OIL SPILL SCIENCE

SEA GRANT PROGRAMS OF THE GULF OF MEXICO

REGIONAL PRIORITY-SETTING TO MINIMIZE HEALTH, SOCIAL, AND ECONOMIC DISRUPTIONS FROM OIL SPILLS: A SUMMARY REPORT AS PART OF THE NATIONAL ACADEMIES AND SEA GRANT COLLABORATIVE WORKSHOP SERIES

Houma, Louisiana ~ Anchorage, Alaska ~ Virginia Beach, Virgina
Santa Barbara, California ~ Mobile and Bayou La Batre, Alabama

Sea Grant
Texas • Louisiana • Florida
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Contents

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Cover photo

Kim-Lien Tran, a Vietnamese American community advocate in Bayou La Batre, Alabama, helps translate audience questions at an evening session as part of the oil spill preparedness series. (Texas Sea Grant College Program)

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Introduction

Following the Deepwater Horizon oil spill of 2010, the federal government asked the National Academies of Sciences, Engineering, and Medicine (NASEM) to establish a new program dedicated to funding and conducting activities related to offshore energy system safety, human health, and environmental resources. The new program became the NASEM's Gulf Research Program (GRP), "an independent, science-based program that funds studies, projects, and other activities in the areas of research and development, education and capacity building, and monitoring and synthesis" (NASEM GRP, 2019). Activities focus on the transfer of knowledge within the Gulf of Mexico region and other U.S. regions where human communities, ecosystems, and energy production coexist. Furthermore, GRP's Thriving Communities Initiative "seeks to improve the quality, accessibility, and use of information about how to protect communities from the impacts of oil spills" (NASEM GRP, 2019). For more information about the GRP, visit www.nationalacademies.org/gulf.

In 2017, GRP and the Health and Medical Division of NASEM hosted a workshop in Washington D.C. titled "Preparing for a rapid response to major marine oil spills: Protecting and assessing the health and well-being of communities" (Giammaria, Nicholson, & Snair, 2018). The workshop participants discussed research opportunities for improving public health preparedness, response, and protection associated with oil spills. They identified potential challenges and opportunities for communities to support preparedness and resiliency after a spill and recommended that GRP gather input at the local level.

To address the need for local-level input and other recommendations identified in the August 2017 workshop, GRP collaborated with seven of the 34 Sea Grant college programs via the Gulf of Mexico Sea Grant Oil Spill Science Outreach Program. The outreach program's team is comprised of staff from the Florida Sea Grant College Program, Louisiana Sea Grant College Program, Mississippi-Alabama Sea Grant Consortium, and Texas Sea Grant College Program. They focus on synthesizing, translating, and delivering peer-reviewed oil spill science information for people whose livelihoods depend on healthy natural resources. With support from the GRP as well as the Gulf of Mexico Research Initiative, the team led two workshops in the Gulf of Mexico region and partnered with the Alaska Sea Grant College Program, University of Southern California Sea Grant Institutional Program, and Virginia Sea Grant College Program to lead regional workshops in their locations. The goal was to gather feedback at the local and regional levels to identify opportunities to improve preparedness for oil spills. The five regions identified for this national collaborative effort—the West Coast, mid-Atlantic, Alaska, and eastern and western Gulf of Mexico—are all home to communities that have been impacted by oil spills. One workshop was planned for each region, focusing on three broadly defined topical areas—minimizing health, social, and economic disruptions after oil spills.

Figure 1. Five regional workshop planning committees and a project planning committee organized the workshops.

A GRP research fellow prepared a pre-workshop summary document to inform the development of the workshop series (Sibley & Hale, 2018). A project planning committee comprised of emergency responders, researchers, GRP advisory board members, and Sea Grant professionals formed in 2018 to guide the development of all five workshops (Figure 1, Appendix). This project planning committee participated in monthly teleconferences to discuss the project objectives, recommend topics and speakers for each workshop, and review planning and reporting documents associated with the overall project. The following, listed alphabetically, were members of the project planning committee:

- Torie Baker, formerly Alaska Sea Grant College Program
- Michelle Covi, Virginia Sea Grant College Program
- Linda Duguay, University of Southern California Sea Grant Institutional Program
- Phyllis Grifman, University of Southern California Sea Grant Institutional Program
- Chris Hale, Texas Sea Grant College Program (chair)
- Doug Helton, National Oceanic and Atmospheric Administration Office of Response and Restoration
- Christopher Hershey, U.S. Coast Guard
- Davin Holen, Alaska Sea Grant College Program
- Richard Kwok, National Institute of Environmental Health Sciences
- Missy Partyka, Mississippi-Alabama Sea Grant Consortium
- Chris Rea, NASEM GRP
- Liesel Ritchie, Oklahoma State University and NASEM GRP Advisory Board
- Marika Schulhof, University of Southern California Sea Grant Institutional Program
- Stephen Sempier, Mississippi-Alabama Sea Grant Consortium
- Martha Sibley, NASEM GRP Fellow, Oklahoma State University

- Kevin Sligh, U.S. Coast Guard
- Grace Walker, Virginia Sea Grant College Program
- Maggie Walser, NASEM GRP

Each of the five Sea Grant program workshop leaders gathered a team of experts to form regional workshop planning committees to organize workshops that would be held on the West Coast and in the mid-Atlantic region, Alaska, and the eastern and western Gulf of Mexico. The workshop planning committees identified locally and regionally relevant themes that aligned with the project's topical areas: improving oil spill preparedness with a focus on the health, social, and economic disruptions that can result from oil spills. Each of the five workshop planning committees identified leaders representing impacted communities as well as experts in emergency response and preparedness, oil spill science, and human health and well-being, and invited them to share their knowledge with an audience of community stakeholders. The committees also established opportunities for participants to provide input that would be recorded and reported back to GRP.

The five workshop planning committees hosted the workshops in locations where communities had experienced or were likely to experience oil spills, listed here in order of occurrence:

- Houma, Louisiana, December 4–5, 2018
- Anchorage, Alaska, February 20–21, 2019
- Virginia Beach, Virginia, March 29, 2019
- Santa Barbara, California, April 5, 2019
- Mobile and Bayou La Batre, Alabama, May 6–7, 2019

Although participants at each workshop discussed lessons learned from past spills, the dialogue focused on preparing communities for future events. The workshops convened key stakeholders to accomplish the following:

- Raise awareness of the issues associated with spills.
- Learn from those directly affected by spills.
- Identify regional-level needs and priorities for improving preparedness.
- Promote networking among groups who may not have previously interacted.
- Identify resources to address gaps in knowledge and other identified needs.

The five workshop planning committees referenced past workshop reports and community needs assessments, and they consulted with the project planning committee to determine workshop themes that would resonate with communities in their regions (Sempier, Graham, Maung-Douglass, Wilson, & Hale, 2015; Giammaria, Nicholson, & Snair, 2018; Sibley & Hale, 2018). This collaborative effort between GRP, Sea Grant, and the Gulf of Mexico Research Initiative focused on the workshop series' designated topical areas—improving oil spill preparedness with a focus on public health, social disruptions, and economic impacts resulting from oil spills—to produce the following specific deliverables:

- clearly identified and articulated regional research and outreach priorities within the topical areas;
- clearly identified and articulated inter-regional research priorities within the topical areas;

- a list of suggested emergency response protocols to include in existing response and regulatory frameworks;
- a list of local, state, or regional pilot project ideas within the topical areas;
- a list of resources available within the topical areas;
- increased understanding of the topical areas by workshop participants;
- a foundation for future funding proposals to support research, outreach, and/or pilot projects related to the topical areas; and
- five workshop reports (one per regional workshop) and a synthesized summary document.

This summary report synthesizes the results from all five workshops and identifies inter-regional research and outreach priorities to consider for future funding proposals. It will be shared with workshop participants in each region, as well as with other local, regional, and national partners interested in improving planning and preparedness related to oil spills and other disasters. For details about each regional workshop, including lists of regionally specific project ideas, suggested protocols, and resources, please refer to the regional workshop reports (Hale, Maung-Douglass, Partyka, Sempier, & Skelton, 2019; Holen, 2019; Partyka, Hale, Maung-Douglass, Sempier, & Skelton, 2019; Schulhof & Grifman, 2019; Walker & Covi, 2019) and visit https://gulfseagrant.org/oilspilloutreach/collaborative-workshop-series/.

Shared Priorities Across Regions

At each regional workshop, facilitators collected feedback from participants during breakout sessions. Facilitators and/or note-takers recorded responses on a flip chart while dialogue took place, focusing on specific workshop outputs. Participants answered the questions listed below:

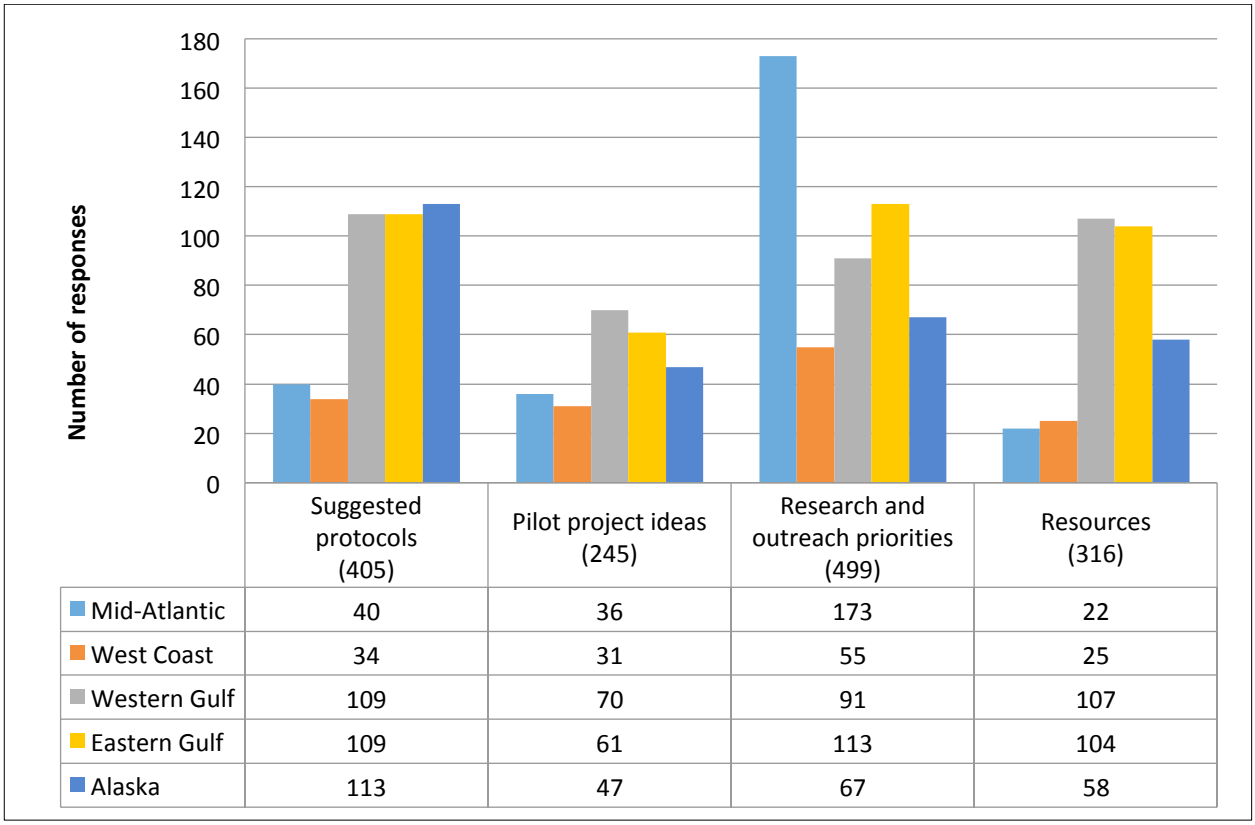
a. What are the **suggested protocols** to include in existing response and regulatory frameworks that address the theme?

b. What **pilot project ideas** do you have that address the theme?

c. What are the **research and outreach priorities** that address the theme?

d. What **resources** are available that address the theme?

In total, 297 workshop participants across all five regions shared 1,465 ideas to improve oil spill preparedness and response within the context of human health and well-being. They identified 499 research and outreach priorities, made 405 suggestions related to emergency response protocols, identified 316 resources that currently exist or are needed, and brainstormed 245 pilot project ideas (Figure 2).



	Suggested protocols (405)	Pilot project ideas (245)	Research and outreach priorities (499)	Resources (316)
Mid-Atlantic	40	36	173	22
West Coast	34	31	55	25
Western Gulf	109	70	91	107
Eastern Gulf	109	61	113	104
Alaska	113	47	67	58

Figure 2. Number of responses to the four questions asked at the five regional workshops. Some workshops had more discussion sessions or were structured differently, which affected the number of responses recorded.

While workshop discussions revealed unique needs and interests in each region, common research and outreach priorities emerged across all regions. This summary report highlights research- and outreach-related themes with national relevance. The regional reports (Hale et al., 2019; Holen, 2019; Partyka et al., 2019; Schulhof & Grifman, 2019; Walker & Covi, 2019) discuss region-specific research and outreach priorities, as well as suggested protocols, pilot project ideas, and resources.

For this report, the 499 research and outreach priorities identified by workshop participants were aggregated and categorized into five themes. Some of the priorities were categorized into more than one theme, for a total of 553 priorities linked to the five themes. These themes, which are summarized in Figure 3, should be considered nationally significant for improving oil spill preparedness, response, and recovery. In the discussion below, nationally applicable research and outreach recommendations are presented for each theme based on common priorities shared at the regional workshops.

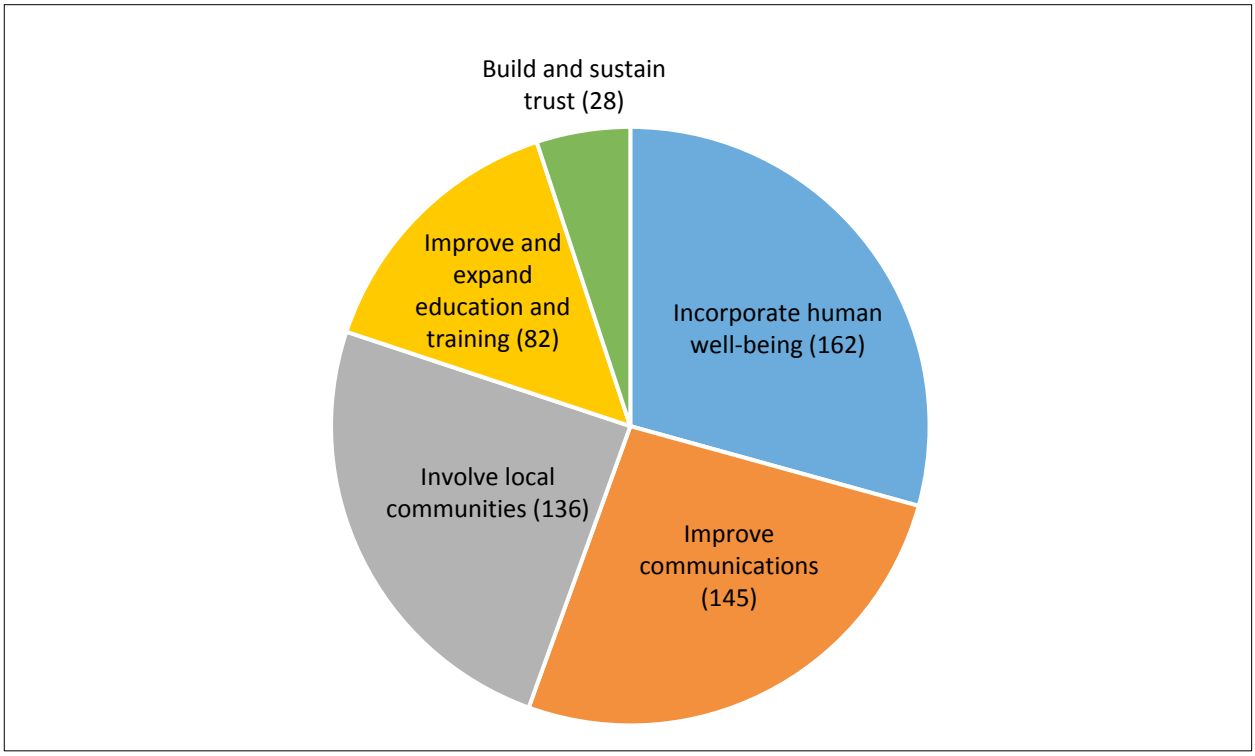


Figure 3. Distribution of research and outreach priorities across all workshops categorized into five nationally relevant themes (N = 553).

Incorporate Human Well-Being Into Preparedness, Response, and Recovery Plans

The most common theme that emerged across regions was incorporating human well-being—including mental, physical, social, cultural, spiritual, and economic aspects—into emergency preparedness, response, and recovery plans (Table 1).

Table 1. Number of research and outreach priorities per region that are related to human well-being.

Region	Number of priorities
Gulf, western	48
Gulf, eastern	41
Mid-Atlantic	40
Alaska	23
West Coast	10
TOTAL	**162**

Recommendation: Evaluate ways to formally and informally integrate human well-being into new or improved emergency response protocols and frameworks. The current system for assessing damage resulting from spills is referred to as the Natural Resource Damage Assessment (NRDA). Most post-spill assessment work involves determining how species, habitats, and other natural resources are impacted; this triggers a series of recommendations and funded projects to restore the environment. The one aspect of NRDA that addresses human impacts is the classification of "lost human and recreational use." The oil and gas industry and emergency response community also use a tool known as Spill Impact Mitigation Assessment to identify response options that reduce environmental and social impacts. Workshop participants stressed that human well-being needs to be comprehensively incorporated into tools, plans, and assessments across all time scales and in partnership with all parties involved in a spill.

Recommendation: Characterize pre-spill community and individual well-being in order to create baselines for short- and long-term recovery. For example, if communities have a process in place to collect and document socioeconomic information over time, that data could be utilized not only to help make damage assessments related to human well-being, but also to guide recovery efforts during and after incidents. Community and individual health assessments need to be made before a spill happens so that appropriate resources (e.g., counseling services, therapy, and financial support) can be made available during and after a spill.

Improve Communications

Improving communications is a national priority with respect to emergency planning, preparedness, response, and recovery, as well as among communities and social groups. Perceptions of risk, especially regarding chronic health concerns, are an underlying communication issue in all regions. Table 2 shows the number of priorities per region that are relevant to this theme.

Table 2. Number of research and outreach priorities per region that are related to communications.

Region	Number of priorities
Mid-Atlantic	47
Gulf, eastern	36
Gulf, western	23
Alaska	20
West Coast	19
TOTAL	**145**

Recommendation: Evaluate communication protocols employed during emergency responses. Workshop participants stated that agencies involved in emergency response need to improve how their information is transferred to impacted communities, considering the fact that different audiences receive and understand information in different ways. Neglected, underrepresented, and remote communities are especially impacted by shortfalls in communication.

Recommendation: Evaluate methods that improve how accurate information is shared with communities during and after spills. The spread of misinformation, false information, and delayed information is a challenge all regions face during and after spills. These communication problems can result in impaired physical, mental, social, and economic health. Participants expressed a need to understand what factors are involved in the spread of spill-related information and misinformation, and how communication can be improved so that individuals and communities receive the most accurate and current information.

Recommendation: Characterize the best communication practices to effectively reach diverse communities. Understanding cultural differences, as well as potential communication challenges (such as language barriers or lack of access to communication technology) in diverse communities can help responders and recovery workers support communities in need. Many workshop participants offered ideas about improving communication at different scales, such as within and between neighborhoods and social groups, or via public communication platforms like radio, television, websites, and social media. The importance of consistent communication before, during, and long after incidents was emphasized at each workshop. Additionally, participants expressed interest in more opportunities for local and regional networking, and for fostering new partnerships to create and continually update communication plans for oil spill response and recovery.

Involve Local Communities

Participants in all workshops stressed the need for increased involvement of local communities in multiple ways during and after spill incidents, as well as during claims and compensation processes. Table 3 shows the number of priorities per region for this theme.

Table 3. Number of research and outreach priorities per region that are related to local community involvement.

Region	Number of priorities
Alaska	38
Gulf, western	28
Mid-Atlantic	27
West Coast	22
Gulf, eastern	21
TOTAL	**136**

Recommendation: Evaluate current methods of engagement with communities that have been impacted or are likely to be impacted by spills. Consistently involving local communities with planning, preparedness, response, and recovery will help them become more resilient in the long term. Evaluating the many factors that impair and improve community engagement at every phase of an incident (before, during, and after) will allow for application of best practices adaptable at regional and local levels. For example, assessing and testing existing or potential engagement practices between emergency responders, public health officials, recovery workers, and impacted communities will help improve contingency planning efforts.

Recommendation: Support research and outreach efforts focused on engagement with disconnected or overlooked groups. Participants in all regions shared experiences in which they felt unengaged or excluded from spill-related activities or opportunities. Representatives from non-native-English-speaking groups, tribes, and rural communities said that in the past they had not been engaged with response and recovery efforts, and that this had caused negative long-term health impacts. For example, the cultural, spiritual, and natural resources of local tribes (whether federally recognized or not) are put at risk during spills, but sometimes responders are not aware of those sensitive resources. Understanding these communities and their needs will improve engagement with them. Participants recommended that future assessments be made in ways that allow culturally appropriate and meaningful involvement. In this way, knowledge can be exchanged and decisions made together for locally relevant planning, response, and recovery.

Recommendation: Evaluate processes for engaging volunteer support during and after spills, and where necessary design more effective processes. Participants expressed a strong interest in and willingness to volunteer in various ways during spills but conveyed diverse challenges to volunteering. Participants acknowledged that getting involved in some aspects of spill response would require commitment to certification, coursework, training, and oil spill drills. Ideas were generated for improving the volunteer and inclusion process locally and regionally. For example, volunteer procedures and protocols already exist in some emergency response plans, though the public may not be aware of them. Increasing awareness of these plans and determining how to improve them or make them more effective for local communities as well as emergency responders would be avenues to explore within this priority area.

Improve and Expand Education and Training

Across all regions, workshop participants expressed the need for education and training in oil spill planning, preparedness, response, and recovery, including information and coursework focused on impacts to human health. Participants felt that this would help them avoid some of the social and economic disruption that results from spills, both during and long after an incident. Table 4 shows the number of priorities per region for this theme.

Table 4. Number of research and outreach priorities per region that are related to education and training.

Region	Number of priorities
Mid-Atlantic	24
Gulf, eastern	18
Alaska	17
West Coast	12
Gulf, western	11
TOTAL	**82**

Recommendation: Create and evaluate educational programs to increase community awareness of the national response system and local and regional response plans. In all regions, there is a need to increase awareness of how the emergency-response Incident Command System works, so that communities will know what they can expect from responders during and after an incident. If people living in spill-prone areas understand the roles and responsibilities of emergency responders in their city, state, and region, they can better manage their expectations and better understand what steps they should (or should not) take during an incident. They will also learn where to find reliable and timely information. Ideas for education spanned from "brown bag lunch" gatherings to increasing awareness of and attendance at Coast Guard-led Area Committee Meetings. By regularly attending classes, seminars, or other educational events and programs, community members can also build new local relationships that will benefit them during future incidents and increase their resilience in the long term. Workshop participants frequently noted that educational opportunities need to be consistently available throughout the year, with consideration of diverse work and family schedules. Programs need to be evaluated for effectiveness and adapted as necessary.

Recommendation: Create and evaluate training programs for emergency responders that include locally relevant information, issues, and best practices. Participants suggested ways that emergency response personnel can supplement their training with local information and knowledge. For example, participants would like to see response personnel receive education about local cultures and incorporate local knowledge into spill drills. Locally and regionally relevant health-related topics should be part of regular training activities. It was recommended that education and training activities be conducted at the neighborhood level and regularly evaluated, tested, and adapted in partnership with the research community.

Build and Sustain Trust

Trust was discussed as a foundational part of the other four themes (incorporating human well-being into response and recovery communication, improving communications, involving local communities, and improving and expanding education and training). Participants in each region often said that without access to trusted people or trusted information, impacted communities will continue to be misinformed, to be ill prepared, and to experience negative consequences from spills. Table 5 shows the number of priorities per region for this theme.

Table 5. Number of research and outreach priorities per region that are related to trust.

Region	Number of priorities
Alaska	13
Gulf, eastern	5
Mid-Atlantic	5
Gulf, western	4
West Coast	1
TOTAL	**28**

Recommendation: Create and evaluate opportunities to develop and foster trusted relationships among and between communities and parties involved in planning for, responding to, and recovering from spill incidents. The key to building trust among all parties is time; many participants emphasized the importance of building and maintaining trusted relationships over time, starting long before an incident occurs and continuing post-incident. Participants at all workshops discussed Coast Guard-led Area Committee Meetings as excellent venues for building trust with industry and response personnel before incidents, though not all communities have access to these meetings or time to attend them. Local social gathering places, neighborhood associations, and other local venues and events were mentioned as places that emergency responders can connect and build trust with communities over time.

Recommendation: Evaluate factors involved in the buildup or breakdown of trust in social networks, and identify methods for sustaining trust. Some participants expressed the importance of trust flowing both ways, meaning that if community members are expected to trust and rely on emergency response agencies during an incident, they in turn expect emergency responders to trust them. The exchange of reliable information is an important component of trust-building during and after an incident; achieving this is made even more challenging due to the ease with which misinformation can now spread on social media.

Regional Highlights

Each regional workshop planning committee met regularly throughout the year to organize their workshop. Speakers and discussion topics were selected based on local and regional interests related to oil spills. Therefore, each workshop had distinctive results that can be used to guide future plans and projects. Below are brief highlights of what makes each region unique as well as some key points from the regional reports. Please refer to the full reports (Hale et al., 2019; Holen, 2019; Partyka et al., 2019; Schulhof & Grifman, 2019; Walker & Covi, 2019) for more details.

Western Gulf of Mexico Regional Workshop, December 4–5, 2018, Houma, Louisiana

Houma is home to a mix of oil industry workers, tribal members, fishing families, and other residents

> "Set up trust between people in advance. Depending on what part of the country, [there are] different levels of trust."
>
> —western Gulf workshop participant

who share ties with the surrounding natural resources. Residents of Houma, and the western Gulf region as a whole, have experienced multiple types of disasters including hurricanes, floods, land loss, and oil spills—including Deepwater Horizon in 2010.

Participants voiced concerns about the disconnect in communication and information flow between and among emergency responders, industries responsible for causing spills, local communities, and other audiences during and after oil spills. More work is needed to understand how information flows through each community and what methods are effective in communicating risks. Discussion centered on integrating communities into the local and regional response framework so that incident-related information, as well as post-incident recovery information, could continue to flow within communities long after a disaster. Participants discussed ways impacted communities (e.g., fishers, tribes, and tourism-dependent businesses) could avoid becoming corrosive communities—in which fears, stress, anxiety, and conflict after a disaster impede the ability to recover. Instead, attendees shared potential ways to build a foundation for resiliency in both the short and long term. Breakout groups discussed ideas for the creation of education and training programs to better prepare people for the mental, physical, social, and economic consequences of future spills—with respect for diverse cultures and capacities. Trust was a common theme; trust building and the use of trusted "gatekeepers" and "liaisons" to channel information during and after spills are needed.

Participants discussed a need for baseline information regarding the socioeconomic conditions of individuals and communities before a spill occurs in order to better track impacts. They expressed concerns with the existing claims and compensation process and interest in researching how economic processes factor into human well-being. Participants also conveyed a need to document psychosocial factors that characterize a community in addition to traditional health statistics.

> "Better communication from state and federal level to local levels, including communication protocols, and ensuring follow up [are needed]. State and federal agencies need help figuring out whom to talk to and the best communication strategies. Sharing of lessons learned, [between] communities with experience in these types of oil-spill-related communications [and] communities that do not have this experience, is needed."
>
> —Alaska workshop participant

Alaska Regional Workshop, February 20–21, 2019, Anchorage, Alaska

Alaska is treasured for its unique geography, but this geography is also a major challenge in planning for or responding to oil spills. Participants at this workshop discussed the need to better inform communities and include them in research and response. Communication and inclusion need to occur in culturally appropriate and meaningful ways.

Participants detailed how the vastness of the region, the difficulty of reaching most rural communities by road, and the often unpredictable weather make it nearly impossible for community members in remote locations to attend and participate in emergency response planning meetings and trainings (e.g., Coast Guard-led Regional Response Team meetings and Area Committee Meetings). Community and tribal leaders expressed willingness to overcome these geographic obstacles to attend planning meetings, but consistent financial resources are needed to support travel to the meetings.

Participants also said that rapid changes to the Arctic are causing a sense of urgency as they look for ways to build community resilience and capacity for response. For example, in the Bering and Chukchi Seas, the retreat of the sea ice brings potential for increased ship traffic and oil and gas exploration. At the same time, many Alaskans depend exclusively on natural resources—healthy wildlife and marine resources are critical for the subsistence way

of life. For this reason, if an incident occurred in a remote location where subsistence living is the norm, villagers would take matters into their own hands while waiting for emergency response personnel to arrive, which presents health and safety concerns. In many cases, rural community members are not trained to respond to oil spills, nor do they have the equipment and resources needed to carry out a response.

Mid-Atlantic Regional Workshop, March 29, 2019, Virginia Beach, Virginia

> "Transparency between federal, state, and local oil spill preparedness plans allows for more experts to be involved, more open communication with the community, and more resources to be shared. Participants encouraged continuing workshops and outreach to educate oil spill communities and increase the number of connections between these communities to improve oil spill preparedness for everyone."
>
> —Walker & Covi, 2019

Offshore drilling is not taking place in the mid-Atlantic region, although communities here are aware that this could change in the near future. Transportation and storage of oil and gas products and other hazardous chemicals is a primary concern in the mid-Atlantic. With the exception of the emergency responders at the workshop, participants from mid-Atlantic communities had relatively little experience with spill impacts, so this workshop enabled new connections and the exchange of ideas.

Workshop participants went beyond identifying regional priorities and voted for top priorities and projects. They want to tailor communication methods for specific communities and to identify the populations most vulnerable to the impacts of an oil spill. Increased connection between local planning committees and Coast Guard-led Area Committee Meetings is needed. Participants also recommended that more local economic experts get involved in planning, preparedness, and response, which would potentially enable short-term aid programs during an incident. Participants were interested in improving public health announcements, particularly related to seafood contamination. Participants also recommended creating counseling programs to help reduce mental health stress after a spill.

> "[We need] better training for volunteer responders. The public is often interested in helping, but if they are to be used, the ICS [Incident Command System] needs to have a training component included to avoid sending untrained personnel into the field. This is a safety and liability concern for the oil companies as well as the professional response teams."
>
> —West Coast workshop participant

West Coast Regional Workshop, April 5, 2019, Santa Barbara, California

The West Coast region is home to active recreation, fishing and tourism industries, tribal communities, and diverse marine wildlife and ecosystems. In addition to a national marine sanctuary, Santa Barbara and Ventura counties contain a high density of offshore oil rigs and platforms, and oil seeps and spills from offshore structures are chronic in the region. Santa Barbara has experienced two major spills—the historic 1969 oil spill and the 2015 Refugio spill—which had profound impacts on the local environment and community. Feedback collected from the Santa Barbara workshop provides insight applicable across the broader West Coast region.

An overarching theme that emerged from the workshop was the need to build better relationships and trust between different agencies and stakeholders within the community before a spill event. Participants expressed a need for a more coordinated response effort. Ideas for relationship building included creating working groups, partnerships, and task forces with community stakeholders and government at all levels. There is a particular need for more inclusion of and relationship building with tribes. Participants stressed that all

coastal tribes should be included in these efforts whether or not they are formally recognized by the state or federal government. Stronger public accountability and involvement by the oil industry in aiding and funding response efforts was also a major focus of discussion. Future efforts on the West Coast should also focus on engaging health care experts and practitioners to improve preparedness for and response to health concerns related to oil spills, such as community exposure to chemicals.

Eastern Gulf of Mexico Regional Workshop, May 6–7, 2019, Mobile and Bayou La Batre, Alabama

> "NRDA [Natural Resource Damage Assessment] is the only process in place that exists after a spill. Can we connect in to the NRDA process to collect human and environmental data with community participants? Do we need to revise the assessment process? What's the additional data we need? What are we lacking? Are we utilizing what is important? …. Only knowing the financial impacts and lost recreation is not enough. Tie [NRDA] into health."
>
> —eastern Gulf workshop participant

Similar to the western Gulf, eastern Gulf communities are culturally diverse, with a mix of oil industry workers, tribes, fishing families, and many others. Many residents depend on the surrounding natural resources. This region has also experienced (and continues to experience) multiple types of disasters over time, such as hurricanes, floods, oil spills, and land loss. Utilizing feedback from previous workshops, the planning team for the eastern Gulf workshop held two sessions to accommodate audiences in rural communities that would not be able to attend a workshop during traditional business hours. For this reason, a two-day session was held in Mobile and a one-evening session in Bayou La Batre.

Participants in both sessions sought greater transparency in and access to information on oil spills and their impacts. They wanted to see increased involvement of community members and leaders during oil spill response, and they saw the need for more training and support of community members on the front lines of disaster response. In both sessions, participants expressed a need for spill prevention. They wanted to ensure that lessons had been learned from the Deepwater Horizon oil spill of 2010.

The biggest difference between the two sessions was the way in which Bayou La Batre participants described their feelings about recovery efforts and research communities. They felt they had been left out of the conversations about oil spills and needed additional support beyond the duration of short-term research and outreach programs. They also expressed frustration at their difficulty in finding information on health impacts from oil spills and at a perceived lack of resources to help their families in times of crisis. It was apparent from both of the workshop sessions that regular engagement with impacted communities by community aides, liaisons, and outreach professionals should be prioritized.

Conclusion

Common interests, issues, and suggestions pertaining to improving human well-being within the context of oil spills emerged in all regional workshops. Based on the input collected across the country, an opportunity has arisen to address these commonalities at a national level. Research and capacity-building institutions can create funding mechanisms that align with the five national themes described in this report. Nationwide, the many agencies, industries, and organizations associated with disaster planning and recovery can utilize these themes as they make changes to their strategic plans and protocols.

While these national themes will help guide future efforts in oil spill preparedness, response, and recovery in a uniform way, it is important to conduct research and develop outreach projects that address the interests and challenges unique to each region. Local

organizations can use the information in the regional workshop reports to build trust, establish resources, and act on the many ideas expressed by community members in each region. Likewise, emergency response and recovery professionals can turn to these reports as they update their local and regional contingency plans. For example, new and improved training programs and plans can be implemented nationally, while local Area Committees and Regional Response Team members can adapt plans based on the needs expressed by their constituents. To access the full set of regional workshop reports, please visit https://gulfseagrant.org/oilspilloutreach/collaborative-workshop-series/.

References

Giammaria, C., Nicholson, A., & Snair, J. (2018). NASEM workshop summary: Preparing for a rapid response to major marine oil spills: Protecting and assessing the health and well-being of communities. *TR News*, 313, 21–25. Retrieved from http://onlinepubs.trb.org/onlinepubs/trnews/trnews313.pdf

Hale, C., Maung-Douglass, E., Partyka, M., Sempier, S., & Skelton, T. (2019). Preparing for oil spills in the western Gulf: A regional workshop report from the National Academies and Sea Grant collaborative workshop series, held Dec. 4–5 in Houma, Louisiana. GOMSG-W-18-001. Retrieved from http://masgc.org/oilscience/Houma-NAS-2019.pdf

Holen, D. (2019). Setting priorities for health, social, and economic disruptions from spills in Alaska: Learning from the past, preparing for the future (report of a regional workshop held February 20–21, 2019, in Anchorage, Alaska). Retrieved from http://masgc.org/oilscience/Workshop_report_Alaska_final.pdf

National Academies of Sciences, Engineering, and Medicine Gulf Research Program. (2019). About the Gulf Research Program. Retrieved from http://nationalacademies.org/gulf/about/index.html

Partyka, M., Hale, C., Maung-Douglass, E., Sempier, S., & Skelton, T. (2019). Preparing for oil spills in the eastern Gulf: A regional workshop report from the National Academies and Sea Grant collaborative workshop series, held May 6–7 in Mobile and Bayou La Batre, Alabama. GOMSG-W-19-001. Retrieved from http://masgc.org/oilscience/Mobile-BLB-NAS-2019.pdf

Schulhof, M. & Grifman, P. (2019). Improving oil spill preparedness and response in Santa Barbara, CA: A workshop report from the National Academies of Science, Engineering and Medicine and Sea Grant oil spill workshop series. USCSG-TR-01-2019. Retrieved from http://masgc.org/oilscience/West-Coast-regional-Oil-Spill-Report_final.pdf

Sempier, S.H., Graham, L., Maung-Douglass, E., Wilson, M., and Hale, C. (2015). Summary of target audience input on oil spill science topics. MASGP-15-006. Retrieved from http://masgc.org/oilscience/final-target-audience-input-2014-early-2015.pdf

Sibley, M. & Hale, C. (2018). Oil spill science: Improving preparedness for marine oil spills to minimize health, social, and economic disruptions. GOMSG-W-18-002. Retrieved from http://masgc.org/oilscience/NAS-Pre-Workshop-Summary.FINAL.pdf

Walker, G. & Covi, M. (2019). Mid-Atlantic oil spill workshop: Are we ready? Mid-Atlantic workshop as part of the National Academies and Sea Grant collaborative workshop series. VSG-19-16. Retrieved from http://masgc.org/oilscience/MAOS-Workshop-Report.pdf

Appendix: Members of the Planning Committees

Project Planning Committee

- Torie Baker, formerly Alaska Sea Grant College Program
- Michelle Covi, Virginia Sea Grant College Program
- Linda Duguay, University of Southern California Sea Grant Institutional Program
- Phyllis Grifman, University of Southern California Sea Grant Institutional Program
- Chris Hale, Texas Sea Grant College Program (chair)
- Doug Helton, National Oceanic and Atmospheric Administration Office of Response and Restoration
- Christopher Hershey, U.S. Coast Guard
- Davin Holen, Alaska Sea Grant College Program
- Richard Kwok, National Institute of Environmental Health Sciences
- LeighAnne Olsen, National Academies of Sciences, Engineering, and Medicine
- Missy Partyka, Mississippi-Alabama Sea Grant Consortium
- Chris Rea, National Academies of Sciences, Engineering, and Medicine Gulf Research Program
- Liesel Ritchie, Oklahoma State University and National Academies of Sciences, Engineering, and Medicine Gulf Research Program Advisory Board
- Marika Schulhof, University of Southern California Sea Grant Institutional Program
- Stephen Sempier, Mississippi-Alabama Sea Grant Consortium
- Martha Sibley, National Academies of Sciences, Engineering, and Medicine Gulf Research Program Fellow, Oklahoma State University
- Kevin Sligh, U.S. Coast Guard
- Grace Walker, Virginia Sea Grant College Program
- Maggie Walser, National Academies of Sciences, Engineering, and Medicine Gulf Research Program

Western Gulf Regional Workshop Planning Committee

- Julie Falgout, Louisiana Sea Grant College Program
- Chris Hale, Texas Sea Grant College Program (workshop leader)
- Emily Maung-Douglass, Louisiana Sea Grant College Program
- Missy Partyka, Mississippi-Alabama Sea Grant Consortium
- Liesel Ritchie, Oklahoma State University and National Academies of Sciences, Engineering, and Medicine Gulf Research Program Advisory Board
- Stephen Sempier, Mississippi-Alabama Sea Grant Consortium
- Brandi Todd, National Oceanic and Atmospheric Administration Office of Response and Restoration

Alaska Regional Workshop Planning Committee

- Torie Baker, formerly Alaska Sea Grant College Program
- Joe Banta, Prince William Sound Regional Citizens Advisory Council
- Kristen Bridges, Department of Health and Social Services
- Jeffrey Brooks, Bureau of Ocean Energy Management
- Davin Holen, Alaska Sea Grant College Program (workshop leader)
- Aaron Poe, Alaska Conservation Foundation, Aleutian and Bering Sea Islands Landscape Conservation Cooperative, and Sustainable Southeast Partnership
- Todd Sformo, North Slope Borough
- Sarah Yoder, Department of Health and Social Services

Mid-Atlantic Regional Workshop Planning Committee

- Steven Becker, Old Dominion University
- Todd Cannon, Virginia Department of Emergency Management
- Elisha Cook, U.S. Coast Guard
- Michelle Covi, Virginia Sea Grant College Program (workshop leader)
- Frank Csulak, National Oceanic and Atmospheric Administration Office of Response and Restoration
- Jay Ford, Chesapeake Bay Foundation
- John Giese, Virginia Department of Environmental Quality
- Ann Hayward Walker, SEA Consulting Group
- David Pugh, U.S. Coast Guard
- Grace Walker, Virginia Sea Grant College Program

West Coast Regional Workshop Planning Committee

- Richard Block, Santa Barbara Zoo
- Errin Briggs, County of Santa Barbara
- Carrie Culver, California Sea Grant College Program
- Phyllis Grifman, University of Southern California Sea Grant Institutional Program
- Sean Hastings, Channel Islands National Marine Sanctuary
- Kristen Hislop, Environmental Defense Center
- Linda Krop, Environmental Defense Center
- Mike Murray, Channel Islands National Marine Sanctuary
- Ben Pitterle, Santa Barbara Channel Keeper
- Kira Redmond, Santa Barbara Channel Keeper
- Marika Schulhof, University of Southern California Sea Grant Institutional Program (workshop leader)
- Molly Troup, Santa Barbara Channel Keeper

Eastern Gulf Regional Workshop Planning Committee

- Carolyn Bigos, U.S. Coast Guard
- Emily Blejwas, Bayou Clinic
- Jordan McGee-Davila, U.S. Coast Guard
- Chris Hale, Texas Sea Grant College Program
- Missy Partyka, Mississippi-Alabama Sea Grant Consortium (workshop leader)
- Eric Passarelli, U.S. Coast Guard
- Stephen Sempier, Mississippi-Alabama Sea Grant Consortium
- Chris Verlinde, Florida Sea Grant College Program
- Daniel Wheeler, U.S. Coast Guard