



STATE OF WASHINGTON  
OIL SPILL ADVISORY COUNCIL

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February 12, 2009

Dear Governor Gregoire, Washington Legislators, Department of Ecology, and Washington Federal Congressional Delegation:

The Washington Oil Spill Advisory Council presents to you its most recent technical study called *Assessment of Capacity in Washington State to Respond to Large-scale Marine Oil Spills*.

This study measures whether the oil spill response resources (equipment and personnel) available for spill response in Washington are sufficient to effectively contain, clean up, and mitigate environmental impacts from a very large spill. The study considers response capacity for five different spill response methods: on-water mechanical recovery, non-mechanical recovery of oil such as chemical dispersants and burning of oil, sensitive shoreline protection, clean up of oiled shorelines to prevent the remobilization of oil, and oiled wildlife response.

A number of elected officials from Washington's Executive and Legislative branches expressed interest in whether Washington has enough capacity to effectively respond to a catastrophic oil spill. Therefore, the Council conducted this study. This study is published on the Council's website at [http://governor.wa.gov/osac/assets/pdf/2009report\\_combined.pdf](http://governor.wa.gov/osac/assets/pdf/2009report_combined.pdf), and copies are available by contacting the Council. The study's Executive Summary is attached.

Washington has one of the top oil spill programs in the country. Yet, this study shows that we must do a better job of requiring potential spillers to have assured access to sufficient physical infrastructure and personnel, or Washington will lack the capacity to effectively respond to a 50,000 barrel oil spill, let alone a spill as big, or larger than, the Exxon Valdez.

After reviewing the study's results, I believe a number of policy changes are prudent. As Chairman, I have issued proposed policy recommendations to the full Council. These proposed policies are to be debated and considered for adoption on April 16, 2009, at the Council's next meeting. These recommendations are attached and also available at <http://governor.wa.gov/osac/assets/pdf/policyrecommendations.pdf>.

Additionally, I believe that as we approach the twentieth anniversary of the Exxon Valdez oil spill this March, the study highlights the need to fully fund Washington's oil spill programs at the Department of Ecology and the Department of Fish and Wildlife.

Going into the Twenty First Century, we need better funded oil spill programs so that we can modernize and be even more vigilant against oil spills.

**The following excerpts show the study's principle findings.**

**In evaluating the capacity for mechanical on-water recovery, this study found the following:**

- Washington has the capacity to recover between 9,500 and 19,500 barrels of a 50,000 barrel instantaneous release during the first 48 hours, using existing resources.
- On-water recovery capacity would be reduced if non-dedicated resources, such as equipment or personnel, are not available during a spill. There is uncertainty about the availability of the resources.
- For an oil spill that threatens to impact multiple sensitive shorelines that are protected by Geographic Response Plans (GRPs), there may not be sufficient workboat or personnel resources to allow for concurrent on-water recovery and GRP deployment operations. Such a shortfall would have the effect of reducing either on-water recovery capacity, GRP deployment capacity, or both.

**In evaluating the feasibility limits for on-water recovery, this study found that several factors can impede response effectiveness:**

- Wind and wave conditions will preclude on-water recovery, GRP deployments, dispersants, and in-situ burning at various limits. The numeric predictions made by the study will likely be reduced by some degree by feasibility limitations.
- There is geographic and seasonal variability to response feasibility limits. In the winter, on-water mechanical recovery is predicted to be not "possible / effective" only five percent of the time in protected waters, but 42 to 78 percent of the time in unprotected waters.
- Oil may reach the beach before it can be encountered by response equipment. Depending on location and conditions, a spill may beach within six to 48 hours. Beaching of oil can also negatively impact this study's numeric estimates.
- Visibility limits such as daylight and fog also will necessarily reduce or preclude spill response effectiveness.

**Highlights from Chairman Cooper's proposed policies to the full Council are as follows.**

1. Assure there are sufficient available and dedicated spill response equipment and personnel resources to collect, within 48 hours, 70 percent of an Exxon Valdez sized oil spill, which would be 257,000 barrels or over 10.7 million gallons.
2. Make a quantum leap in the amount of spill response equipment available for use in Washington in the early hours after a spill if capacity in Washington will be sufficient to collect 70 percent of over 250,000 barrels within 48 hours.

3. Get spill response resources on scene twice as fast and plan to collect more oil faster, before it can disperse and become largely unrecoverable.
4. Evaluate capacity by examining complete recovery systems, not just skimmers. Use the internationally accepted *ASTM F-1780-97* method to evaluate how much oil recovery systems can collect, not the less rigorous EDRC method.
5. Take steps to enhance the degree of certainty that non-dedicated resources will be available on the day of an oil spill.
6. Enhance oil spill drills in Washington to mitigate uncertainties regarding the availability of non-dedicated resources and trained personnel, and the ability to concurrently conduct on-water recovery and deploy Geographic Response Plans.

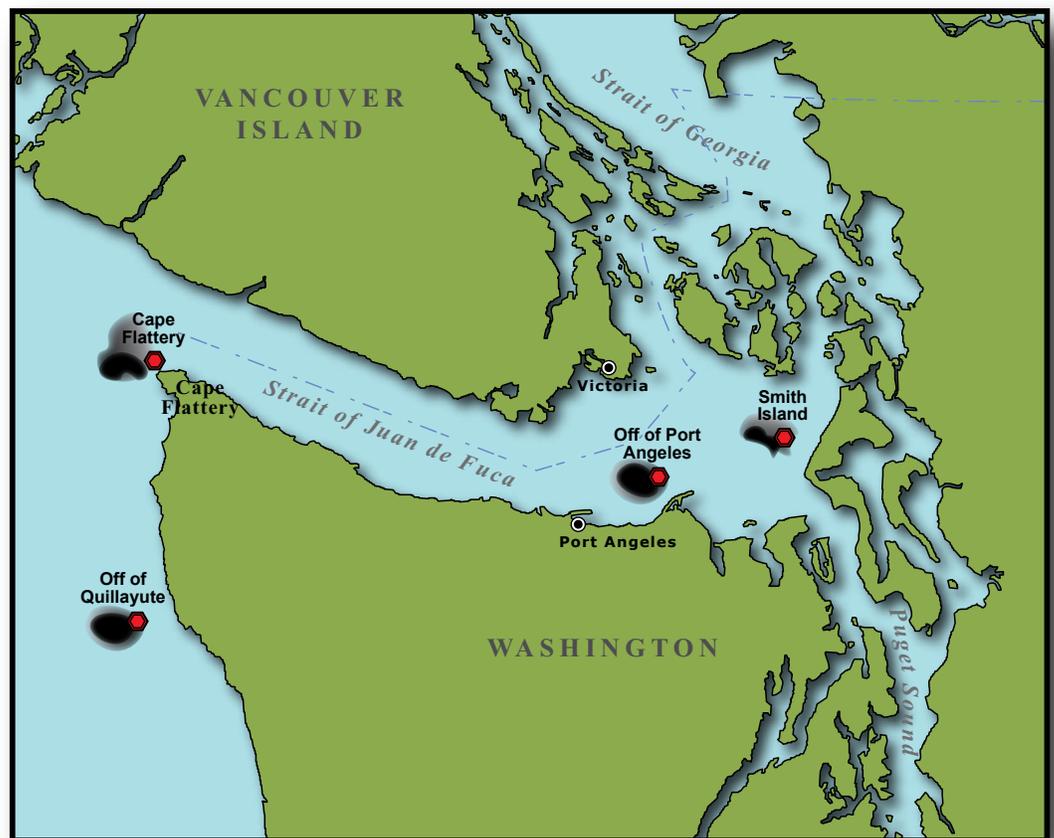
Thank you. Please do not hesitate to contact Council staff if you have any questions about this report.

Very respectfully,

A handwritten signature in cursive script that reads "Mike Cooper". The signature is written in dark ink and is positioned above the typed name and title.

Mike Cooper, Chair  
Washington Oil Spill Advisory Council

# Assessment of Capacity in Washington State to Respond to Large-scale Marine Oil Spills



*February 2009*

Prepared by: Washington State Oil Spill Advisory Council

# Executive Summary

The purpose of this report is to provide the citizens of Washington State with an assessment of the current marine oil spill response capacity available in Washington State. Specifically, the study sought to measure whether the oil spill response resources (equipment and personnel) available for a spill in Washington would be sufficient to effectively contain, clean up, and mitigate environmental impacts from an oil spill. The study uses several oil spill scenarios in order to assess response capacity for a range of spill volumes.

This study considers response capacity for five different spill response methods: on-water mechanical recovery of oil, sensitive shoreline protection, non-mechanical response methods such as chemical dispersants, cleanup of shorelines to prevent beached oil from remobilizing, and oiled wildlife response. Each analysis is conducted separately, using discrete methodologies. Combined capacity is not assessed, nor can the estimations for each response be considered cumulatively. Limits placed on response feasibility by environmental conditions that may exist at the time of a spill are discussed as they relate to all response methods; potential reductions to response capacity are described.

This study estimates the amount of response capacity available for spill in Washington. It does not make broad determinations regarding how much capacity is “enough.”

While these results estimate capacity based on 2008 information, the results of this study remain valid, absent any dramatic changes to response resources or infrastructure.

1. This report addresses the following questions:  
What is Washington’s capacity to recover oil using mechanical on-water recovery systems?
2. What is Washington’s capacity to protect a sensitive shoreline areas, primarily through geographic response plan deployment?
3. What is Washington’s capacity to use non-mechanical response methods (in situ burning or dispersants) to remediate an on-water spill?
4. What is Washington’s capacity to prevent beached oil from being remobilized into the environment? Once oil hits a shoreline or near-shore area, how much oil can we likely recover before it refloats or further penetrates into shoreline substrate?

5. What is Washington’s capacity to treat and rehabilitate large numbers of birds and mammals injured from a large oil spill?
6. When, where, and how frequently will weather conditions limit our ability to mount a response? How often will response be impaired or not practical due to poor visibility, high currents, and winds and waves? How often would oil beaching during the first 48 hours limit the capacity recover, disperse, or burn the oil?

### **On-Water Recovery Capacity**

In evaluating the capacity for mechanical on-water recovery, this study found the following:

- Washington has the capacity to recover between 9,500 and 19,500 barrels of a 50,000 barrel instantaneous release during the first 48 hours, using existing resources. In general, response capacity is higher for geographic areas that are located within close proximity of equipment caches.
- On-water recovery capacity estimations can be dramatically limited by environmental conditions that may exist at the time of a spill. These are discussed as “response feasibility” in this report.
- On-water recovery capacity would also be reduced if non-dedicated resources, such as equipment or personnel, are not available at the time of the spill. The availability of non-dedicated resources is not certain.

On-water recovery capacity estimates are built on a series of optimistic assumptions, including assumptions regarding response equipment capabilities.

### **Sensitive Shoreline Protection**

In evaluating the capacity for sensitive area protection, this study found the following:

- Demand for boom, workboats, and response personnel to implement sensitive area protection through Geographic Response Plan (GRP) deployment will vary depending upon the timing and severity of potential impacts to GRP sites.
- For an oil spill that threatens to impact multiple GRP sites, there may not be sufficient workboat or personnel resources to allow for concurrent on-water recovery and GRP deployment operations. Such a shortfall would have the effect of reducing either on-water recovery capacity, GRP deployment capacity, or both.

### **Non-Mechanical Response**

In evaluating the capacity for non-mechanical response, this study found the following:

- It is estimated that effective dispersant application could treat between 1,400 and 8,000 barrels of a 50,000 barrel release, using available resources. If this were done concurrently with on-water recovery, there is a significant chance that the on-water recovery estimate would have been less optimistic because dispersing oil makes it harder to collect.
- It is estimated that effective in situ burning could treat as much as 4,800 barrels of a 50,000 barrel spill, based on availability of fire boom.

### **Shoreline Cleanup to Prevent Remobilization of Oil**

In evaluating the capacity for shoreline cleanup, this study found the following:

- Thousands of trained shoreline cleanup personnel could be required to respond to a 50,000 barrel release under high-consequence conditions. Hundreds may be needed in response to a less serious spill in better conditions. This study estimates that a maximum of 684 shoreline response personnel are available in Washington. However, the availability of all these workers is not certain.
- Additional mechanical shoreline cleanup equipment would improve shoreline cleanup capacity.

### **Wildlife Response**

In evaluating the capacity for wildlife response, this study found the following:

- Washington does not presently have the capacity to treat the 6,000 birds that could be oiled by a major spill. Washington's may soon reach capacity to rehabilitate 100 birds. Thereafter, through a planning processes, Washington will strive to meet the current legal capacity standards to treat up to "1,000 plus" birds, around 1,500 birds.
- Current legal standards pose no capacity requirements for treating mammals. Washington is working to develop a hazing plan to navigate large mammals away from spill areas. Washington has capacity to treat only a few pinnipeds, such as harbor seals and up to 25 sea otters.

### **Response Feasibility**

In evaluating the feasibility limits for on-water recovery, sensitive area protection, and non-mechanical response, this study found the following:

- Several factors can impede response effectiveness.
- Wind and wave conditions will preclude on-water recovery, GRP deployments, dispersants, and in situ burning at various limits.
- There is geographic and seasonal variability to response feasibility limits. For example, in the winter, on-water mechanical recovery is predicted to be not “possible/effective” only five percent of the time in protected waters, but 42 to 78 percent of the time in unprotected waters. Annually, on-water recovery is possible in all areas, except at the mouth of the Columbia River, over 50 percent of the time. Dispersant use in unprotected waters will be not “possible/effective” 30 percent of the time in the winter, but at least 54 percent of the time in the summer.
- Oil may reach the beach before it can be encountered by response equipment, which would cause an opportunity loss for spill recovery or treatment. Depending on location and conditions, a spill may beach within six to 48 hours.
- Visibility limits such as daylight and fog will necessarily reduce or preclude spill response effectiveness.

These limits were not factored into the numerical estimates of response capacity for on-water recovery, sensitive shoreline protection, non-mechanical on-water response, preventing remobilization of oil through shoreline cleanup, or oiled wildlife response operations.

### **Ideas for Improvement**

The chapter summaries at the end of each chapter more fully discuss these technical findings and provide technical and practical ideas for improving response.

### **Limitations of Study**

This study likely overestimates response capacity for each response method, because the capacity estimates do not reflect realistic constraints posed by competing resource demands, loss of opportunity to encounter oil due to weathering and beaching, efficiency losses caused by a range of factors, uncertain resource availability, and the potential for multiple response modes to compete with or discount the effectiveness of other modes.

This study relies on modeled scenarios, and therefore the applicability of results is related to how closely the modeled conditions (environment, tactics, and efficiency assumptions) mirror reality. This study used scenarios that were as representative as possible to spills that occur in Washington. Data limitations may have also impacted results, particularly for the response feasibility analysis. Assumptions regarding response tactics and work rates could also impact the results. Uncertainties regarding resource availability are acknowledged, but are not applied quantitatively to change numeric estimations.

At every juncture where uncertainties existed or assumptions were required, this study chose to apply optimistic or favorable assumptions, in order to ensure that the response capacity estimate reflected maximum capacity under the best possible conditions.

Chapter 7 of this report more fully discusses strengths and limitations of this study. Also, the Introduction to this report provides a brief discussion of the this study's approach and selection of methods, of the assumptions used, and of the uncertainties impacting capacity estimates.

### **Public Policy Implications Regarding How Much Response Capacity is Enough**

This study estimates that the maximum on-water recovery capacity for the first 48 hours of a 50,000 barrel spill is between 9,500 and 19,500 barrels, depending on location. To derive this estimation, this study evaluates all available resources that could be brought to bear within 48 hours. Had the spill scenarios this study evaluates exceeded 50,000 barrels, there would not have been an appreciable increase over 48 hours in available response resources.

While this study does not make judgments about whether this capacity is *enough*, it may be appropriate for policy makers to make such a determination.

For example, while this study does not address a catastrophic marine oil spill, Washington may be at risk of oil spills ranging in size from 250,000 to two million barrels. Given this study's findings about the capacity to respond to a 50,000 barrel oil spill, it is reasonable to consider whether additional improvements are needed to prepare for a catastrophic event.

### **Implications of this Study to Future Oil Spill Response and Preparedness Planning**

Finally, the analysis in this study enhances our understanding of oil spill response capacity considerably. Yet, it also establishes a foundation for future analyses.

The response capacity estimates in this report could be used by spill response managers when selecting response tactics or gauging resource needs for any size oil spill. For example, the response capacity estimates about on-water recovery or non-mechanical response estimates may help response managers to create realistic expectations about the likely effectiveness of initial response efforts. A better understanding of response feasibility limits will also enhance response decision-making.

The response capacity calculations used in this study could be revisited with additional spill response resources to predict how additional equipment might impact overall capacity. Such information can help to guide future equipment purchases.

**DRAFT PROPOSED POLICY RECOMMENDATIONS FROM CHAIR**  
**Policy Recommendations of the Washington Oil Spill Advisory Council**  
*Enhancing Capacity in Washington*  
*To Respond to Large-scale Marine Oil Spills*

## **RECOMMENDATIONS**

These recommendations apply to state and federal legislative and executive bodies as indicated by context. It is the Council's hope that the minimum standards and assurances set forth in these recommendations will be implemented through law or regulation.

### **1. Assure Capacity Exists to Collect 70 Percent of a Catastrophic Spill within 48 Hours**

Regulators should assure that sufficient dedicated spill response equipment and personnel resources are available to collect, within 48 hours, 70 percent of an Exxon Valdez sized oil spill, which would be 257,000 barrels or over 10.7 million gallons. While a spill this size would be catastrophic, it is not the largest spill possible in Washington. It would be possible for there to be an instantaneous release spill of well over 800,000 barrels, over three times larger than the Exxon Valdez spill.

Achieving this level of capacity—the ability to pick up nearly 180,000 barrels of oil in 48 hours—could be accomplished through the recommendations below taken as a whole.

### **2. Make Quantum Leap in Available Equipment Caches**

There must be a quantum leap made in the amount of spill response equipment available for use in Washington in the early hours after a spill, if capacity in Washington will be sufficient to collect 70 percent of over 250,000 barrels within 48 hours. The public expects enough capacity to handle a catastrophic oil spill, and RCW 90.56.210(1)(b) requires it.

In addition, the following equipment additions warrant particular attention as possibilities to improve capacity. Acquiring additional dedicated oil storage devices for vessel skimmers that have little storage capacity would enhance on-water recovery capacity. Acquiring Current Buster recovery systems also would help decrease the demand for portable storage. Requiring the use of proven, state-of-the-art technologies as dedicated resources would improve on-water recovery on the outer coast's unprotected seas. This would include the Ocean Buster and the high-capacity skimmers and off-shore-recovery-classed supply vessels used in the Norwegian Sea. Requiring the dedicated use of proven technologies capable of tracking and remotely sensing oil (ultraviolet spectrum analysis) and then automatically generating GIS/GPS maps (Scanning Laser Environmental Airborne Fluoresensor) would increase response feasibility in darkness and fog. Requiring proven technologies, such as the Current Buster, for booming and skimming oil in high-current areas would increase capacity in high-current environments. Also, additional all-terrain vehicles mounted with scrapers, bob cats, and "Super Sacks" would assure that mechanical beach cleanup is possible if authorizing agencies allow mechanical recovery of oil from beaches to prevent oil from remobilizing.

**Policy Recommendations from Washington Oil Spill Advisory Council**  
*Enhancing Capacity in Washington to Respond to Large-scale Marine Oil Spills*

### **3. Get Resources on Scene Twice as Fast**

Regulators should require a significant increase in the percentage of oil that contingency plan holders must plan to recover in the early hours of a spill—before oil can disperse and become largely unrecoverable. It would help to double the speed with which plan holders must plan to have response equipment arrive on scene and to increase the amount of oil they must plan to collect by hour 48. This could be implemented with the next contingency planning rule revision as follows:

- a. Amend WAC 173-182-355 to -430 to require, at a minimum, that the resources currently required to arrive on scene at hour six be required to arrive on scene at hour three, and so on. In addition, define “on scene” to mean the edge of a planning area farthest from the equipment’s location, not the closest.
- b. Amend WAC 173-182 to require that equipment be stored in more locations around Washington’s marine waters.
- c. Amend WAC 173-182-355 to -430 to increase the volume of oil that plan holders must plan to recover by hour six through 42, ultimately requiring that plan holders plan to collect 180,000 barrels by hour 48. Following in Alaska’s footsteps, the Council finds that it would be reasonable to significantly increase the amount of oil that plan holders must plan to collect. Alaska law (18 AAC 75.438) requires sufficient resources to control and cleanup, within 72 hours, up to 300,000 barrels for cargo volumes greater than 500,000 barrels.
- d. Amend WAC 173-182-355 to -430 to require that plan holders show the capability to conduct on-water recovery operations and deploy geographic response plans (GRPs) 24 hours a day.

### **4. Use ASTM Method to Determine On-water Recovery Capacity**

To evaluate how much oil can be collected by skimmers and their recovery systems, use *ASTM F-1780-97 (2002), A Standard Guide for Estimating Oil Spill Recovery System Effectiveness*, not the currently used Effective Daily Recovery Capacity method.

Develop a technical manual illustrating how recovery systems in Washington could be assembled, including storage. An example of this is Alaska’s SERVS Technical Manual that identifies task forces and components.

### **5. Enhance Degree of Certainty that Non-dedicated Resources Will be Available on the Day of an Oil Spill**

It is possible to mitigate the concern that equipment relied upon for contingency planning will not be available on the day of an oil spill for spill response by implementing the following six recommendations. “Resources” means workboats (including tugs and barges), shoreline cleanup equipment, workboat operators, and shoreline cleanup workers.

#### **Policy Recommendations from Washington Oil Spill Advisory Council**

*Enhancing Capacity in Washington to Respond to Large-scale Marine Oil Spills*

- a. Dedicated Resources Only Before 48 Hours: Count only dedicated resources in contingency plans toward resources needing to be on scene before hour 48 and toward resources needed to comply with minimum planning standards.
- b. Firm Commitments Only: In contingency plans, include only dedicated resources unless plan holders show they have contractually guaranteed access to that equipment as well as appropriately trained dedicated personnel to operate that equipment. Contracts for dedicated resources must create a commitment more firm than “you can use the resources *if they are available*.”
- c. Location of Resources: Require that resources, including personnel, who will be needed within the first 24 hours are stationed where there is a reasonable assurance they will be on-scene within the timeframes set forth in the planning standards. Additionally, add columns to the worksheets used to evaluate contingency plans memorializing an evaluation of the availability of dedicated workboats and personnel for various tasks, including workboat operation and shoreline cleanup.
  - Shoreline Cleanup Workers: Regarding the availability of shoreline cleanup workers to prevent beached oil remobilization, do not grant final approval of contingency plans until plan holders demonstrate they have access to enough shoreline cleanup workers for a spill that requires many hundreds of workers within the first 48 hours. A certain portion of these workers should be dedicated. Additionally, amend WAC 173-182-520 so that it does not simply rely on the federal planning standard, but rather provides a numeric and timeframe standard similar to the other planning standards set forth in WAC 173-182 (for example, 100 shoreline cleanup workers within six hours).
  - Shoreline Cleanup Equipment: Regarding the availability of heavy equipment for preventing beached oil remobilization, do not grant final approval of contingency until plan holders demonstrate they have sufficient dedicated heavy equipment, transfer, and storage devices to conduct beach removal operations. Additionally, amend WAC 173-182-520 so it does not simply rely on the federal planning standard, but rather provides a numeric and timeframe standard similar to the other planning standards set forth in WAC 173-182 (for example, 20 all terrain vehicles mounted with scrapers, bob cats, and 1,000 “super-sacks” within 12 hours).

## **6. Enhance Oil Spill Drills done in Washington**

Oil spill drills in Washington should be enhanced as follows to mitigate uncertainties regarding the availability of non-dedicated resources and trained personnel, and the ability to conduct concurrent on-water recovery operations and GRP deployments.

- a. Councils Participation in Drills: Immediately facilitate the Council's participation at drills in which the Washington Department of Ecology Spills Program is involved.
- b. Deployment Drills; Size and Complexity: Increase the size and complexity of deployment drills so there is certainty that the equipment and personnel that contingency plans and paper-tabletop-drills show to be available actually will be available and can be properly managed during spill response. A significant portion of the resources should be deployed and tasked, not piecemeal, but all at once.

Instill a mantra during drills of immediately responding to a spill's potential, regardless of the oil reported to be spilled. This approach may cause over-responses, but this is better than under-responding.

- c. Recovery Systems: Set up drills to collect information about how recovery systems would be assembled given the spill scenario for the drill. Meet this requirement with dedicated resources only.
- d. Mechanical and Human Resources; Availability / Ability to Use: Set up drills to test the actual availability and ability to use mechanical and personnel resources. This would include:
  - The availability of best new technologies for seeing oil in limited visibility situations and proficiency in sending GPS-based field reports to command, having command translate those into operational directives, and electronically sending these to the field.
  - "Toes on the line" requirements for workboat crew and shoreline cleanup workers, particularly foremen and forewomen, in addition to a demonstration that trainings and certifications are current.
  - The availability of beach cleanup equipment for preventing the remobilization of oil.