



# Geographic Response Strategy Exercise Series – Chatham/Harwich

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## After-Action Report/Improvement Plan

April 5, 2022

The After-Action Report/Improvement Plan (AAR/IP) aligns exercise objectives with preparedness doctrine 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>	2022 Chatham/Harwich GRS Exercise
<b>Exercise Dates</b>	April 5, 2022
<b>Scope</b>	This is a full-scale exercise, planned for approximately 6 hours in Stage Harbor. Exercise play is limited to Stage Harbor and the Mitchell River in the vicinity of the Chatham Harbormaster's dock, the Mitchell River near Toms Neck, Chatham, MA and the adjacent shorelines.
<b>Focus Area(s)</b>	Prevention, Protection, Response
<b>Capabilities</b>	Environmental Response/Health and Safety, Operational Coordination, Operational Communications.
<b>Objectives</b>	<p><b>Objective 1:</b> Demonstrate the ability to deploy oil spill equipment from one or more MassDEP pre-positioned oil spill response trailers utilizing common Geographic Response Strategy (GRS) tactics.</p> <p><b>Objective 2:</b> Demonstrate the ability to assemble a spill response organization utilizing Incident Command System (ICS) principles through execution of an Incident Briefing (ICS 201) and implementation of on-site incident management and tactical operations.</p> <p><b>Objective 3:</b> Demonstrate the ability to effectively communicate between multiple local, state, and federal agencies including fire departments, police departments, harbormasters, and other state and federal first responders using VHF and UHF communications.</p>
<b>Threat or Hazard</b>	Discharge of oil into a navigable waterway
<b>Scenario</b>	An oil spill has occurred that threatens Stage Harbor. The Chatham and Harwich Fire Departments and Harbormasters will utilize various common Geographic Response Strategy (GRS) tactics to protect sensitive resources in Stage Harbor and the surrounding area.
<b>Sponsor</b>	Massachusetts Department of Environmental Protection (MassDEP)
<b>Participating Organizations</b>	<p>Participating organizations will include:</p> <ul style="list-style-type: none"> <li>• Chatham Fire Department (CFD)</li> <li>• Chatham Harbormaster (CHM)</li> <li>• Harwich Fire Department (HFD)</li> <li>• Harwich Harbormaster (HHM)</li> <li>• Sandwich Fire Department Drone Team (SFD)</li> <li>• Massachusetts Maritime Academy (MMA) UAS Drone Corps</li> <li>• MassDEP</li> <li>• U.S. Fish &amp; Wildlife Service (Monomoy National Wildlife Refuge)</li> <li>• U.S. Coast Guard Sector Southeastern New England (USCG)</li> <li>• Moran Environmental Recovery (MER)</li> <li>• Nuka Research</li> </ul> <p><b>Note: See Appendix B for participant count</b></p>
<b>Point of Contact</b>	<p>Julie Hutcheson, Marine Oil Spill Program Coordinator  Massachusetts Department of Environmental Protection  Oil Spill Prevention and Response Program  1 Winter St.  Boston, MA 02108  (617) 366-7424  julie.hutcheson@mass.gov</p>

First Responders participate in classroom training



First Responders practice heaving line throwing



Photos courtesy of Nuka Research

First responders practice assembling the boom



Shore team supports and assists with on-water boom deployment



Photos courtesy of Nuka Research



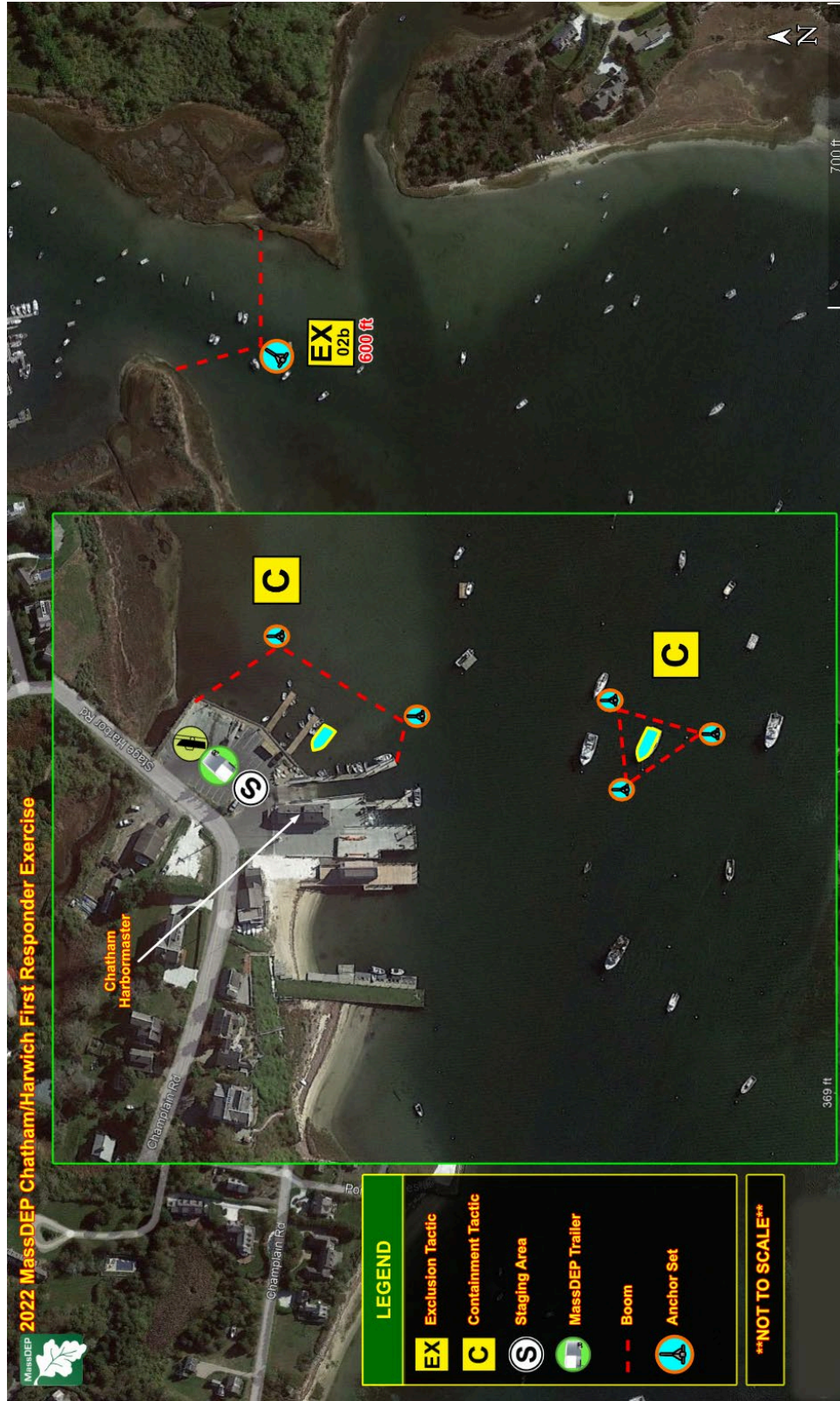


Figure 1. Exercise Tactics Map

## ANALYSIS OF CAPABILITIES

Aligning exercise objectives and 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 capabilities, and performance ratings for each capability as observed during the exercise and determined by the evaluation team.

Objective	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 from one or more MassDEP pre-positioned oil spill response trailers utilizing common Geographic Response Strategy (GRS) tactics.	Environmental Response/Health and Safety	P			
Demonstrate the ability to assemble a spill response organization utilizing Incident Command System (ICS) principles through 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, police and harbormaster departments using VHF and UHF communications	Operational Communications	P			
<p>Ratings Definitions:</p> <p><b>Performed without Challenges (P):</b> 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.</p> <p><b>Performed with Some Challenges (S):</b> 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.</p> <p><b>Performed with Major Challenges (M):</b> 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.</p> <p><b>Unable to be Performed (U):</b> The targets and critical tasks associated with the core capability were not performed in a manner that achieved the objective(s).</p>					

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

Core Capability	Organizational Capability Target	Associated Critical Tasks	Exercise Observations
<b>Environmental Response/ Health and Safety</b>	<b>Overview of Response Equipment</b>	<ul style="list-style-type: none"> <li>• Access Mass DEP Trailer</li> <li>• Identify boom and sorbents</li> <li>• Connect boom together</li> <li>• Connect towing bridle to boom</li> <li>• Connect components of anchor system together</li> </ul>	<ul style="list-style-type: none"> <li>• Participants were attentive during the classroom session, asking great questions throughout and providing feedback and were fully engaged and participatory in the hands-on equipment training.</li> </ul>
	<b>Basic Booming Operations</b>	<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>• Under the direction of both Deputy Chief Tavano, IC for the EX-02b deployment, and Captain Ryan Clark, IC for the containment boom deployment, all vessel crews worked well together in towing, positioning and anchoring 600 ft of boom to form a chevron exclusion array and 550 ft of boom to complete the containment boom configuration.</li> <li>• For the EX-02b deployment, two, two-person shore teams were delivered by small boat to the eastern and western bank of the Mitchel River to set-up double rebar shoreside anchor points. Both teams safely and deftly established anchor points and secured the boom as it was delivered to them by small boat.</li> <li>• During boom deployment and positioning, vessel strike teams solved problems as they arose including safely navigating around and clearing the boom over and around existing floats and channel markers.</li> </ul>
	<b>Implement Tactics in GRS</b>	<ul style="list-style-type: none"> <li>• Deploy Exclusion boom (EX) chevron array</li> </ul>	<ul style="list-style-type: none"> <li>• MARINE 77 (HHM), H27B (CHM, and H25 (CHM) worked well together to tow, connect, and configure boom sections, and transport equipment and shore teams.</li> <li>• MARINE 77 took the apex under tow and completed the configuration and deployment of EX-02b.</li> </ul>
<b>Operational Coordination</b>	<b>Create and Execute an Assignment List (ICS 201)</b>	<ul style="list-style-type: none"> <li>• Fill out ICS 201</li> <li>• Assignments in ICS 201 are followed and on-scene adjustments were made as necessary</li> <li>• Participants demonstrate command and control of exercise</li> </ul>	<ul style="list-style-type: none"> <li>• Command staff from CFD, CHM, HHM, and HFD proactively developed a deployment plan and ICs for both the exclusion and containment booming evolutions deftly coordinating with three vessel strike teams, three shoreside support teams, and additional shoreside command and control elements.</li> </ul>

Core Capability	Organizational Capability Target	Associated Critical Tasks	Exercise Observations
			<ul style="list-style-type: none"> <li>The use of drones from the MMA UAS Corps and Sandwich FD, including command, control and visual surveillance support from the JBCC Heavy Rescue 411 and SFD Mobile Testing Unit enhanced overall deployment efforts by providing real-time drone video imagery that was immediately available to individual responders through the use of smart phone technology.</li> </ul>
<b>Operational Communications</b>	<b>Effectively Communicate Using VHF equipment</b>	<ul style="list-style-type: none"> <li>Create Communications Plan</li> <li>Communicate with other participants using organic VHF equipment</li> </ul>	<ul style="list-style-type: none"> <li>Utilizing VHF Channel 66, command staff maintained clear and frequent communication with all strike teams and independently recognized the need to alter the deployment plan when necessary.</li> <li>All participating elements generally maintained clear and frequent communications throughout both boom deployment evolutions.</li> </ul>

**Table 2. Summary of Organizational Capability Targets and Associated Critical Tasks**

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

## Objective 1: Demonstrate the ability to deploy oil spill equipment from one or more MassDEP pre-positioned oil spill response trailers utilizing common Geographic Response Plan (GRS) tactics

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

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

#### Strengths

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

**Strength 1:** Under the direction of both Deputy Chief Tavano, IC for the EX-02b deployment, and Captain Ryan Clark, IC for the containment boom deployment, all vessel crews worked well together in towing, positioning and anchoring 600 ft of boom to form a chevron exclusion array and 550 ft of boom to complete the containment boom configuration.

**Strength 2:** Shoreline anchor teams safely and deftly established anchor points and secured the boom as it was delivered to them by small boat.

**Strength 3:** Vessel strike teams solved problems as they arose including safely navigating around and clearing the boom over and around existing floats and channel markers.

#### Areas for Improvement

While the full capability level was achieved, some minor areas for improvement were noted:

**Area for Improvement 1:** Some equipment items were not anticipated or made available

**Reference:** MassDEP GRS Exercise Planning/Operations Brief Protocol

**Analysis:** In some instances, heaving lines were not readily available for vessel strike teams during boom deployment operations and vessel-to-shore transfer evolutions. Additionally, boots were not acquired for shoreline anchoring teams prior to delivering shore team members to shoreline anchor locations

## Objective 2: Demonstrate the ability to assemble a spill response organization utilizing Incident Command System (ICS) principles through 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 capability aligned to this objective are described in this section.

### Capability 2: Operational Coordination

#### Strengths

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



**Strength 1:** Command staff from CFD, CHM, HHM, and HFD proactively developed a deployment plan and ICs for both the exclusion and containment booming evolutions deftly coordinating with three vessel strike teams, three shoreside support teams, and additional shoreside command and control elements.

**Strength 2:** The use of drones from the MMA UAS Corps and Sandwich FD, including command, control and visual surveillance support from the JBCC Heavy Rescue 411 and SFD Mobile Testing Unit enhanced overall deployment efforts by providing real-time drone video imagery that was immediately available to individual responders through the use of smart phone technology.

### Areas for Improvement

While the full capability level was achieved, some minor areas for improvement were noted:

**Area for Improvement 1:** Use of observers on vessel strike teams to convey deployment configuration information derived from drone imagery.

**Reference:** MassDEP GRS Exercise Planning/Operations Brief Protocol

**Analysis:** While real-time drone imagery was helpful, vessel strike team members who are fully engaged in either vessel handling or boom deployment activities are not in a position to utilize this imagery. Having an observer on board to relay information gleaned from drone imagery would be ideal in enhancing and aiding in equipment deployment and configuration.

## Objective 3: Demonstrate the ability to effectively communicate between multiple local, state, and federal agencies including fire, police and harbor master departments using VHF and UHF communications

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

### Capability 3: Operational Communications

#### Strengths

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

**Strength 1:** Overall communication was enhanced due to the fact that both towns maintain a close working relationship during both emergency and non-emergency situations. Command staff maintained clear and frequent communication with all strike teams and independently recognized the need to alter the deployment plan when necessary. All participating elements generally maintained clear and frequent communications throughout both boom deployment evolutions.

#### Areas for Improvement

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

**Area for Improvement 1:** N/A

**Reference:** N/A

**Analysis:** N/A

Vessel towing boom with support from the shore strike team



Photos courtesy of Massachusetts Maritime Academy UAS Corp

Shore Team and a small boat work together to establish a shoreside anchor point



Photos courtesy of Massachusetts Maritime Academy UAS Corp

Successful test of the exclusion boom configuration using peat moss as an oil surrogate



Photos courtesy of Massachusetts Maritime Academy UAS Corp

## Appendix A: IMPROVEMENT PLAN

This IP is developed specifically for MassDEP, MER, Nuka Research and the Towns of Chatham and Harwich, MA as a result of the MassDEP GRS Exercise conducted on April 5, 2022.

Capability	Issue/Area for Improvement	Corrective Action	Capability Element <sup>1</sup>	Primary Responsible Organization	Organization POC	Start Date	Completion Date
Capability 1: Environmental Response/Health & Safety	1. Modification to GRS	Update EX-02b testing date on page 2 of GRS to reflect latest test conducted on 05APR22.	Planning	Nuka Research	M. Popovich	04/07/22	05/01/22
Capability 3: Operational Communications	2. Vessel Strike Team Observers	Assign observers to vessel strike teams to assist in relaying deployment configuration information to vessel operators and onboard personnel who are managing equipment deployment; especially when drone technology is being used.	Planning, Organization	Nuka Research	M. Popovich	04/07/22	05/01/22

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



During the Hot Wash, Chatham’s Emergency Manager brought up discussion on the offshore transit of petroleum vessels along the outer Cape and the impact that a potential spill would have on the sensitive environments and living marine resources along the outer Cape including Chatham, the Monomoy National Wildlife Refuge, and the Cape Cod National Seashore (CCNS). Data provided by NOAA (Figure 1 below) depicts the movement of petroleum through the nearby Boston Harbor Vessel Traffic Lane (immediately east of the Outer Cape and CCNS) in 2019. The table indicates that a significant number of petroleum vessels (tug/tow & tankers) transit off the coast between 8 and 25 nautical miles in the vicinity of the “C” buoy. Additional items were discussed to include a future Table-Top Exercise (TTX) that will focus on potential oil spill scenarios occurring in the vicinity of the Lower and Outer Cape, the myriad of governmental and non-governmental agencies that would be involved in the response to a large vessel oil-spill, and the potential acquisition of a weather buoy that would assist agencies and mariners with risk management decisions to mitigate the severity of a large oil spill. The Town of Chatham would like to enter into further discussion with MassDEP to plan and conduct a future TTX and discuss the potential acquisition of a weather buoy.

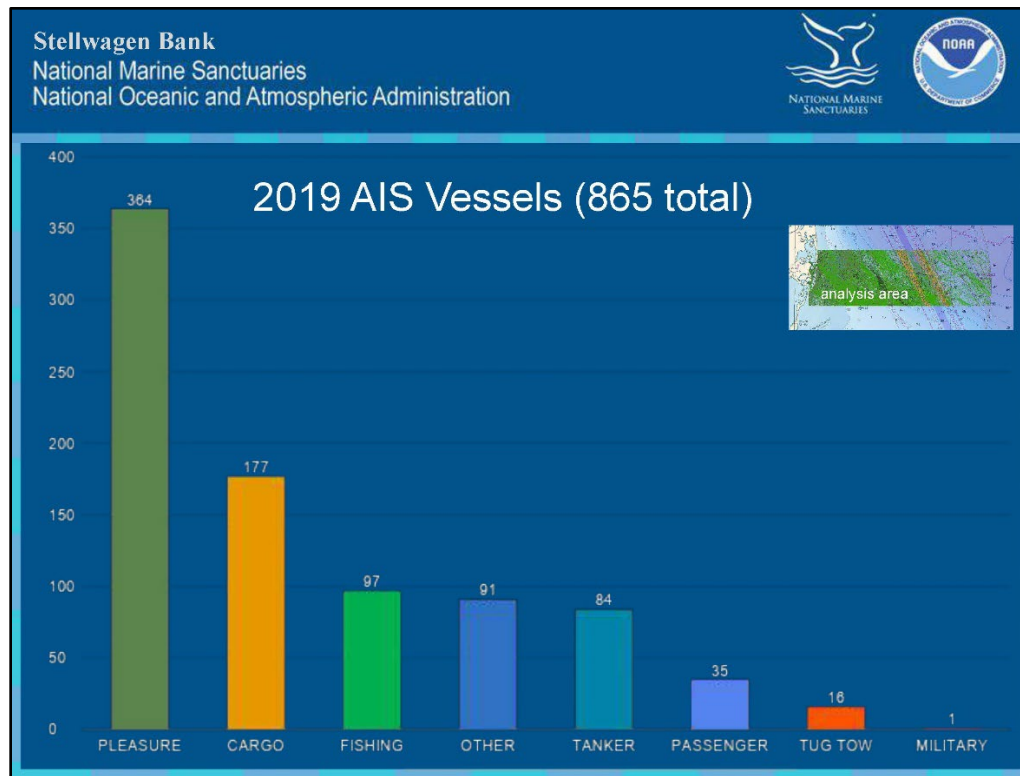
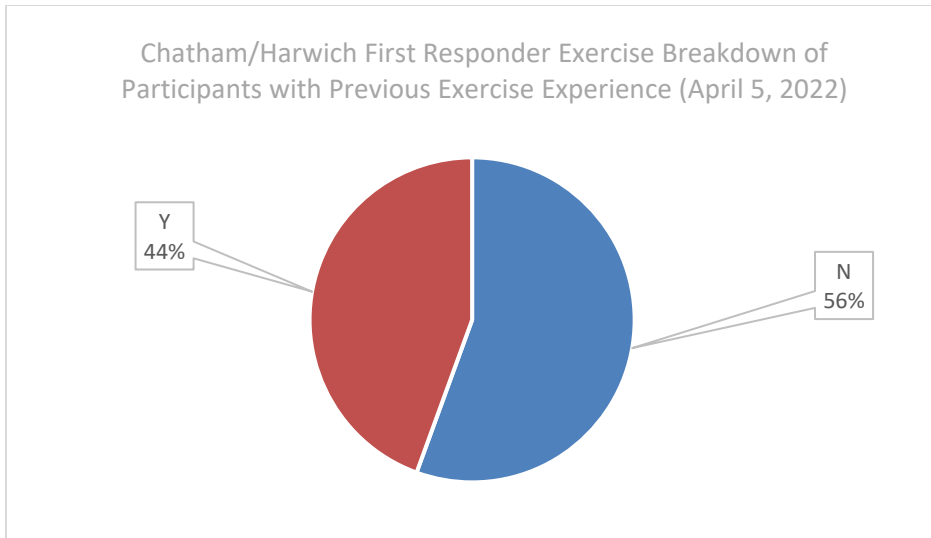


Figure 1. Movement of petroleum through the Boston Harbor Vessel Traffic Lane in 2019

**APPENDIX B: PARTICIPANTS & RESOURCES**


<b>Participating Organizations</b>	
<b>Town of Chatham, MA</b>	<b>Participant Count</b>
Chatham Fire Department	9
Chatham Harbormaster	5
Chatham Shellfish Department	3
<b>City of Harwich, MA</b>	
Harwich Fire Department	10
Harwich Harbormaster	2
<b>Town of Sandwich, MA</b>	
Sandwich Fire Department (Drone Team)	3
<b>TOWN PARTICIPANTS</b>	<b>32</b>
<b>Federal</b>	
United States Coast Guard Sector Southeastern New England	2
United States Fish & Wildlife Service (Monomoy National Wildlife Refuge)	1
<b>State/Other</b>	
Massachusetts Department of Environmental Protection (MassDEP)	2
Massachusetts Maritime Academy UAS Corps	2
Joint Base Cape Cod Fire Department	2
Barnstable County EMA/CERT	3
Nuka Research and Planning Group, LLC (contractor for MassDEP)	3
Moran Environmental Recovery (contractor for MassDEP)	2
<b>TOTAL</b>	<b>49</b>



Agency	Resource	Kind	Exercise Function
Chatham Harbormaster	H27B Carolina 27 ft	Vessel	Boom Deployment Support
Chatham Harbormaster	H25 Carolina 25 ft - 25 ft	Vessel	Boom Deployment/Support
Chatham Fire Department	Oil Spill Response Trailer	Equipment	Boom Deployment
Harwich Harbormaster	MARINE 77 Eastern 27 ft	Vessel	Boom Deployment/Support
Harwich Fire Department	Oil Spill Response Trailer	Equipment	Boom Demonstration
JBCC Fire Department	Heavy Rescue 411	Vehicle	Drone Tracking/Support
Sandwich Fire Department	Mobile Testing Unit	Vehicle	Drone Tracking/Support



## APPENDIX C: PARTICIPANT FEEDBACK



**MassDEP**  
**Geographic Response Plan (GRP)**  
**Exercise and Testing Program**

**Participant Feedback Form**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Strongly disagree	Mildly disagree	Neutral	Mildly agree	Strongly agree

**Please use the above rating scale to answer the questions for each of the following topics.**

<b>The objectives were clearly explained and the exercise met those objectives.</b>	<b>1   2   3   4   5</b>
Comments:	
<b>The material appropriately challenged me and the pace of instruction was correct.</b>	<b>1   2   3   4   5</b>
Comments:	
<b>The instructor(s) did an excellent job.</b>	<b>1   2   3   4   5</b>
Comments:	
<b>I found the classroom to be a comfortable learning environment.</b>	<b>1   2   3   4   5</b>
Comments:	
<b>I feel more prepared to respond to an oil spill than I did before this exercise.</b>	<b>1   2   3   4   5</b>
Comments:	
<b>The best thing about this training was _____.</b>	
<b>This training could have been improved by _____.</b>	

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

(Rev 2016)


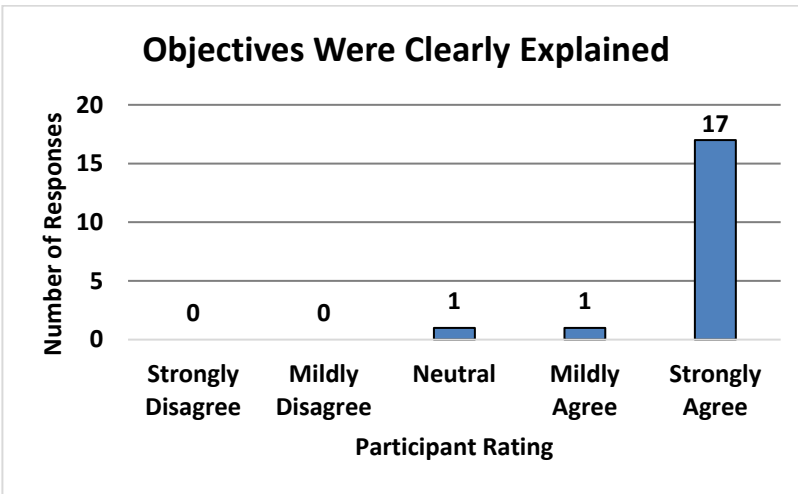
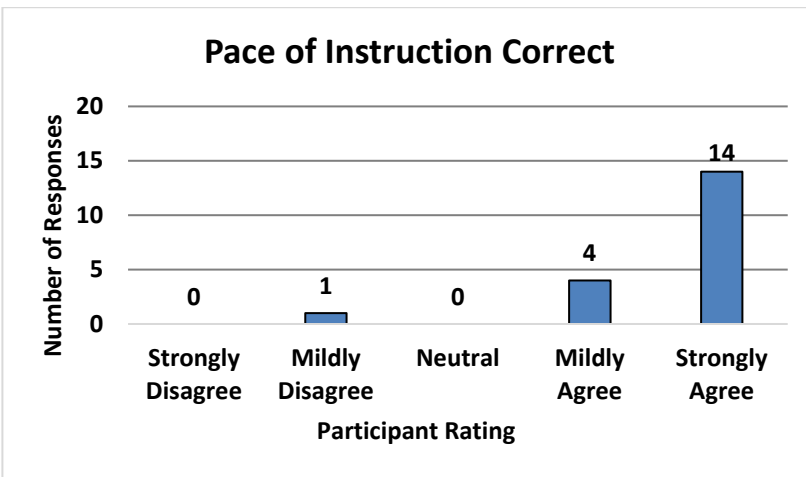


Figure 2. Participant Feedback Form

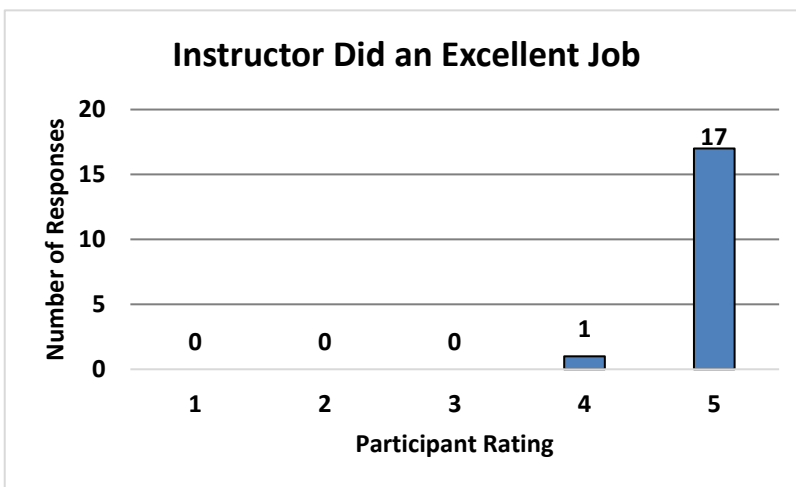
### Participant Feedback Summary



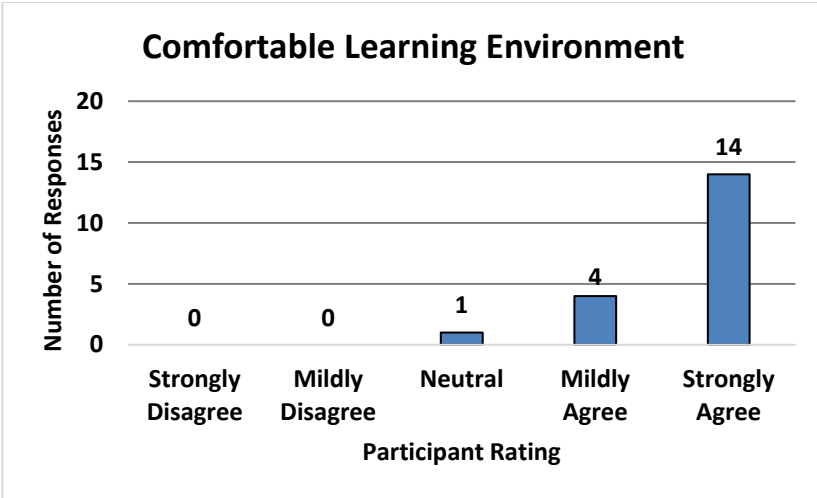
Comments: "Good instructions",  
"It was well run"



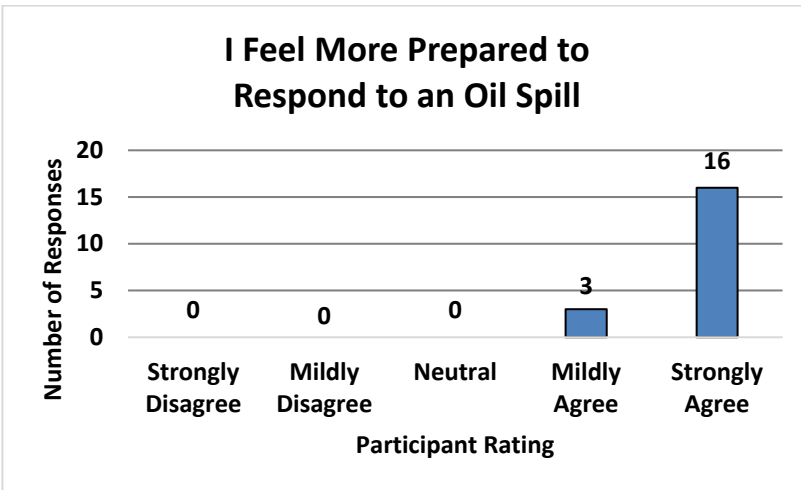
Comments: "Big group, so some people just observed. "



Comments: "Superb", "Very informative"



Comments: "Very good", "Perfect day"



Comments: "Excellent drill", "Definitely"

**The best thing about this training was...**"Live training", "Practical exercise", "Instructors-Participants", "Working with different agencies", "Hands on with the equipment", Practical evolution, "Excellent refresher", "Good inter agency collaboration", "Hands on training", "Hands on", "Actual deployment and use of equipment in trailer", "Learning new skills", "Hands on training", "Instructors were professional and clearly articulated the course materials and hands on instructions."

**This training could be improved by...**"Do more often. Every two years would be helpful", "More in field exercises", "Frequency - Need to do evolution every 24 months minimum", "Laser boom lengths at each connection point", "More hands-on time with critique at the end", More time", "This training was great. No improvements come to mind"