

Summary of Target Audience Input on Oil Spill Science Topics

Based on Input Collected Between
August 2014 and February 2015

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Background

In 2014, the Gulf of Mexico Research Initiative (GoMRI), which is administered through the Gulf of Mexico Alliance, supported a new oil spill outreach program that the four Sea Grant College Programs based in the Gulf of Mexico are administering. The purpose of the program is to increase the use of oil spill science by people whose livelihoods depend on a healthy Gulf. The GoMRI/Sea Grant oil spill science outreach team is continuously engaging with people in small and large group settings to learn about their oil spill science-related questions and concerns. Below is a snapshot of information collected from target audience members from July 21, 2014, through February 19, 2015. This information represents engagement with 530 people.

Approaches to soliciting input

One-on-one or small-group meetings with target audience members

Between July 21, 2014, and February 4, 2015, the GoMRI/Sea Grant oil spill outreach team met with 264 target audience members across the Gulf at 106 one-on-one meetings or small group meetings of less than 20 people. During these meetings, a variety of questions were asked including what oil spill science questions people still had and which broad oil spill topics and GoMRI theme areas they were most interested in learning more about.

Input sessions with large groups of target audience members

Between October 15, 2014, and February 19, 2015, the GoMRI/Sea Grant oil spill science outreach team facilitated 10 large group input sessions with a total of 266 participants. Often these input sessions were held in conjunction with existing meetings or workshops. These larger group settings had 15-80 participants and included participants providing input on oil spill science questions and topics either verbally, through interactive polling devices or through written formats. Many other large group input sessions will be held in the coming months and will also be held in conjunction with team-led oil spill science seminars.

Summary results

Tables 1 and 2 summarize the participation of the different target audiences in the one-on-one and small group meetings and large group input sessions. There were often multiple target audiences and multiple individuals from each audience represented at each of these meetings or sessions. Tables 3 through 5 highlight some additional information that was gathered in the one-on-one and small group sessions and include broad oil spill topics of interest, GoMRI themes that participants were interested in, and ways people find out about oil spill science related issues. Finally, Table 6 highlights the frequency that target audience members mentioned 449 oil spill topics. This table is a reflection of input from individual, small and large group meetings, and input sessions. Therefore, a topic mentioned by an individual at a single meeting is counted as equal to a topic mentioned in a large group input session. No weighting was applied to topics that were mentioned at different types of venues, locations or target audiences. The appendix includes the topics that were used to create Table 6.

Table 1. Number of meetings with at least one member from target audience group represented.

Target audience group	Number of small group meetings with target audience represented*	Number of large group input sessions with target audience represented*
Natural resource managers	30	3
Sea Grant extension specialists or agents	26	4
Environmental non-profit staff members	15	4
Fishers	14	2
Emergency responders or managers	12	5
University/College researchers	11	0
Tourism specialists	10	2
Public health officials	9	3
Port and harbor employees	6	1
Elected officials	4	2
GoMRI outreach specialists	1	0

*Multiple target audiences may have been present at a small group meeting or large group input session.

Table 2. Location of one-on-one meetings or small group meetings with target audiences.

State	Number of small group meetings in state	Number of large group input sessions in state
Florida	25	1
Louisiana	24	2
Mississippi	21	3
Alabama	20	2
Texas	16	2
Total meetings/sessions	106	10
Total number of participants	264	266

Table 3. Number of times broad oil spill-related topics were mentioned at each one-on-one meeting or small group meeting that was held between July 21, 2014, and February 4, 2015.

Oil spill-related topic	Number of individual or small group meetings the topic was mentioned
Ecological topics	88
Dispersants	66
Human health	60
Fate and transport	45
Spill response	35
Oil industry	12

Table 4. Number of times each GoMRI theme area was mentioned at each one-on-one or small group meeting that was held between July 21, 2014, and February 4, 2015.

GoMRI theme	Number of small group meetings theme was mentioned
Theme 3: Environmental effects of the petroleum/dispersant system on the sea floor, water column, coastal waters, beach sediments, wetlands, marshes, and organisms; and the science of ecosystem recovery.	87
Theme 5: Impact of oil spills on public health including behavioral, socioeconomic, environmental risk assessment, community capacity and other population health considerations and issues.	58
Theme 1: Physical distribution, dispersion, and dilution of petroleum (oil and gas), its constituents, and associated contaminants (e.g., dispersants) under the action of physical oceanographic processes, air sea interactions, and tropical storms.	35
Theme 2: Chemical evolution and biological degradation of the petroleum/dispersant systems and subsequent interaction with coastal, open-ocean, and deep-water ecosystems.	30
Theme 4: Technology developments for improved response, mitigation, detection, characterization and remediation associated with oil spills and gas releases.	23

Table 5. Sources that participants at the one-on-one or small group meetings used to find oil spill science information between July 21, 2014, and February 4, 2015.

Information source	Number of meetings source was mentioned
Media	22
Government	20
Peers	17
University	11
Peer reviewed journals	3
Public meetings	3

Table 6. Frequency of topics and subtopics mentioned by target audiences at small group meetings and large group input sessions from July 21, 2014, through February 19, 2015.

Topic and subtopic	Number of mentions
Ecosystem Level Impacts	151
Habitat	44
Fisheries	40
Animal Health	34
Trophic impacts	7
Water quality	5
Invasive species	2
Long-term	2
Other related topics	18
Human Health	78
Seafood safety	43
Physical health	4
Air quality	3
Community level	3
Long-term	3
Mental health	2
Spill response	2
Other related topics	18
Dispersants	75
Impacts at organism level	21
Environmental impact	8
Human health	8
Policy	6
Deep sea	4
Long term understanding	4
Alternatives	3
Other related topics	21
Response	30
Best Management Practices	9
Technology	9
Science	5
Communication	2
Other related topics	5
Fate and Transport	29
Transport	8
Location	6
Degradation	5
Hurricane impacts	4
Other related topics	6

Table 6. (continued)

Topic and subtopic	Number of mentions
Human Dimensions	22
Economic impacts	10
Community impacts	7
Other related topics	5
Tar Balls and Oil Mats	18
Data Needs	7
Communications	6
Synthesis	4
Monitoring	3
Other Topics	26
Total	449

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Appendix

Specific oil spill science questions and topics

The following section identifies the 448 specific oil spill related science questions and topics that were identified at one-on-one meetings or small group meetings and at the large group input sessions. Topics are arranged by broad topic and in many cases several subtopics. The topics and subtopics are in the same order found in Table 6.

Ecosystem Level Impacts

Ecosystem level impacts: Habitat

Restoration

- Beach restoration - to quality that was seen before the oil spill
- Best way to restore
- Habitat restoration
- Habitat restoration - beach and wetlands
- Impacts of areas that were damaged - allows justification for future restoration projects
- Restoration of locations impacted by the Deepwater Horizon oil spill (e.g., Cat Island in LA)
- Sediment transport models - related to restoration
- Sediment transport models in the littoral zone - related to restoration
- Wetland impacts - related to restoration
- What coastal restoration projects are being done to compensate for areas (marsh) destroyed by oiling?

Benthic

- Benthic/microbial communities
- Effects that oil had on the bottom ecosystem
- Is the bottom clean? If not, is it better to leave the oil on the bottom or clean it up? How have the bottom sediments been impacted?
- Land use map of ocean/coastal benthic habitats
- Oil mats on seafloor
- What did the oil do to the seafloor?

Shoreline

- Effects of oil on habitats (mangroves)
- Effects on Mississippi dead zone and Louisiana wetlands
- Erosion and oiled shoreline - How strong is that connection? How much did the Deepwater Horizon oil spill contribute to erosion?
- Oil impacts, on marsh, and erosion, there are more questions than answers

Long-term

- Long-term impacts on habitats and species, effects on life cycles due to oil
- Long-term effects on nursery habitats
- Long-term impacts on nurseries

Beaches

- Beaches - macro and micro-organism community-level differences due to oil and cleanup methods
- Oil in the sand

Oysters

- Effects of oil to oyster beds
- Oyster reef impacts - related to restoration

Seagrass

- Habitat mapping - impact of shading on seagrasses (e.g., subaquatic vegetation)
- Impacts on seagrass beds

Other related topics

- Impacts of oil on natural resources (two mentions within input session results)
- What are the environmental effects to broad areas, beaches, wetlands (two mentions within input session results)
- Effect on managed resources, in general
- Effects of oil on environment itself (e.g., beach, marsh)
- Water quality, beach
- Impact of oil on habitats
- Impacts on soils
- Impacts to habitats - oil, tar, etc. left on beaches/islands, off-shore habitats, coral reefs
- Research on coastal habitats- not just LA wetlands; estuarine, dunes, beaches (e.g., Panhandle FL), mangroves
- Natural recovery of habitats - wetlands and oyster reefs
- Oil impacts to marine ecosystems
- Oil spill impacts to the environment, habitats, and specific organisms
- Wildlife impacts, specific to habitat or ecosystem wide impacts

Ecosystem-level impacts: Fisheries

Fisheries population

- Effect on fisheries 5-year (referenced Exxon Valdez spill)
- Effects on fish populations
- Fisheries - population status
- Fisheries - population status; Has the harvest gone up or down and why?
- Impact on fisheries – specifically, reproductive health
- Impacts on commercially important seafood species
- Population dynamics, success of young, changes in breeding
- Recruitment of fish species
- Why is recreational fishing open in an area, but not commercial fishing (e.g., Bay Jimmy, LA)

Long-term impacts

- Long-term impacts to fisheries as a whole (i.e., shrimp, fish, etc.)
- Long-term time series data for fisheries (in reference to growth, feeding, etc.)
- What are the long-term impacts of the oil spill? (particularly on fisheries - shrimp and oysters)
- What are the long-term impacts to species/populations? How did the spill effect their reproductive rates, size and numbers? Specifically crabs, flounders, sea turtles, dolphins, oysters. How were nursery areas impacted?
- What is the long-term effect on individual fisheries (e.g., shrimp, oysters)?

Oysters

- Impact of oil on fisheries - oysters
- Oysters - How are they doing? How did the oil impact them?

- Oysters- impact from oil spill (FL, MS)
- When are the oysters coming back?

Crabs

- Crab population declines due to oil and dispersants?
- Decline of blue crab population
- Effect on blue crab populations
- Why declines in crabs/crab larvae?

Fish

- Menhaden oil content (fishers asking questions, oil content reduced after spill but seems to have recovered)
- Speckled trout population (fishers have asked about this topic)
- What was the impact on the bluefin tuna spawn in the Gulf?
- Why are fishermen catching many speckled trout, but the ones caught are larger than usual?
- Speckled trout - why are they so much smaller in the years after the Deepwater Horizon oil spill? The ratio of small fish: keepers seems imbalanced compared to years prior to Deepwater Horizon oil spill.

Shrimp

- Shrimp and shrimp habitat impacts from oil
- Shrimp impacts, seafood in general
- Shrimp production numbers (catch)

Landings

- Changes in seafood production (pre- vs. post-Deepwater Horizon oil spill)
- Fisheries landings - commercial industry has a perception that stocks are down
- Fisheries landings data, and other data sets that we might come across from non-GoMRI sources, could potentially be posted on the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC) website, to supplement the data there, toward the eventual evolution of GRIIDC as the central location for all oil spill data

Other related topics

- Effects on harvested species
- Effects on oysters and fish
- Effects to speckled trout and other recreational species, as well as commercial ones (e.g., shrimp)
- How is the oil impacting spawning areas?
- Impact of oil on fisheries - shrimp, fish, crab
- Impacts of oil on aquatic life (fisheries specific)
- Oil impacts on fisheries (shrimp, crab, oyster)

Ecosystem level impacts: Animal health

Fish

- Are there some fish that are impacted more than others (tied to bioaccumulation)?
- Believes cocahoe minnow heavily impacted in terms of population abundance (due to reproductive problems from oil) - Is this true?
- Episodic losses of fish species
- Fish health
- Fish health and disease

- Fish lesions - lots of questions right after the spill
- Impacts on diadromous fishes
- Impacts to fish (e.g., speckled trout)
- What is the impact to fish larvae and early stages?
- Why have minnow (cocoahoe minnow) populations declined post-spill?
- Bluefin tuna - major species (spawn only in Gulf and Mediterranean)
- Fisheries - specifically blue crab, bottom feeders, status; Are they currently recovering?

Mammals and turtles

- Effects on sea life - sea turtles, dolphin (two mentions within input session results)
- Dolphin deaths related to dispersant use in oil spill
- Long-term effects on wildlife - including non-commercially important species (e.g., dolphins)
- Sea turtle - mass stranding in 2010 (shrimp fishery is often blamed for die-offs but the fishery was closed during this time because of the oil spill)
- Turtle nesting
- Turtles - still getting calls, especially concerned about Kemp's Ridley, worried about impacts of water quality

Invertebrates

- Do oil droplets make it into crab larvae?
- Effects of oil on key species (oyster, crab, shrimp)
- Were there really shrimp without eyes resulting from the spill?
- Effect of oil on beach invertebrates
- Ability of shrimp to reproduce post-oil spill? (especially in Grand Isle and Bay Jimmy in LA)

Wildlife

- How were the birds affected
- Impacts of oil and dispersants on wildlife
- Impacts of oil on wildlife - secretive marsh birds

Long-term impacts

- Long-term impacts - turtles, shorebirds, fishing grounds
- Sub-lethal impacts (reproductive, illness, development of cancers)

Other related topics

- Are animals bouncing back?
- How is the health of the fish, crabs, and turtles?
- Impacts on migratory species - mammals, turtles, birds, fish
- Species-specific impacts (turtles, native plants, birds, shrimp)
- From public (in the past) - impacts of oil on fisheries and wildlife (e.g., dolphins, turtles, birds)

Ecosystem level impacts: Trophic impacts

- Impacts of oil on food chain (two mentions within input session results)
- Environmental impacts
 - Oil and dispersant impacts on the food chain
 - Marsh and shore birds, impacts to trophic levels, toxicity – major and minor impacts
 - Bioaccumulation and productivity - fish, turtles, marine mammals
- Impact on food webs - invertebrate, specifically fiddler crab monitoring
- Long-term effects on food web

- Trophic level relationships
- Where is the oil not only physically but also biologically through trophic levels?

Ecosystem level impacts: Water quality

- Effects of Deepwater Horizon oil spill and hypoxic dead zone in the Gulf
- How does the water quality coming into the Gulf of Mexico effect on the overall restoration of Gulf waters?
- Latest information on water quality
- Water quality
- Water quality (received questions from tourists, but this was common even before the oil spill)

Ecosystem level impacts: Invasive species

- Invasive species - related to oiled sites and response efforts
- Is there a connection between the oil spill and lionfish invasion?

Ecosystem level impacts: Long-term

- Long-term impacts to ecosystem health and fisheries implications
- Long-term monitoring to assess water quality

Ecosystem level impacts: Other related topics

- Impacts of oil at ecosystem level (six mentions within input session results)
- Impact of oil on fisheries, ecosystems, microorganisms
- Ecological/biological impacts if oil/dispersants reach the coastal areas in Pinellas County, FL
- Ecosystem-level effects
- How long will it take the system to recover from the oil spill?
- Impact on biodiversity
- Impact on life stages
- Impact to reproductive process (wildlife)
- Interested in big picture ecosystem interactions (e.g., tie in with hypoxia, wetlands, restoration efforts)
- Long-term data set for toxins in the Gulf
- Total impacts of the oil spill/summations about what happened (# of species and acres impacted)
- Toxicity
- What is the overall condition of the Gulf of Mexico now, has it bounced back from the spill?

Human Health

Human health: Seafood safety

- Seafood safety (11 mentions within input session results)
- Is seafood safe to eat? (three mentions within input session results)
- Food safety (two mentions within input session results)
- How is the oil spill connected to vibrio? (two mentions within input session results)
- Are you finding oil in the seafood?
- Chefs ask is Gulf seafood safe - want to see seafood testing results. Does federal and each state agencies publish the results? Where can I find the info so I can show them?
- Food safety - contaminant effect vs. ecological effect (populations)
- Food safety (heard concerns from stakeholders - skeptical when told food was safe to eat; did not trust state or federal agencies)
- Food safety, and health and human impacts at meetings
- How do tar balls impact seafood?

- Impacts to seafood safety (as they impact tourism)
- Is LA seafood safe to eat?
- Is the seafood safe? - Public perception is that the industry is permanently damaged, there are long-term negative impacts, and there are changes in genetics and population levels.
- Perception of seafood, especially with dispersants and lesions on red snapper and think fish not healthy to eat
- Public health - seafood safety, including levels of polycyclic aromatic hydrocarbons (PAHs)
- Seafood and water safety
- Seafood certification process
- Seafood safety - during the oil spill there was a perception that shrimp was not safe to eat
- Seafood safety - lots of questions right after the spill
- Seafood safety - most concerns from people that are not living along the Gulf Coast
- Seafood safety - what tests were used and what parts of the seafood were tested?
- Seafood safety – where are the testing results posted?
- Seafood safety reassurance
- Seafood safety - what is the long-term impact?
- Seafood testing/marketing
- Vibrio

Human health: Physical health

- Did dispersants make people sick?
- Effects on health (both human and environment)?
- How did the oil spill impact health (especially pregnant woman)?
- How could the health of people involved in cleanup effort be affected by oil and/or dispersant?

Human health: Air quality

- Air quality (two mentions within input session results)
- Human health exposure - inhalation hazards from aerosol oil spray or burning of oil
- Public health - impacts of air pollution/air quality

Human health: Community level

- Community level impacts, such as public health issues from spraying of dispersants and burning of oil and impacts to livelihoods
- Community well-being
- Public health - community awareness

Human health: Long-term

- Long-term effects on human health?
- Public health - chronic health impacts; seafood safety – impacts of dispersant and oil
- Public health - long-term exposure/re-exposure

Human health: Mental health

- Impacts of stress to mental health
- Mental and financial impacts of the spill on Jackson County, MS

Human health: Spill response

- Public health - need a common message - referred to cleanup workers forced to wear personal protective gear, but tourists out on beaches with no protective gear
- Public health - related to emergency preparedness

Human health: Other related topics

- Smaller impacts over time - e.g., sicknesses, suicides (two mentions within input session results)
- Water safety (two mentions within input session results)
- Are the stories about people developing rashes/skin conditions/breathing issues (post-exposure to Corexit) true?
- Beaches - what are the safety thresholds? – Closing/reopening beaches, are there tools available to test for these levels?
- Determine “trigger points” for response to protect public health (referred to states, cities, etc., not knowing when to close beaches)
 - Would be helpful to determine criteria during which beaches are closed
 - Similar to hurricane evacuation – categorize hurricanes and evacuate accordingly
- Impacts of oil to public health
- Is it safe to go into the water (swimming, boating)?
- Public health - independent monitoring
- Public health - physical and mental
- Public health - related to resiliency
- Public health - what health impacts did the spill have on residents (physical and mental)?
- Public health (people are blaming all ailments on oil spill)
- Why hasn't GoMRI funded more public health projects?

Dispersants

Dispersants: Impacts at organism level

- Impacts of dispersants on food chain (two mentions within input session results)
- Are dispersants responsible for the decrease in oyster or shrimp production?
- Dispersant - toxicity of oil and dispersant
- Dispersant impacts on fisheries (shrimp, crab, oyster)
- Dispersant use and how it has impacted the fisheries
- Dispersants - dioctyl sodium sulfosuccinate (DOSS) testing, impacts to fisheries - blue crabs, oysters, food chain, offshore vs. inshore, communities, spawning activities, fall migration
- Effect of dispersants on fish populations
- Effects of dispersant on fisheries important species
- Effects of the dispersants on the marine life
- How do oil and dispersants affect maturation of recreational fishing species (esp. blue crab and speckled trout)?
- How has the dispersants affected stone crabs, adults, juveniles and larvae?
- Impacts of dispersants on fisheries - oyster
- Impacts of dispersants on fisheries - shrimp, fish, crab
- Impacts of dispersants on wildlife - secretive marsh birds
- Impacts of dispersed oil on fish larvae
- Impacts of oil and dispersants/how stocks were effected - especially for red snapper, oysters, shrimp, flounder and blue crab
- Is dispersant harmful to fish?
- It has been a bad year for speckled trout – is this an after-effect of the spill?
- Oil and dispersant impacts on larvae (fisheries and others)
- Oil and dispersant impacts to shrimp
- What are the effects of oil and dispersants to fish?

Dispersants: Environmental impact

- Impacts of dispersants at ecosystem level (two mentions within input session results)
- Effects that dispersant had on the bottom ecosystem
- Impact of dispersant on habitats
- Impact of oil and dispersants on marsh plants
- Impacts of dispersants on natural resources (two mentions within input session results)
- Impacts of oil spill/dispersants on sediment/bottom

Dispersants: Human health

- Dispersant effects on human/animal health
- Dispersants - How toxic are they really? Are they still being sprayed?
- Dispersants related to public health
- Do dispersants enter atmosphere (i.e., if sprayed from plane, can they be transported by wind and inhaled)?
- How did dispersants effect human health? What are the long-term impacts? Is dispersant use linked to an increase in cancer rates?
- Impacts of dispersant exposure to skin, liver, respiratory, renal systems (in humans)
- Impacts of dispersants to public health
- Is dispersant harmful?

Dispersants: Policy

- Why is Corexit banned in UK/Europe and not in the US? (two mentions within input session results)
- Affects to recreational fishing species and health
- Coordinate dispersant use with the federal government
- Dispersant regulations
- Should dispersants continue to be used?

Dispersants: Deep sea

- Deep sea dispersant use
- Dispersants - What happened to the dispersants? What were the impacts of using dispersants?
- Effects of Corexit in deep sea
- What are the effects of the oil and dispersants on the deep sea?

Dispersants: Long-term understanding

- Dispersants- specifically dispersants to use in the short-term vs. long-term (BP is a long-term spill, Texas had a short-term spill), or dispersants used for acute impacts
- Interested in better long-term understanding of oil and dispersants - too many studies have been looking only at short-term effects.
- Long-term fate and longevity of dispersants
- Long-term impacts of oil and dispersant

Dispersants: Alternatives

- Alternatives to Corexit (two mentions within input session results)
- Dispersant alternatives

Dispersants: Other related topics

- Dispersants (six mentions within input session results)
- Did dispersants make the oil worse?
- Dispersant - impacts

- Dispersants - effects and distribution
- Dispersants, in-situ burning
- Dispersants - overall impact, how to use them? Who should use them?
- Dispersants, UV lighting indexing
- DOSS (dioctyl sodium sulfosuccinate)
- How are dispersants distributed through the Gulf and the environment (e.g., could dispersants and oil be on the seafloor and get re-suspended in the water during a storm)?
- Impact of dispersants
- Impact of oil and dispersant
- Stakeholders have asked about dispersants
- What are the effects of dispersants?
- What are the (short- and long-term) general impacts of using dispersants?
- Where were dispersants sprayed - map showing actual sprayed areas
- Why use Corexit when it's terrible?

Response

Response: Best management practices

- After-action review - what response efforts which and which didn't
- Best response practices
- Do's and don'ts of response equipment and practices
- Effectiveness of the response techniques that were used during the oil spill
- Emergency response - what response techniques worked? What responses were most effective? referred to booms during spill; dispersant use; use research to make changes to the area contingency plans
- Is the well still leaking, and what's being done to keep something like this from happening again?
- Metrics for cleanup activities
 - Cleanup effort vs. damage (point of diminishing returns)
 - SCAT (Shoreline Cleanup and Assessment Technique) data – pre-oil spill
 - Sandy beaches, below-sand detection (instead of having to take cores)
 - Elevation – track oil, allow to determine where oil that washed up on the beach could be as sand begins to shift
 - BSEE bureau of safety and environmental enforcement
- They hear a lot of "it's going to happen again, what's the improvement in response?"
- What lessons were learned from the spill and how are they planning on improving them?

Response: Technology

- New technology (including sorbents and alternative dispersants), tools, products that can aid in emergency response
- Oil management techniques, how do they work and utilized
- Oil spill technology
- Response techniques
 - Background data – used by responders (once they reach a metric, they can “move on” to the next step in their response efforts)
 - Chemical markers
- Response techniques- active vs. passive by habitat used during the Deepwater Horizon oil spill
- Response techniques/tactics
 - Use science and past experiences
 - Keep techniques flexible (technique used will vary depending on how much oil is weathered, sea and weather conditions, etc.)

- New products – tested? (background: during the spill, a lot of vendors were trying to push new products on responders; could have used info about how effective they were)
- Creative and innovating, new techniques, innovation
- Trust fund - provide continued funding for this
- Skeptical of new rig technology - How good are "fixes" that have been made?
- The positive and negative impacts of surfactants/dispersants
- Why is the EPA not utilizing microbes to aid in degradation (e.g., "tigerbugs")?

Response: Science

- Impacts of response efforts on natural resources (two mentions within input session results)
- Applied science from the oil spill, interested in techniques learned that can be applied to future oil spills
- Research and development of new oil spill response techniques
- Risks of mobilizing in response to spill (effects to wildlife and communities)

Response: Communication

- Emergency response framework - interested in understanding who is in charge, how to respond when a spill occurs, and what the impact is to public health to direct people to the entities in charge and answer their questions if need be
- What is being done to respond to the oil spill?

Response: Other related topics

- How do we clean up oil - Hazmat landfill/floodwaters?
- How do you respond to an oil spill under extreme conditions (e.g., a hurricane)?
- Preparing for the next oil spill
- Response efforts
 - Impacts of response efforts
 - Physical impacts to habitats (particularly on submerged aquatic vegetation and oyster beds)
 - What worked and what didn't
- Spill response and fate/transport of oil: what happens, exactly and in detail, when an oil spill occurs? Step-by-step process of the spill in the environment (simple visualization w/ simple captions) - e.g. Trajectory of oil as it travels? Who responds immediately?

Fate and Transport

Fate and transport: Transport

- Oil transport (two mentions within input session results)
- Can and will the oil reach Tampa Bay?
- Circulation patterns
- Currents - nearshore, offshore, inshore and models (U.S. Coast Guard request) - geographic response plans
- Effects of storms in physical transport of oil on benthos
- Hydrodynamic models - related to restoration
- Oil transport - where is the oil?

Fate and transport: Location

- Where is the oil? (two mentions within input session results)
- Distribution of oil
- Oil impacts/amount still left on bottom, in water column
- Think there is a giant blob of oil going back and forth in the Gulf killing things
- Where the oil and what is are the impacts on the environment?

Fate and transport: Degradation

- Amount of oil still in the environment - tar balls on Horn Island (MS), mats on bottom, impacts of hurricanes
- Barrier islands - how much oil remains/impact due to shifting sand
- Mass balance estimate for oil
- If response techniques (such as SCAT—Shoreline Cleanup and Assessment Technique) underestimated the amount of dispersed oil in wetlands
- Is the oil still there? And, if so, how much is left?

Fate and transport: Hurricane impacts

- Impacts of hurricanes on oil spill (used NOAA fact sheets) (two mentions within input session results)
- Will hurricanes stir up oil from benthos?
- Will oil wash up after a hurricane?
- Will tar mats that come up during storms have impact (i.e., be biologically/chemically active)?

Fate and transport: Other related topics

- Fate and transport of oil and dispersant (three mentions within input session results)
- Fate and transport of oil and dispersant - on and in shore (sand), in water column
- Deep shelf systems movement - is this movement unique, how to model it
- Degradation of oil - water currents, oil decomposition rates

Human Dimensions

Human dimensions: Economic impacts

- Economic impact (two mentions within input session results)
- Economic effects on restaurants
- Effects of oil spill on tourism
- Effects to fishing industry (and local economy, by extension)?
- General overview of tourism before and after the spill
- Impacts on vessel schedules
 - Florida and Louisiana lost off-shore revenue, had to reduce lease rates to entice boaters
 - Most ports have an oil response plan, some have contracted companies
- Impacts to navigation
- Livelihood re-training opportunities (When will more be available? How to get funding to host such an event/apprenticeship?)
- They are interested in the economic and social impacts of the oil spill

Human dimensions: Community impacts

- Community perceptions of oil spill impacts
- Impact on seafood industry - How will DWH oil spill affect the livelihoods of fishing communities in the long-term?
- Impacts to fishing communities
- Impacts to fishing community (and ultimately the economy)

- Impacts to seafood industry
- Long-term and short-term impacts (statistics) to for-hire fishing
- Survey of areas in Gulf that still have not recovered (commercial fishers are seeing areas in the Gulf where there was but no longer is any life)

Human dimensions: Other related topics

- Human dimensions
- Human dimensions/ socio-economics linked with the environment as well as policy
- Species specific population changes
- Vulnerability of cultural sites - during disasters and disaster response efforts
- The social aspects of oil spill science - impacts on coastal communities, coastal restoration and economies

Tar Balls and Oil Mats

- Tar balls (six mentions within input session results)
- Public health - vibrio and oil, tar balls, dispersants (referred to calls re: increased vibrio cases because of the oil spill)
- Submerged oil mats
- Tar ball handling, how to clean off residue if contact is made with a tar ball
- Tar balls - related to beach re-nourishment (when sand is pushed toward the water, tar balls might be exposed)
- Tar balls - toxicity level on own and with Corexit, impact over time
- Tar balls (number on beach before spill; percentage of oil)
- Tar balls and tar mats
- Tar balls and tar mats, water quality - Is it OK to swim in the water? Are tar balls harmful?
- Tar balls, sand patties and other forms of oil that end up on beaches (and can affect camping)
- Tar balls/weathered oil/tar mats - What is their impact on environmental/human/wildlife health?
- Tar mat - especially interested in mapping tar mats between sandbars off of Gulf Shores, AL
- Why are tar balls still washing up?

Data Needs

- Comprehensive baseline data - Is this available?
- Data
 - Need baseline data to be prepared for/track impact of disasters
 - Data from current research projects can serve as pre-assessment data in case of future events (immediate and long-term scale)
- GOMEXSI, an inventory of life in the oceans - data needs re: food web, interactions, impacts (<http://gomexsi.tamucc.edu/>)
- Overall trends and indications in research findings (impact patterns, fluctuations in insect/plant populations, etc.)
- Information on other types of spill science (diesel = #most common type of chemical spilled)
- Long-term access to data
- Primarily data access/sharing long-term monitoring

Communications

- Communicating, sharing and partnering on oil spill issues between agencies, organizations, entities, etc.
- Communication

- Communication - need a designated “team” of experts to funnel questions to during a disaster
- Ways to collaborate with oil spill science team's outreach program
- Outreach
 - One unified, common message
 - Include info learned from Deepwater Horizon oil spill
 - Products – help public understand why decisions are made/techniques used, Oil Pollution Act (OPA) 101, Booming 101, Oil 101 (different types of oil, based on geographical region)
 - National/area contingency plans (and define local role), created for elected officials, tourism, local emergency managers
 - Trainings - Couldn't cleanup at night
 - Could help with future efforts
 - Liquid Nitrogen Gas (LNG) – coming to area; learn from other regions
- The streamlining of oil spill information between entities

Synthesis

- What products does the oil spill outreach team have or will make available from the science?
- Overall synthesis of this research into products to support management
- Synthesis as it relates to timing - can groups synthesize data in a timely manner, for planning and response?
- Synthesis - What is the plan to bring the pieces of the puzzle together?

Monitoring

- Is there a monitoring system to understand currents (and therefore transport of oil and dispersants)?
- Life of an oil spill — media, students, natural resource managers -what happens when oil spill happens from birth to death — what happens physically and chemically---then can say what can happen to the spill over time
- Long-term monitoring of impacts

Other Topics

- General info about the oil spill - What occurred? What are the impacts?
- General overview of prior oil spill conditions
- Long-term effects of oil spill
- How do we integrate research conclusions into plans?
- Resources – U.S. Coast Guard’s incident report – contains useful information for the team; details about the level of preparedness during and after the spill
- Community assessment for public health emergency response (CASPER) survey (AL) – public health information
- The benefits of the rigs to reef program
- Naturally occurring seeps
- Long-term impacts
- Overall scale/relevance of impacts
- Other issues/questions - Mississippi River , freshwater supply, hypoxia, currents
- Possible differentiation between local and oil effects
- Prevention of future spills - investment, redundancy in safety check
- Severity index created for individual vs. ecosystem or local vs. Gulf-wide impacts
- Shale as a potential export because it is a "condensate"- as potential future interest in the South Texas region
- Technology

- Tidal inundation studies
- Timeline of effects? What is the endpoint?
- What is the timeline for effects? What is the endpoint (i.e., how will we know that we are done seeing effects from the spill)? Is there an endpoint?
- What magnitude of impacts will be over time how impacts inter-relate across ecosystem and how to improve response
- Where to direct oil spill calls - person was inundated with phone calls from public during oil spill and did not know where to direct them
- Can we really claim causality for many things we *believe* to be oil spill related?
- Cause and effect studies
- Do we know all that we could, i.e., did the spill affect more than we realized?
- Bathymetry, wave energy and action (building- islands, restoration) - inside Mississippi Sound nearshore
- Beach re-nourishment, protocols with tar balls, how to handle sand from possibly oiled sites