



# U.S. Environmental Protection Agency Geographic Response Plan - 2018 Merrimack River (MR-11A) Exercise

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After Action Report

August 14, 2018

The After-Action Report/Improvement Plan (AAR/IP) aligns exercise objectives with preparedness doctrine to include the National Preparedness Goal and related frameworks and guidance. Exercise information required for preparedness reporting and trend analysis is included; users are encouraged to add additional sections as needed to support their own organizational needs.

## EXERCISE OVERVIEW

<b>Exercise Name</b>	2018 Merrimack River (MR-11A) Exercise
<b>Exercise Date</b>	August 14, 2018
<b>Scope</b>	This exercise was a Full Scale Exercise, planned for approximately six hours in Hooksett and Bow, NH, and upon the waters of the Merrimack River. Exercise play was limited to the Merrimack River and the adjacent shoreline in the vicinity of the Ferry Street Boat Ramp in Hooksett, NH.
<b>Mission Area(s)</b>	Response
<b>Core Capabilities</b>	Environmental Response/Health and Safety, Operational Coordination, Operational Communications.
<b>Objectives</b>	<p>Objective 1: Demonstrate the ability to deploy oil spill equipment utilizing common Geographic Response Plan (GRP) tactics.</p> <p>Objective 2: Demonstrate the ability to assemble a spill response organization utilizing Incident Command System (ICS) principles through development and execution of an Incident Briefing (ICS 201) and implementation of on-site incident management and tactical operations.</p> <p>Objective 3: Demonstrate the ability to effectively communicate between multiple local, state, and federal agencies including fire departments, police departments, and other state and federal first responders.</p>
<b>Threat or Hazard</b>	U.S. Environmental Protection Agency.
<b>Scenario</b>	An oil spill has occurred in the Merrimack River. Pembroke, NH has been designated the best location to respond to the spill. Responders will utilize GRP MR-11A to deploy boom to protect sensitive resources in the vicinity of Pembroke, NH and other areas downriver.
<b>Sponsor</b>	U.S. Environmental Protection Agency.
<b>Participating Organizations</b>	<p>Participating organizations included:</p> <ul style="list-style-type: none"><li>• New Hampshire Department of Environmental Services (DES)</li><li>• New Hampshire Department of Cultural Resources, Division of Historical Resources</li><li>• Central New Hampshire HAZMAT Team</li></ul>



- U.S. Coast Guard (USCG)
- U.S. Environmental Protection Agency (EPA)
- Nuka Research and Planning Group, LLC (Nuka Research)

Note: See Appendix B for participant count.



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New Hampshire DES and Allenstown FD vessels  
work together to deploy boom.



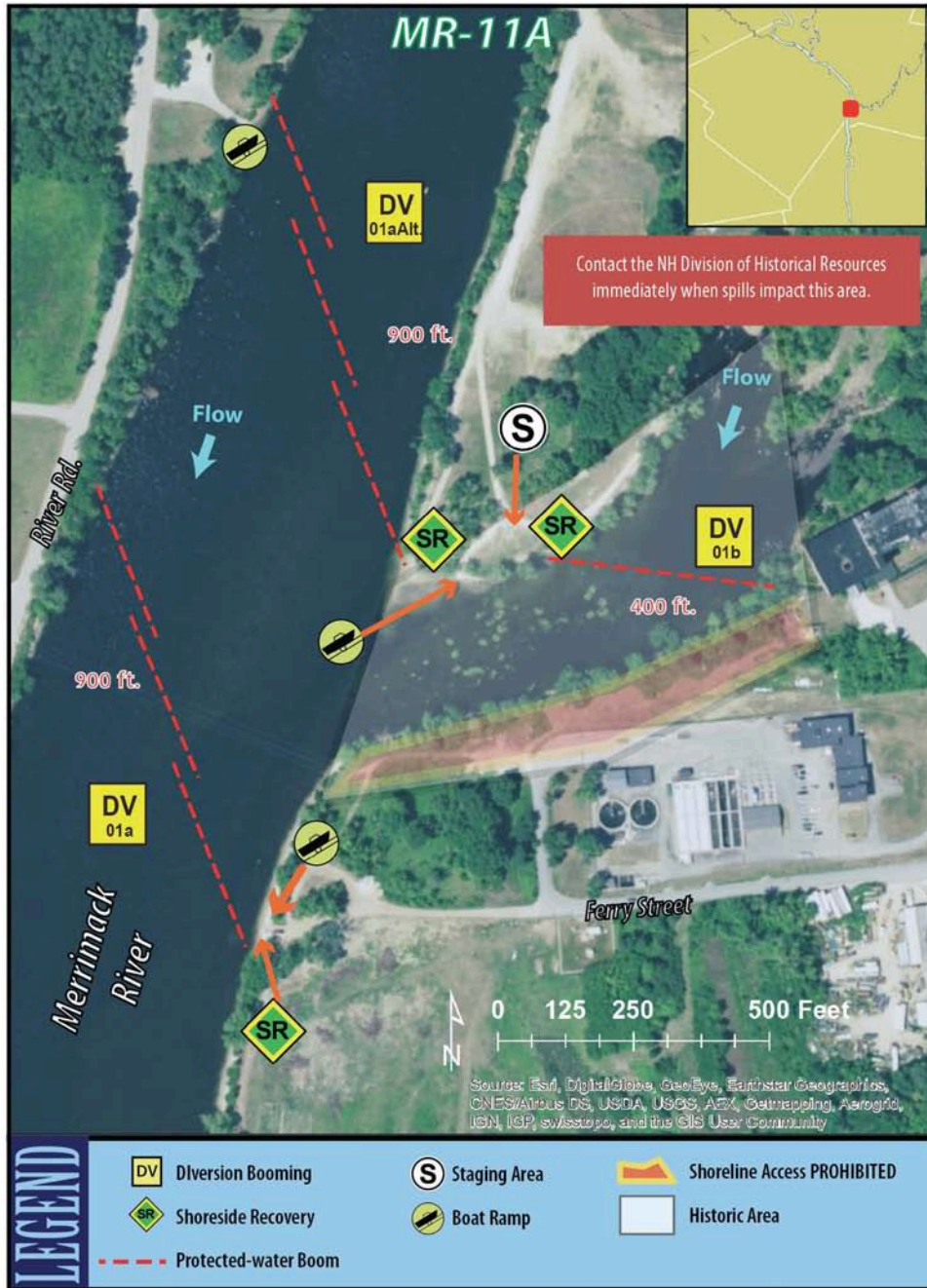
Exercise participants conduct an  
operational briefing prior to deploying boom.



Photos courtesy of Nuka Research & Planning Group



Merrimack River Geographic Response Plan  
Suncook/Hooksett MR-11



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Nuka Research and Planning Group, LLC  
Data Sources: Nuka Research & Planning Group, LLC, US EPA Region 1

Figure 1. Merrimack River MR-11A GRP

## ANALYSIS OF CORE CAPABILITIES

Aligning exercise objectives and core capabilities provides a consistent taxonomy for evaluation that transcends individual exercises to support preparedness reporting and trend analysis. Table 1 includes the exercise objectives, aligned core capabilities, and performance ratings for each core capability as observed during the exercise and determined by the evaluation team. Table 2 includes compiled data from the Exercise Evaluation Guide (EEG) including the organizational capability targets, associated critical tasks, and observations as observed during the exercise and determined by the evaluation team.

Objective	Core Capability	Performed without Challenges (P)	Performed with Some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
Demonstrate the ability to deploy oil spill equipment utilizing common Geographic Response Plan (GRP) tactics.	Environmental Response/ Health and Safety	P			
Demonstrate the ability to assemble a spill response organization utilizing Incident Command System (ICS) principles through development and execution of an Incident Briefing (ICS 201) and implementation of on-site incident management and tactical operations.	Operational Coordination	P			
Demonstrate the ability to effectively communicate between multiple local, state, and federal agencies including fire departments, police departments and other state and federal first responders.	Operational Communications	P			
<p><b>Ratings Definitions:</b></p> <ul style="list-style-type: none"> <li>• Performed without Challenges (P): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.</li> <li>• Performed with Some Challenges (S): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.</li> <li>• Performed with Major Challenges (M): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s), but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks for the public or for emergency workers; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.</li> <li>• Unable to be Performed (U): The targets and critical tasks associated with the core capability were not performed in a manner that achieved the objective(s).</li> </ul>					

**Table 1. Summary of Core Capability Performance**

Core Capability	Organizational Capability Target	Associated Critical Tasks	Observation Notes
<p><b>Environmental Response/ Health and Safety</b></p>	<p><b>Booming Operations</b></p>	<ul style="list-style-type: none"> <li>• Transport and tow boom.</li> <li>• Anchoring and Connecting boom to shore</li> <li>• Safe vessel and crew operations. (Refer to ICS-208)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Performed Without Challenges (P)</b></li> <li>• All operations conducted in a safe manner.</li> <li>• NH DES vessel proved to be a very capable asset as it towed all the boom into position and repositioned anchors to achieve the desired cascade configuration for tactic DV-01a. Extraordinary skill was demonstrated in towing sections of boom upriver.</li> <li>• The Allenstown FD vessel deployed the oil surrogate (peat moss) and served as the safety vessel for the exercise. The vessel could not tow boom because it did not have a tow bit. Towing boom from the stern is the proscribed method when towing for any distance other than maneuvering to prevent engine damage. A tow bit would also allow it to safely tow another vessel in a search and rescue scenario as well. <b>Recommendation:</b> <u>Recommend installation of a tow bit on the Allenstown FD vessel to increase its effectiveness in oil spill response by allowing it to tow boom.</u></li> <li>• NH DES equipment was readily available in the response trailer. The 12-inch boom appeared to have been used on multiple occasions and is at the end of its service life. <b>Recommendation:</b> <u>Repair or replace the 12-inch boom in the NH DES trailer</u></li> <li>• The shore team did an outstanding job of faking the boom out on the boat ramp, facilitating its deployment into the water.</li> <li>• Boom was secured to both banks of the Merrimack River using tree straps. The NH DES boat crew did an outstanding job of utilizing a tree strap to secure boom to the west bank while the shore team on the east bank did an excellent job of using another tree strap to secure boom to the shore</li> <li>• The shore team effectively accomplished boom recovery. They showed great teamwork in recovering the boom and loading it into the NH DES trailer on the boat ramp.</li> <li>• Safety Officer did an outstanding job of ensuring lifejackets were worn at all times and ensuring safe booming operations.</li> <li>• Hands-on training for equipment use was very effective.</li> </ul>
	<p><b>Implement Tactics in GRP</b></p>	<p>Diversion Boom (DV-01a)</p>	<ul style="list-style-type: none"> <li>• <b>Performed Without Challenges (P)</b></li> <li>• Due to increased water levels in the Merrimack River, the DV-01a tactic was modified slightly by increasing the length of boom to 1100 feet by increasing the southernmost section to 500 feet of 12" boom.</li> <li>• The prevailing current drove the surrogate along the length of the DV-01a tactic. The northernmost section effectively diverted the surrogate into the middle section. Evidence of entrainment was clear at the southern end of the middle section where increased current was observed as a result of outflow</li> </ul>

			<p>from the Suncook River located east of the deployment location. Evidence of entrainment was observed all along the south section connected to the east bank of the Merrimack. The vast majority of the surrogate ended up collecting at the anticipated shore side recovery location.</p> <ul style="list-style-type: none"> <li>• The use of trip/tag lines allowed for easy adjustment of several anchors used for the for the diversion booming tactic.</li> <li>• Mooring balls were effectively used to mark the beginning point of a new section of cascade boom, effectively speeding up the deployment process and keeping the northern portion of each boom segment from being pulled underwater by the current.</li> <li>• Allenstown Fire Department and the Allenstown Sewer Commission are not listed in the contact information on page 6 of the GRP. <b>Recommendation:</b> <u>Add contact information for Allenstown Fire Department and the Allenstown Sewer Commission to GRP MR-11.</u></li> <li>• Mr Dave Trubey provided information on new locations of historically sensitive areas in and around Memorial Park. This additional information makes Memorial Park a less desirable site for conducting oil spill response operations. <b>Recommendation:</b> <u>Make revisions to MR-11 to reflect newly identified historically sensitive areas.</u></li> <li>• The staging area for this exercise was changed during the final planning meeting due to a site inspection by NH DES revealing that the condition of the boat ramp at Memorial Park had degraded since site surveys were completed and that significant improvements to the Allenstown boat launch on Ferry St had been completed, making this site more preferable to use for the exercise. Given this, DV-01a-alt and DV-01b tactics will be removed from the MR-11 GRP. In lieu of these tactics, a deflection tactic will be added in the vicinity of Memorial Park to ensure spilled oil does not impact the prohibited access area on the south bank of the Suncook River. <b>Recommendation:</b> <u>Make revisions to MR-11 to reflect upgrades to Allenstown boat launch.</u></li> <li>• A poster size GRP would have been helpful in facilitating the operations briefing for this exercise. <b>Recommendation:</b> <u>Include poster sized GRP for operational briefings for future exercises.</u></li> <li>• IC combined equipment demo with ops brief. Very effective presentation of information.</li> </ul>
<p><b>Operational Coordination</b></p>	<p><b>Create and Execute An Assignment List (ICS 201)</b></p>	<ul style="list-style-type: none"> <li>• Assignments in ICS 201 are followed and on-scene adjustments.</li> <li>• Participants demonstrate command and control of exercise</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Performed without Challenges (P)</b></li> <li>• IC effectively controlled exercise and the ICS-201 was carried out as designed. Strike teams were well organized and effectively carried out assigned tasks.</li> <li>• IC maintained constant awareness of all assets under his direction.</li> <li>• Safety Officer actively implemented the exercise safety plan (ICS-208) and was very conscientious in the execution of duties.</li> </ul>

<p><b>Operational Communications</b></p>	<p><b>Effectively Communicate Between Multiple Agencies</b></p>	<ul style="list-style-type: none"> <li>Communicate with other participants in accordance with the communications plan.</li> </ul>	<ul style="list-style-type: none"> <li><b>Performed without Challenges (P)</b></li> <li>VHF and voice communications were outstanding. There were enough marine radios for all participants and voice communications were effectively used as well when appropriate.</li> </ul>
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Table 2. Summary of Organizational Capability Targets and Associated Critical Tasks

NH DES personnel demonstrate the use of a tree strap to anchor boom to shore.



Photo courtesy of Nuka Research & Planning Group

Exercise participants prepare a segment of boom for deployment on the Merrimack River.



Photo courtesy of Nuka Research & Planning Group



The following sections provide an overview of the performance related to each exercise objective and associated core capability, highlighting strengths and areas for improvement.

## **Objective 1: Demonstrate the ability to deploy oil spill equipment utilizing common Geographic Response Plan (GRP) tactics.**

The strengths and areas for improvement for each core capability aligned to this objective are described in this section.

### **Core Capability 1: Environmental Response/Health and Safety**

#### **Strengths**

The full capability level can be attributed to the following strengths:

**Strength 1:** Participation by exercise participants from federal, state and local agencies (EPA, USCG, NH DES, Allenstown FD) was excellent and they all worked well together. All exercise participants were extremely engaged and actively involved.

**Strength 2:** The NH DES vessel proved to be a very capable asset as it towed the boom into position and repositioned anchors to achieve the desired cascade configuration for tactic DV-01a. Extraordinary skill was demonstrated in towing sections of boom upriver.

#### **Areas for Improvement**

The following areas require improvement to achieve the full capability level:

**Area for Improvement 1:** Recommend installation of a tow bit on the Allenstown FD vessel to increase its effectiveness in oil spill response.

**Reference:** N/A.

**Analysis:** The Allenstown FD vessel deployed the oil surrogate (peat moss) but and served as the safety vessel for the exercise. The vessel could not tow boom because it did not have a tow bit. Towing boom from the stern is the proscribed method when towing for any distance other than maneuvering to prevent engine damage. A tow bit would also allow it to safely tow another vessel in a search and rescue scenario as well.

**Area for Improvement 2:** Repair or replace the 12-inch boom in the NH DES trailer.

**Reference:** N/A.

**Analysis:** NH DES equipment was readily available in the response trailer. The 12-inch boom appeared to have been used on multiple occasions and is at the end of its service life.

**Area for Improvement 3:** Add contact information for Allenstown Fire Department and the Allenstown Sewer Commission to GRP MR-11.

**Reference:** N/A.

**Analysis:** Allenstown Fire Department and the Allenstown Sewer Commission are not listed in the contact information on page 6 of the GRP.

**Area for Improvement 4:** Make revisions to MR-11 to reflect newly identified historically sensitive areas.

**Reference:** N/A.

**Analysis:** Mr. Dave Trubey provided information on new locations of historically sensitive areas in and around Memorial Park. This additional information makes Memorial Park a less desirable site for conducting oil spill response operations.

**Area for Improvement 5:** Make revisions to MR-11 to reflect upgrades to the Allenstown boat launch.

**Reference:**

**Analysis:** The staging area for this exercise was changed during the final planning meeting due to a site inspection by NH DES revealing that the condition of the boat ramp at Memorial Park had degraded since site surveys were completed and that significant improvements to the Allenstown boat launch on Ferry St had been completed, making this site more preferable to use for the exercise. Given this, DV-01a-alt and DV-01b tactics will be removed from the MR-11 GRP. In lieu of these tactics, a deflection tactic will be added in the vicinity of Memorial Park to ensure spilled oil does not impact the prohibited access area on the south bank of the Suncook River.

**Area for Improvement 6:** Include poster sized GRP for operational briefings for future exercises.

**Reference:** N/A.

**Analysis:** A poster size GRP would have been helpful in facilitating the operations briefing for this exercise.

**Objective 2: Demonstrate the ability to assemble a spill response organization utilizing Incident Command System (ICS) principles through development and execution of an Incident Briefing (ICS 201) and implementation of on-site incident management and tactical operations.**

The strengths and areas for improvement for each core capability aligned to this objective are described in this section.

## Core Capability 2: Operational Coordination

### Strengths

The full capability level can be attributed to the following strengths:

**Strength 1:** IC effectively controlled exercise and the ICS-201 was carried out as designed. Strike teams were well organized and effectively carried out assigned tasks.

### Areas for Improvement

The following areas require improvement to achieve the full capability level:

**Area for Improvement 1:** None

**Reference:** N/A

**Analysis:** N/A

### **Objective 3: Demonstrate the ability to effectively communicate between multiple local, state, and federal agencies including fire departments, police departments and other state and federal first responders.**

The strengths and areas for improvement for each core capability aligned to this objective are described in this section.

## Core Capability 3: Operational Communications

### Strengths

The full capability level can be attributed to the following strengths:

**Strength 1:** VHF and voice communications were outstanding. There were enough marine radios for all participants and voice communications were effectively used as well when appropriate.

### Areas for Improvement

The following areas require improvement to achieve the full capability level:

**Area for Improvement 1:** None

**Reference:** N/A

**Analysis:** N/A

Boom is secured to the east bank  
of the Merrimack River



Photo courtesy of Nuka Research & Planning Group

Exercise participants work together to  
recover boom after the exercise.



Photo courtesy of Nuka Research & Planning Group

Oil surrogate (peat moss) put in the water is  
diverted along the DV-01a tactic toward shore.



Photo courtesy of Nuka Research & Planning Group

New Hampshire DES vessel brings  
section of boom to shore.



Photo courtesy of Nuka Research & Planning Group

## APPENDIX A: IMPROVEMENT PLAN

This IP has been developed specifically for the exercise participants of this Geographic Response Plan (GRP) Exercise conducted on August 14, 2018.

Core Capability	Issue/Area for Improvement	Corrective Action	Capability Element <sup>1</sup>	Primary Responsible Organization	Organization POC	Start Date	Completion Date
Core Capability 1: Environmental Response/Health and Safety	1. Upgrade response vessel.	Recommend installation of a tow bit on the Allenstown FD vessel to increase its effectiveness in oil spill response.	Equipment	Allenstown FD	TBD	TBD	TBD
	2. Repair/replace boom	Repair or replace the 12-inch boom in the NH DES trailer	Equipment	NH DES	TBD	TBD	TBD
	3. Revise MR-11	Add contact information for Allenstown Fire Department and the Allenstown Sewer Commission to GRP MR-11.	Planning	Nuka Research	Mike Popovich	8/21/18	9/1/18
	4. Revise MR-11	Make revisions to MR-11 to reflect newly identified historically sensitive areas.	Planning	Nuka Research	Mike Popovich	8/21/18	9/1/18
	5. Revise MR-11	Make revisions to MR-11 to reflect upgrades to Allenstown boat launch.	Planning	Nuka Research	Mike Popovich	8/21/18	9/1/18
	6. Audio-visual Aids	Include poster sized GRP for operational briefings for future exercises.	Exercise	Nuka Research	Mike Popovich	TBD	TBD
Core Capability 2: Operational Coordination	None.	None.	N/A	N/A	N/A	N/A	N/A
Core Capability 3: Operational Communications	None.	None.	N/A	N/A	N/A	N/A	N/A

<sup>1</sup> Capability Elements are: Planning, Organization, Equipment, Training, or Exercise.

## APPENDIX B: EXERCISE PARTICIPANTS

<b>Participating Organizations</b>	
<b>Town of Allenstown, NH</b>	
Allenstown Fire Department	2
<b>Town of Nashua, NH</b>	
Nashua Fire Department	1
Nashua Office of Emergency Management	1
<b>Federal</b>	
United States Environmental Protection Agency (EPA)	3
United States Coast Guard (USCG)	4
Nuka Research and Planning Group, LLC (contractor for US EPA)	2
<b>State</b>	
New Hampshire Department of Environmental Services (DES)	6
New Hampshire Department of Cultural Resources, Division of Historical Resources	1
Central New Hampshire HAZMAT Team	2
Lower Merrimack River Local Advisory Committee	1
<b>TOTAL</b>	<b>23</b>

66% of participants reported having previous GRP exercise experience.

# APPENDIX C: EXERCISE EVALUATION FORM

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**U.S. Environmental Protection Agency  
Geographic Response Plan (GRP)  
Exercise and Testing Program**

**Participant Feedback Form**

1 Strongly disagree	2 Mildly disagree	3 Neutral	4 Mildly agree	5 Strongly agree
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Please use the above rating scale to answer the questions for each of the following topics.

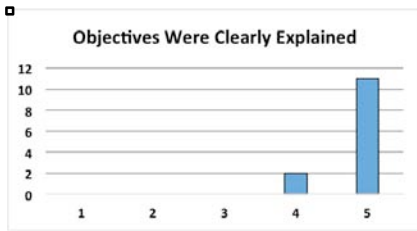
The objectives were clearly explained and the exercise met those objectives.	1   2   3   4   5
Comments:	
The hands-on training was useful and the pace of instruction was correct.	1   2   3   4   5
Comments:	
The hands-on training instructor(s) did an excellent job.	1   2   3   4   5
Comments:	
I feel more prepared to respond to an oil spill than I did before this exercise.	1   2   3   4   5
Comments:	
The best thing about this training was_____.	
This training could have been improved by_____.	

Please use the back of the sheet if you need more room for comments.

(Rev 2018)



### Student Feedback Summary



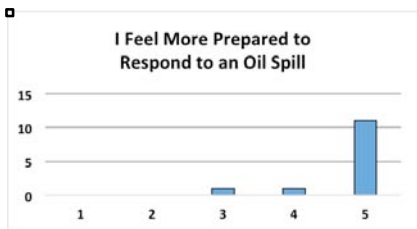
**Comments:** "I appreciate the detailed map and exercise pamphlet. Well planned exercise and GRP."



**Comments:** "Hands on training is key. I appreciate the live feedback during the exercise. Very good tips on ground tackle, things to watch out for (boom location, anchoring)."



**Comments:** "Especially the Captain...That guy was amazing."



**Comments:** None

#### The best thing about this training was...

"Good exercise of boom deployment. Anchoring techniques. Being on the water. Live deployment, also great idea deploying the peat moss to simulate an actual spill. Also great having a lot of different stakeholders (FD, EPA, USCG, local, etc). Hands on training is always the best way to learn and the instructors were very knowledgeable. Seeing the boom deployed and seeing the effect it had on collecting the peat moss. Hands on. The flow of product demo'd. Being able to take time to work out collection method. Anchoring. It was practical. Coordination between groups, diverse attendees, learning limitations of GRP, improving GRP. Tackle - boom deployment."

#### This training could be improved by...

"Defining roles. Maybe, if practicable, further discussing the oil capture point and where/how is the best method to actually capture the oil. Boom reel. More hands on. Extra boat. Creating anchor sets on land, more practice. What can go wrong with product capture & hazards."