



Community Engagement Strategies for Marine Oil Spill Planning and Response



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Executive Summary

With an expected increase in tanker traffic in Vancouver, Canada and associated marine oil spill risks, it is crucial that planning professionals and decision-makers take steps to prepare for a major oil spill, including enhancing community engagement efforts. Through 23 semi-structured interviews with professionals involved in oil spill planning and response in BC and the US, this research project investigates current community engagement practices in BC, comparing them with practices in US communities which have been impacted by past major oil spills. Overall, there were a higher percentage of US interviewees (86%) who have conducted community engagement activities compared to BC interviewees (67%). For both US and BC interviewees, *outreach communication* is the most common type of engagement activity, followed by *consultation and workshops*, and the least practiced was *training and exercises*. With the exception of the Western Canada Marine Response Corporation (WCMRC) and federal agencies such as the Canadian Coast Guard and Transport Canada, most BC interviewees stated that they generally rely on outreach communication efforts immediately following minor spills and do little to no pre-event community engagement.

The main challenges and concerns highlighted by interviewees included misinformation and mistrust, low public interest, public health concerns and hazards (particularly for convergent volunteers), causing fear and panic, and having limited time and resources. Recommendations include preparing information packets prior to a major oil spill which can be immediately distributed to the public following an event, providing an official forum for citizens to share their input into marine oil spill planning (e.g., a Citizen's Advisory Council for BC), and encouraging pre-registered and pre-trained volunteers who are ready to go in the event of a spill (e.g., by working with existing volunteer networks such as Beach Watch or Block Watch community groups). Overall, this research project promotes strategies for the continuous advancement of marine oil spill community engagement efforts, especially in Vancouver, BC and in other coastal communities which have not yet experienced a major oil spill event but are at risk of one.

Who is this report for?

This report is intended for anyone interested in learning more about community engagement challenges and best practices for marine oil spills, particularly with a focus on Vancouver, Canada. Readers may include residents of coastal communities in British Columbia (BC), planning professionals, local government staff, oil spill responders, communications specialists, researchers, university students, and anyone who enjoys the beach and seeks to protect our marine environment and coastlines.



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Context

Introduction

Community engagement has been identified as a key component in effectively preparing for and responding to disasters such as marine oil spills (Whittaker et al., 2015; Government of Canada, 2018; Aldrich & Meyer, 2015; National Research Council, 2015; Walker et al., 2014; National Academies of Sciences, Engineering, and Medicine, 2017). Walker et al. highlight that a successful oil spill response does not only involve stopping the release and cleaning up of the spill; it also involves engaging with local community members to ensure their voices are heard and needs are met (2014). Nevertheless, community participation continues to be underutilized in disaster planning and management (Norris et al., 2008; Patel et al., 2017; Aldrich & Meyer, 2015; Walker et al., 2015). Community engagement is often overlooked during preparedness and treated as a low priority during response (Walker et al., 2015). Recent challenges in involving the community have shown that some spill response authorities view community members primarily as safety risks rather than helpful resources (Whittaker et al., 2015; National Academies of Sciences, Engineering, and Medicine, 2017). Community members have felt left out, leading to problems of distrust and misinformation. This has negatively impacted communities' recovery from the incidents as well as the efficiency and effectiveness of oil spill response (Georgia Strait Alliance, 2015; Heiltsuk Tribal Council, 2017).

To address these challenges, recommendations have been made to engage with communities before an oil spill so that when a spill happens, trust has already been established among community members and authorities, expectations and roles have been clarified, and response authorities and community members are prepared to efficiently alleviate the impacts of the spill together (National Academies of Sciences, Engineering, and Medicine, 2017).

Furthermore, it has been recommended to evaluate current methods of engagement with communities that are likely to be impacted by spills, particularly identifying the factors that impair and improve community engagement. Assessing these factors allows for the application of best practices at regional and local levels, and in turn, helps improve contingency planning efforts for marine oil spills (Hale et al., 2019). While there have been studies that have looked at community engagement efforts in communities that have experienced a major oil spill (Walker et al. 2015; Smith et al., 2016), few studies have looked at engagement efforts in communities that have yet to experience a major oil spill but are at risk of one. Considering the recommendations in the literature to engage community members before an oil spill, there is a need to assess the outreach efforts not only in communities that have already experienced a major oil spill, but also those that are likely to experience a major spill in the future. To address this need, my research project looks at community engagement efforts in Vancouver, British Columbia (BC).



Photo Credit: Wikimedia.org / Xicotencatl

Context

Why Vancouver, BC?

- **Projected Increase in Marine Vessel Traffic**

Vancouver is at risk of marine oil spills from various ship sources, including oil tankers. With the recent approval of Canada's Trans Mountain pipeline expansion project, there will be a significant increase in oil tanker traffic in the region. Typically, five tankers a month transport crude oil from the Westridge Marine Terminal; with the pipeline expansion, this number can increase to approximately 34 tankers per month depending on market demands (NEB, 2016). Considering this potential increase in marine vessel traffic and the associated oil spill risk, it is crucial that appropriate disaster planning takes place, including adequate community engagement efforts.

- **Challenges in Past Oil Spill Response**

In 2015, Vancouver experienced a minor oil spill when a bulk carrier cargo ship, M/V Marathassa, spilled 2,700 litres of fuel oil into English Bay. Although the spill was relatively small, there were several impacts on the local community, such as beach closures along English Bay and a one-month ban on recreational fishing of shellfish and groundfish in the Burrard Inlet (CBC News, 2015). In terms of economic costs, the City of Vancouver spent approximately \$500,000 on response efforts, the Vancouver Aquarium spent approximately \$180,000 on environmental testing after the spill, and the Wildlife Rescue Association of BC spent approximately \$21,000 to rescue impacted wildlife (CBC News, 2018; Baker, 2016).

This experience and other past spills in BC have highlighted challenges in oil spill response particularly with regard to community engagement (Georgia Strait Alliance, 2015; Heiltsuk Tribal Council, 2017). Local community members have often been placed on the sidelines, leading to misinformation, disengagement, and feelings of distrust and resentment

on how the oil spills have been handled (Georgia Strait Alliance, 2015; Heiltsuk Tribal Council, 2017). This is a significant concern considering that community members are often the first who discover a spill, and they are left to deal with the consequences of oil spills long after the initial response is completed.

Vancouver is an interesting case study because the community has experienced a recent minor oil spill that has put marine oil spills on the radar of response authorities and community members. On the other hand, it has not yet experienced a major oil spill although it is at risk of one. In preparation for a potential major oil spill in the future, it is crucial that the challenges described above be addressed.

This research project explores community engagement practices for marine oil spill planning in Vancouver. It compares BC practices with community engagement practices in US communities which have experienced past major oil spills. Furthermore, my report identifies challenges experienced by both BC and US professionals in their community engagement efforts as well as recommendations to address these challenges. Overall, my research provides insight on strategies and opportunities for coastal communities which have not experienced major oil spills to increase their capacity to prepare for, respond to, and recover from marine oil spills through community engagement efforts.



Photo Credit: Chad Strohmeier

Research Methods

Research Questions:

1. What has been done to engage community members in preparing for a major oil spill in Vancouver, BC?
2. How do community engagement efforts in BC compare with other communities that have experienced a major oil spill in the past (i.e., in the US)?
3. What are challenges and concerns that oil spill professionals have encountered in terms of engaging community members about marine oil spills?
4. What are recommendations/best practices for doing oil spill engagement in a community that has not yet experienced a major oil spill but is at risk of one?

Research Design & Methods

I conducted 23 semi-structured interviews with altogether 27 individuals to gain insight on community engagement practices for marine oil spill planning in BC as well as in communities in the US which have experienced a past major oil spill. I also gathered data about current gaps and challenges, and suggestions for improving engagement efforts for oil spills. Interviewees are professionals involved in marine oil spill planning and response, including emergency managers, environmental specialists, response officers, and oil spill communications specialists.

Two groups of professionals were recruited and interviewed. The first group (interview numbers 1-9) consisted of professionals in the Metro Vancouver region of BC who have had minimal direct experience with major oil spill events (i.e., spills greater than 100,000 L). This group of interviewees primarily consisted of those who had attended a local workshop in October 2018 on the “Model of Impact of Dilbit and Oil Spills in the Salish Sea” (MIDOSS) project, with the exception of three interviewees who were recruited through snowball sampling.

The second group (interview numbers 10-23) consisted of professionals from the US who have had direct experience with a major oil spill. I compiled a list of oil spills over >100,000 L within the past 20 years (e.g., Cosco Busan, Deepwater Horizon, Kalamazoo River). To identify potential US interviewees and obtain their contact information, I conducted an internet search of news articles, relevant organizations’ websites, and other resources related to these major oil spills. Three US interviewees were recruited through snowball sampling.

Overall, all interviewees were selected on the basis of their knowledge of and involvement in preventing, preparing for, responding to, and/or recovering from marine oil spills in North America. The interviewees represented emergency response agencies, environmental non-governmental organizations, local governments, and relevant state and federal agencies (e.g., NOAA, the EPA, Canadian Coast Guard, Transport Canada). *(Section continued next page).*



Photo Credit: Flickr / NSW Maritime

Research Methods

Research Design & Methods (Cont.)

Interview questions focused on interviewees' experiences with community engagement practices for marine oil spills and their perspectives on involving community members in preparing for and responding to oil spills. Interviewees were asked to describe any challenges they have encountered in terms of engaging with the public, and were also asked about the types of information they think would be most useful to include in educational resources. Lastly, interviewees were asked to highlight any recommendations, best practices, or lessons learned they had for engaging with community members about marine oil spills.

The interviews were conducted from July 2019 to July 2020: six interviews were conducted in-person in BC, while 18 interviews were conducted by phone. The interviews typically lasted between 30 and 75 minutes; they were audio-recorded (when permitted by the respective interviewees) and transcribed.

The interview transcripts were qualitatively analyzed using a thematic coding approach and NVivo 12 software. As a basis for my thematic analysis, I used a framework developed by Walker et al. (2015) in which they categorized community engagement practices into three main types: 1) outreach communication (one-way information flow from authorities to public audiences), 2) consultation (structured dialogue from the public to the authorities), and 3) participation (joint problem-solving and collaborative action between authorities and public). For the purposes of this research project, I adapted the second and third categories (for specificity): 2) consultation and workshops and 3) training and exercises.



Photo Credit: Flickr / Coast Guard News

Interview Findings

Types of Community Engagement Activities

Of the 23 interviewees, 18 (78%) have been involved in community engagement efforts for marine oil spills. Ten interviewees have done more than one type of community engagement activity. The most common type of engagement activity is outreach communication, followed by consultation and workshops, then training and exercises (see Figure 1).

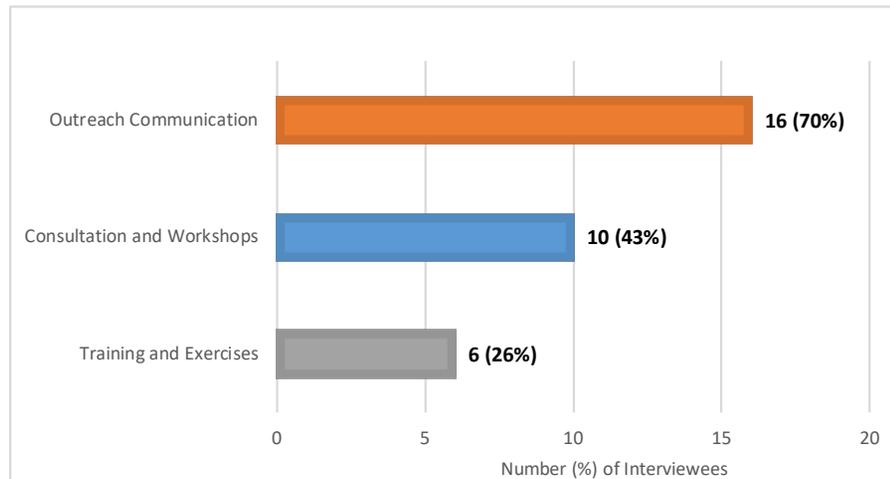


Figure 1. Types of Community Engagement Activities (*Note: Some interviewees conducted more than one type of community engagement practice; other interviewees have not done any community engagement.)

- **Outreach Communication**

In BC, interviewees highlighted the main method of education and outreach communication was through organization websites and social media pages. For example, one interviewee mentioned that there is a dark site that the response organization can activate during an incident, which will have information about the status of the oil spill, the response tactics being used, oiled wildlife information, and other incident information approved by unified command (Project Manager, Interview 8).

After the M/V Marathassa spill, a joint information centre manual was developed for public affairs and communications staff including a framework of how communications officers can work together during a spill to develop common messaging. The manual also contains recommendations on how to communicate to the public, such as how to phrase information about oil spill response (Emergency Management Specialist, Interview 1). Aside from these efforts, public forums and conferences about the oil spill risks and hazards have also been held in BC in the past.

Among US interviewees, there was generally a greater extent of outreach communication compared to BC interviewees. During and immediately after major oil spills, public information officers from government agencies held open house information sessions where responders, health officials, and restoration planners were all available to answer community members' questions. Furthermore, communications staff attended neighbourhood meetings (e.g., Block Watch meetings) to convey oil spill information and address community members' concerns and feedback. Information was also made available on government websites and response agencies' outreach blogs and social media about the volume of oil reaching the shore, response efforts, and the expected duration of clean-up. Information about beach closures and impacts on wildlife, fisheries, sensitive habitats, and recreation was also provided both online and through open house sessions. In addition, federal agencies held longer-term restoration planning open houses for local members, scientists, researchers, universities, and other resource managers and agencies to discuss potential restoration projects.

Interview Findings

- **Outreach Communication (Cont.)**

Interestingly, some coastal municipal staff who have experienced a major oil spill said they still do not place a very high priority on oil spill response planning. One interviewee suggested that they have a much greater need to address storms, floods, and wildfires compared to oil spills (Coastal Resources Manager, Interview 21). He considers major oil spills as once in a lifetime events, so his department does not spend a lot of energy and resources to communicate oil spill risk. Similarly, another interviewee said that no additional oil spill outreach to the public is being conducted by his department following the spill event (Director of Emergency Operations, Interview 16). Nevertheless, following major oil spills such as Exxon Valdez and Deepwater Horizon, successful community engagement initiatives in the US were established such as the Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) (established after the Exxon Valdez oil spill) and the Sea Grant Oil Spill Science Outreach team (established after the Deepwater Horizon oil spill).

In preparation for future spills, federal agencies have also held outreach events for coastal communities at risk of an oil spill, to inform them about the latest oil spill response strategies and science. Some of these events included open houses showcasing different resources, such as online oil spill mapping tools.

- **Consultation and Workshops**

Consultation activities such as workshops in BC have been generally conducted by federal agencies such as the Canadian Coast Guard and Transport Canada. For example, the Canadian Coast Guard has facilitated meetings that promote a two-way flow of information with community members who have local knowledge about docks, shorelines, tides, etc. (Project Manager, Interview 8). Transport Canada has engaged with community members as part of their risk assessment

project. The project involved visiting communities, holding open-house style sessions for community members to learn about the risk assessment and share their feedback on the results (Regional Environmental Preparedness Response Officer, Interview 7).

Similarly in the US, federal agencies have also held workshops with community members. For example, the National Oceanic and Atmospheric Administration (NOAA) has held meetings with local community members to provide an opportunity for them to share their perspective on where the oil is likely to go based on their local knowledge of currents (Regional Response Officer, Interview 19).

Three interviewees (one from BC and two from the US) mentioned that a main engagement tool for consultation and workshop activities is Geographic Response Strategies (GRS). GRS are site-specific response plans tailored to protect sensitive habitats threatened by an oil spill. The interviewees described that they often try to involve community members in the process of developing and refining GRS through workshops. A diverse range of community members attend these workshops such as biologists, archaeologists, bird watchers, fishers, and divers who can help identify sensitive areas and suggest ways to improve local response plans. The interviewees highlighted the benefits of the GRS workshops, including being able to incorporate invaluable local knowledge into their response strategies while also developing connections and trust among local communities (Communications Manager, Interview 6). Furthermore, one interviewee mentioned that they use an online mapping tool called "Environmental Response Management Application" (ERMA) (developed by NOAA) during these workshops, which has helped community members visualize GRS in an interactive way (Regional Response Officer, Interview 19).

Interview Findings

- **Training and Exercises**

Training and exercises were the most controversial type of community engagement activity, primarily because of health hazard and waste hazard concerns. For example, one interviewee in BC suggested that providing training for the general public can create an expectation that they are going to be involved in oil spill response, which may not be the case (Communications Manager, Interview 6). While the interviewee's organization does not provide training to volunteers, it provides training to skilled, local contractors who are given access to equipment. These local contractors can only deploy under the response organization's direction. Recognizing the natural inclination for community members to show up and want to help clean up their local beaches, the response organization has also developed a convergent volunteer plan for managing volunteers and identifying tasks that pose less health risks, such as surveying shoreline areas that have not yet been impacted by the spill. Another BC interviewee suggested that providing people an avenue in their community to do volunteer work may help alleviate the stress that is caused by an oil spill (Emergency Planning Officer, Interview 3).

Other organizations have conducted training and exercises for community members. Two interviewees (one in BC and one in the US) mentioned that they provide response training courses including Hazardous Waste Operations and Emergency Response (HAZWOPER) and Shoreline Cleanup and Assessment Techniques (SCAT) classes. These training courses cover how to use response equipment, when to use the equipment, how to work with other partners, how to set up an incident command post, and so forth (Project Manager, Interview 8 and Regional Response Officer, Interview 19).

These response organizations also hold regular local oil spill exercises and drills in coastal communities, running through scenarios and GRS to prepare for future spills with community members. While the training is open to anyone, most participants are First Nations, federal and provincial staff, and industry partners. The interviewees highlighted that the main benefits of community training and exercises have included being able to: build relationships and trust before a major spill happens; clarify expectations about roles and responsibilities; and allow community members to have a greater voice and presence in planning and preparedness. Acknowledging the safety concerns, however, one of the interviewees emphasized that it is important for trained community members to respond to spill events collaboratively with response authorities as opposed to trying to respond to the event on their own (Project Manager, Interview 8).



Interview Findings

Summary of Differences Between US and BC

Overall, a greater percentage of US interviewees have led community engagement activities compared to BC interviewees (see Figures 2 and 3).

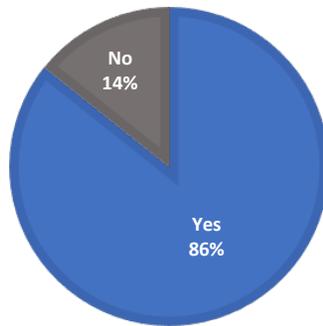


Figure 2. US interviewees who have led community engagement activities

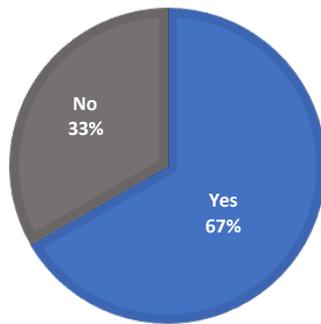


Figure 3. BC interviewees who have led community engagement activities

Most community engagement activities in BC have been led by federal agencies such as the Canadian Coast Guard, while community engagement in the US has been led by a more diverse range of groups including federal and state agencies, non-governmental organizations, and coastal municipalities.

In terms of type of engagement activities by location, there was a higher percentage of outreach communication activities among US interviewees versus BC (see Figure 4).

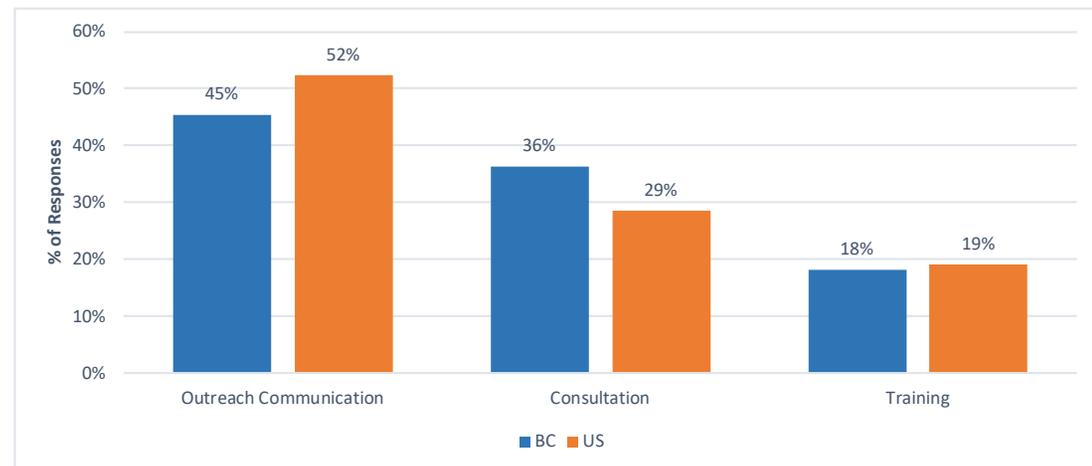


Figure 4. Types of Engagement Activities (BC and US Interviewees)

One possible explanation for this is most US coastal municipalities had participated in outreach during major spill events, whereas in BC, coastal municipalities generally have not conducted extensive outreach due to having no past major spill in the area. BC interviewees highlighted that they would mainly depend on public information officers to release information after spill events, and they conduct little or no pre-event community outreach. Furthermore, several non-governmental organizations in the US have done outreach communication activities (e.g., blogs, social media, press releases), but have not conducted workshops and consultation activities. On the other hand, in BC, most community engagement activities are done by federal agencies which conduct both outreach and consultation activities, thus explaining a smaller difference in outreach versus consultation percentages among BC responses relative to US interview responses.

Interview Findings

Challenges and Concerns

Interviewees were asked to describe the challenges and/or concerns that they have encountered related to community engagement (see Table 1).

Table 1.
Community Engagement Challenges and Concerns

Challenge	# of Responses	% of Interviewees
1. Misinformation and mistrust	11	48%
2. Low public interest	10	43%
3. Public health concerns	5	22%
4. Causing public fear	4	17%
5. Limited time and resources	4	17%

(Note: Some interviewees encountered more than one type of challenge and concern.)

- **Misinformation and Mistrust**

The most common challenge mentioned by interviewees is misinformation and mistrust. One interviewee suggested there is a huge risk of rumours and pseudoscience spreading among community members, especially if there is no official source of oil spill information (Oil Spill Science Communicator, Interview 22). Four interviewees highlighted that the issue of misinformation is especially challenging when there is a distrust in the government and/or oil spill companies and the information being conveyed is complex and/or controversial (e.g., information about dispersants). Another interviewee mentioned that it is often difficult to keep up with misinformation being shared on social media; official websites are not usually updated immediately due to lack of information following a spill (Project Manager, Interview 8).

- **Low interest and motivation**

Several interviewees stated that another common challenge for community engagement is low interest among the public as the perceived threat for major oil spills is generally low. There is usually high motivation immediately after major oil spills such as Deepwater Horizon and Exxon Valdez; however, interviewees described how the motivation only lasts for a few years until the public begins to lose interest again. One interviewee highlighted that nobody is likely to pay attention if oil spill information is released before a spill occurs (Oil Spill Science Communicator, Interview 22); nevertheless, she suggested that having factual oil spill information ready (as a “break glass in case of emergency” box) would be useful to help calm people down in the event of the spill.

One interviewee explained that a challenge has been conveying to the public that smaller oil spills are a regular occurrence and that, regardless of how small a spill, prevention is still important to avoid negative impacts on the environment (Regional Operations Supervisor, Interview 14). Contrastingly, one interviewee in South Louisiana said that smaller oil spills are so common in the area since a major portion of their industry is oil and gas exploration and production, that his department no longer engages with community members about oil spill risk because they are used to seeing these and simply report them to the sheriff’s office or Coast Guard (Director of Emergency Operations, Interview 16).

Interview Findings

Challenges and Concerns (Cont.)

- **Public Health Concerns**

The most common challenge mentioned by interviewees is misinformation and mistrust. One interviewee suggested there is a huge risk of rumours and pseudoscience spreading among community members, especially if there is no official source of oil spill information (Oil Spill Science Communicator, Interview 22). Four interviewees highlighted that the issue of misinformation is especially challenging when there is a distrust in the government and/or oil spill companies and the information being conveyed is complex and/or controversial (e.g., information about dispersants). Another interviewee mentioned that it is often difficult to keep up with misinformation being shared on social media; official websites are not usually updated immediately due to lack of information following a spill (Project Manager, Interview 8).

“There’s all these photographs of people going in with mops and buckets and standing in oil with flip flops... You’re just trying to tell them ‘No, you can’t do this, you’re going to get hurt, it’s a health issue.’ But they want to be really responsive and helpful.”

- Restoration Program Manager

- **Causing public fear Limited time and resources**

Although low interest was a common challenge, four interviewees also mentioned the concern of oversensitivity toward oil spill information. They described that a potential challenge with sharing information about oil spill risks is causing unnecessary fear among community members, such as property owners near high risk sites. Furthermore, one interviewee mentioned the challenge of media (e.g., pictures of oiled wildlife) triggering emotional responses and fear.

- **Limited time and resources**

Another challenge mentioned was limited time and resources for community engagement activities. Since community engagement can be expensive and time-consuming, it can be a challenge for planners and responders to prioritize resources for community engagement in a way that sustains community interest in the long term (Program Manager, Interview 17). This can also be a challenge on the participant side. One interviewee highlighted that when reaching out to potential attendees for mock spill exercises, several community members would express interest in participating but would ultimately decline the offer because they did not have the time or resources to go to the exercise and participate (Regional Response Officer, Interview 19).

Recommendations

- **Outreach Communication:**

To address the challenge of misinformation, the most pertinent information of interest to the public should be compiled before a major spill into an information packet ready to be distributed to the public immediately after a major spill (Oil Spill Science Communicator, Interview 22). This packet should include synthesized peer-reviewed information on which areas are most likely to be impacted, what are the health and safety risks, and what can be done to clean up the spill. By having this packet ready before a spill, response authorities can help minimize the spread of rumours and misinformation by immediately providing evidence-based information for the public.

Furthermore, to increase attendance for information sessions, response organizations should focus content on people's concerns and passions (e.g., impacts on charismatic megafauna such as whales, dolphins, and sea turtles) and local context (e.g., making connections to their specific community).

One interviewee mentioned that online webinars have been well-attended during COVID-19, suggesting that making outreach events more convenient and accessible for participants can increase interest and attendance in oil spill information sessions (Oil Spill Science Communicator, Interview 22).

Lastly, interviewees highlighted that the most successful community engagement activity during major spills have been open house sessions where response authorities, scientists, and public information officers are available to answer community members' questions. Thus, roles and responsibilities should be established beforehand as to who will be able to facilitate open house sessions and address community members' concerns.

- **Consultation and Workshops:**

As for consultation and workshops, identifying and developing initial contacts with local community champions and members of the public who are passionate about the environment, are essential in establishing a system of connections and support within communities and combat mistrust. These community leaders can help introduce others in the community to marine oil spill preparedness and how to get involved. Furthermore, oil spill professionals should aim to have at least one community representative (e.g., commercial fisher, university researcher, etc.) at oil spill planning meetings. A Citizens' Advisory Council for BC and the West Coast should be established to provide an official forum for citizens to provide their input into marine oil spill planning and response.



Photo Credit: Flickr / Virginia Sea Grant

Recommendations

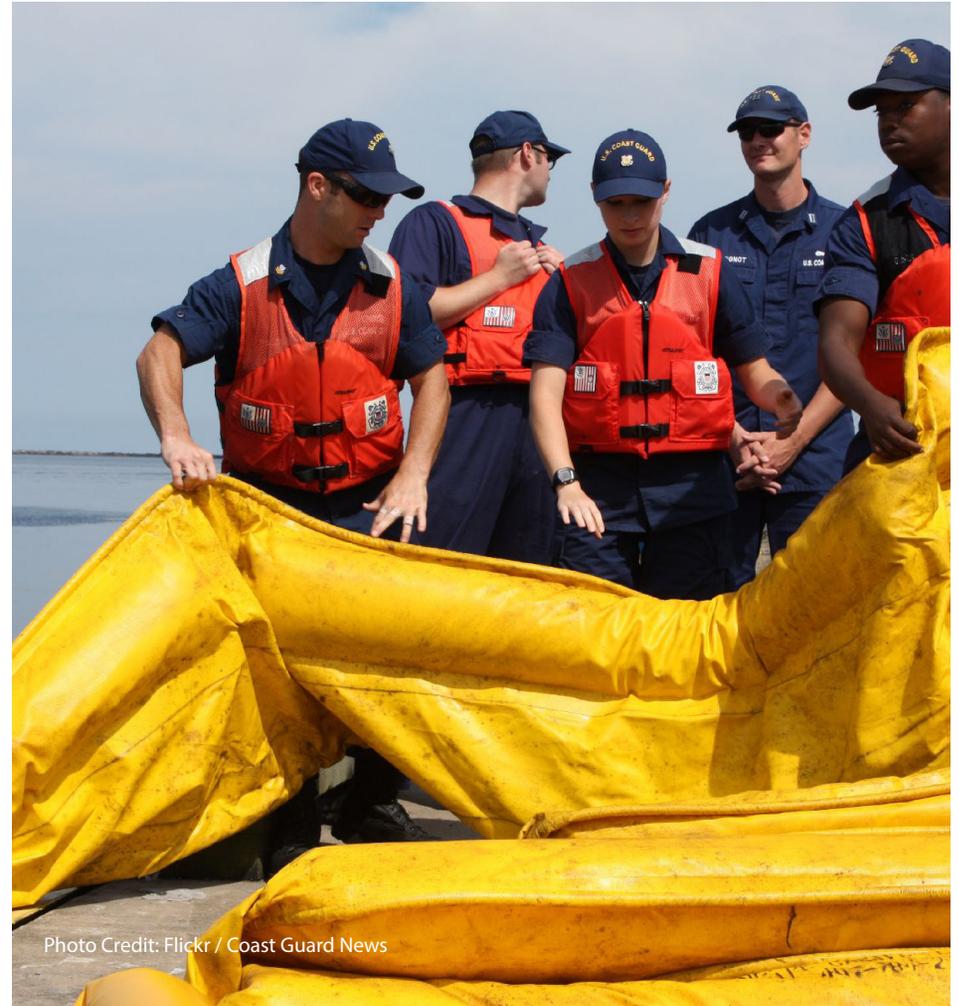
- **Training and Exercises:**

To address the challenge of public health hazards, a concise volunteer handout/ packet should be developed for convergent volunteers before a spill occurs, with information about volunteer requirements, available tasks, and potential health hazards and how to avoid them.

Responders should identify tasks volunteers can assist in low-risk activities during spill clean-up which do not require training, such as transporting oiled wildlife to wildlife rehabilitation centres, cleaning up beaches that have not yet been impacted, and ensuring fellow community members stay away from closed beaches.

In addition, local governments, response organizations, and non-governmental environmental organizations should encourage pre-registered and pre-trained volunteers so they are ready to go in the event of a spill and do not require on-the-job training during a spill response. A mechanism such as a web-based system can be used to register volunteers. Response organizations should offer annual refresher courses and drills for volunteers.

Working with existing volunteer networks (e.g., Beach Watch or Block Watch community groups) and universities can help ensure long-term interest in oil spill response training. Funding from the government or oil industry for HAZWOPER training should be provided to community members to enhance community capacity to respond and assist in an oil spill.



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