Addressing Public Concerns During Spill Response

June 28 - 29, 2016
Florida Fish and Wildlife Research Institute
St. Petersburg, FL

A WORKSHOP REPORT

COASTAL RESPONSE RESEARCH CENTER

Coastal Response Research Center

NOAA

Acronyms

ACM	Area Committee Meeting
ACP	Area Contingency Plan
CAFE	Chemical Aquatic Fate and Effects Database
COTP	Captain of the Port
CRRC	Coastal Response Research Center
DDO	Dispersants and Dispersed Oil
DEP	Department of Environmental Protection
DRC	Gulf of Mexico Disaster Response Center (ORR)
DWH	Deepwater Horizon Oil Spill (also known as MC-252 and Macondo)
ERD	Emergency Response Division (ORR)
ESA	Endangered Species Act of 1973
ESI	Environmental Sensitivity Index
FIO	Florida Institute of Oceanography
FOSC	Federal On Scene Coordinator
FWC	Florida Wildlife Conservation Commission
FWRI	Fish and Wildlife Research Institute
GOM	Gulf of Mexico
GoMRI	Gulf of Mexico Research Initiative
GRP	Geographic Response Plans
ICS	Incident Command System
ISB	In-situ Burning
JIC	Joint Information Center
MMPA	Marine Mammal Protection Act of 1972
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheets
NGO	Non-Governmental Organization
NIMS	National Incident Management System
NMFS	National Marine Fisheries Service (NOAA)
NOAA	National Oceanic and Atmospheric Administration
NRPT	NOAA Regional Preparedness Training
OPA 90	Oil Spill Pollution Act of 1990
ORR	Office of Response and Restoration (NOAA)
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
RP	Responsible Party
RPI	Research Planning Inc.
SAB	Save All Birds
SHPO	State Historic Preservation Office
SSC	Scientific Support Coordinator
UC	Unified Command
USCG	United States Coast Guard
USF	University of South Florida
USFS	United States Forest Service
UW	University of Washington

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Introduction

On June 28-29, 2016, the Coastal Response Research Center (CRRC)[1] and the National Oceanic and Atmospheric Administration (NOAA) Gulf of Mexico Disaster Response Center (DRC) co-sponsored a NOAA Regional Preparedness Training (NRPT) workshop at the Florida Fish and Wildlife Research Institute (FWRI) in St. Petersburg, FL entitled "Addressing Public Concerns during Response… sorting fact from fiction during response." The workshop focused on understanding the public's desire to be informed during a response and the need to plan for and execute an effective public communications plan during a potential oil spill.

Following the workshop, CRRC and DRC conducted a one-day training on June 30, 2016, on risk communication and the use of social media during a response which was open to all workshop participants. Fifty three workshop and training participants (Appendix A) represented federal and state agencies, industry, response organizations, academia, and non-governmental organizations (NGOs).

This workshop was the third in the NRPT series to provide a focused training activity to enhance Gulf of Mexico (GOM) regional preparedness across NOAA line offices and among key state, federal, and other stakeholders. The overall goal of the NRPT workshops was to better understand coastal disasters: the human and natural resources at risk, the roles and responsibilities of the different response agencies, the science that drives decision-making, and the importance of public outreach.

The first workshop was held in Galveston, TX on May 25-26, 2016, and focused on preparedness, planning and improvement of response to a potential oil spill threatening the Flower Garden Banks National Marine Sanctuary. The workshop examined response options such as dispersant use and *in-situ* burning (ISB), while developing the framework for an environmental tradeoff analysis to evaluate response options. The workshop also provided the opportunity for the spill response community to build relationships with the Sanctuary staff, understand the role each group plays in a response, and create a common understanding of the issues at the regional level. The second workshop, held in Mobile, AL on June 8-9, 2016, focused on preparedness, planning and improving response to an oil spill occurring during a natural disaster (e.g., flooding from a tropical storm). Additionally, the workshop explored the roles and responsibilities under the *Robert T. Stafford Disaster Relief and Emergency Assistance Act* (Stafford Act) and the *Oil Pollution Act of 1990* (OPA 90).

[1] A list of acronyms is provided on Page 1 of this report.

Workshop

Introduction

Nancy Kinner (CRRC), Charlie Henry (DRC), and Kathleen O'Keife (Florida Fish and Wildlife Conservation Commission (FWC)), provided the welcome and introductions for the workshop. Charlie Henry provided background information about the NRPT workshops series and goals. The workshop focused on addressing public concerns and improving communication during oil spills. The workshop goal was to improve responders' knowledge of the current state-of-science and their ability to communicate to the public about the response, including dispersant use, seafood safety, fisheries impacts, and public health.

The workshop consisted of plenary presentations and three breakout sessions. Plenary presentation topics included: oil spill response options, shoreline response, natural resources in the region, public health, tourism, and interaction of science and the response community. The workshop examined potential response options such as the use of dispersants, ISB and mechanical recovery, and the type of decision process used by the Unified Command (UC) during a spill. With this understanding of how response technologies would be used during a spill scenario, breakout groups examined the type of information that the public would want to know in four areas: (1) response technologies, (2) shoreline protection and restoration, (3) natural resources, and (4) human dimensions. In addition to identifying the types of questions that the public would like to have answered, the breakout groups discussed what information is known or unknown and how best to address public concerns during three breakout sessions.

The agenda for the workshop is located in Appendix B.

Plenary Sessions

During the initial day of the workshop, a series of plenary speakers discussed the types of response strategies and technologies that might be employed during a spill offshore and at the shoreline. The speakers provided background information and set the stage for the spill scenario that would be used by the breakout groups to discuss potential public concerns and how to best address those concerns. The plenary speakers provided a summary of their presentations below. Slides for the presentations are in Appendix C.

Overview of Scenario

Brad Benggio (NOAA Office of Response and Restoration (ORR), Emergency Response Division (ERD)) provided an overview of the workshop scenario which was based on an oil spill offshore of Tampa Bay, including: when and where the spill occurred; the type and amount of oil spilled; the oil properties and chemistry (including fate and effects); forecast movement (i.e., trajectory) of the oil; and resources at risk. The scenario developed for the workshop was a 50,000 gallon spill, 36 miles offshore of Tampa Bay (Figure 1), during July 2016. The oil was a domestically produce crude oil being shipped offshore. The countermeasures available included: dispersants, ISB, mechanical recovery, and shoreline cleanup.

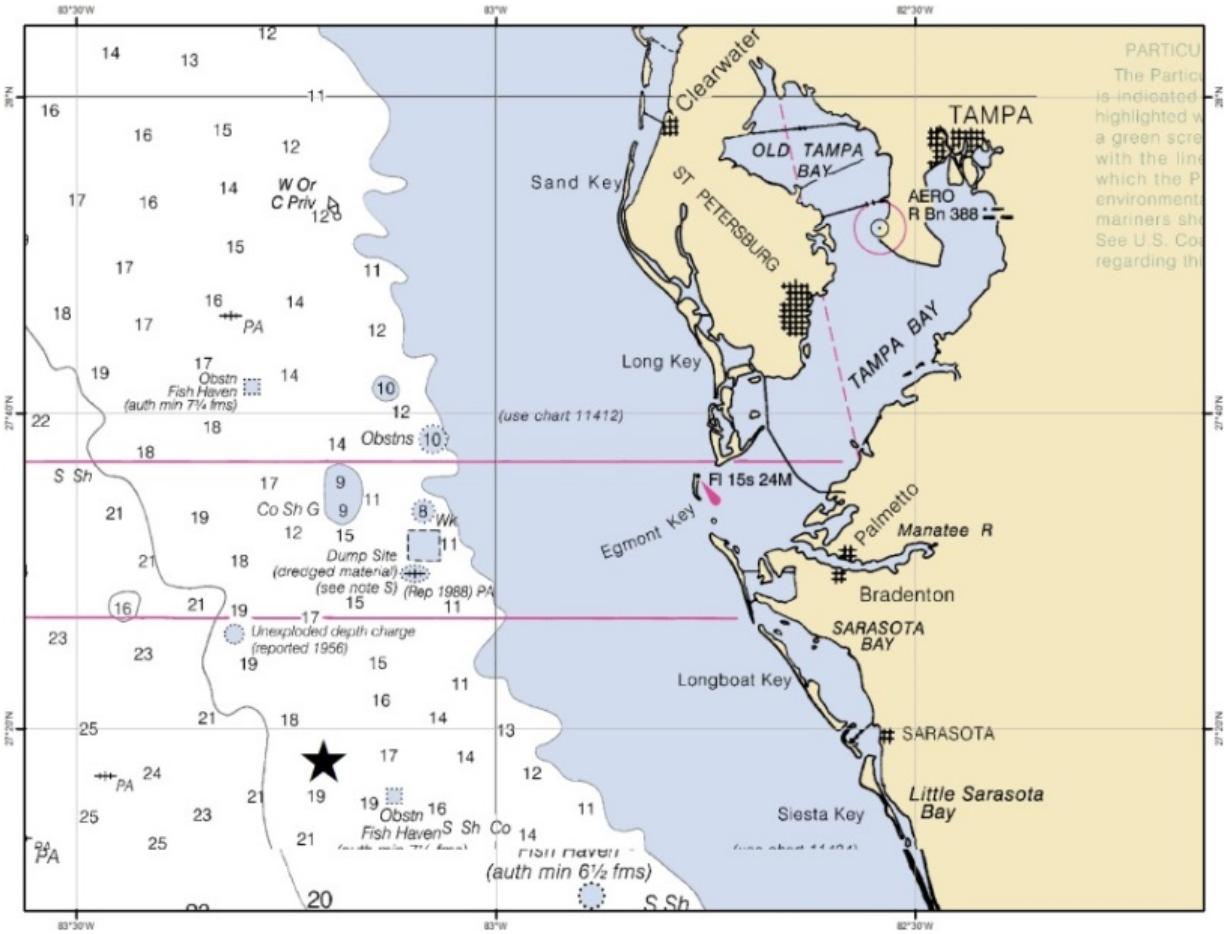

Figure 1. Map of Tampa Bay. The black star is the location of the 50,000 gallon spill, 36 miles offshore of Tampa Bay, developed for the workshop spill scenario.

The area response plans include Environmental Sensitivity Index (ESI) maps, Geographic Response Plans (GRP), Tidal Inlet Protection Strategies, and the digital Area Contingency Plan (ACP).

There is significant information available with respect to identifying important environmental resources. There are ESI maps developed for the Tampa Bay Estuary (Figure 2) that document species, important habitats species occurrences, and economic and recreational resources.

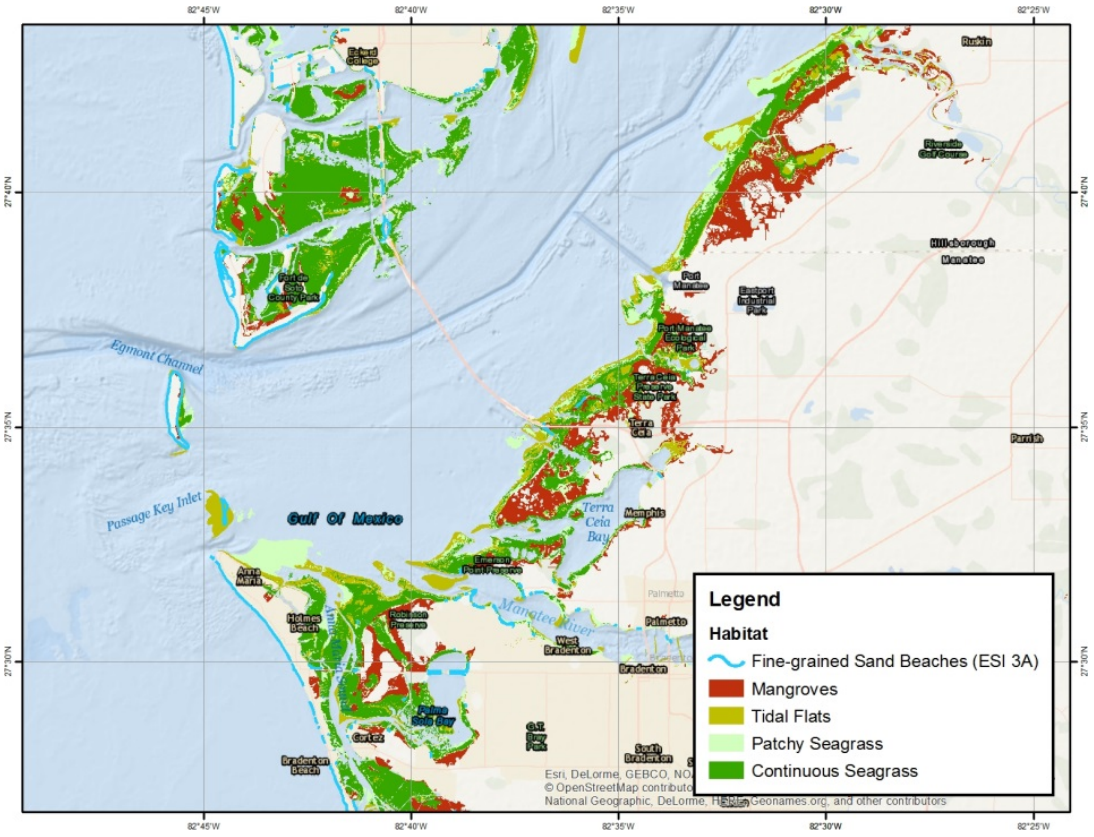

Figure 2. Environmental Sensitivity Index map of Tampa Bay include fine-grained sand beaches (blue line), mangroves (red), tidal flats (yellow), patchy seagrass (light green), and continuous seagrass (dark green).

The spill scenario impacts include affected habitats of seagrasses (1,060 acres), mangroves (120 acres), and turtle nesting beaches (11.25 linear miles). Affected animals include, but not limited to:

- Diving birds
- Shore birds
- Waterfowl
- Wading birds
  - Snow egret
  - Roseate spoonbill
- Gulls and terns
  - Least tern (threatened)
- Reptiles
  - Green sea turtle (endangered)
  - Loggerhead sea turtle (threatened)
- Mammals
  - West Indian manatee (endangered)

The spill scenario, as with more recent environmental disasters, would be subject to greater public scrutiny due to the expanded use of social media. As part of the exercise, it was important to discuss information management and, in particular, how to interact with the potential social media feeds that would occur as a result of the spill. Because of the greater public awareness associated with other recent spills there will be a need to develop strategies to provide timely information on the response, protect natural and economic resources, and address public health concerns.

Overview of Oil Spill Response Technologies

Charlie Henry (NOAA DRC) provided an overview of oil spill response technologies. The Scientific Support Coordinator (SSC) must be able to answer a series of five questions when attempting to determine the best course of action during a spill response:

1. What was spilled and how does it change over time?
2. Where is it going (e.g., as affected by wind, tides)?
3. What is at risk in terms of environmental resources?
4. What are the potential impacts to those resources?
5. How do we mitigate the potential impacts? In evaluating the best options for mitigating impacts, it is important to do no more harm than good.

There are several fundamental principles in determining an oil spill response strategy which include:

- Protecting human life,
- Controlling the source,
- Containing the oil at or near the source,
- Protecting sensitive habitats/environments,
- Recovering the spilled oil,
- Minimizing environmental impact from the spill, and
- Enhancing natural recovery (mitigation).

Mechanical Recovery

The objective of mechanical recovery is to contain spilled oil as close to the source as possible and minimize impacts. Mechanical recovery systems entail the use of booms and skimming systems that contain and remove the oil. Mechanical recovery is difficult to effectively operate in open water conditions where sea-state, wind, remoteness of location and currents can challenge the effectiveness of the systems.

Dispersants

Dispersants were first used in large quantities during DeepWater Horizon (DWH) in the GOM during 2010. They can be applied to reduce the overall impact of a large oil spill to the environment as a whole (i.e. mass movement of oil on to shoreline habitats such as beaches, marshes, mangroves etc.). The use of dispersant requires potential tradeoffs; it increases potential risks to water column biota in order to reduce potential injury to surface water and nearshore and shoreline natural resources.

In Situ Burning (ISB)

ISB was also used extensively during the DWH spill. The use of the technology must consider potential effects related to air quality and the environmental resources down wind or down current from the burn area. ISB results in a significant amount of smoke and particulate release; so prevailing winds must be

evaluated to reduce impacts to humans and other resources. The location of important benthic resources, hard bottoms, fish and shellfish habitats and transport mechanisms must be considered when determining where the residual from a burn might ultimately sink to the bottom.

Oil and chemical spills are unplanned and uncontrolled events. The job of a spill responder is to: protect life; establish control of the spill if it can be done safely; and prevent or reduce environmental damage. It is a matter of using the best judgement and experience from past oil spills to make the best possible choices for a response given the available information and resources for responding to the spill.

Shoreline Protection and Cleanup

Jacqui Michel (Research Planning Inc. (RPI)) provided an overview of shoreline protection and cleanup, including chemical counter measures. The following questions were used to frame the presentation on shoreline response and restoration:

- What are the response options available?
- How do we select the best **c**ombinations of options?
- What tools are available to help our selections?
- What are realistic expectations of response and restoration effectiveness?
- What tradeoff considerations should be considered for each countermeasure?
- How do we best communicate these options and tradeoffs to the public?

The tools used to answer these questions include ESI maps and databases; GRPs, and NOAA Emergency Response Division guides and Chemical Aquatic Fate and Effects (CAFE) database which includes properties, toxicity, degradation rates.

Public concerns about shoreline protection are: 1) expectations that the oil can be effectively contained and recovered by booming or other on-water tactics (i.e., the public wants to put booms “everywhere”); and 2) the response wants the public to know that they are doing something, even if it is not effective. Public issues during shoreline cleanup arise from concerns that any oil has an effect and thus must be removed. The public believes that technology should be able to remove all the oil. Instead, responders must carefully evaluate response methods to make sure that they do an effective cleanup and not cause more harm.

A response team uses an active, iterative consultation process with resource managers to ensure that the response minimizes environmental impacts while meeting appropriate cleanup endpoints that drive the shoreline cleanup. The response community should engage the public in the process so they understand and accept the response strategy. As an outcome of the workshop, effective communication strategies that will enhance the public’s understanding, “involvement”, and acceptance of chosen cleanup countermeasures and endpoints should be developed.

Natural Resources

Nancy Thompson (Florida Keys Marine Lab) provided an overview of natural resources with a focus on the importance of fisheries and protected species to the FL economy and how it relates to potential public concerns. Commercial and recreational fisheries support over 160,000 jobs statewide and contribute almost $50 billion annually to the FL economy. Florida’s west coast, where the scenario spill

occurs, ranks #1 in recreational fishing in the number of recreational trips and value. The shrimp fishery, which occurs largely in the GOM, had a value of $702 million in 2014. It is the single most valuable commercial fishery in the United States. The other major fisheries along Florida's west coast target groupers and snappers. The primary recreational species include groupers and snappers, mackerels, drum, blue crabs and shrimp.

Estimates of the value of protected species are largely based on their importance to ecotourism programs including sea turtle nesting, beach walk, and manatee viewing at aggregation sites. For example, in SC, on one nesting beach, the value of nesting sea turtles was estimated to be almost $50 million per year. Florida conducts similar walks and is the primary nesting area for sea turtles in the GOM and Western North Atlantic which presumably makes FL's sea turtle ecotourism value even greater. It has been estimated that manatee viewing in Citrus County alone brings in $8-9M per year through ecotourism.

The impact of an oil spill or any other natural or man-made event is determined by the location and extent of the event, the species present, and the life stages occurring during the spill. For example, the life cycle of shrimp is dependent on the water quality and the flow of freshwater into the estuaries. Fresh water is critical to their growth and productivity. Thus, a spill that might impact the quality of that freshwater could be critical to productivity of that population and the overall fishery. Sea turtles nest on beaches and hatchlings migrate into offshore waters where they may spend years before returning to coastal waters to feed. Both sea turtles and blue fin tuna are highly migratory and use the entire GOM and may move in and out of the Atlantic Ocean and Caribbean as well.

The seasonal distribution of living marine resources, and the current life stage, the habitat and the resource requirements at the time of the spill will result in the amount of impact and provide the context for addressing concerns of the public and stakeholders. The range of concerns could include:

- "How safe is the seafood to eat?"
- "Can I get seafood for my store/restaurant?"
- "Can I fish? If not, when can I fish?"
- "Where can I fish?"
- "Will the management of important commercial or recreational fish species change?"
- "What can I do to help?"

Public Health

Robert Dickey (University of Texas Marine Science Institute) provided a public health overview. Petrochemical spills in the marine environment provoke many public concerns about hazards to human health and degradation of the environment. Such concerns include the safety of oil exposed seafood and beaches. Analysis of seafood and beaches in the aftermath of DWH indicated that public health risks from exposure to harmful crude oil residues returned to pre-spill levels soon after the oil spill had dissipated. However, public confusion, disquiet and socioeconomic recovery were in part prolonged by an abundance of conjecture competing with communications of factual, technically accurate information. Implementation and communication of official response strategies and health risk assessments also triggered anxieties about uncertainties in toxicological knowledge, related risk

information and jeopardy of vulnerable populations. Long after the oil spill had dissipated, concerns persisted about residual oil buried in beach sand and lingering submerged oil mats that could remobilize and present future exposure risks.

From a public health protection perspective, the DWH response revealed deficiencies in communication strategies; local-scale demographic and baseline human health data; benchmark environmental contaminants data; toxicology of crude oil components; and, integration of human and environmental health status and trends. The science underpinning disaster response is rarely unconditional, and communicating uncertainties in the midst of definitive information can undermine risk messaging if not well prepared and expertly performed. The development of such knowledge bases and communication skills will help improve the effectiveness of responses, risk communications and outcomes for future large-scale disastrous events.

Other Impacts

There was a plenary session addressing other impacts including tourism, volunteers, and interactions between the scientific and response communities.

Tourism

David Downing (Visit Clearwater St. Petersburg) provided an overview of FL tourism, the impacts of DWH on the tourist industry and the lessons learned. FL tourism is a $9 billion industry and on a yearly basis, approximately 15 million people visit the state. Pinellas County is the largest tourist area in Florida. The panhandle was the area projected to be the most impacted by the spill; however, the Tampa Bay area and southward was also impacted significantly with 50,000 job losses. Local Floridian tourists, being psychologically affected, did not frequent the beaches. Prior to DWH, the tourism industry was just coming out of recession which made it difficult to assess the actual dollar loss on the DWH impacts.

As might have been expected following the spill, there was political grandstanding which may have been well-intentioned, but it resulted in bad publicity for all of the coastal locations. For example, BP, as part of their efforts to help Gulf coast communities, developed promotional material for television and other venues. Materials included images of the BP brand on beautiful beaches and it was requested to remove these materials because people were associating the beaches with BP.

To improve tourist visits, the tourism industry, working with local partners in hotel tourism industry, advertised an “oil free guarantee” for rooms. While the “free night” program was not established with the large international chains, local partners implemented the program via the *Visit St. Petersburg Clearwater* affiliation. Another key factor to the survival of the Gulf coast tourism was that Miami and other communities on the east side of the state, less affected by the spill, could have taken advantage of poor business in the GOM and Tampa Bay. Fortunately, the State worked together on promoting the tourist industry as a whole.

Volunteers

Lee Fox (Save All Birds (SAB)) provided an overview of volunteers during an oil spill. SAB is an example of a highly effective organization which can mobilize and organize a pre-trained group of volunteers under

the direction of a small cadre of employees. By developing protocols for all operating procedures in advance and conducting pre-spill training programs for its volunteers, SAB has the ability to respond rapidly and effectively to spills. SAB has a network of 17 committees that spread the workload and ensure all tasks are covered.

SAB identified four stages for a successful oiled wildlife response program:

- Preparation including preplanning and training,
- Mobilization to a site including all support logistics,
- Rescue and release, and
- Demobilization and final documentation.

One of the reasons for the effectiveness of SAB is their preplanning and organization. This pre-planning includes providing instructions for media releases and addressing inquiries about rescue operations.

Interactions Between Scientific and Response Communities

Steve Murawski (University of South Florida (USF)) provided an overview on the interactions between the scientific and response communities. The interaction between the scientific community and responders has been proven to be an important asset to address environmental unknowns and improve response. The 2012 *Memorandum of Understanding (MOU) Between USCG and Florida Institute of Oceanography (FIO) Regarding the Academic and Marine Research Contribution to USCG Oil Spill and Hazardous Material Response Plans* provides for the following:

- Allows USCG to utilize marine science institutions to provide scientific expertise to address issues raised during a response,
- Allows for a coordinated public message,
- Allows universities and their researchers to retain the right to publish with no requirement to consult with the USCG before developing publications,
- Requires the development of a plan to establish this coordination, and
- Identifies the need for FIO and USCG to increase research funding to support oil spill response and for the joint development of priorities for research funding.

Breakout Sessions

The objective of the breakout sessions was to understand the needs and requirements of risk communication during a spill response using the offshore scenario as a means of focusing the breakout groups on potential public concerns that could arise during an incident. Specifically the breakout groups were asked to focus on:

1) Understanding and communicating with the public about their concerns (e.g., dispersant use, seafood safety, fisheries impacts, public health, tourism),
2) Developing an understanding of the knowns, uncertainties and disagreements surrounding the complex issues involved in a response,
3) Understanding the most effective ways to transmit information to public that addresses their needs, and
4) Understanding the state-of-science of risk communication during oil spills.

Following the Plenary Session the workshop participants were divided into four Breakout Groups:

- Response Technologies Group focused on the use of ISB, dispersants and mechanical recovery and how to inform the public about their use,
- Shoreline Protection and Restoration Group discussed the technologies for protecting the shoreline and coastal resources and how to inform the public about their use,
- Natural Resources Group identified the important natural resources and habitats in the region, with an emphasis on fisheries and seafood issues, and how to effectively relate the potential impacts to the public, and
- Human Dimensions Group discussed public health, tourism and volunteers' concerns and how to provide the best information to concerned citizens effectively.

There were three breakout sessions that were organized to answer the following questions:

- Breakout Session I – What will the public want to know or ask about the topic?
- Breakout Session II – What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?
- Breakout Session III – How can these public concerns be effectively addressed?

The initial breakout session identified questions the public might want to know about each of the four subject areas. Although these questions reflected the specific spill scenario off Tampa Bay, many are consistent with questions the public would ask of responders in most spill locations. Questions were expressed as they would be expected to be stated by the public.

The subsequent two sessions began to answer these questions by first understanding the knowns and unknowns about these issues (Session II) and the final session addressed how to best present the information about these questions to the public (Session III).

In the following sections of the report, the results of each breakout group is summarized by presenting Session I-III sequentially by the topic identified in each breakout group for continuity. An effort was made by CRRC to diversify the participant expertise in each breakout group. Each group had a group lead to help facilitate discussion and a note taker equipped with a laptop computer and projector to

capture the discussion. The breakout group notes, which consisted of a completed matrix previously developed to record the discussion, can be found in Appendix D.

Response Technologies Breakout Group

The Response Technologies Group addressed issues and questions related to dispersants, ISB, mechanical recovery, and other issues such as the UC, and situational awareness.

Dispersants

What will the public want to know or ask about with respect to dispersants?

- What is the State's position on the use of dispersants in state waters?
- How long will dispersants stay in the water column?
- Should dispersant use be based on the potential to impact benthic or reef resources?
- Why are the use of dispersants banned from Europe?
- How do we know if dispersants are actually working?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

Knowledge about the use and effects of dispersants in the environment has increased substantially following the DWH spill where dispersants were used extensively for the first time. Inherent in the questions is a general uncertainty about the use of dispersants in FL waters because of the concern about toxicity and dosage. The federal and state regulators should agree about the use of dispersant, location and monitoring programs as part of the response.

Dispersants are not 100% effective in dispersing spilled oil. The effectiveness is dependent on environmental conditions including wind, waves, and temperature. More study is needed to better understand the conditions that provide for the greatest dispersion of oil. Dispersants dilute rapidly in the environment, and the rates of dispersion differ based on environmental conditions. The potential impacts of dispersants on benthic and coral habitats is being studied extensively as part of the Gulf of Mexico Research Initiative's (GoMRI) DWH spill research program. Some of these studies indicate that dispersant and dispersed oil (DDO) is being observed in some locations in the GOM deepwater benthic environments.

The UC and the state and federal agencies should take into account fate and effectiveness when determining dispersant use. The dispersant Corexit 9500 is banned in Europe based on one failed toxicity test. Use of Corexit 9500 in the U.S., and in the scenario, requires approval by federal and state agencies prior to application for any response. It is important to undertake more research and monitoring to better understand the effectiveness of dispersants in the environment and their potential short and long term environmental impacts. A monitoring program will be developed prior to any application to the spill.

How can these public concerns be effectively addressed?

State and federal agencies should meet and determine their positions regarding the use of dispersants, including the conditions under which they may be used. It is important to make available as much information as possible to the public on dispersant use, their toxicity and the known environmental impacts. Organizations (e.g., GoMRI) should produce one-pagers on how dispersants work, and the results of other monitoring studies would provide useful information to the public. In addition, it is important to share information on the short and long term monitoring results following the application of dispersants.

ISB

What will the public want to know or ask about with respect to ISB as a response technology, its potential impacts and its effectiveness?

1) Is the smoke harmful?
2) Does the oil burn completely?
3) What are the odors and residue from a burn?
4) Can ISB be used in Tampa Bay?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

The use of ISB, like other response options, requires a tradeoff between the potential impacts of ISB and the spilled oil. Some of the known impacts are smoke, odors and burn residue. Smoke and odors can be mitigated by observing potential air transport patterns prior to a burn. Changing conditions such as winds or storms can add a level of unknowns to such a planning process. It is known that not all oil will be burned as part of a response. This is similar to other response technologies where not all oil is removed. It is known that some of the burn residue will ultimately sink to the bottom. The amount of this deposition, the concentration, and the location will depend on tides and currents. The overall effectiveness of ISB in the scenario can be assessed by designing an effective monitoring program.

How can these public concerns be effectively addressed?

ISB can be a useful tool for oil spill response. When using ISB as a response method, the UC will consider the potential impacts to humans and the environment (i.e., air quality, residuals). It is important that information is provided to the public on ISB benefits and impacts. In addition, air and monitoring data should be posted as part of any ISB application. To further inform the public, the UC should also develop and issue one pagers on ISB as a response method including: potential airborne hazards, air modeling, ordinances on burning, and collecting and disposing of oil and residues.

ISB is unlikely to be used within Tampa Bay as part of any response. A permit would be required in order to use ISB.

Unified Command (UC)

What will the public want to know or ask about with respect to the UC within an Incident Command System (ICS) structure, its operations and decision-making?

1) How does the public better understand the response terminology?

2) Does the cleanup plan work?
3) Who makes decisions about the response?
4) Why is the public not part of the UC?
5) Why is the Responsible Party (RP) responsible for the cleanup?
6) How long will the process take?
7) Will the leaking ship be brought into port?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

The questions regarding the ICS structure and the UC require an explanation of the structure and how it works. The ICS structure provides for unity of command, a structure for planning, decision making, operations, and a developed common terminology. Local representation within the UC is contingent upon local authorities or local government having jurisdiction, authority and resources to add to the response, and is a decision made by the Federal On Scene Coordinator (FOSC) and other members of the UC. If the local government is not part of the UC, there may be a liaison assigned to communicate and coordinate with the local government. Decisions are made in the UC by assessing the best information available gathered from multiple agency inputs. It is important to make the public familiar with how these decisions are made.

Since the UC structure requires numerous organizations to share information and develop joint decisions, it is critical that the ICS system is understood by all levels of government, NGOs and industry that could be involved in a spill or pollution response. The UC structure provides for orderly review of data so that decisions can be made based on the best information available in a timely fashion. It also provides one point of contact for the public where they can obtain the most accurate and up-to-date information.

Questions were asked about whom the RP is, and why the RP has such a significant role in the cleanup. The UC needs to make information on OPA 90 and the Stafford Act available through workshops, webinars, and other materials which describe how the UC process works, the role of the RP and the involvement of local citizens in the response.

How can these public concerns be effectively addressed?

The ICS was devised by the USFS to help fight complex forest fires. It has been adopted by the spill response community to allow scientists, experts and federal and state responders to work jointly to make informed decisions for an incident and take necessary actions during. This model follows the National Incident Management System (NIMS) which provides a structure to implement a response plan. It is important for the UC to frequently explain the response plan and update the public on the execution of the plan. Typically, liaisons are appointed for government entities who are not part of the UC and possibly not part of the ICS structure underneath the UC. The public is usually kept aware of ongoing response operations, threats to the community or other important information through a Public Affairs POC or Public Affairs Team made up of representatives from the members of the UC. Often this is in the form of a Joint Information Center (JIC), which is invaluable in keeping the public up to date

regarding the spill and response efforts. The public can also participate prior to a spill during the planning process by attending an Area Committee Meeting.

Under OPA 90, the RP is fiscally responsible for the cleanup of a spill. If the spiller is not fulfilling its obligations, the USCG will take over that role. In the case of this spill scenario, the offshore response is expected to take three to four days. Ongoing monitoring will determine if additional cleanup is required.

The Captain of the Port (COTP) and owner of the vessel will determine the best course of action for the vessel. The vessel will not be moved until the leak is contained and the ship is determined to be sea-worthy. During the response, the COPT of Tampa will determine whether the port is open or closed. The COTP will monitor the conditions and the potential transport of oil in managing port access.

Situational Awareness/Other Related Issues

What will the public want to know or ask about with respect to situational awareness and other general issues in the scenario?

- Who is the RP and how is that established?
- Where is the ship located? What direction is the oil moving?
- Who are the cleanup workers and what are the safety protocols?
- Is bioremediation a response option for this cleanup?
- How do we get research samples to study?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

Questions were asked with respect to the viability of using bioremediation as a tool to address the spill. Bioremediation is different than biodegradation which is the natural breakdown of oil by bacteria present in the environment. Bioremediation is not part of the response plan and would not be used in this open water scenario to respond to this spill. It is not a quick way to respond to spills and has not been found to be easily applied in the open ocean.

The safety of workers during a response is extremely important. For that reason, all workers are trained and issued safety equipment before going into the field. Workers are monitored for compliance to protocols during the cleanup by response professionals.

Questions were also asked about the location of the leaking vessel and which direction the oil is moving. The UC tracks the oil daily and is also using models to predict which way the oil will be transported based on environmental conditions. This information is valuable for placing response equipment in locations where it can effectively collect or disperse oil. In addition, it provides the public, through the UC outreach program, data on where the oil is moving relative to natural resources and human assets.

How can these public concerns be effectively addressed?

Bioremediation is not part of the offshore/open water response plan and would not be used for this spill. There will be natural biodegradation of the oil over time as a result of natural biological processes. This process is particularly important in areas such as mangroves and marshes where cleanup impacts

can often be as harmful as the spilled oil. It is important for the UC to explain to the public the response plan technologies, their strengths and weaknesses, as well as the difference between bioremediation and natural biodegradation.

Cleanup is always conducted by workers that have received safety training. In addition, these cleanup workers are outfitted with safety equipment such as protective clothing, boots and masks. The cleanup is always conducted under Occupational Safety and Health Administration (OSHA) guidelines and monitored by response professionals.

Mechanical Recovery

What will the public want to know or ask about with respect to mechanical recovery, including oil skimming and booms, its impacts to the environment and its effectiveness?

- Why is there not enough equipment and why does the skimming process take so long?
- Why does it appear that responders are not skimming?
- Why are volunteer vessels not used to skim?
- Are booms trapping sea turtles?
- Are booms impacting sea grass and other habitats?
- Why is the UC not using three-knot booms?
- Why can the responders not pick up all the oil before it reaches the coast and important habitats?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

Questions were asked as to whether there is enough equipment to effectively skim a significant volume of oil as part of the response. Skimming will not collect all the oil due to the volume spilled and the expected environmental conditions. There is sufficient boom in the area to deploy for this spill. There is no plan to use volunteer vessels to conduct skimming because of the lack of training, liability and equipment requirements. A suggestion has been made about using three-knot boom. To date, three-knot boom has not been shown to be effective in oil cleanups such as this one.

The use of boom has not been shown to cause significant impacts to natural resources. If turtles or other protected species are observed near skimming operations or are somehow trapped, all skimming in that area would be stopped. Impacts to critical habitats such as sea grasses, marshes and mangroves are not anticipated as skimming would be conducted offshore.

How can these public concerns be effectively addressed?

There are always questions as to the availability of skimming equipment and its placement. Skimming is only part of the response and can only remove a portion of the oil. The UC will direct the use of skimming assets to the areas where they can be most effective based on the concentration of oil and the sea conditions. It is important that the public is made aware of where skimming is occurring, how effective it is and where future deployments might occur. This information will help the public, commercial fisherman, and other marine businesses avoid areas where skimming might be occurring.

Shoreline Cleanup and Restoration Breakout Group

The Shoreline Cleanup and Restoration Group addressed issues and questions related to impacts to the shorelines, operations, priorities for cleanup, boom placement, and new, innovative technologies.

Impacts to the shorelines

What will the public want to know or ask about with respect to oil impacting the shoreline, including reimbursement for damages?

- Can I ever use the beach again with my family?
- How can I get research samples?
- If oil comes ashore, should I burn it?
- Are cleanup workers safe?
- How much money am I going to get?
- Will I be put in a hotel or receive other compensation?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

The public is concerned about whether the beaches they visit will ever be useable again. The UC uses the Shoreline Cleanup and Assessment Technique (SCAT) to assess an affected shoreline after an oil spill. SCAT surveys begin early in the response to assess initial shoreline conditions, and ideally, continue during operational cleanup. SCAT helps to set priorities for cleanup and monitors the response to ensure the habitat is restored to the proposed endpoints. What is unknown is the time frame for completion of the cleanup. Sometimes pockets of oil are hidden or missed and are not discovered until later, thus extending the process; but with the SCAT monitoring process, ultimately the beach will be cleaned to established levels.

The length of time to complete the cleanup will be “as long as it takes” to meet the UC objectives for cleanup. Based on prior experience, the UC will be able to provide estimates for the various parts of the response. The UC will continue to make the results of the SCAT process available to the public.

The question of response workers safety was raised with regard to offshore and shoreline cleanup. There will be a safety plan develop by the UC that ensures worker safety. That safety plan will be monitored as part of operations. The only uncertainty is if the workers ignore their training and fail to follow the plan as designed.

Questions were raised about the potential compensation to the public, including payment and potential relocation. The UC or the RP will set up a process for filling claims and addressing concerns. False claims will be prosecuted. The time frame for receiving reimbursements is unknown. Payment for any evacuation (i.e. hotels) will be based on evacuation orders issued by the local Emergency Management Agency.

Answers to questions regarding beach and fishing/other recreation closure will be available from the UC. The UC will also inform the public on alternative locations (e.g., for beaching, fishing). Because the amount of time to complete the cleanup is initially unknown, the exact timing when a resource will be re-opened will be based on the SCAT process and environmental testing results.

How can these public concerns be effectively addressed?

In order to inform the public about general issues regarding shoreline cleanup, the UC should develop materials that document the use of SCAT and the development of cleanup endpoints.

Site safety plans ensure the safety of all workers involved in the cleanup. The UC should develop documents that explain the requirements and explain the training and monitoring of all workers on the website.

The UC and or the RP will develop a claims process for the public to refer to and use where appropriate. This information should provide the process for submitting and evaluating claims, the amount of documentation required, and the potential time frame for review.

Operations

What will the public want to know or ask about with respect to operations?

- Is my beach open and can I go there?
- Can I fish? Will the area be closed to fishing?
- How long with the response take and how long will I be impacted? Why is the cleanup crew not working around the clock?
- How will the oil be cleaned up?

How can these public concerns be effectively addressed?

Local authorities manage closures and will make available information on the status of beaches as they occur. Florida already maintains a beach information site which the public is familiar with and it could be used for the spill scenario. As described above, the UC will make available information on the SCAT process and estimate the length of the cleanup based on past spills. The UC will provide updates on the ongoing evaluation, the cleanup process, or the potential need to adjust the current techniques to reach endpoints. The UC will also notify the public on fisheries openings and closures and alternative fishing sites.

Priorities for Cleanup

What will the public want to know or ask about with respect to how priorities were set for cleanup and how those priorities would impact individuals?

- How will the natural investments (i.e. preserves, beaches, recreational facilities) be protected?
- With respect to wildlife and bird sanctuaries, what will be done to protect nesting birds?
- How are you going to prioritize the protection and cleanup of sites?
- Is my beach going to be oiled?
- How can we protect or keep oil from my beach, home, etc.?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

The UC will develop priorities for cleanup by using multiple available resources including: the ACP, GRPs, ESI maps, local expertise and other sources as available. After identifying the priority resources, UC operations will determine the booming requirements for important human use areas (e.g., beaches), environmental areas (e.g., wildlife, sanctuaries, marshes), and other areas.

How can these public concerns be effectively addressed?

As part of the outreach effort, the UC will provide information on who is involved in the GRP development and the purpose of that plan. The GRPs are guidelines and actual operations may need to adjust booming strategies, based on the on-the-ground conditions, to protect natural and economic resources.

To assist public in understanding the potential impact of the spill on local beaches, the UC will provide access to the oil trajectory forecasts with documentation on how to interpret the information. This will be supplemented with local closure information.

Boom Placement

What will the public want to know or ask about with respect to boom placement?

- Where are you placing boom and what resources are you protecting?
- Do we have enough boom available for me and others?
- Why can you not boom the entire bay?
- Why do you not use the three-knot boom?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

The placement of boom would be established by the UC as described in the GRP. The boom will be placed to protect natural resources, economic resources and property as identified by planning documents and all available information as discussed above. Individual personal property will be protected in accordance with the priority of resources and the trajectory of the oil transport. It is not prudent or possible to boom the entire bay given the size of the area and the availability of boom. As

addressed in the Response Technology Group the use of three-knot boom has not determined to be effective and would not be used in this response.

How can these public concerns be effectively addressed?

Protective booming will be made based on resource information and planning information. This will be supported by an explanation of the prioritization process related to human life and the environment. The USCG will establish a notification process for boaters on the location of boom and access points for navigating the protected areas.

New Innovative Technologies

What will the public want to know or ask new innovative technologies?

- Why can you not use my new "super-duper alternative" oil clean-up equipment?
- Where do I send my hair or noodles?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

A question was asked if or how new suggested technologies would be considered for use in the response. During the DWH, the Alternative Response Technology Program was established to evaluate and test various technologies. Any new technologies need to be tested and proven to be effective before being implemented. Due to the size of the spill and the shorter time estimated for this cleanup, such a process may not be appropriate.

How can these public concerns be effectively addressed?

To determine the value of new technologies the UC could develop and implement an Alternative Response Technology Evaluation System. The details of this system will be made available publicly. The value of using this system will depend on the length of the cleanup or the need for specialized cleanup technologies.

Natural Resources Breakout Group

The Natural Resources Breakout Group developed questions based on the need for baseline data, a number of important biological groups, habitat types, sampling strategies and recreation. The biological groups include: birds, fish, plants and invertebrates, mammals and sea turtles.

Baseline Data and Cultural Resources

What will the public want to know or ask about with respect to baseline data?

- What baseline information exists?
- Do we need more research to inform the baseline?
- What are the cultural resources in the area?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

Whenever a potential spill or disaster occurs, there is always a question of whether a sufficient amount of baseline data exists upon which scientist and agency personnel can determine the amount of impact. Important tools that can be used to evaluate a baseline include:

- ESI maps
- GRPs
- Mussel Watch
- Southwest Florida Water Management District
- Tampa Bay Estuary Program
- National Marine Fisheries Service (NMFS) critical habitat surveys for fisheries
- FL DEP
- Universities
- FWC Marine Resources GIS Database

Although there are substantial data available, it may not provide the spatial, seasonal or quantitative information that is needed to conduct a statistically sound assessment. There is a need for more information with better replication due to the inherent variability in the natural environment. Specifically for Tampa Bay, there is a need for toxicological data, habitat mapping and abundance mapping of flora and fauna. With baseline and subsequent impact assessment data, there is always a concern for the origin of the data, chain of custody and the validity of the information for legal challenges. This emphasizes the need for data documentation throughout the process.

Cultural and historic resource data is available from a variety of sources including: the State Historic Preservation Office (SHPO), ESI maps, GRPs and the ACP. What is known about this information is usually the specific locations, preservation or mitigation techniques. There are often unknowns about the value of these assets for prioritization during a response event. It is important to engage the cultural and historic representatives to assist the UC with this prioritization.

How can these public concerns be effectively addressed?

It is important for the UC to communicate with the public about the value of baseline data and that the Tampa Bay area has been highly studied. As discussed above, more quantitative data dealing with toxicology and natural contaminant levels will always be helpful. Site specific and detailed seasonal information provide clarity in establishing response priorities and assessing short and long term impacts.

Birds

What will the public want to know or ask about with respect to birds?

- What is the plan for protecting birds?
- What is the threat of oil and dispersants to birds?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

There is information on birds for this area in ESI maps, GRPs, and the ACP and in the breeding bird atlas. What is lacking is more detailed information on population dynamics, nesting and bird movements

within and through the area. Further, there is limited information on body burden of contaminants, including dispersants. More data are needed on the long term fate of birds exposed to oil and dispersants. Long term monitoring is required as part of this spill response to better understand short and long term impacts to birds.

How can these public concerns be effectively addressed?

The UC should inform the public, as part of the outreach program, about the plan to protect and rescue birds affected by the spill. The UC will have a Wildlife Management Plan in place for birds and will be coordinating with local wildlife rescue organizations (e.g., SAB). Information will be provided on how to volunteer to help support these rescue efforts.

Fish

What will the public want to know or ask about with respect to fish and fisheries?

- What is the plan for protecting *Endangered Species Act of 1973* (ESA) listed fish species?
- What is the plan for protecting recreationally important fish species?
- Will there be fisheries closures?
- What is the impact to commercial fisheries from oil and dispersants?
- What is the threat of oil and dispersants to fish?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

The questions regarding fish are focused on ESA, recreational and commercial species present in the Tampa Bay region. The ESA species habitats are known to exist in the region. What is not as well-known is presence of each species and their abundance. There are also areas of disagreement as to whether these species and their habitats are adequately protected.

There are data available on recreational species, their size classes and abundance. From creel surveys and license data, there is information on who is fishing in the Bay. What are not well-understood are the population movements of these species. There are economic estimates of the value of recreational fishing but these values are an area where there is disagreement. A better understanding of the economic value of fishing will be possible as more data are collected.

It is expected there will be impacts to both recreational and commercial fishing from the spill. From a commercial standpoint, the location and duration of the impacts are unknown. In addition, the species and habitats impacted may change due to the uncertainty regarding the movement of the spill. Based on monitoring studies, the contamination levels, the impact to various species and the related economic impacts will be better understood for both commercial and recreational species.

The potential for fishery closures exists due to the spill. The location of the closures and the species affected depends on the trajectory of the spill and the effectiveness of the cleanup. The monitoring of species contamination, fish kills and habitat impacts will be better understood. This information will help inform decisions regarding fishery closures.

How can these public concerns be effectively addressed?

There is a plan for conservation measures to avoid impacts to both recreational and commercial species which is available from the UC outreach program or from NMFS. The UC recognizes the importance of fisheries to FL and works diligently (e.g., by testing) to protect those fisheries and open closed areas as quickly as fish are determined safe for consumption. As part of the information available to the public, the UC will identify and publish alternative safe locations for fishing.

Mammals and Sea Turtles

What will the public want to know or ask about with respect to marine mammals and sea turtles?

- What is the plan for protecting ESA and *Marine Mammal Protection Act of 1972* (MMPA) listed mammals?
- What is the plan for protecting sea turtles?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

The existing data for marine mammals and sea turtles are contained in ESI maps, GRPs and the ACP. In addition, there are monitoring programs as well as data from the standing networks. There is limited data on the cumulative effects of oil and dispersants on these groups. Data from the DWH spill, however, has improved knowledge of the acute and chronic effects. There are areas of disagreement as to the effectiveness of protection and of rehabilitation for sea turtle and marine mammal species. Post spill monitoring data will improve this information.

How can these public concerns be effectively addressed?

The plans for conservation measures for these species will be available from the UC via the outreach program. The 1993 spill showed that the recovery of the species will vary by species and habitat depending on the location and level of impact.

Plants and Invertebrates

What will the public want to know or ask about with respect to plants and invertebrates?

- What are the impacts of oil on plankton?
- What are the impacts of oil on plants?
- Is the oil adding nutrients to the Bay's nutrient problem?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

There are water quality, nutrient, phytoplankton and zooplankton data available for the Bay. DWH studies indicate that phytoplankton may have been stimulated by the oil spill, although the presence of low-salinity water in the region makes it difficult to discount the importance of riverine-borne nutrients as a factor (Ozhan *et al*., 2014). A few other studies suggest that the oil spill was toxic to some phytoplankton species, whereas others indicate that the degree of tolerance to the oil or to dispersants

differs among species. Thus it is still unclear and may be species specific. Results of monitoring from this spill may help to clarify the impacts further.

Impacts to zooplankton may depend on the life stages when the organisms were exposed to oil and possibly dispersed oil. Since many zooplankters become the adults of commercial or other important habitat-formers, the impacts may not be observed until the adult populations. Results of a water quality monitoring study and plankton studies will advance the understanding of these impacts.

How can these public concerns be effectively addressed?

Throughout the response and after, the FL DEP is required to monitor water quality to determine what impacts have occurred and when those impacts are determined to be over. These water quality data will be available from the DEP website on a weekly basis.

Habitats

What will the public want to know or ask about with respect to marine habitats?

- What is the impact of the spill on seagrasses, mangroves, and marshes?
- What are the impacts of the spill on important habitats to fish, mammals, reptiles, invertebrates and plants?
- Will response actions impact the resources and in what ways?
- How long will it take for habitats and species to recover?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

If the oil reaches these habitats, it is expected that there will be both acute and chronic impacts to the resources and the habitat will be disrupted as a spawning, nursery or feeding area, for some period of time. It is unknown how effective response and restoration activities will be and there is debate over the use of restoration techniques versus natural recovery. The actual timing of recovery is dependent on the amount of oil and dispersed oil reaching the site as well as the effectiveness of any response and restoration activity.

How can these public concerns be effectively addressed?

There have been significant improvements in the health of seagrasses in Tampa Bay in the last 30 years. Likewise, there has been a similar focus on other sensitive habitats. Knowledge about the location and the potential impacts of the spill to these resources will guide the response. Past spills have provided a body of knowledge as to the most effective way to protect these resources from the spill while minimizing damage from response and restoration techniques. This may include using natural degradation in areas such as mangroves, where more rigorous cleanup techniques may cause greater harm. Information on response technologies as they relate to sensitive habitats will be provided by the UC as part of the outreach program.

Recreational Opportunities

What will the public want to know or ask about with respect to recreation in general?

- What are the effects of the spill on recreational opportunities?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

Recreational opportunities (e.g., fishing, boating, visiting the beach, birdwatching) may be impacted by the spill and the response actions depending on the trajectory of the spill. Alternate locations for recreation will be suggested by agency and UC public outreach programs. Limiting activities in areas of impact or response activity areas (i.e., closures) will provide a safe environment for the public. Any closures will be removed as soon as it is deemed safe for all citizens.

How can these public concerns be effectively addressed?

Information on recreational closures (e.g., beaches, fishing, boating) will be available from the UC. Up to date information on cleanup, the reopening of recreational sites, and alternative recreation locations will be provided.

General

What will the public want to know or ask about with respect to sampling and research?

- How can researchers get samples for ecological and biological research?
- How do you report the presence of oil or oiled wildlife (e.g. citizen science, crowdsourcing)?
- Do we have enough facilities to process all the samples?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

The public can play a role in supporting the cleanup by reporting the presence of oil and oiled wildlife. Wildlife hotlines will be established online for reporting observations. Online reporting will also be available through the UC to identify oil and impacted wildlife. One problem that exists with citizen science is the veracity and quality of the information received.

During a spill of this magnitude there is a need for volunteers to assist with wildlife and bird restoration. The capacity of this response (e.g., time, financial contributions) for organizations (e.g., SAB) remain unknown until the cleanup is ongoing. Experience with previous spills has demonstrated how important it is to make sure the public is aware, through briefings, of their important role in the cleanup.

How can these public concerns be effectively addressed?

In order to make sure the public has an opportunity to effectively contribute to the cleanup, the UC and volunteer organizations need to make information available on how to report oil and oiled wildlife, and how to volunteer. It is important for agencies and the UC to identify volunteer organizations immediately and coordinate activities between the responders and the volunteers. Clear communication is important so that response activities are understood and roles are clearly defined.

Human Dimensions Breakout Group

The Human Dimensions Breakout Group developed questions focused on human health, recreation, tourism, volunteerism and other information.

In Breakout Session I, 30 questions were developed in five categories. The largest number of questions was generated in the categories of Human Health and in the broad area of Other, encompassing areas related to questions as to how the spill will directly impact them.

Human Health

What will the public want to know or ask about with respect to human health?

- Is the beach safe?
- Are tarballs dangerous or hazardous?
- Are dispersants dangerous?
- Is it safe to swim in the water?
- What are the human health effects of oil, dispersed oil, dispersants, ISB smoke?
- Is there a greater health risk for subsistence fishers?
- What is the impact on community mental health?
- How can I report my health issues?
- When dispersants are used, is it safe to eat seafood?
- Who is a trusted source we can talk to about seafood safety

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

Human health issues are some of the most important to the public. The questions regarding human health focus on potential contact with the spilled oil, DDO and seafood safety. If there is oil in the water or on the beach, or if tarballs are present in large numbers, the area will likely be closed to swimming or other recreational activities. If the public adheres to the closure warning there will be limited/no risk. If people do not adhere to the closure signs and warnings, there is a potential for risk from inhalation, ingestion, aspiration or dermal contact. The closed area may change due to the projected trajectory of the oil or change in environmental conditions. Initially, the established closures may be conservative until the responders determine the trajectory of the spill. Tarballs do appear on FL beaches in small numbers and are not necessarily a risk from a recent spill. However, there is a risk from tarballs due to ingestion and possibly contact.

There is a disagreement as the type of exposure and the threshold levels in water that constitute a hazard to humans. With ongoing research and results from monitoring studies conducted during and after this spill, it should be possible to improve the data on toxicity and exposure thresholds in water.

There are legitimate human health concerns related to the effects of oil, DDO and the smoke from ISB. Those effects could be acute, chronic, cancerous or non-cancerous. There are a large number of oil components for which adequate toxicology does not exist. In addition to these unknowns, there is disagreement on the threshold of effects and controversy as to which chemicals to include in risk

analysis. Better toxicology data and identification of the most vulnerable populations can improve regional risk models.

Oil spills and the related economic impacts can also have negative effects on the mental health of individuals and the overall resilience of communities. Citizens will want to know where they can get assistance to deal with these mental health issues. Impacts to humans have been shown to be greatest when income is affected. It is unknown how long these impacts last, but the duration is likely related to the impact of the spill, the response, and the restoration time.

The public will want to know how to report any health issues, either physical or mental. As part of the outreach program, contact numbers will be established where the public can obtain help, on an emergency or more routine basis. This effort is not normally part of the UC responsibility; they are responsible for the safety of responders. Local and state public health agencies should establish these links.

The primary risk from dispersants to workers is from inhalation. In the Response Technology and Shoreline Breakout groups, worker safety was discussed. Workers are relatively safe if they follow their training and use protective equipment. Dispersants are generally used offshore. They degrade rapidly and are present in low concentrations if they reach the shoreline. There is confusion about the potential risk of dispersants through the ingestion of seafood. Material Safety Data Sheets (MSDS) include risk as "only a large volume risk". The toxicity of dispersants is better known now and current dispersants are less toxic than older formulations.

Subsistence fishing communities consume significantly more seafood than the general population, thus increasing their potential exposure. However, there is little data on the amount of seafood consumed by these populations. There are many unknowns and areas of disagreement about threshold concentrations, exposure and individual susceptibility to increased hydrocarbon concentrations. Long term heath monitoring may provide better data on these populations.

Seafood safety is always a high priority, especially for segments of the population for which seafood is a significant part of their diet. Likewise, commercial fishermen also have a major concern about the safety of seafood as it is significant to their economic well-being. There is always a question about the safety of seafood when dispersants are used as part of the response. Fishery closures associated with a spill are opened by health authorities when the seafood is safe from all contaminants, including dispersants. The timing for such openings is dependent on monitoring and may be different depending on geographical locations or species. More data is needed to better understand the relationship of the toxicity of DDO to seafood safety.

There is always a concern from the public regarding who can be trusted to provide accurate information about seafood safety. Points of contact for public health agencies need to be disseminated early in the response process. Key also is the identification of respected external experts who can validate agency actions.

How can these public concerns be effectively addressed?

The primary concern of the response team is to keep the public safe and well informed about the progress of the cleanup. Daily maps of beach openings and closures, including the siting of oil, should be posted to websites and distributed to local media. Daily updates on environmental and public health issues should also be issued to the media. Guidance documents on oil, oil impacted beaches, DDO and cleanup activities should be developed and be available for public dissemination as soon as the UC is established.

Information on oil, tarballs, and dispersant toxicity should also be developed and issued to the public. This information should discuss known toxicity, and sub-lethal effects as they relate to human health. Information should also discuss the potential chances to encounter contaminants through contact, water or air. Literature should discuss the importance of adhering to closure warnings.

The stress of this type of disaster can cause mental health issues, often related to personal or economic loss. Keeping the public informed on the progress of the cleanup and the reopening of “clean" areas will help to relieve some stress. Information on mental health resources should be made available.

Daily closure maps with information on alternative safe beaches are very important to the public and the tourist industry. The State of Florida has already in place a system of communication on beach status. Media and news outlets could be incorporated to announce the status of beaches.

Environmental and public health officials and the USCG can provide daily updates on the status of the spill and public health concerns.

The public should not be exposed to dispersants because they are only applied offshore if used; they degrade and are diluted rapidly, thus eliminating exposure potential to humans. Some components of oil can be hazardous at high concentrations. The public should be informed, via the UC and other public health sources, that if you are exposed you should remove yourself from the situation, get to well-ventilated area, and see a local physician. In general, the public will not be exposed to harmful concentrations of oil, DDO, ISB smoke or dispersants as part of cleanup operations.

Special communication may be required to engage subsistence fishers. Subsistence fishers and others who rely on seafood as a major staple are not at higher risk if they observe the fishery closures and they do not eat the seafood from the oil-impacted areas. It will be important to develop a guidance document (e.g., on oil hazards) for fishing, oil-impacted beaches including stranded oil, tarballs, DDO, or cleanup activity that are carefully written for these populations.

Seafood safety is an important issue for all residents as well as the tourist industry. Fisheries resources are extensively tested before they are reopened to fishing and seafood consumption. The UC and agencies’ responsibilities are to keep the public safe and informed about the status of fishery closures. The status of clean seafood should be communicated widely to avoid economic impacts especially due to the importance of the tourist industry to the region.

Recreation

What will the public want to know or ask about with respect to recreation?

- Will charter boats operate and will I be able to fish?
- How do I clean my boat?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

Recreational fishing will continue in areas not closed as part of the response. Charter fishing boats will use alternate locations suggested by agencies that avoid contamination and cleanup activities. Fishing will return to closed areas when contamination levels are deemed safe.

Recreational fishermen who have concerns about cleaning their vessels and equipment can refer to public information on how to best complete the process. Any costs associated with the cleaning should be documented and submitted as part of the claims process.

Tourism

What will the public want to know or ask about with respect to tourism?

- What information should be given to local tourists from neighboring counties?
- Will the spill come back in the news years later continuing to impact tourism?
- How do we communicate to tourist with different communication needs?
- Will cruise ships be diverted? Will the port be closed to ships?
- How will this spill affect tourism? How do we keep them coming during the process?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

Tourism is an important part of the economy of FL and the Tampa Bay region. The messaging for tourists who might come to the area will differ depending on the origin of the tourists. Those tourists who might visit from neighboring counties would receive a simpler message because these people would better understand the geography and location. Tourists who come from further away would require more complicated information that familiarizes these people with the location and the potential for clean sites. Foreign tourist information has the complication of different languages and multiple press releases. Messaging should emphasize the availability of other adjacent coastal locations where recreational activities are unaffected.

Cruise ships frequent the Port of Tampa. These ships will continue to use the Port unless the COTP determines the need to divert vessel traffic based on the spill trajectory and the response.

Tourism will be impacted in the short term due to the spill. However the tourism industry and the state will need to develop messaging that can be transmitted widely, including internationally, to bring tourists back. The tourism industry representatives will need to work with hotels, resorts, the recreation industry and others to offer incentives. This process may require a plan that spans several years until the area's reputation is reestablished.

How can these public concerns be effectively addressed?

The impacts to tourism will be significant initially. The tourist industry will need to employ an active advertising program that emphasizes the positives for the area and offers specials like "free days" if oil impacts visitor days. When the cleanup is completed the tourist industry will need to develop extensive marketing material aimed at target groups including international tourist locations.

Volunteers

What will the public want to know or ask about with respect to volunteers?

- Where do we send people who want to volunteer?
- Where do I go to get training?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

Volunteers are an integral part of the restoration process. It is important to post opportunities for volunteering and volunteer training on the UC and other websites. Training for these volunteer opportunities usually takes three days.

How can these public concerns be effectively addressed?

It is important to identify and to build up the cadre of volunteer groups before spills occur (see also Natural Resources Breakout Group). This knowledge will assist the UC to put volunteer groups "in action" more quickly if a spill occurs.

Other

What other topics related to human dimensions will the public want to know or ask about?

- Is there somebody who can help us?
- Is there anybody we can trust?
- Where can we go for the next information update?
- How do we address conflicting objectives for communications?
- How do we address conflicting images?
- Will the community be resilient?
- How do we get samples for public health research?
- Do I need to change my wedding plans?
- Who is responsible for covering losses, including business?
- How do I get my claims reimbursed?
- Will I need to be evacuated? When and for how long?

What is known or uncertain? What are areas of disagreement? What might be knowable in the future with regard to these public concerns?

There is a theme throughout all of the breakout groups that deals with the public's need to have accurate, timely and trustworthy information. With respect to the other breakout groups, that

information is focused on the cleanup process, safety and the protection of natural resources. With respect to human dimensions, the concern is for personal property, safety and human health. It will be the responsibility of the UC and agencies to provide the information required by the public in a timely way, using as many different media as possible. Recent disasters have demonstrated that incorrect information appearing on the internet is difficult to correct once it has been released. Thus, there is a need to be prepared to issue information as quickly as possible. It is important for the UC to also be issuing images that will document oil location, cleanup activity, natural resource protection and restoration; especially as anyone can record images and post to the internet.

Community resiliency is important to all citizens because of the economic issues, including jobs and business continuity. The DWH spill provides a guideline as to the time for recovery. The size of the spill and the success of the response will impact the recovery time and the return to normalcy for the community.

The scheduling of personal activities like weddings should not be affected by the spill or cleanup process unless it is scheduled for a closed beach or recreational facility. For any question about these activities the public should contact the public information number to verify availability of a location.

The public concern about the impacts to personal property and business raises the question of who is responsible for recovering losses and how they file a claim. Businesses usually have business interruption insurance to cover losses due to this type of event. The insurance broker should help with the process and they may wish to file a claim against the RP. The claims process will be established as part of the determination of spill liability and will be made public by the outreach program. More detail about claims and evacuations was discussed as part of the Shoreline Cleanup and Restoration Breakout Group response.

How can these public concerns be effectively addressed?

There is a long standing distrust by the public, the RP and the response community. Therefore, it is important to provide frequent information on the progress of the cleanup and to provide information regarding the time frames for recovery from other spills such as DWH. One participant suggestion to make the public aware of the progress is to have special events that highlight milestones toward completion (e.g., public release of recovered birds, ceremonial beach openings with press coverage).

Resiliency of the community is dependent on the recovery of recreational and business activity in the region. The cleaning and opening of commercial and recreational fisheries areas will improve two major industries: seafood and tourism. It is important for the UC and agencies to keep the public informed of these developments via the outreach program.

Workshop Conclusions and Recommendations

Each of the four breakout groups developed a significant number of questions with similar themes. A summary of these questions are listed below. These questions provide an indication of the types of questions that responders will experience in future spills no matter where the location of the incident. As a result, these questions provide excellent training material for regional response teams and for pre-prepared public information packets in the GOM and beyond.

- Who is in charge of the cleanup?
- What is the UC and how does it work?
- Where can I get timely, reliable, and trustworthy information about the spill and the cleanup?
- What is OPA 90?
- Is there a directory of oil spill nomenclature?
- What technologies will be used to clean-up the spill? How are they chosen?
- How do these technologies work?
- How is the clean-up strategy developed and the cleanup priorities established?
- How will you protect my personal property?
- How will you protect public property?
- What is the closure process? How will I be informed? When will the area be open again?
- What is the reimbursement process? How will it operate?
- How will you protect natural resources? What natural resources are at risk?
- How will the spill affect commercial fishing?
- How will the spill affect recreational fishing? And other recreation?
- How do you track the movement of oil?
- Is my health, physical and mental at risk?
- How do I know if my seafood is safe? What are fisheries closures? How long do they last?
- Are subsistence fishermen at greater risk?
- How can I volunteer?
- How can we maintain the tourism during and after the spill?

By using these questions and others that might be developed from the DWH spill as a guide, training materials and workshops can be developed to train responders at all levels, from potential UC members to on the ground responders who will encounter citizens as part of the daily clean-up responsibilities.

There consistent themes regarding how to respond to the concerns raised by the public. It is clear that a significant number of the questions are of a general nature regarding how responders will react to a spill and deploy various strategies to limit impacts. Written or electronic material on these subjects could be developed in advance and be available to the UC and outreach coordinators immediately when the response headquarters is established. This would permit the outreach efforts to “get out front” of the inevitable misinformation that will begin to surface on the internet.

As part of any effort it is important to identify all the sources of site specific information that is available for each region. Each of breakout groups identified the many sources of information that would be available for this spill scenario. For example these included:

- ESI database
- SHPO
- GRPs
- ACP
- Breeding bird and wildlife surveys
- Estuary programs
- State DEP fisheries data
- NMFS critical habitat surveys for fisheries
- State and federal threatened and endangered species for the area
- FWC fisheries independent and dependent monitoring data

By expanding the effort to identify sources of information for other regions, and including academic sources where appropriate, the responses team could have an index of sources to guide cleanup efforts, prioritize the use of response tools and protect natural resources in advance of any spill.

Training

CRRC and DRC conducted a one-day training on June 30, 2016, on risk communication and the use of social media during a response which was open to all workshop participants. The agenda for the training can be found in Appendix E.

Presentations

The training included topics on risk communication state-of-science, social media, agency perspectives on risk communication, and risk communication during the Deepwater Horizon Oil Spill (DWH). Below is a list of the presentations titles, speakers and their affiliations. The training presentation slides are located in Appendix F.

- Risk Communication – State-of-Science:
  - *Risk Communications State-of-Science*, Ann Hayward Walker (SEA Consulting)
  - *SeaGrant's Role in Communication During DWH*, Monica Wilson (FL SeaGrant)
- Social Media:
  - *Social Media Use During Crisis Events*, Elodie Fichet (University of Washington (UW))
- Risk Communication – An Agency Perspective:
  - *NOAA Perspectives*, Keeley Belva (NOAA)
  - *ESF 14 External Affairs and Public Information*, Aaron Gallaher (State of FL)
  - Shannon Herbon (FL Department of Environmental Protection (DEP))
  - LT John Fitzgerald (U.S. Coast Guard (USCG))
- Risk Communication During DWH – Reflections of Responders:
  - David Kennedy (NOAA)
  - James McPherson (FEMA)
  - *Initial NRDA Communications Approach During DWH*, Tom Brosnan (NOAA)

References

Koray, Ozhan, Michael L. Parsons, Sibel Barg. 2014. How Were Phytoplankton Affected by the *Deepwater Horizon* Oil Spill? BioScience 64 (9): 829-836.

Appendices

Appendix A: Workshop and Training Participants

Appendix B: Workshop Agenda

Appendix C: Workshop Presentation Slides

Appendix D: Breakout Group Notes

Appendix E: Training Agenda

Appendix F: Training Presentation Slides