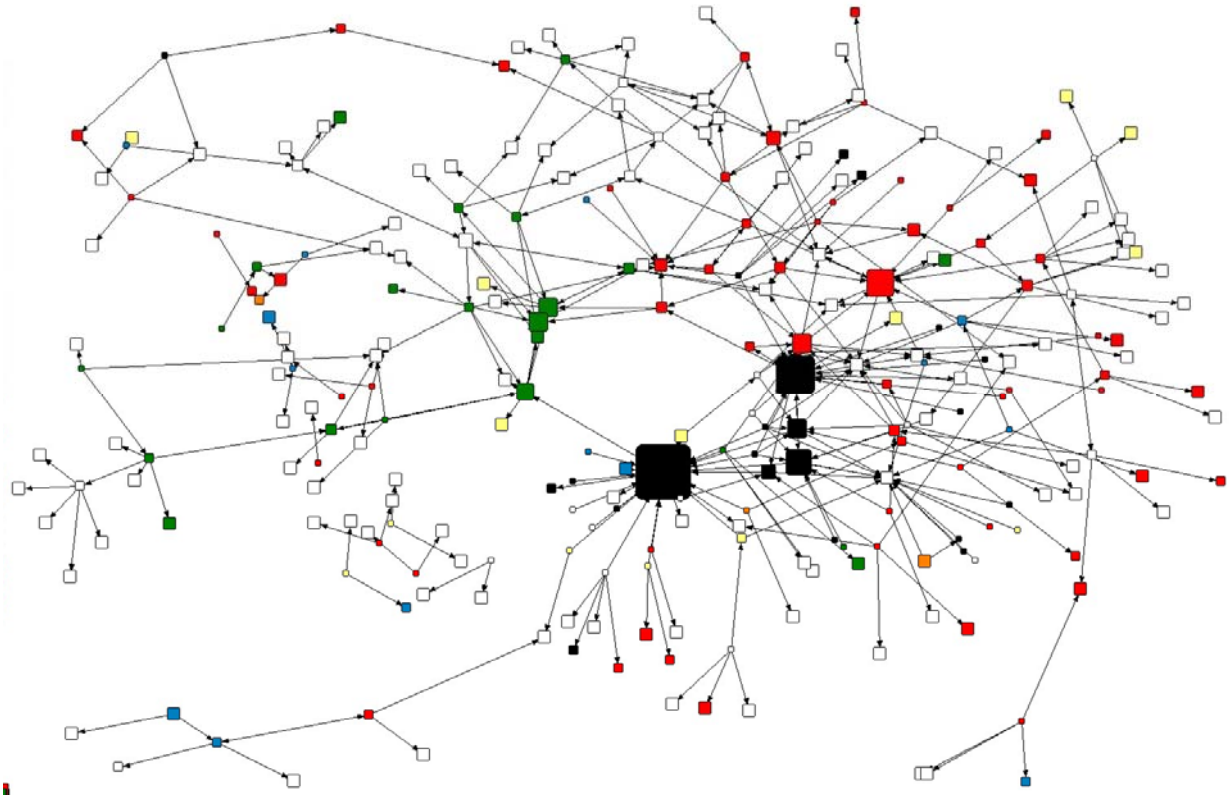
Measures of Centrality for Social Network Analysis
Indegree centrality: number of ties directed to the node (popularity)
Betweenness centrality: number of times a node acts as a bridge along the shortest path between two other nodes (primary connector for the network)

The SNA II results can also be examined based on a person's self-report professional affiliation (Figures 2 and 3). There is good representation across affiliations with only a few sections of the sociogram displaying people who primarily communicate with others with the same affiliation. Note the large black nodes fairly centered within the sociogram. These nodes represent Sea Grant oil spill science outreach team members. They have become prominent in the social network in both the indegree and betweeness centrality measures. This suggests that the Sea Grant team members are successfully engaging with target audiences, which seek them for credible oil spill information.



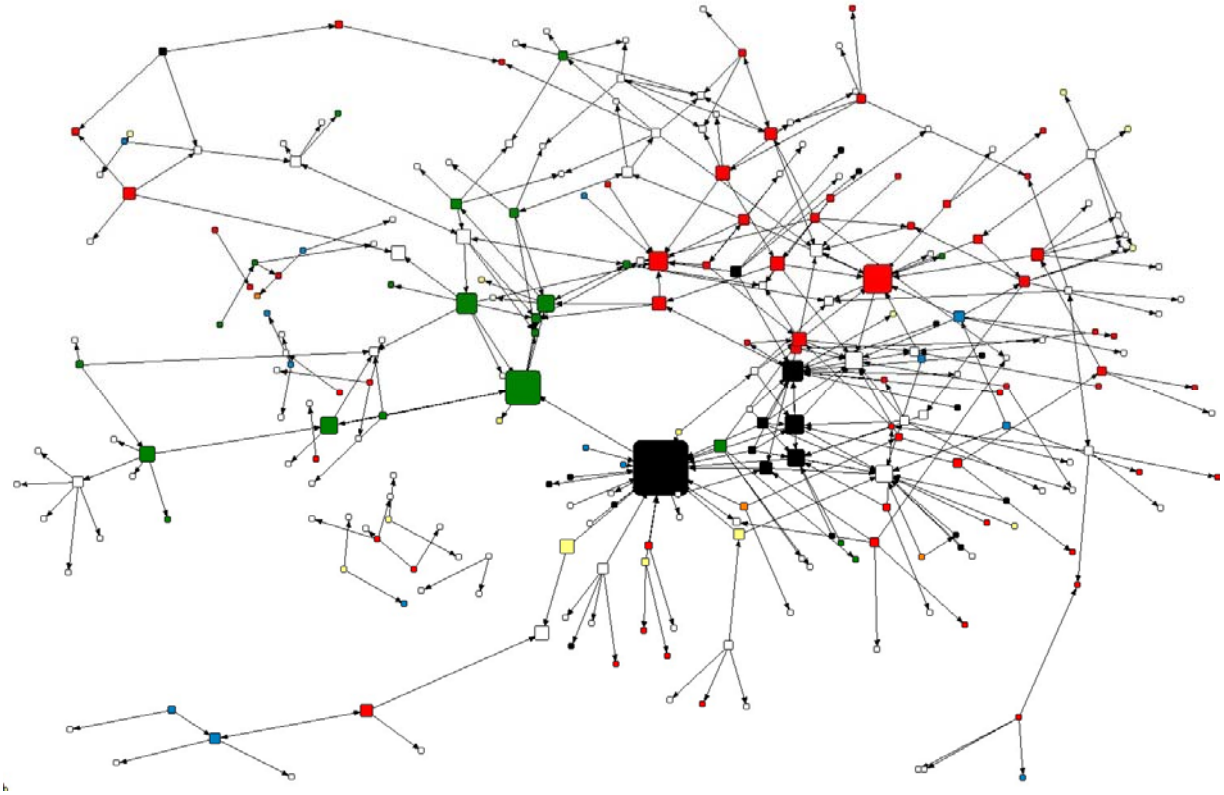
Gulf Regions	
	West (TX)
	Northern (LA, MS, AL)
	Eastern (FL)
	Regional/National
	Unknown

Figure 1. Base network of respondents based on where they primarily work (node color).



Professional Affiliation	
	University/College Researcher
	Emergency Responder/Manager
	Natural Resource Manager
	Environmental Non-Profit
	Outreach Specialist, Sea Grant, or GoMRI
	Fisher
	Other or Unknown

Figure 2. Sociogram depicting the indegree centrality (node size) of people that provide credible, relevant and timely oil spill science information, and associated professional affiliation (node color).



Professional Affiliation	
	University/College Researcher
	Emergency Responder/Manager
	Natural Resource Manager
	Environmental Non-Profit
	Outreach Specialist, Sea Grant, or GoMRI
	Fisher
	Other or Unknown

Figure 3. Sociogram depicting the betweeness centrality (node size) of people that provide credible, relevant and timely oil spill science information, and associated professional affiliation (node color).

Comparing SNA I Results to SNA II Results

For SNA II a larger number of people were asked to complete the survey compared to people contacted for SNA I. The comparison of response rates and participants by state for SNA I and SNA II revealed several similarities (Tables 7 and 8). Also, a greater percentage of respondents indicated that they have received oil spill information in the last 12 months (80% for SNA I versus 88% for SNA II).

Table 7. Comparison of the number of people contacted and number that responded to the SNA I and SNA II surveys.

Round	SNA I			SNA II		
	Number contacted	Number responded*	Response rate	Number contacted	Number responded*	Response rate
Round 1	333	139	42%	602	218	36%
Round 2	85	53	62%	87	46	53%
Round 3	56	30	54%	27	14	52%
Total	**474**	**222**	**47%**	**716**	**278**	**39%**

*Number responded is indicated if the person completed at least a portion of the survey.

Table 8. Comparison of the number and percentage of people that responded to the SNA I and SNA II surveys by affiliation.

Affiliation	Number of Respondents to SNA I	Number of Respondents to SNA II
University/college researcher	58 (26%)	81 (29%)
Emergency responder/manager	18 (8%)	34 (12%)
Natural resource manager	20 (9%)	28 (10%)
Environmental non-profit employee	19 (9%)	24 (9%)
Outreach specialist/Sea Grant	26 (12%)	21 (8%)
Fisher, commercial	13 (6%)	15 (5%)
Fisher, for-hire	12 (5%)	13 (5%)
Public health official	6 (3%)	10 (4%)
Elected official	5 (2%)	7 (3%)
Fisher, recreational	7 (3%)	7 (3%)
Tourism specialist	9 (4%)	5 (2%)
Outreach specialist, GoMRI	18 (8%)	4 (1%)
Ports and harbor employees	3 (1%)	2 (1%)
Other	8 (4%)	27 (10%)
Total	**222 (100%)**	**278 (100%)**

In addition to asking survey respondents to identify specific people that they contact for oil spill science information they were asked what other sources they use to seek oil spill science information. Credible sources of information varied depending on the target group but at least

a dozen people identified seven different broadly defined sources (Table 9, Appendix III). Most of the people from the different target audience groups wanted to learn more about the ecological impacts of the oil spill, but there was also substantial interest in fate and transport, spill response, dispersants and human health (Table 10). Table 11 provides more detail on the subtopics that survey respondents expressed interest.

Acknowledgements
This research was made possible in part by a grant from The Gulf of Mexico Research Initiative, and in part by the Sea Grant programs of Texas, Louisiana, Florida and Mississippi-Alabama. This is publication number **GOMSG-S-16-001**.

Table 9. Top seven most frequently mentioned categories by target group to the question "Are there other sources you use to obtain credible, relevant and timely oil spill science-related information? If so, please identify up to three."

Target Group	Federal sources	GoMRI	Peer reviewed literature	Conferences	Sea Grant	Universities	States	Other	Total
University/College researcher	8	24	17	4	7	4	2	18	84
Emergency responder or manager	15	1	5	6	1	1	0	7	36
Outreach specialist, Sea Grant	7	4	3	2	4	0	3	1	24
Environmental non-profit staff member	7	2	3	0	1	1	3	5	22
Natural resource manager	3	4	1	0	2	1	0	6	17
Elected official	1	1	0	0	0	2	1	1	6
Public health official	1	1	0	0	0	0	1	2	5
Fisher, commercial	1	0	0	0	0	0	0	1	2
Outreach specialist, GoMRI	0	1	0	0	0	0	0	0	1
Tourism specialist	0	0	0	0	1	0	0	0	1
Fisher, for-hire	0	0	0	0	0	0	0	0	0
Fisher, recreational	0	0	0	0	0	0	0	0	0
Ports and harbors employee	0	0	0	0	0	0	0	0	0
Other	6	2	4	8	0	4	2	6	32
Total	**49**	**40**	**33**	**20**	**16**	**13**	**12**	**47**	**230**

Table 10. Top five most frequently mentioned oil spill science topics by target group when each respondent could identify up to three oil spill science topics they wanted more information.

Target Group	Broad Oil Spill Science Topic Mentioned by Respondent						Total
	Ecological	Fate and transport	Spill response	Dispersants	Human health	Other	
University/College researcher	44	25	10	10	8	20	117
Emergency responder or manager	13	10	7	2	1	15	48
Environmental non-profit staff member	9	2	7	5	1	2	26
Outreach specialist, Sea Grant	11	1	2	3	3	5	25
Natural resource manager	12	0	2	2	0	1	17
Elected official	2	0	1	2	2	1	8
Fisher, commercial	3	1	0	2	0	0	6
Tourism specialist	3	0	1	0	1	1	6
Public health official	1	0	0	0	3	0	4
Outreach specialist, GoMRI	0	2	1	0	0	0	3
Ports and harbors employee	1	0	0	0	1	0	2
Fisher, for-hire	0	0	0	0	0	0	0
Fisher, recreational	0	0	0	0	0	0	0
Other	11	15	6	2	0	2	36
Total	**110**	**56**	**37**	**28**	**20**	**47**	**298**

Table 11. Number of broad oil spill science topics (in bold) and subtopics (unbold) within the broad topics identified by survey respondents.

Broad Oil Spill science Topic and Subtopic	Number of mentions
Ecological	**110**
Animal related impacts	36
Fisheries related impacts	27
Habitat related impacts	25
Deep ocean related impacts	8
Other	8
Trophic related impacts	6
Fate and transport	**56**
Transport	20
Degradation	16
Other	14
Marine snow	6
Spill response	**37**
Technology	20
Best management practices	10
Other	4
Science	3
Dispersants	**28**
Other	19
Effectiveness	4
Alternatives	3
Environmental impacts	2
Human Health	**20**
Seafood safety	7
Other	6
Physical impacts	5
Air quality	2
Monitoring	**13**
Other Topics	**34**

Appendix I:

Unedited Responses to Open-ended Question—
Have GoMRI or GoMRI-supported efforts (e.g. research, outreach) helped you with your job?

No (28 responses)

Please describe how they could:

- Gomri could provide a broader array of research opportunities (but possibly more modestly funded); gomri could provide more directly relevant science and in an "extension" type way provide scientifically based debunking of both extremes (either people saying oil is not very toxic; or saying it is not survivable)
- GOMRI has funded a lot of researchers that don't fully understand oil spill response. They have conducted much research that is either not relevant (e.g., studying how dispersants change the transport of hydrocarbons in beach sand) or used unrepresentative exposure conditions during lab-based fate and effects studies. Publications resulting from this research has confused the science on oil spill response. GOMRI could improve this by conducting a critical review of prior research and establishing stronger quality controls on current / future research.
- The projects have been confined to Gulf coast universities, not where the best science and resources are.
- They could be open to federal and state government employees
- To date the research has not provided equations for oil fate that can be used to model oil spills around the world, under different environmental conditions.
- While GOMRI-supported efforts are producing great science and interesting new insights, the work to date has been focused on the "what" of the oil and its fate and not as much as the "now what" that generates insight about how to manage the Gulf ecosystem going forward.
- 1.) Oil Spill Science research, projects and findings should be translated into Vietnamese language for fishing communities with Limited English Proficiency (LEP) populations. Afterwards, to disseminate the relevant information via targeted outreach in accessible manner. 2.) Many coastal communities (e.g. fishing communities have significant environmental, socio-economic, and health issues as a result of the Deepwater Horizon/ BP Oil Drilling Disaster that are exacerbated by other environmental issues (freshwater diversions, harmful algae bloom, subsidence, land loss, degraded/loss marshes/habitats & natural disasters). These communities, their livelihoods, culture & way of life is seriously threatened. Scientific research priorities/focus areas should be more relevant, applicable, and practical to help address/solve these issues. 3.) Increased understanding/awareness by scientific community that people/communities are integral part of the natural environment and ecosystem. Incorporating socio-economic data and ecosystem services into research and restoration. 4.) Explore cooperative research and/or community-based participatory research models; prioritize, invest, and create funding opportunities for cooperative research that incorporates fisher folks Traditional Ecological Knowledge (TEK), ecosystem services and community-based fisheries monitoring and restoration projects.
- I'm not familiar with the research it supports and the research findings. Additional outreach on that would be informative for me, and allow me to convey that information to others
- Not sure what they do
- Real support for efforts that could have integrated ecosystem and coastal community outcomes associated with the Macondo blowout. Really no human/public health support prioritized in the

program. GoMRI support could have been used to leverage much larger, sustainable support for inshore ecosystem management and coastal community resilience and health.

Yes (101 responses)

Please describe how:

Helped with applied work

- As a GoMRI outreach specialist, I communicate the GoMRI research with a variety of groups so I must know what is going on in order to share it. I also appreciate the sharing between outreach specialists to improve my own programs.
- Better info on which to base recommendations.
- By providing information relevant to policy making consistent with science.
- I am an outreach professional. GoMRI science greatly adds to the wealth of information that I share with the public.
- I work with floodplain managers and local government officials. I receive questions about the impacts to the natural environment and also about whether or not a future hurricane/coastal storm could potentially uncover oil and what effects that may have on the beaches/barrier islands.
- In developing our annual wildlife impacts report, we have relied heavily upon publicly available GOMRI data prior to the release of the draft and final PDARP for the Gulf oil spill. We continue to use GOMRI as another way to keep our finger on the pulse of oil spill science, in particular as it relates to wildlife and their habitats.
- Information from some of the funded research has been used to inform management decisions
- Some of the individual studies were used as support for the settlement for DWH.
- The more applied research on oil fate and toxicity for dispersed oil, in nearshore habitats, and intertidal habitats is of greatest value.
- Their sponsored research provides the foundation for our outreach program.
- They have provided information to better our oil spill modeling software that tracks the fate and effect of spilled oil in the environment.
- Use as part of technical work.

Holding conferences

- Annual conference
- Annual conference is critical event for sharing information and discoveries; consortia scientists providing required science outputs
- Conferences, researchers, papers.
- I attended last Gulf Oil Spill Science Conference in Tampa. I have not however had the time to access the full GOMRI research data base and navigated thru there. I have directed some of our researchers to do that however found it hard to get information I needed from Posters which were too small print to read in the download tool and I was not able to get full manuscripts information or get back to the data or papers that presentations were done against. I needed data from the Ixtoc presentations but was not able to get that information.
- I have presented research at GOMRI conferences
- Meeting academics at the conference and engaging in productive conversations.
- Newsletter and research conferences

Information source

- Data from research
- An excellent information resource; opportunities to present research proposals
- By providing much needed information to me and my constituents...
- GOMRI efforts have made me more informed
- Oil spill information
- Outreach and research sharing
- Pertinent information
- Presented on topics of interest
- Provided info on oil spill science.
- Provided science-based information and resources
- Providing information relating to follow-up from the BP/DH spill
- Provision of timely and meaningful information.
- Supporting citable research
- They have provided good information and provide opportunities to network and share information and lessons learned.
- They have provided me with information, however I have had no questions come to my office on the topic to share said information.
- Timely publication of data makes it easy to access the latest information.
- To a limited degree, providing perspective from the Gulf region

Other Suggestions

- Papers in peer-reviewed journals. However I note that many papers are not reviewed by other non-GOMRI experts and so must do critical reviews.
- Some GoMRI programs are shedding light in needed areas. I think that CARTHE and DEEPEND in particular are quite interesting and useful. Other programs seem good in concept, but it isn't clear how things will play out. The data management project in particular is really needed, but I fear it will not provide what the region needs. The other issue I see is a potential lack of permanence. We will learn something via GoMRI (and RESTORE), but what we really need are ways to improve the information we collect and the analyses. These are operational issues that I do not think can be developed given the current direction of major funding programs in the region. Another issue that GoMRI faces is the fact that federal scientists (at least NOAA scientists) were barred from GoMRI participation. That removed a large pool of highly relevant expertise from the program and created substantial communication barriers. I point to the fact that some GoMRI programs are actually borrowed directly from Deepwater NRDA programs - just without the NOAA scientists who helped imagine, develop, and implement them. Information from those programs does not easily flow back to management agencies as far as I can tell. Now that Deepwater NRDA is effectively over, I hope that something can be done to correct these issues so that information is shared more effectively.
- Some of the research is very relevant and helpful, but some is disconnected from the realities of oil behavior and oil spill response and is not useful. Exposure concentrations for effects studies MUST be measured, not simply calculated. And if exposures are significantly greater than those expected or encountered in the environment, this should be made explicit and not simply reported as an adverse effect. Context is important. If realistic exposure concentrations or scenarios do not result in an observed effect, then this should be reported too.

Other Comments

- I am a member of the GOMRI Research Board. My long term (35+) years interest in oil pollution research and research-policy-communications outreach interests are well matched with GOMRI.
- I am be the wrong person to be taking this survey, I am a member
- No job, but ongoing deep curiosity and concern
- Provided review of proposals, provided indication of where oil spill science is going
- Studies being done in the wake of the Deepwater Horizon spill.
- The results of GOMRI research have informed my thinking about what additional research needs to happen in the Gulf of Mexico.

Sea Grant

- Both yes and not yet: Yes in the collaborative conversations I've had with Chris Hale. Not yet in that we haven't been able to overlap with efforts as much as some of our conversations indicate we should (i.e. we have plans for more fun stuff ahead!)
- Brilliant team of effective communicators
- Emily Mung has come to my town to give talks
- I am glad that there is a team of oil spill science outreach professionals who can sort through all the research that is being done and distill it into easier to read bulletins with the highlights that help me with my work with nature tourism industry folks and other interested individuals. But that those folks are also available to help when I have a need for more specific information.

Outreach Materials

- Dependable source for outreach materials to address clientele questions/needs.
- Newsletters and science papers
- Seminars
- Seminars and meetings
- The pamphlets produced on the oil spill science have been very useful to answer questions from interested members of the public.
- The seminars

Assisted with Partnerships

- Co-collaborators
- GoMRI assisted Audubon in obtaining satellite tracking devices for birds about a year after the spill. Working with the Univ. of Minnesota, Audubon fitted these to five American White Pelicans to help identify paths and destinations to the gulf region from their breeding grounds in Minnesota. The team also began work to see if oil-products (and associated impacts) could be detected in feathers of these birds: as an indicator of direct or indirect exposure.
- GRIIDC is synergistic with GCOOS portal where I access most of my data. Sea Grant oil spill team is doing a great job producing useful information.
- Helped with efforts associated with Harmful Algal Bloom economic assessments.
- Interaction with GoMRI researchers and outreach personnel has been very beneficial. However, the quality of the science and the pertinence and applicability of the research questions being addressed has been mixed in some cases, both really good and sometimes not so good.

Supported Research

- Economical support to projects
- Financial support through consortium funding

- Funded research
- Funding and access to science/ data
- Funding for Texas Centers of Excellence for research into Gulf environmental and resilience issues.
- funding research here at the Sea Lab
- GOMRI funded research project (4 years ago)
- GOMRI has fast-tracked oil spill research and has brought forward innovative insights by engaging the academic sector
- Have provided funding for my research
- I am currently funded and working for Gomri through the University of Miami RSMAS.
- I am funded by them in one of the consortiums; they have helped me train new scientists and support my staff.
- I am part of a GoMRI-funded project.
- I have funding to provide valuable new knowledge in regards to petroleum in the marine environment.
- I part of GoMRI-funded consortia.
- I work at a Research University, so the grant I received from GoMRI was very helpful.
- I'm funded by GoMRI
- Indeed they have. As both a contributor to GoMRI science and a user, I find that the organization is credible, promotes high-quality integrated science, and looks for ways to distill science for use by managers and the public.
- Led a GoMRI-funded consortium
- My research is supported by one of the Consortia Grants (CARTHE)
- Provided funding
- Supervise GoMRI funded researchers.
- Supported students and research
- The funding that it provided us allowed me to explain the formation of the droplet size distribution from the DWH blowout. The later focus on synthesis and practicality is a step in the right direction.
- they fund my research
- We have an award from GoMRI to support our toxicological research

Appendix II:

Unedited Responses to Open-ended Question—
What are the three largest contributions to society GoMRI should have made by the time the program ends?

New Science

Ecosystem

- A comprehensive conceptual model of the Gulf of Mexico Ecosystem that can serve to drive and link future research efforts.
- A more complete understanding of the Gulf ecosystem.
- Accurately report on how the Gulf of Mexico recovered from the DWH spill over the decade
- Actionable Ecosystem Perspectives: I've seen recent food web models come out of the Gulf region suggesting the manatees squid and bluefin tuna eat bivalves. NRDA and GoMRI's DEEPEND program have discovered new vertebrates in the Gulf. I think we're deluding ourselves if we take a position that existing information can support ecosystem-level approaches to management. Yet, virtually everything from fisheries management to replumbing the Mississippi to developing new energy programs should be based in and understood in some ecosystem context. How do we systematically get to a point where we can make such assessments? I think we need to review our survey programs, the information streams that we currently have, the technologies that we could employ but don't (e.g., molecular biology, observational system simulation experiments to devise appropriate monitoring strategies), the information that we know we should have but don't and then design a long term plan to build program that takes us to those goals. Rather than dilute the funding we have via GoMRI and Restoration and the available effort (there are only so many scientists/managers/etc.), why not imagine a future where we are prepared and proactive and try to get there? I think if we were to treat this as a large scale opportunity to develop a model system for managing a coastal system, we'd be much better off.
- Better understand the natural cycle of ocean ecology as a function of changing environmental conditions
- Better understanding of gulf ecosystem, connectivity, and how oil spills impact local assemblages and processes.
- Better understanding of Gulf ecosystem, including links and drivers
- Better understanding of Gulf of Mexico
- Better understanding of Gulf of Mexico ecosystems (including the human dimensions) and their response to oil spills
- Better understanding of the long-term impacts on the natural environment and marine life
- continued studies for potential genetic alterations in plants and animals in the future
- Deep water geochemistry/microbial ecology and systems biology
- Deeper and longer-term understanding of oil spill impacts and recovery for the DWH spill
- deeper understanding of the Gulf of Mexico
- Enhanced understanding of environmental and human impacts of spill to inform future response and recovery
- Enhancing our understanding of the Gulf ecosystem
- Expanding our understanding of gulf ecosystems
- Gain at least a superficial understanding of impacts of Deepwater Horizon oil spill to food web

- Greater scientific understanding of oil spill impacts to Gulf fisheries and coastal & offshore habitats
- Help us better understand oil spill impacts on the ecosystem via #1 above
- How did the spill impact the Gulf ecosystem, and ...
- Improve our knowledge of the complex GoM ecosystem
- improved understanding the life histories and distributions of hitherto poorly studied NGoM species
- Increase the body of knowledge on GOM ecosystems
- Increase the body of knowledge on Oil Spill Impacts to Ecosystems
- increased amount and quality of knowledge of oil spill impacts on ecosystems
- Increased understanding of the Gulf of Mexico ecosystem (species, population and community levels)
- Information on oil effects to managed species
- Information on the effects to habitat from oil and dispersants
- More accurate science using relevant exposure conditions.
- more coastal marshes protected
- More science describing the resilience of the Gulf of Mexico from an ecosystem basis.
- Much improved knowledge on the DWH oil spill, including its impacts on GOM
- Provided interested folks with science-based information on the environmental impacts of the DWH spill
- Provided interested folks with science-based information on the impacts of the DWH spill on fish and marine creatures
- Quantify offshore impacts of DWH spill
- Scientific consensus on issues relating to oil contamination events and effects on Gulf ecosystem resources and coastal communities.
- Set up a process to provide long term research that investigates the environmental impacts of the DWH Spill
- Support for living marine resource scientific studies that serve as guideposts in the face of future oil spills
- Understand the long term persistence of oil in the environment and its potential impact (the impact is a long shot, but it would be good to start)
- Understand the magnitude of impact from oil spills on the environment and if necessary, what can be done to minimize impacts.
- Understanding how DWH impacted the Gulf
- Understanding the effects of oil on our coastal environment.
- Understanding the long term impacts to wetlands

Fate and transport

- Better knowledge of the fate and effects of dispersed oil under realistic exposures and settings
- Better models of dispersion and biodegradation.
- Better predictive models.
- Better understanding of deep blowouts and response measures to them
- Dramatically improved prediction models of what a future spill would do to marine and coastal systems
- Facilitate Research towards understanding the cycling of oil in pelagic, open ocean systems.
- Focused on the predictions of the long-term fate of oil spills

- Focus on the relations between oil fate and biology, e.g. the efforts to link oil spills to the long-term fate of oil by generations flocculates/marine snow
- Fundamental understanding of oil-spill transport issues
- Greater understanding of oil interacting with the ocean
- Help us to better understand oil spill dynamics in the Gulf
- Help with oil fate forecasting as a function of oil chemistry and environmental conditions
- Identification of fate of the oil
- Improved tools for predicting oil spill transport
- Increased amount and quality of knowledge on transport of oil in the GoM region
- Knowledge of the fate and effects of oil in the GOM
- Meaningful contributions to oil spill fate
- New techniques to better detect and track oil in the environment and animals
- Significant advance in knowledge of fates and effects of sub-sea oil well blowouts in deep water no matter where they occur worldwide.
- Understanding mechanisms of spill dynamics and dispersant applications
- Understanding physical dispersion of oil from Deepwater Horizon

Recovery

- Better understanding of period of recovery
- Better understanding of the recovery process for affected resources
- Describe the anticipated recovery time for various resources to residents of the region.
- How better to achieve long-term, comprehensive restoration of the Gulf.
- information on restoration
- Integrated research results that yield quantifiable measures of injury and recovery.
- Restoration and planning for future
- status of recovery
- The transfer of their applicable findings from the research community to practitioners of restoration.
- Will it recover?

Dispersants

- Better understanding of dispersants
- Impacts of dispersants
- More effective and less toxic dispersants
- More thorough research products about dispersants effects on the environment and humans
- New, less-damaging dispersant listings
- Value of adding dispersants

Seafood and fisheries

- Providing science-based information on impacts on seafood, other sea life.
- Understanding the long term biological impacts to fisheries
- Understanding the long term economic impacts to fisheries

Synthesis

- Bibliography and easy categorization indexing to access relevant research. As I said, I have not been in the GRIIDC tool yet.
- Big picture syntheses of results that are understandable to a lay audience
- Credible research on BP spill impacts
- Synthesis, involving also non-GOMRI scientists

Translation

- Translate scientific findings to management and decision makers
- Translating spill science into better environmental policy and management

Needs

- Highlight remaining areas for further research needed related directly to enhancing recovery
- Identification of additional needed studies
- Increased focus on oil spill research

Other

- Across all injured resources, report trends in recovery rates
- A clear understanding of what GOMRI science taught us about the Gulf and where gaps still remain
- Better understanding of impacts of oil spills
- Deeper understanding of oil spills
- Develop technology for the future of science in the Gulf
- Furthering research on several of the data gaps that still exist in the science of resources within the Gulf of Mexico.
- Good science and real answers to toxicity (humans and aquatic organisms)
- High quality research
- Increased knowledge of oil spill impacts
- New insights on Gulf
- New science
- New science discoveries that can be used to improve management
- Objective assessment of the impacts of DWH
- Oil spill effects
- Produce top notch research
- Provide a holistic description of oil spills
- Provide lasting stable support for oil spill research and training
- Provide more unbiased information about oil spills (too much doom and gloom)
- Published research and educational tools for use by individuals within and outside of GoMRI
- Realistic contextual interpretation of results that is supported by the science
- Research
- Research
- Research support
- Research that improves our understanding of the impacts of the spill
- Scientific literature
- Sound science, vetted and validated by outside experts

- Speedy and cost-effective assessment and remediation of natural resource damages from oil spills
- Strong science
- Support science, including social science, that facilitates 1 and 2.
- Understand long term impacts
- Understand non lethal impacts
- Understanding acute and chronic effects of the oil spill
- Understanding impacts of oil spill
- Understanding short- and long term effects of DWH
- Understanding the impact of DWH

Informing response

Technology

- Awareness of technologies for oil spill remediation
- Best available oil spill prevention measures
- Better cleanup technology and effects of existing methods such as dispersants.
- Better spill response tools like booms and skimmers
- Effective measures to degrade or remove oil after it is spilled into the environment
- Improve the tools available to spill responders.
- Improved remediation
- Increase the body of knowledge on oil spill treating products and their pluses and minuses.
- Much improved technology advancement to prepare for future spills
- New innovations for understanding and responding to future events
- New spill clean-up technologies and protocols
- New tools for oil spill response and impact assessment
- Provide new technologies that will assist policy makers and first respondents with decisions regarding future oil spill
- Provide support/mechanisms to fold developing research and technology into ACPs and RRPs, often where ideas meet the challenge of application and reality.
- Technology development for improved mitigation

BMPs

- Appropriate guidance for Macondo impact remediation
- Better understanding of what should and should not be done if there were another similar event in the Gulf
- Enable response personnel access to well organized information on oil spill response
- Enhanced understanding of response options and approaches
- More education describing why certain response options are used and others aren't.
- Novel research on oil spill response techniques that document efficacy or shortcomings (e.g. disconnect between skimmer rated recovery rates and actual recovery rates)..
- Provide the science to reduce the effects of the next major spill
- Recommendations for response to another spill event
- Ways to clean up more safely and effectively
- We should be more able to respond more efficiently to the next Gulf disaster (in many ways, we are less capable now than we were in 2010 with lost infrastructure)

Other

- Oil spill prevention
- Ways to prevent or limit future spills
- Ability to assist with future spill response and recovery
- GoM is much better prepared for a spill in the future.
- Helped reduce the risk of a future spill in the GoM
- Identified specific areas at risk for any future spill
- Improved our ability to recover from oil spills and increase our resilience.
- New science discoveries that can be used to improve oil spill response
- Oil spill cleanup
- Research that improves future decisions regarding oil spills
- Research that is applied to managers or those that make decisions about preparedness measures
- Reveal the role of dispersants in blowouts
- Steps to translate that knowledge to OCS Policy and to oil spill response communities.
- Stronger connections between the response and research community

<u>Informed Public</u>

- A better informed public
- Better public appreciation of spills and spill response, and long term effects of major spills
- Better understanding of where to find more information
- Clear explanation to the public on the environmental impacts
- Clear fact sheets on oil impacts
- Communicate the harm to the marine environment to the public
- Convey REAL world/applicable science to the public and response community and not that which is self motivated to receive more funding or to follow popular trends of thought.
- Deliver the relevant spill science in a digestible format to the decision makers (elected officials, government leaders, response practitioners)
- Describe the impacts of the oil spill to residents of the region.
- Development of possible means to rectify the concerns many people have...
- Educate the public on the fragile balance of natural systems and how human activity is upsetting that balance
- Educate the public on their vital interconnectedness to the natural environment
- Education
- Ensure the public gains a basic understanding of how dispersants work and what alternatives are being developed.
- Greater public awareness and understanding of oil spills
- Help the general public better understand the impacts and risks associated with oil spills
- Help us to understand what this means for the Gulf as a society/community via #2 above
- Importance of citizen science
- Improve the translation o science to the public
- Increase science literacy
- Information
- Information dissemination

- Mitigating the nonscientific hysteria created by activists and providing scientific arguments for the consequences of oil spills.
- Outreach
- Public outreach
- Public outreach and education
- Showing that statements made by some professors and scientists were totally misleading as to what really happened and why.
- Timely outreach of pertinent information.

Human Impacts

- Better understanding of oil spill impacts to the social and economic fabric of coastal communities
- Financial assessment of impact of spill on economies
- Investigate and elucidate the role of the "social" media on economic consequences
- Provide a better understanding of the economic value of GoM resources to the region and nation
- Clearly identify the link between major disasters and social impact to people.
- Discuss resiliency efforts instead of only focusing on response measures
- Fair overview of the effects of spill and response on society
- How did the spill impact people?
- Increase community awareness and resiliency
- Increased amount and quality of knowledge of human (health & socioeconomic) impacts from oil spills
- Many coastal communities (e g. fishing communities have significant environmental, socio-economic, and health issues as a result of the Deepwater Horizon/ BP Oil Drilling Disaster that are exacerbated by other environmental issues (freshwater diversions, harmful algae bloom, subsidence, land loss, degraded/loss marshes/habitats, natural disasters). These communities, their livelihoods, culture & way of life is seriously threatened. Scientific research priorities/focus areas should be more relevant, applicable, and practical to help address/solve these issues.
- More programs targeting community organizations
- Move involvement of community organizations
- Provided interested folks with science-based information on the human health impacts of the DWH spill
- Understanding of the effects of oil spills on the environment and the humans.

Preparing for the Future

- An increase in the science capacity in the Gulf of Mexico region to respond to future spills
- Education of scientists in the field
- Exposure for the fantastic science that researchers around the Gulf conduct.
- Graduate student opportunities to train future scientists
- Helping establish a better informed group of scientists and resource managers in the Gulf region, regarding oil spill impacts and recovery (including beyond their immediate research and projects)
- Increase the knowledge base of oil spill science for future generations
- Train a next generation of scientists
- Train young scientists

- Well-trained, next generation of scientists (e.g. through student support)
- Championship of a Gulf wide, sustainable community of science that is inclusive of scientists and others who have received support from GoMRI as well as those who have not.
- Consolidate a network of Gulf scientists
- Documentation for future reference...
- To build a network of collaborative scientist to assess and study complex, Gulf-wide issues

Data

- A legacy of data that is not only accessible, but readily usable by the machines and models of today and tomorrow
- All data and information acquired from GoMRI-funded work should be readily available in a searchable database, and ideally, able to be integrated across disciplines
- Continuing to further the database of knowledge for resources within the Gulf of Mexico.
- Data systems: Difficult to access information is not useful information and the region has wholly inadequate data systems. This cuts across all institutions (academics, states, feds, etc.). We cannot have a situation where data is regarded as a possession, is inaccessible in emergency situations, is largely undiscoverable because few know about it, etc. This needs to be corrected and it needs to be corrected at a regional level. Resources that could be used for science and management are wasted just dealing with data access.
- Database of information on Gulf of Mexico processes.
- Housed data
- Making the data collected by the GoMRI initiative available to the public.
- Promotion of data sharing among government, academia and the private sector
- Provide a clearing house for oil spill info that is research based
- Sharing data with the public in an accessible way

Other

Human health

- A full accounting of public health effects
- Accurate information on the toxicological and health risks associated with petroleum spill containment technologies
- Better resourcing public health research and multidisciplinary research with a major public health theme
- Contributed to understanding the public health effects of oil spills
- Oil spill impacts on seafood resources in the northern GoM
- Provide practical information to inform public health, environmental and industry decision-making.
- Provide the scientific basis to explain impacts of excessive crude oil on human health and the marine environment.
- Understanding of basic human health consequences from Deepwater Horizon oil spill
- Work-related exposures among spill/cleanup workers independent of the PRP

Baseline data

- A baseline database for toxic compounds and ecosystem health (standing stocks, etc.) with an established monitoring program
- Establish a baseline of the state of the Gulf

- Establish an integrated informational OSR clearinghouse across the Gulf states.
- Established baseline data on the GOM ecosystem
- establishing baselines for future assessment & ensure metrics to assess recovery
- Establishment of baseline data (shoreline, nearshore, etc.)
- General ecosystem and scientific knowledge of the Gulf so if another spill happens we will have a "baseline"
- Good data background

Monitoring

- Assisted in setting up GoM monitoring system
- Continue toxicity monitoring from oil spills
- Creation of long term monitoring programs
- Established commitment to long term ecosystem monitoring
- Infrastructure for sustained ocean monitoring should be well established
- Monitoring: Many of our monitoring programs were developed thirty years ago (before people had personal computers) and for narrow issues (fisheries management). We're now asking far more of those data and they aren't up to the task. Additionally, the Gulf has the largest amount of at-sea industrial infrastructure and the highest risk of heavy weather of any US coastal System. It also has the perhaps the worst ocean observing capability. We should be building the kind of monitoring system that we will want 5, 10, 30 years from now and it should address the problems we have and those the we know we will face. I actually think it is unethical to not move in this direction having just gone through Deepwater and knowing the kinds of challenges climate will bring. GoMRI and the other funding programs could coordinate and help force this issue along against the status quo inertia we seem to have built up over time.
- Technology development for improved monitoring

Serving as a model

- A model for how multiple governmental and environmental organizations can work together in a leverage way that avoids duplication and competiveness.
- A new conceptual framework on how to deal with oil spills
- Be an instrument for coordinating and leveraging various Gulf science initiatives.
- Demonstrate how an industry funded research program can fund independent science projects
- Establish trust in federal and state sources of information by the general public
- Funding more science & monitoring
- Funding vehicle

Others

- Accountability is required for those industries engaged in risky activity.
- Contribution 1 will go a long way towards preparing for a future spill
- Couldn't say.
- Increasing awareness of human encroachment in the deep sea.
- None (3 mentions)
- Propose effective regulation for deep-sea e energy production

Appendix III:

Unedited Responses to Open-ended Question—
Are there other sources you use to obtain credible, relevant and timely oil spill science-related information? If so, please identify up to three.

Federal

- Administrative Record for PDARP
- Area Committees
- Deepwater Horizon NRDA Trustees
- EPA
- Federal statistics
- Field observations of oil from NOAA
- Field observations of oil from US Coast Guard
- Government agencies
- Government web sites
- http://response.restoration.noaa.gov/
- http://www.bsee.gov/About-BSEE/Contact-Us/Contact-Us/
- http://www.gulfspillrestoration.noaa.gov/
- http://www.nrc.uscg.mil/
- https://dwhdiver.orr.noaa.gov
- https://www.doi.gov/pressreleases/interior-department-releases-final-well-control-regulations-ensure-safe-and
- National Institute of Health Website
- Natural resources damage assessment publications
- NOAA (8 mentions)
- NOAA DARRP
- NOAA ERD publications
- NOAA ERMA generally
- NOAA Office of Response and Restoration (2 mentions)
- NOAA Oil Spill Response website
- NOAA ORR
- NOAA RESTORE Act Science Program (2 mentions)
- NOAA SSC's
- NOAA website (2 mentions)
- NOAA website for PDARP
- NOAA websites and publications
- NRDA
- NRDA website
- NRT and RRT websites
- response.restoration.noaa.gov
- restorethegulf.gov
- US Coast Guard (2 mentions)
- US Fish and Wildlife
- Working Groups (hosted by government, ITAC, etc.)
- www.epa.gov

GoMRI

- GOMRI (12 mentions)
- GoMRI website (12 mentions)
- GoMRI newsletter (10 mentions)
- GoMRI eNews
- GoMRI oil spill conference
- GoMRI program
- GOMRI website and consortia website
- GOMRI Website, GRIIDC Database
- GOMRI/GRIIDC website

Peer Reviewed Results

- Scientific journals (8 mentions)
- Peer-reviewed scientific literature (6 mentions)
- Scientific literature (4 mentions)
- Google scholar (3 mentions)
- ResearchGate (2 mentions)
- *Some* journals seem decent, many appear to have very, very poor peer review processes.
- Citation alerts from journals
- Journals (e.g. Marine Pollution Bulletin)
- literature searches
- Marine Pollution Bulletin
- Peer reviewed journals in Web of Science
- Peer Reviewed Research Paper Citations
- Scientific literature search via Web of Science
- Society of Environmental Tox and Chemistry (journal)
- Staying current with recent scientific literature, including use of Google Scholar alerts, Research Gate, etc.

Conferences

- International oil spill conference (6 mentions)
- AMOP proceedings (3 mentions)
- Attending conferences, symposia, and training events, including interacting with other researchers, resource managers, instructors, etc.
- Clean Gulf Conf.
- conference talks/posters/proceedings
- conferences e.g. GOMRI
- GOMOSES Conference
- ICCOPR. 2015. Oil Pollution Research and Technology Plan. ICCOPR, pg 1-294.
- Major Conferences (IOSC, SpillCon, InterSpill)
- Meetings & Conferences
- Oil Spill Science Meeting
- Research conferences
- Scientific conferences

Sea Grant

- Sea Grant (6 mentions)
- Gulf Region Sea Grant oil spill science specialists
- http://www.dwhprojecttracker.org/?utm_source=SeaGram%20May%202015&utm_campaign=SeaGram%203%202015&utm_medium=email
- http://www.dwhprojecttracker.org/?utm_source=SeaGram+May+2015&utm_campaign=SeaGram+3+2015&utm_medium=email
- Louisiana Sea Grant
- Miss/AL Sea Grant Oil Spill Seminars
- MS/Al Sea Grant Consortium (2 mentions)
- MSAL Sea Grant Oil Spill Science
- Newsletters from Se3a Grant
- www.gulfseagrant.org

Universities

- Coastal Response Research Center: crrc.unh.edu
- http://crrc.unh.edu/
- CWC PI emails
- Dauphin Island Sea Lab
- Ed Buskey - DROPPS at UTMSI
- Florida Oceanographic Institute
- GOMURC
- Harte Research Institute
- There are a handful of academic groups doing high quality work. Rudi Strickler at Johns Hopkins, Sokolofsky.
- U I ersigy of South Alabama
- University of Fairbanks, Alaska (Kelly McFarlin; Mary B. Leigh)
- University of Newcastle, UK (professor Ian Head)
- www.uh.edu/uh-energy

States

- Alabama Marine Resources
- GBNERR
- Louisiana State University scientists
- Mississippi Department of Environmental Quality
- Mississippi Department of Marine Resources
- Natural Resource Damage Assessment trustees for Louisiana
- Regional staff with Louisiana Department of Environmental Quality
- State Agency Resources
- Texas General Land Office
- The Louisiana Coastal Protection and Restoration Authority
- Tx General Land Office
- TX Natural Resource Conservation Commission

Others

GOMA

- GOM Alliance website
- GOMA (5 mentions)

Technical reports

- API
- API reports
- Published papers, and not necessarily peer review, such as IOSC papers
- tech reports from authoritative sources such as NRDA
- Technical journals
- Technical Reports
- various IPIECA documents and guidelines

Web

- GOOGLE
- Google alerts
- Internet
- Internet search
- Thomas Reuters Web of Science
- Wikipedia (references therein)

Others

- Field observations of oil from responsible party
- International spill control organization
- International Spill Control Organization newsletter
- Local consultants
- Newsroomink.com
- numerical oil spill model tools for fate predictions, e.g. the OSCAR model
- Petroleum News
- Science Daily
- Science magazine
- Science News
- SINTEF
- Environmental Law Institute
- Gulf Restoration Network
- Ocean Conservancy
- The Nature Conservancy
- GCOOS
- GCOOS website
- Above the Fold
- Closer to the event, perhaps. Now... meeting all three criteria... not necessarily.
- GRHOP
- Gulf of Mexico Program

- It is a challenge for MSCVAFF to receive credible, relevant & timely oil spill science related information. Sources of information include the MS-AL Sea Grant, federal & State agencies, NRDA Trustee & RESTORE Councils, GoMRI & academic institutions.
- NAS Gulf Research Program
- Newspapers
- NOT media reports of preliminary science NOT
- Scientists doing the research
- Well known scientists
- Word of mouth with other oil spill scientists