

Oil Spill Preparedness and Response: Building the Capacity to Protect Public Welfare and Support Community Resilience

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ABSTRACT

Some oil spills become disastrous for communities who live and work in proximity of the spill, even when a disaster is not formally declared. For decades, social science researchers have reported the negative impacts of such oil spills on communities, but their findings remain in the literature and have not resulted in improvements to oil spill preparedness and response practice.

Effective response to an oil spill which has the potential to become a social disaster requires leaders in emergency management to proactively address spill threats to public welfare in addition to stopping the release of oil and cleaning up the spill. To accomplish this, the oil spill community could proactively engage stakeholders at the grass-roots level to share information, address questions and concerns through risk communication, and include inputs for pre-spill planning. The capacity to engage with vulnerable communities and stakeholders before, during, and after an oil spill is one measure of a successful response.

This paper is a collaborative effort among oil spill specialists, social science researchers, and community members on the Eastern Shore of Virginia to prepare for a serious oil spill and mitigate its potential threats. This remote area of global ecological significance is highly vulnerable to an offshore persistent oil spill that could negatively impact the way of life of many

community members who depend upon the environment. Prior to this effort, community members were not engaged in oil spill preparedness. A subcommittee of the Virginia Area Committee sought community input in developing a new annex of the Area Contingency Plan. This effort engaged non-governmental organizations (NGOs), academia, watermen, local governmental agencies, and others on the Eastern Shore, recognizing the importance of two-way communications with stakeholders, rather than one-way outreach. In addition, social scientists who have studied major spills identify opportunities to adapt oil spill practices and help communities recover from potential psychosocial and incident-specific impacts.

The community aspects of the new annex were exercised during a 4-day, full-scale Area Exercise under Preparedness for Response Exercise Program (PREP), along with other pre-exercise activities, to support public welfare and community resiliency. Through this work, the authors demonstrate adaptations to strengthen incident management by leveraging networks of trusted relationships developed during planning with local government, elected officials, and communities.

INTRODUCTION

Our opening assertion is that a noteworthy disconnect exists between oil spill preparedness and response and protecting public welfare, which undermines community resilience following some spills (Walker 2017). Most oil spills do not result in a social disaster at the community-level, but some do. This disconnect is a regulatory gap, probably due to the environmental pollution focus of oil spill laws, regulations, plans and practice, most of which were created or updated following a major ship-source oil spill, e.g., EXXON VALDEZ OIL SPILL (EVOS) in 1989, and were informed by physical science studies of pollutant effects on the environment. Post-spill studies of affected communities have been carried out by social

scientists, behavioral scientists, and public health scientists among others following the EVOS and other spills, e.g., SELENDANG AYU (Alaska US, 2004), PRESTIGE (Spain, 2002), HEBEI SPIRIT (South Korea, 2007), COSCO BUSAN (California US, 2007), and DEEPWATER HORIZON (Gulf of Mexico US, 2010). Their findings (Picou et al., 1992, Gill and Picou 1998, Picou et al., 2004, Ritchie and Gill 2006, Cheong 2012, Osofsky et al., 2012, Gill et al., 2012, Hansel et al., 2015, Lichtveld et al., 2014, Ritchie et al., 2018) have had little influence on national pollution laws or oil spill preparedness and response regulation, as promulgated by the Clean Water Act, Oil Pollution Act of 1990, and National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Until recently, specialized physical and social research has occurred within their respective research silos, frequently without the involvement of oil spill practitioners, e.g., decision makers, preparedness specialists, responders, and technical advisors.

For this paper, the authors focus on *public welfare at the community level*. The US Constitution grants Congress the power to provide for the General Welfare of the United States (US) as part of their legislative authority. No definition for public welfare appears in the NCP (NCP 1994). In the authors' view, public welfare means for the good of the society. Given that national pollution laws are unlikely to be amended, an important question therefore is, "What if anything can be done to strengthen protection of public welfare?"

We consider potential answers to the above question, and discuss practical ways that existing oil spill regulatory frameworks can be adapted to:

1. Recognize spill characteristics which could lead to impacts on community welfare,
2. Strengthen spill preparedness and response plans and protocols,
3. Improve the capacity to protect public welfare during spill response, and ultimately

4. Implement preparedness and response actions to support community resilience when spills impact public welfare.

This paper is oriented toward improvements in the United States; however, the recommendations are applicable generally to oil spills in other countries which impact communities.

METHODS

This paper consists of a review of literature and regulatory frameworks relevant to the topic (Background); application of reviewed information to identify and demonstrate preparedness activities in coastal Virginia that could help resolve regulatory gaps (Discussion); and recommendations drawn from the demonstration activities (Conclusions). The literature reviewed includes information about research related to public welfare as a component of human effects of oil spills; the current status of oil spill preparedness, response, and compensation; and sociological findings about oil spills as potential disasters.

BACKGROUND

Human Effects of Oil Spills

Some oil spills have the potential to result in human impacts at the individual and community levels (Figure 1). This graphic was developed for the 2017 National Academies of Science, Engineering and Medicine (NASEM) workshop, “Preparing for a Rapid Response to Major Offshore Oil Spills: A Workshop on Research Needs to Protect the Health and Well-being of Communities,” by a practitioner and individuals with expertise in sociology, public health research and practice. Workshop participants also included oil and gas operations and oil spill response, environmental health and surveillance systems, disaster recovery and resilience, disaster research, risk assessment and communication, public policy and practice (NASEM

2017). Public welfare encompasses community-level effects, that is, economic, sociological and cultural, not individual psychological or physical health effects.

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Figure 1. Overview of Possible Human Effects from Marine Oil Spills. Source: Sandifer and Walker, 2018

Three points are important. First, in the US where the reportable quantity for an oil spill is a visible sheen, most oil spills are small, *de minimis* spills, and do not result in adverse human effects. Second, socio-economic damages resulting from an oil spill have long been recognized and are addressed through compensation regimes, but most other human effects are considered personal injury and omitted, explicitly or implicitly, from existing regulations and compensation regimes. Third, the safety of human life is articulated as the top priority in the US, which also calls for assessing the threat to public health or welfare (NCP 1994), sections 300.317, 320, 322.

Oil Spill Plans and Compensation

National contingency plans for oil spills exist in at least 160 maritime nations to mitigate and respond effectively to marine pollution incidents (ITOPF 2012). The 1967 oil tanker, TORREY CANYON, was the primary catalyst of planning at the national and international levels for accidental ship-related spills which transit the world's oceans. Subsequently, other major spills from ships and fixed sources, e.g., coastal facilities, pipelines, and offshore oil exploration and production facilities, in other parts of the world demonstrated the need for broader, more localized contingency planning for spills impacting the marine environment.

In 1974, recognizing the need to compensate those who suffer damages from ship-source pollutants, the Organization for Economic Co-operation and Development (OECD) adopted a recommendation to implement “The Polluter Pays Principle”. The OECD’s Environment Committee identified the types of reimbursable costs in combating oil spills. This guidance also defines allocations of oil spill preparedness costs, as well as claims for reimbursement of response costs (Walker 2016). Socio-economic effects from ship-source spills, for which there is a documented basis for compensation, are addressed in global insurance. The International Oil Pollution Compensation (IOPC) Funds provide compensation for oil pollution damage that occurs in Member States.

Litigation for denied claims is a source of chronic stress for victims of human-caused disasters, e.g., major oil spills (Gill and Picou 1998; Picou et al., 1998) who are involved in prolonged court deliberations for damages. Using the 2007 HEBEI SPIRIT as an example (IOPC Funds 2019), 127,483 claims totaling 4,227 billion KRW (Korea Won) were submitted by 2012, the deadline for submission under Korean Law. A team of Korean and international surveyors was established to monitor the clean-up operations and investigate the potential impact of the pollution on fisheries, mariculture and tourism activities including such claimants as handgatherers, fisherfolk, water park owners, flatfish farm owners, village fisheries, salt farmers, grass eel catchers, shrimp and sea cucumber farm owners. The rationale for denying, grouping, or upholding claims is presented in the *Judgements by the Korean Court* document and is a worthy read. This example highlights fishery/seafood-related claims, and Picou et al., 2004 also shows that spill-related impacts are evident through a broader community.

In the US, financial compensation for defined damages may be claimed against the Oil Spill Liability Trust Fund (OSLTF), when the responsible party fails to provide direct

compensation. As outlined in 33 CFR 136, claims may be made for uncompensated removal costs or uncompensated damages, including damages to subsistence use resources and loss of profits and earning capacity caused by an actual or threatened oil spill. Under the OSLTF, Natural Resource Damage Assessment (NRDA) is the legal process that natural resource trustees use to evaluate the impacts of oil spills, hazardous substance releases, and ship groundings on natural resources and which is used to compensate the public for damages. Humans are not natural resources; NRDA offers little, if any, relief to impacts on public welfare. Beyond this, personal injury damages are not claimable, but instead must be litigated for compensation.

Current State of Preparedness

The NCP defines the framework for pollution preparedness and response in the US, including organizational structure and procedures. One of the general organizational concepts is for federal agencies to coordinate pollution-related activities with affected states, local governments, and private entities. As specified in the NCP, United States Coast Guard (USCG) provides On-Scene Coordinators (OSC) as the lead official for marine oil spills. Under the leadership and authority of the OSC, a diverse organization of agencies, trustees, stakeholders, commercial entities, and community members work together to perform three basic functions: 1) pre-incident planning, preparedness, and coordination; 2) notification and communications; and 3) response operations to an actual or threatened oil spill.

The NCP outlines the purpose of Area Contingency Plans (ACP) and Area Committees (ACs) which includes working with appropriate federal, state, and local officials. Preparedness activities such as developing plans and response to discharges of oil and releases of hazardous substance, pollutants, and contaminants in the coastal zone are done through ACPs. Several

challenges are associated with ACPs: it's cumbersome, not easily located by external partners and, does not reach or assist local communities in preparing for an oil spill.

Currently, the USCG does not engage communities the developing ACPs, but adaptations can be made. According to USCG policy on emergency management planning participation, the response community builds stronger relationships across program lines, as well as, in the joint, unified, and multi-agency environments (USCG 2019). Also, the National Preparedness Goal refers specifically to the “whole of community” to assist with building a resilient nation. USCG policy encourages greater participation by the whole of community to build stronger relationships in joint, unified and multi-agency environments (USCG 2016).

The OSC Report for the Deepwater Horizon Oil Spill (USCG 2011) notes that ACPs were developed with the consensus of the affected states at the local level, i.e., the Area of Responsibility (AOR) of USCG sectors. Sector AORs can be quite large and lack adequate staff to engage all communities throughout an AOR. The reality was that, prior to the Deepwater Horizon (DWH) oil spill, only those primarily involved in pollution and emergency response knew about ACPs, not community members or elected officials. Communication with communities occurred only during the response or was conducted through state officials. Despite responders trying their best to help, many lost income for a prolonged period.

Although the NCP has a gap regarding planning and coordination with communities, the USCG must engage with community members during preparedness to achieve the National Preparedness Goal. Communities of high vulnerability should be pre-identified, e.g., communities dependent upon coastal tourism or fishing population. Then, the USCG hold AC meetings in community locations hosted by community organizations with whole-community

representation. USCG AC members also should take advantage of previously established relationships to reach out to various community and opinion leaders, e.g., key actors.

Current State of Response

In the context of response in the coastal zone, the NCP applies to oil spills originating from vessels, offshore or onshore facilities, pipelines, or other sources, into or on the navigable waters of the United States. Upon notification that a spill has occurred, the USCG OSC is authorized, and in most instances required, to take response actions necessary to protect the public health or welfare or the environment. Typical response actions include investigating and performing an on-site assessment of the spill; evaluating its magnitude and severity and the associated threat to public welfare; identifying the pathways of human and environmental exposure; and characterizing the potential impact on natural resources, property, and human use.

During the preliminary investigation, the OSC will determine whether spilled oil 1) is in a harmful quantity and 2) presents a substantial threat to public health or welfare, including, but not limited to, subsistence fisheries, wildlife, other natural resources, and public and private property, shorelines and beaches. Factors to be considered in classifying a spill as a substantial threat to public welfare include, but not limited to, the size and character of the discharge, the nature of the threat to public welfare, the OSC's experience, and consulting with other lead agency officials and authorities on issues outside the OSC's technical expertise.

Knowledge generated by the local community, along with information from federal, state, and local governments, should be used to assist the OSC in devising response strategies to protect public welfare where effective standard techniques are unavailable. Each community may exhibit varying resilience to oil spills and be affected in unique ways. When an incident occurs,

defensive actions begin as soon as possible to prevent, minimize, or mitigate threats to public welfare. But OSCs have no guidance about which spills threaten public welfare, and therefore often don't recognize those aspects of the situation. Although first responders and emergency managers are responsible for protecting public health and safety, and direct evacuations pursuant to existing state or local procedures, public welfare *per se* may be beyond those responsibilities.

Response personnel trained in the Incident Command System (ICS) should be familiar with the USCG Incident Management Handbook (USCG 2014) which states the following safety objectives: (a) Provide for the safety and welfare of citizens and response personnel. (b) Provide for the safety and security of responders and maximize the protection of public health or welfare. (c) Conduct an operational risk assessment and ensure controls are in place to protect responders and the public. Therefore, at the onset of an actual or threatened oil spill, the OSC should provide prompt, accurate information on the nature of the incident and actions to mitigate impacts to public welfare. The Incident Management Team (IMT) could task liaison officers (LOFR), safety officers (SOFR), public information officers (PIO) and other technical specialists to address public welfare, including assessing community questions and concerns through two-way risk communications during response. A challenge is that implementing public welfare actions to support resilience are beyond the traditional ICS and key messages, transparency, and coordinating meetings with assisting agencies. Rather, the OSC will need to adapt traditional ICS, beginning with setting specific objectives to work with affected communities, assigning ICS positions to include public welfare responsibilities, developing strategies to support public welfare, which becomes groundwork to support resilience and recovery.

Consistent with the NCP, the character and complexity of an oil spill is a primary factor to be considered in classifying a spill as a substantial threat to public welfare. The Shoreline Assessment Manual (NOAA 2013) lists several factors to characterize shoreline impacts, and some relate to public welfare: 1) cultural resource considerations; 2) recreational or industrial use of oiled shorelines; 3) seasonal use factors; and 4) commercial, recreational, and/or subsistence consumption of resources. Data used to calculate extent of contamination is collected during Shoreline Cleanup Assessment Techniques (SCAT) activities, where teams of trained observers use Section 8 of the Shoreline Oil Summary form to document recreational and cultural issues that may be impacted by response actions. The authors believe a process like SCAT could serve as a model to identify communities whose welfare is threatened by a spill, which in turn would be used to inform OSC response decisions and priority actions.

Social Science of Disasters

Not all oil spills are disasters. From a social science perspective, hazard events are only considered disasters with respect to their social causes and effects; they must be understood within a social context. There are numerous definitions of disasters; here we use the term to refer to “a serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources” (United Nations ISDR 2019). In considering the disaster potential for oil spills, it is important to think about community resilience. This is “the ability to prepare for and adapt to changing conditions and to withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents” (Presidential Policy Directive-21 2013).

Human dimensions of oil spills are illuminated within the context of social science research on technological hazards and disasters. Most of the empirical research focuses on the EVOS oil spill in Alaska and the DWH offshore oil blowout in the northern Gulf of Mexico. Findings from these studies concern issues of community well-being and various vulnerabilities to well-being posed by oil spill incidents and disasters. Existing, research-based evidence has the potential to inform the development of recommendations for practitioners, decision-makers, and stakeholders about how to prepare for, respond, and recover from an oil spill or disaster.

An overview of the body of knowledge on technological (man-caused) hazards and disasters reveals unique social reactions and impacts compared to findings from natural disaster research (Norris et al., 2002). Unique features include identification of a primary responsible party, human exposure to toxins and ambiguity of harm, damage to natural ecosystems and ecosystem resources, increased socioeconomic uncertainties, emergence of a corrosive community, and prolonged psychosocial stress (e.g., see Abramson et al., 2010; Gill et al., 2016; Lee and Blanchard 2012; Palinkas 2012; Ritchie 2012, Ritchie et al., 2018). The strongest predictors of stress range from family health concerns and commercial ties to renewable resources to concerns about economic impacts and exposure to oil and dispersants (Ritchie et al., 2011). Results are consistent across studies of larger spill events (EVOS and DWH) and, to some degree, investigations of smaller spills (e.g., the SELENDANG AYU shipwreck and oil spill).

Oil spills pose significant risks for many coastal communities, particularly those that have close economic, cultural, and social ties to environmental resources which may be damaged, lost, or threatened by such events. Preventing, diminishing, and/or mitigating social impacts from spills are basic goals of emergency response. Understanding community resilience and vulnerabilities to oil spills, and having appropriate, accurate information before and during

the crisis is important. This can be accomplished by identifying key actors in communities and implementing a Community Oil Spill Vulnerability Index (COSVI) prior to a spill incident. The authors, i.e., Ritchie and Gill, propose that a COSVI include factors such as communities' social capital, human capital, natural resource capital, and potential exposure to oil spills.

When an oil spill occurs, IMTs set priorities to protect sensitive resources based on the NCP, ACPs, and protocols like SCAT mentioned above. However, there are no protocols or response experts with respect to human dimensions of oil spills. They lack inadequate information to develop and implement a human dimensions prioritization strategy or fully predict the community stakeholders who will become involved when a spill occurs. Moreover, little is understood by oil spill planners and responders about how, and the extent to which, communities and various groups within communities are vulnerable to oil spills. In sum, there is a lack of adequate understanding of community resilience to oil spills. The OSC and IMT need a process that could be implemented to assess public welfare and increase community resilience and inform response decisions. A process like SCAT may be a practical way to assess public welfare. Table 1 depicts seven steps to review public welfare at the community levels in parallel to the steps in SCAT, which could be implemented during response.

Step	Shoreline Cleanup Assessment Technique (SCAT)	Public Welfare Review (PWR) - Technique
1	Conduct reconnaissance survey	Meet with Key Actors. – <i>Also see #6 in Table 2</i>
2	Segment the shoreline	Identify Key Stakeholder Groups in spill area. Identify groups/organizations/individuals in the community; focus on resources user groups; mental health providers; those with maritime capacity to respond (keep it local or ensure locals have first opportunity); those with local knowledge; and vulnerable groups.
3	Assign teams and conduct shoreline surveys	Assign Social Science Team Lead and Begin Data Collection and Analysis. Have a lead social scientist and, in large incidents, a team of social scientists to carry this out. Implement data from the Community Oil Spill Vulnerability Index (COSVI); collect primary data; examine information about capacity of various forms of community capital.
4	Develop cleanup guidelines and endpoints	Develop Report(s) on Findings and Observations. These will clearly convey to OSC when “response” actions are complete.

5	Submit reports and sketches to Planning Section	Submit report that includes an executive summary; recommendations are for response actions.
6	Monitor effectiveness of cleanup	Monitor Implementation of Recommended Actions.
7	Do final evaluation of cleanup activities	Collect Post-incident Evaluation Data to assess community-level recovery status.

Table 1. Parallel steps of SCAT and Public Welfare Review Technique (PWR-T)

More is known about mental health issue needs after a natural disaster than a technological disaster. Some mental health professionals have been trained to help mitigate disaster-induced psychological stress. Such “response” strategies focus on delivery of mental health services, specifically counseling and emphasize reaching vulnerable populations including children, the elderly, females, minorities, and other at-risk populations who lack resources to cope with disaster events. For some oil spills, vulnerable populations would include people, groups, and communities with cultural, social, and economic ties to renewable natural resource ecosystems threatened and damaged by the event. These strategies may be adapted to technological disaster events, but they are less effective because technological disaster impacts tend to be unique and linger for years.

DISCUSSION: APPLICATION OF COMMUNITY STRATEGIES

The Virginia Area Committee made (VAC) a deliberate effort to strengthen preparedness at the community level. The findings of social science research were reviewed to guide the design of engagement activities (see Table 2) with community stakeholders. They are typically unaware of the NCP and oil spill plans yet could be affected by a serious oil spill. As noted earlier, this is a gap in oil spill regulations. Cheong (2012) points out that for communities to adapt to environmental change, i.e., an oil spill, and build a capacity for adaptive resilience, providing knowledge and resources external to the community are necessary. Belief in the validity and trustworthiness of expert knowledge and government-disseminated information

hinges upon appropriate knowledge transfer from oil spill specialists, which occurs over time, i.e., during preparedness.

An important catalyst for the VAC was the August 2017 NASEM workshop (Table 2, #1). In September 2017, the Barrier Islands Subcommittee of the VAC, chaired by The Nature Conservancy, met to begin developing a special annex for the Eastern Shore of Virginia (Table 2, #2), the area of greatest risk should a marine oil spill occur, due to its extraordinary ecological value, remote location (logistically challenging), and the largest hard clam aquaculture economy in the world, among other factors.

The lower portion of the Delmarva Peninsula is referred to as Virginia's Eastern Shore (ES). It includes the longest chain of undeveloped barrier islands in the US, which consists of 14 islands, is 70 miles long. Designated an International Biosphere Reserve by the United Nations, most of the barrier islands are owned by The Nature Conservancy (TNC), a global conservation NGO. Others are owned by federal and state agencies, and a few privately-owned parcels.

#	Preparedness Activity (Date)	Guiding References
1	National Workshop: Preparing for a Rapid Response to Major Marine Oil Spills: Protecting and Assessing the Health and Well-Being of Communities (8/2017)	NASEM 2017
2	Special Annex to the Virginia Area Contingency Plan (includes initial ICS 201 for two counties) (9/2017-1/2019) developed by Barrier Island Subcommittee, chaired by The Nature Conservancy	Cheong 2012 Colten 2012 Tierney 2009
3	Identification of local stakeholders (1/2019)	Walker et al., 2013, Walker and Bostrom 2014, Picou et al., 2004
4	Mid-Atlantic Oil Spill Workshop, Virginia Beach VA (National Academies and Sea Grant collaborative workshop series (3/2019)	G. Walker and Covi, 2019
5	Stakeholder meetings (6/2019) – daytime and evening. Also conducted participant baseline resilience assessment via audience poll and community resource questionnaire	Cheong 2012 Finucane et al., 2019 Petrun et al., 2019
6	Key Actor/Opinion Leader meeting – small group of Key Actors (8/2019)	Covello et al., 1998, Walker 2014, Walker and Bostrom 2014, Walker et al., 2014
7	Community Open House – part of exercise program (9/10/2019)	Walker and Bostrom 2014 Fullarton and Palermo 2008

8	Key Actor/Landowners meeting – <i>part of exercise program</i> (9/11/2019)	Parker et al., 2008
9	Stakeholder dispersant training – <i>part of exercise program</i> (9/10/2019)	NASEM 2019, Bostrom et al., 2015, Walker et al., 2015 Milkman and Berger, 2014
10	Stakeholder plan – <i>part of exercise program</i> (8-9/2019)	Addassi 2017, Dubach 2015, Newcombe 2003
11	ICS adaptations (pre-exercise drafts of ICS 201, volunteer ICS 204, Stakeholder Plan and Press Release) – <i>part of exercise program</i> (9/2019)	Tierney 2009, Walker 2017, Walker et al 1995, USCG 2015, VAC 2010
12	Exercise – command post – <i>part of exercise program</i> (9/12/2019)	USCG et al., 2016, USCG 2014, VAC 2010, ERMA 2020, Cheong 2012
13	Equipment deployment exercise – field – <i>part of exercise program</i> (9/12-13/2019)	Cheong 2012, VAC 2010; Environmental Response Management Application (erma.noaa.gov/atlantic) - Sector Hampton Roads Geographic Response Strategies

Table 2. Virginia Eastern Shore preparedness activities informed by researcher and practitioner literature.

The draft of the Eastern Shore Annex (the Annex) was completed in March 2019 for the seaside; bayside planning will begin in 2020. The next steps for the draft Annex were to: 1) identify local key actors (Table 2, #3), obtain their input for a revised version, and 2) involve local stakeholders using it during a major oil spill exercise, carried out under the national PREP guidelines (USCG 2016). The list of local stakeholders included 164 local individuals from key stakeholder groups, e.g., aquaculture/watermen/ecotour; government, science (academia), NGO, public/other. Some of the members of both the Barrier Island Subcommittee were also on the Planning Committee for a mid-Atlantic oil spill workshop (Table 2, #4) and they identified Eastern Shore key actors to invite to the Mid-Atlantic workshop.

Pre-exercise preparedness activities began in June 2019. All identified key actors were invited to two community meetings (Table 2, #5), daytime and evening, at the Virginia Institute of Marine Science (VIMS). Approximately 70 attended. In addition to introducing participants to the Annex, two activities were carried out: 1) a scoping activity through an audience poll to

discern community attitudes, concerns, knowledge base about oil spills; and 2) a questionnaire to assess paid and volunteer response capabilities was distributed to community members. Based on interactions at these meetings, several key actors expressed interest in participating in a small group meeting to further advance oil spill discussions and obtain their recommendations (Table 2, #6). The full-scale exercise program was conducted at the Eastern Shore Community College, consisting of a series of activities to provide additional opportunities for mutual learning, transfer of technical oil spill knowledge, and relationship building, both in the “command post” setting and in the field (Table 2, #7 – 13). Specific events were designed for agencies, fishers, and aquaculture businesses to explore the issues of fishery closures, seafood safety, and claims. In the scenario, aquaculture beds were closed by state department of health; no warning was given to local aquaculture growers.

Based on the experience in Virginia, the following are insights about setting realistic expectations for community involvement during oil spill preparedness and designing engagement activities:

1. A special, respectful effort during preparedness to engage with community organizations and individuals in their respective venues builds trust and transfers knowledge which is invaluable.
2. Work with industry cooperatives, which are a ready resource for in-country oil spill knowledge.¹
3. Seek a local host to identify the venue, help develop the meeting agenda, and invite participants. With personal invitations to all events, the greatest number and diversity of

¹ For example, the Oil Spill Response Limited ‘Confident Ambassador’ programme has trained hundreds of industry staff worldwide to raise awareness of progress in oil spill response.

community members participated in the first community meetings; few attended additional meetings. Make the most of that first meeting because it may be a single opportunity.

4. Business owners such as fishers, aquaculture, eco-tours owners, understandably put business first. Attending an oil spill meeting wasn't a winning competing priority. Nonetheless, if a spill were to occur, their concerns would become urgent drivers for information and engagement.
5. The State OSC can provide continuity for community engagement and help the USCG Sector, whose personnel turn over about every 3 years, initiate proactive community engagement, assessment, and information sharing before and during an incident.
6. Should pollution threaten a fishery, be aware that State and federal fishery and seafood management agencies do not coordinate proactively with their stakeholders about emergency fishery closures or seafood testing, i.e., two-way information exchange. IMTs have lacked a mechanism to exchange information about the spill situation with seafood stakeholders. Consider using the recently adopted Regional Response Team 6 Appendix 42 (Seafood Liaison Specialist) to facilitate information sharing about a spill with the seafood and fishing industry (Walker et al., 2020).
7. Oil spill exercises focus IMT attention on pollution control issues at the outset of an incident. Public welfare issues and community engagement are almost impossible to address on Day 1. Key leadership positions, e.g., OSC/Unified Command, which could make public welfare a priority, tend to be preoccupied with urgent spill control actions and unprepared to be proactive until it's too late. Therefore, the community will turn to other, less knowledgeable sources of information, e.g., social media, to address their

questions and concerns about the spill. The IMT position probably best suited to become a trusted relationship owner with communities would be a local Assistant Liaison Officer (ALOFR), working closely with the other positions to learn about community risk questions and concerns, assess community welfare, and develop appropriate response actions to mitigate community impacts. Key to success would be ALOFR appointment at the outset.

CONCLUSIONS

Few reported oil spills represent serious threats to public welfare. Nonetheless, IMTs and OSCs (both federal and state) should consider the possibility with initial notification using this criterion:

Oil spills that are likely to impact public welfare include any persistent or non-persistent oil spill that attracts the intense attention of the media, local community, political officials, and/or threatens impacts on tourism, fishing, aquaculture, or any community resource, especially if the spill occurs during tourism, fishing or spawning season.

Through social media, it's inevitable that the kinds of above events will lead to negative public participation and comment. Therefore, isn't it wise to adapt plans, protocols, and proactively manage such participation? To this end, the authors recommend a range of actions during oil spill preparedness (planning process refinements) and response (adapt protocols, when needed which would be infrequently) to protect public welfare and support community resilience.

1. USCG leadership at the all levels should address public welfare and adapt preparedness and response protocols accordingly.

2. State representatives or their equivalents in other countries should engage communities about every 3 years. They can identify political and community triggers/concerns and advise national authorities, e.g., federal OSCs.
3. Train specialists (e.g., Incident Management Assistance Team/IMAT and IMPAs) to prompt the OSC and other leaders during response to look for stressors and traumas (see Figure 1), which may impact public welfare, and develop appropriate response strategies.
4. Identify and document stakeholders/vulnerable communities as part of spill planning.
5. Bolster ACPs to identify vulnerable segments of a community; leadership and organizational profiles of key actors with interest, influence, or a mandate in public welfare protection; and sub-plans to coordinate public welfare-centric volunteers.
6. Adapt ICS forms (201, 202, 204; a new public welfare 232 is in progress) pre-spill to include default objectives to assess and protect public welfare during response.
7. Educate ICS practitioners at seminars, workshops, exercises, and events to develop proficiency in this non-traditional aspect of response.
8. When the above type of spill occurs, activate an Assistant Safety Officer for Public Health (including behavioral health) to focus on public welfare, an Assistant Liaison Officer to proactively engage community key actors, and trained specialists to carry out Public Welfare Review-Technique.
9. Immediately appoint a Seafood Liaison Specialist when a spill threatens fishing or aquaculture areas and closing fisheries is even a remote possibility (RRT 6, 2019b).
10. Incorporate these recommendations into regional policies, contingency plans, and training protocols.

Transferring such oil spill knowledge about response strategies including dispersant use and other response option tradeoffs, oil behavior, fate and effects, and even claims processes, helps create realistic expectations about spill response, better understanding of environmental effects and recovery rates, develops mutually beneficial relationships, and is an investment in community resilience. These actions are compatible with recent community resilience research findings (Finucane et al., 2019; Petrun et al, 2019).

To address the obvious question, “Who pays for this?” recommended actions can be incorporated into current planning activities at the discretion of government leaders who have authority and accountability for oil spill preparedness and response. Communities will need to understand that these actions don’t change existing spill compensation and claims processes. The authors recognize that recommended actions during response may be considered problematic; however, they’re not needed for most spills. OSCs and Incident Commanders possess the discretion to include the above responsibilities in their IMTs. We believe proactive engagement during response will prove to be mutually beneficial for responders and affected communities.

Our intention is to make all readers aware that public welfare impacts will arise during some spills and can significantly undermine the perceived success of the response, largely because of the absence of clear regulatory guidance and advance planning. The infrequent but serious consequences on responder reputations and affected communities should be sufficient incentive for preparedness and response specialists to adapt their plans and protocols now. Exploring new collaborations with state representatives and implementing actions like those above, proactively, will help the IMT recognize the undercurrents of threats to community welfare and fend off the tornado of political and public outcry. Adapting preparedness and response protocols now can be a win-win for the IMT and communities.

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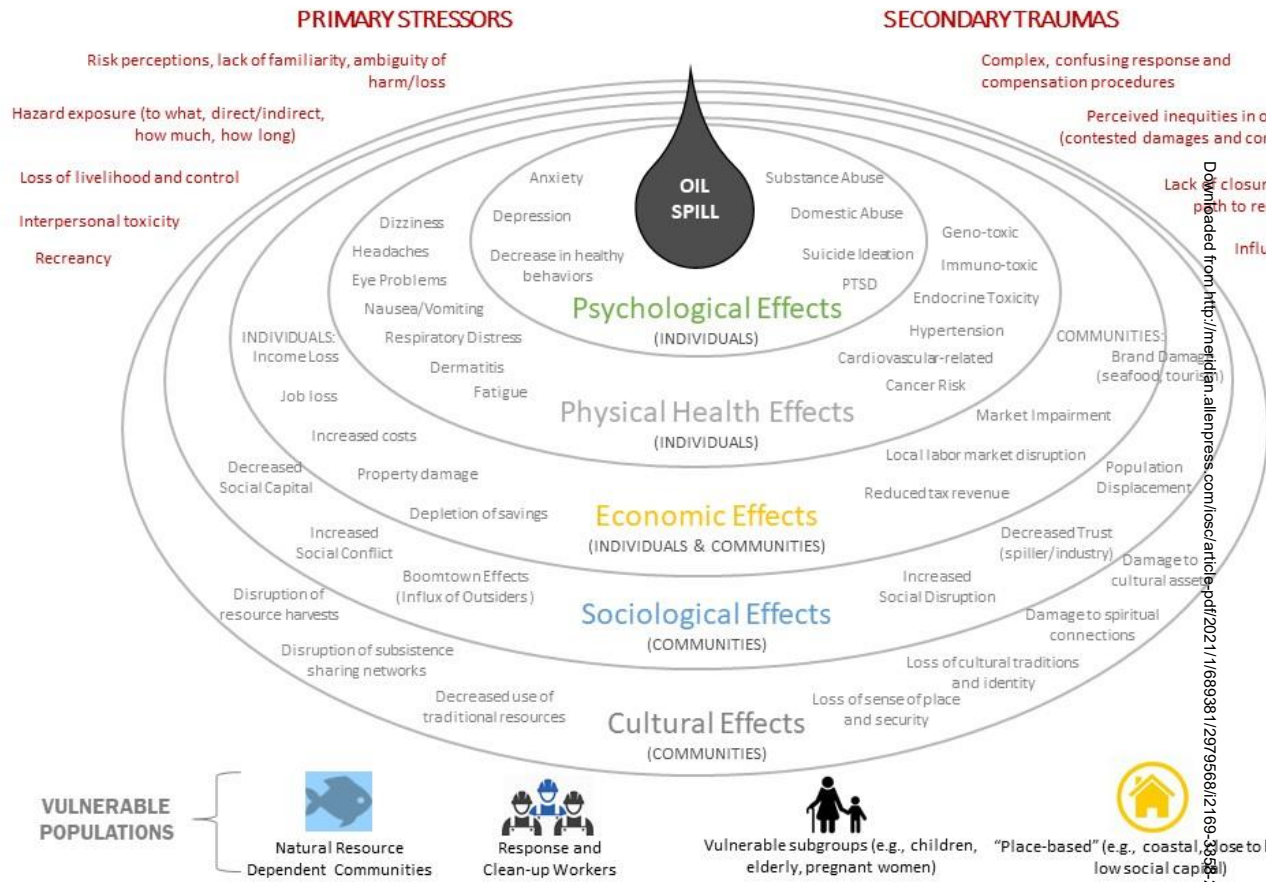
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Figure 1. Note - reviewer suggested making full page



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