Spill Tactics For Alaskan Responders (STAR) Manual Training

Instructor Guide

This Instructor Guide provides information and recommendations for conducting oil spill training on the following topics:

- Safety,
- Boom and Response Equipment
- Tactics and Strategy

The following materials are included in the instructor guide for your use. Since training will need to be tailored to the students you will be teaching, you should feel free to modify these materials as necessary to suit your needs.

Agenda: A recommended agenda for training is included in enclosure (1). Depending on the equipment and time available for training, this training can be taught as a classroom only session (Day 1 Agenda) or as a prelude to the use and deployment of oil spill response equipment in an exercise type format (Full Agenda). Times will vary to suit local conditions, classroom availability and tides/currents in the event of an exercise. A sample communications plan and safety briefing are included as enclosures (1a) and (1b) respectively if the full agenda is being utilized to perform an exercise.

Instructor Activity Guide: Enclosure (2) is a breakdown of each module of training. It provides recommended activities to reinforce the training.

PowerPoint slides: Enclosure (3) is the Powerpoint presentations to be used in the classroom for all 3 modules.

Instructor notes: Enclosure (4) provides the instructor notes to go along with the PowerPoint slides. You should feel free to add your own experiences to the notes where appropriate.

Participant Feedback Forms: Participant Feedback forms are provided in enclosure (5). Please provide them to the students prior to the start of class. Form 1 is designed to get student feedback on the instruction. Form 2 is designed to measure the student's confidence levels on how much they have learned. Both are valuable for improving the training program. Ask the students to fill out the left side of form 2 before beginning training. Also encourage students to take notes on feedback throughout the day as thoughts occur to them instead of waiting to the end of the day to fill out the form. Please put the forms in the enclosed envelope and mail them back to ADEC.

Spill Tactics For Alaskan Responders (STAR) Manual Training

Student Guide: The student guide is provided as enclosure (6). It contains a version of the PowerPoint slides for the students to take notes and links to additional information found in the instructor guide. A copy should be provided to each student.

Enclosures: (1) Sample Agenda
(1a) Sample Communications Plan
(1b) Sample Safety Briefing
(2) Instructor Activity Guide
(3) PowerPoint Slides
(4) Instructor Notes
(5) Participant Feedback Forms
(6) Student Guide

Spill Tactics For Alaskan Responders (STAR) Manual Training

Sample Agenda

Time	Activity	Location
Day 1		
0900	Instructor Introduction and Administrative Notes	TBD
0915	Student Introductions	TBD
0930	Oil Spill Safety Module	TBD
11:15	Oil Spill Boom and Response Equipment Module	TBD
1215	Lunch	TBD
1245	Oil Spill Boom and Response Equipment (cont)	TBD
1345	Oil Spill Tactics and Strategy	TBD
1515	Review/Participant Feedback Forms	TBD
1530	Adjourn	TBD
Day 2		
0730	Mobilize and Stage Equipment	TBD
0800	Conduct equipment familiarization and hands-on training	TBD
0830	Safety, Operational, and Communications Briefing	TBD
0900	Deploy first booming tactic. Deploy surrogate (peat moss or oranges). Evaluate configuration. Retrieve equipment.	TBD
1030	Deploy second booming tactic. Deploy surrogate (peat moss or oranges). Evaluate configuration. Retrieve equipment.	TBD
1200	Lunch	
1230	Demobilize all boom, rinse and repack equipment	TBD
1300	Hot Wash/Complete and turn in all Participant Feedback Forms	TBD
1330	Demobilize/Adjourn	TBD

Sample Communications Plan

RADIO COMMUNICATIONS PLAN	1. Exercise Name	2. Date/Time Prepared	3. Date/Time For Exercise

4. Radio Channel Utilization

System	Channel	Function	Frequency/Tone	Assignment	Remarks
				Incident Commander	
				Safety Officer	
				Exercise Control	
				Vessel 1	
				Vessel 2	
				Vessel 3	
				Shore Team 1	
				Shore Team 2	

5. Prepared by:

Spill Tactics For Alaskan Responders (STAR) Manual Training

Sample Safety Brief

KNOWN SAFETY HAZARDS:

- **Lines under tension** (boom towing and shoreside anchoring)
- **Pinch points** (connecting boom, boom towing, vessel operations)
- **Heavy lifting** (boom and anchors) - Observe safe lifting practices.
- **Entanglement** – Personnel, lines/rigging, and boom. Personnel, lines, propellers. Maintain situational awareness when working around lines, anchors and boom during shoreside and on-water deployment operations to ensure that entanglement does not occur. Do not stand in the bight of lines or where boom is faked out for deployment.
- **Loose clothing and jewelry** – Refrain from wearing loose clothing that may snag or become entangled on equipment. Jewelry including necklaces and rings should be removed while engaged in equipment deployment operations.
- **Slips, trips, and falls** - Exercise caution in wet, muddy, and rocky areas and when working on piers or bulkheads near water to avoid falling. During boom deployment and retrieval when working in, on, or near the equipment trailers and ramps, special precaution must be taken to avoid injury when working on trailer ramp and around trailer ramp cables. Caution tape provided in trailer should be attached to trailer ramp cables to mark their location.
- **Crushing injuries** – Use caution when working with anchors, driving shoreside stakes with sledgehammer, and when working alongside other vessels to avoid crushing injuries.
- **Vessel Operations** – Working in close proximity to other vessels; Boom deployment and towing, and rigging near outboard motors and vessel screws/propellers.
- **Flotsam and debris** – Conduct shoreside walkdown (Exercise Safety Officer) to identify and remove dangerous objects including glass, sharp objects, or debris washed up on shore that may endanger participants and/or impede exercise activities. Medical waste should only be retrieved by on-scene medical personnel. Flotsam should only be removed if it can be done safely and only if it impedes exercise activities.
- **Hypothermia** – Dependent on water temperature. If participant is immersed in water, extricate safely and quickly and treat as appropriate.
- **Heat Stress/Stroke** – Dependent upon air temperature and humidity. Exposure to extreme heat may put participants at risk for heat stress. Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat rashes. Participants exhibiting heat stress related symptoms must be treated immediately IAW participating agency protocols.
-

SPECIFIC PRECAUTIONS:

- An Exercise Safety Officer will be identified and be responsible for participant safety.
- FIRST AID equipment is available. EMT/Paramedics are available on-scene
- Personal Flotation Devices (PFDs) are required for all vessel personnel and all shoreside personnel working along shoreline, bulkheads or piers.
- Steel-toe boots and safety glasses should be worn.
- Hearing protection should be worn when working around generator and air compressor.
- All vessel operators will conduct a safety brief with passengers to review vessel-specific safety precautions.
- During vessel operations, a spotter should be assigned to provide guidance to vessel operator. Utilize fenders when mooring alongside pier/dock and when rafting with other vessels.
- Man overboard – Assigned vessel spotter must maintain constant visual contact with man overboard and provide position and direction to vessel operator. “Emergency” phrase must be communicated to all exercise participants. Incident Commander or Exercise Coordinator will halt all exercise activity.
- Vessel load balancing - Each vessel operator must ensure that personnel and equipment are stationed and distributed appropriately on deck.
- Hydration – Participants must ensure they remain properly hydrated based on their level of exertion and on-scene weather conditions (heat, humidity). Water is provided.
- Sunscreen – Participants should ensure proper sunscreen application based on weather conditions.

Spill Tactics For Alaskan Responders (STAR) Manual Training

Instructor Activity Guide

Oil Spill Safety Module

Instructor Activity	Student Activity	Additional Material
Attention Getter: Get attention of students showing audio/video of scene 1 and experiences of people during the Exxon Valdez Oil Spill. Explain relevance to their role if a similar spill occurred today.	Review video	http://jukebox.uaf.edu/site7/exxonvaldez
Learning Objectives: Explain what will be taught. • Reporting an oil spill. • Accessing response equipment in an Alaska DEC Conex box. • Allowing and excluding access to an oil spill site. • Safely identifying the hazards associated with an oil spill. • Conducting a safety brief and; • Putting on and taking off personal protective equipment.	Understand what they will learn	Alaska STAR Manual: Section B, Part I http://dec.alaska.gov/spar/PPR/star/docs.htm

Prerequisites: Explain the courses that are necessary before taking this this course. • HAZWOPER • ICS • Prior Spill Experience	Understand that these prerequisites are helpful but not necessary to assist in an oil spill.	HAZWOPER https://www.osha.gov/dep/ohe/application_worksiteresponse.html ICS https://training.fema.gov/IS/NIMS.aspx
Reporting an Oil Spill: Explain procedures for fulfilling state and federal requirements.	Understand how to report an oil spill in accordance with state and federal requirements.	State requirements: http://dec.alaska.gov/spar/spillreport.htm Federal requirements: http://www2.epa.gov/sites/production/files/2014-06/documents/spccfactsheetspillreportingdec06-1.pdf
Accessing ADEC Conex Box: Explain the procedures for accessing an Alaska ADEC Conex Box and other sources for oil spill response equipment. **Activity:** If community has conex box, conduct a tour with the students. Arrange for this with the local key custodian.	Understand where equipment is stored in their community. Visit locations of equipment if practicable.	Conex Box Map/Website http://dec.alaska.gov/spar/PPR/lra/Conex_Map.htm

Site Control: Explain general site control procedures. **Activity:** Create a mock spill site, either on a map or outside if practicable, and establish boundaries for hot/warm/cold zones.	Understand general site control procedures and participate in mock site control exercise.	Alaska STAR Manual: Section B, Part I, B.3. http://dec.alaska.gov/spar/PPR/star/docs.htm OSHA Guidelines https://www.osha.gov/Publications/complinks/OSHG-HazWaste/9-10.pdf DOT Emergency Response Guide http://phmsa.dot.gov/hazmat/library/erg
Safety Assessment: Explain general safety practices and considerations.	Understand safety practices and considerations.	Alaska STAR Manual: Section B, Part I http://dec.alaska.gov/spar/PPR/star/docs.htm ADEC Form 201-5 http://dec.alaska.gov/spar/PPR/docs/ics/ICS_201-5.pdf IPIECA Oil Spill Responder Safety Guide: Chapter 6 http://www.ipieca.org/publication/oil-spill-responder-health-and-safety

Specific Safety Hazards: Explain the difference between oil spill and gasoline spill response. Explain how to use a Safety Data Sheet (SDS) to find information on a spilled product. Have class review SDS for home heating oil. **Activity:** Obtain copies of the SDS for diesel fuel or other petroleum product prevalent in the community and review with the class.	Understand use of the SDS and the difference between responding to gasoline spill and oil spill. Find information for a product on an SDS.	Safety Data Sheet: https://www.osha.gov/Publications/OSHA3514.html Oil Spill Monitoring Handbook: Chapter 6.0 https://www.amsa.gov.au/environment/maritime-environmental-emergencies/national-plan/Contingency/documents/Oil_Spill_Monitoring_Handbook.pdf OSHA Safety and Health Awareness for Oil Spill Cleanup Workers. https://www.osha.gov/Publications/Oil_Spill_Booklet_05.11_v4.pdf
Safety Briefing: Explain the types of information passed at a safety briefing. **Activity:** Provide students with pre-filled in ICS-208 form and have a volunteer(s) give a safety briefing to the class.	Understand what information needs to be passed during a safety briefing and how to document that one occurred.	Alaska STAR Manual: Section B, Part I http://dec.alaska.gov/spar/PPR/star/docs.htm
Personal Protective Equipment (PPE): Explain the importance of PPE and the risks of not using it, the differences between levels A/B/C/D and that instruction will only focus on level D PPE. **Activity**: Have Level D PPE available to demonstrate to class. Hold up each piece of PPE and have students identify them.	Understand the risks of not using PPE and that they will only be using Level D PPE in an oil spill event.	Alaska STAR Manual: Section B, Part I, B. 2. http://dec.alaska.gov/spar/PPR/star/docs.htm

Putting on PPE: Demonstrate proper donning procedures. Describe any "tricks of the trade" for putting on PPE. **Activity:** Show scene 12 of safety video to students and have students practice putting on PPE. Provide correction.	Students practice	Alaska STAR Manual: Section B, Part I, B. 2. http://dec.alaska.gov/spar/PPR/star/docs.htm
Entering Work Zone: Explain that students should never work alone as part of an oil spill response.	State the reasons for using the "buddy system"	Alaska STAR Manual: Section B, Part I, B. 2. http://dec.alaska.gov/spar/PPR/star/docs.htm
Departing Work Zone/ Decontamination: Explain how to set up a dry decontamination corridor and to move responders through it after they complete their work in the work zone. **Activity:** Have students set up dry decontamination corridor and have some walk thru in Level D PPE to be decontaminated.	Understand how to set up a dry decontamination corridor and move responders through it. Participate in activity.	Alaska STAR Manual: Section B, Part I, B. 4. http://dec.alaska.gov/spar/PPR/star/docs.htm
Review: Periodically review material presented in safety section as indicated in PowerPoint presentation.	Participate in review activities	

Oil Spill Boom and Response Equipment Module

Instructor Activity	Student Activity	Additional Material
Attention Getter: Get attention of students by showing audio/video of experiences of people during the Exxon Valdez Oil Spill. Discuss what equipment is available in their community to respond to an oil spill.	Review video	http://jukebox.uaf.edu/site7/exxonvaldez

Learning Objectives: Explain what will be taught.
• Identify boom components
• Conduct Basic booming operations including:
  ○ Towing
  ○ Anchoring in the water
  ○ Anchoring to shore
  ○ Adjusting boom to avoid common failures
• Identify Oil Spill Response Equipment including:
  ○ Sorbent Materials
  ○ Oil Recovery Systems
• Oil Storage Systems
	Understand what they will learn.	Alaska STAR Manual: Section B, Part III
		http://dec.alaska.gov/spar/PPR/star/docs.htm

Boom Components: Identify the four different categories of boom and the basic components of boom. **Activity:** Arrange for a section of boom either inside or outside the classroom so students can view the boom as components are being identified.	State categories of boom and components of boom. Participate in activity.	Alaska STAR Manual: Section B, Part III, B.1. http://dec.alaska.gov/spar/PPR/star/docs.htm

Towing Boom: Explain techniques for towing boom. **Activity:** If practical, deploy a small segment of boom in water and have students take turns towing it around harbor.	State the different techniques for towing boom. Participate in activity.	Alaska STAR Manual: Section B, Part III, B.1. http://dec.alaska.gov/spar/PPR/star/docs.htm
Anchoring Boom: Explain the components of an anchoring system, how to anchor and reposition anchor. Use animations in scene 7 of Boom and Equipment video. **Activity:** Have students assemble anchor systems. If equipment and boats are available, have them practice setting an anchor and repositioning it.	Identify the components of an anchoring system and describe how to drop and reposition an anchor. Participate in activity.	Alaska STAR Manual: Section B, Part III, B.1. http://dec.alaska.gov/spar/PPR/star/docs.htm
Connecting Boom to Shore: Explain the different methods of anchoring boom to shore. **Activity:** if equipment is available, have students practice using all methods.	State the different methods for connecting boom to shore. Participate in activity	Alaska STAR Manual: Section B, Part III, B.1. http://dec.alaska.gov/spar/PPR/star/docs.htm
Avoiding Boom Failure/Adjusting Boom: Explain the different types of boom failure and how to prevent them.	State different types of boom failures and ways to prevent them from occuring.	
Sorbents: Explain what types of sorbents are in ADEC Conex boxes and what types of oils they work well with. **Activity:** Have examples of sorbent materiel for students to examine. Have students identify sources of sorbent material available in their community.	State situations where different types of sorbents should be used. Participate in activity.	Alaska STAR Manual: Section B, Part III, B.10. http://dec.alaska.gov/spar/PPR/star/docs.htm

Oil Recovery Systems: Explain the different types of oil recovery systems and the advantages/ disadvantages of each system. **Activity:** Have students identify oil recovery systems available in their community.	State the main types of oil recovery systems and the advantages/disadvantages to using them.	Alaska STAR Manual: Section B, Part III, B.10. http://dec.alaska.gov/spar/PPR/star/docs.htm ACS North Slope Spill Response Equipment: Section C. http://www.alaskacleanseas.org/wp-content/uploads/2014/11/2014-Spill-Response-Equipment-Manual-rev1-Compatibility-Mode.pdf
Oil Storage Systems: Explain the different types of oil storage systems. **Activity:** Have students identify oil storage systems available in their community.	State the differing types of storage systems. Participate in activity.	Alaska STAR Manual: Section B, Part III, B.10. http://dec.alaska.gov/spar/PPR/star/docs.htm ACS North Slope Spill Response Equipment: Section F. http://www.alaskacleanseas.org/wp-content/uploads/2014/11/2014-Spill-Response-Equipment-Manual-rev1-Compatibility-Mode.pdf
Review: Periodically review material presented in boom and equipment section as indicated in PowerPoint presentation.	Participate in review activities.	

Spill Tactics For Alaskan Responders (STAR) Manual Training

Oil Spill Tactics and Strategy Module

Instructor Activity	Student Activity	Additional Material
Attention Getter: Get attention of students by showing audio/video of experiences of people during the Exxon Valdez Oil Spill. Obtain GRS for the community if available. Discuss what sensitive areas in their community would need to be protected in the event of an oil spill.	Review video and participate in discussion	http://jukebox.uaf.edu/site7/exxonvaldez

Learning Objectives: Explain what will be taught.
• Develop a strategy to respond to an oil spill using
  ○ The tactics in the Alaska STAR Manual,
  ○ Local knowledge
  ○ and Pre-existing Geographic Response Strategies created by work groups sponsored by Alaska DEC
• Using the following tactics to protect sensitive areas including:
  ○ Deflection Booming
  ○ Exclusion Booming Tactic
  ○ Passive Recovery Techniques
• Using the following tactics to recover spilled oil from water including:
  ○ Diversion booming tactics
  ○ Preparing a site for shore side recovery
  ○ Preparing a shoreline to minimize contamination
	Understand what they will learn,	Alaska STAR Manual: Section B, Part III & Part IV. http://dec.alaska.gov/spar/PPR/star/docs.htm

Spill Tactics For Alaskan Responders (STAR) Manual Training

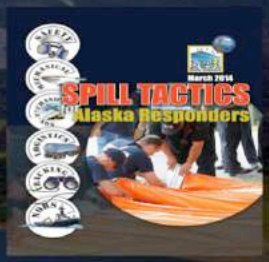
Oil Spill Response Strategies: Explain the importance of local knowledge in developing strategies to respond to oil spills BEFORE a spill occurs. Explain how to use a Geographic Response Strategy (GRS). **Activity:** Review GRS for the community you are instructing. If no GRS is completed, obtain a map and identify sensitive areas.	Understand how to read a GRS and use it to respond to an oil spill. Participate in activity.	Alaska STAR Manual: Section B, Part IV, B. 1. http://dec.alaska.gov/spar/PPR/star/docs.htm
Tactics/Strategy Overview: Show video (Scene 6 of Tactics and Strategy Video) **Activity:** Review GRS for the community you are instructing to see what tactics are used. If no GRS is completed, use map with identified sensitive areas and discuss potential tactics to protect them.	Understand how tactics for oil spill response can be used in general and specifically in their community. Participate in activity.	Alaska STAR Manual: Section B, Part IV, B. 1. http://dec.alaska.gov/spar/PPR/star/docs.htm
Diversion Booming: Explain the different configurations for diversion booming. **Activity:** If practical, conduct live demonstration with students.	Understand when you would use the different configurations for diversion booming. Participate in activity.	Alaska STAR Manual: Section B, Part III, B. 8. http://dec.alaska.gov/spar/PPR/star/docs.htm
Shore side Recovery Tactics and Site Preparation: explain how to prepare a site for shore side recovery. **Activity:** If practical, conduct live demonstration with students.	Understand how to set up a prepare a site for shore side recovery. Participate in activity.	Alaska STAR Manual: Section B, Part III, B. 10. http://dec.alaska.gov/spar/PPR/star/docs.htm

Deflection Booming: Explain the different configurations for deflection booming. **Activity:** If practical, conduct live demonstration with students.	Understand when you would use the different configurations for deflection booming.	Alaska STAR Manual: Section B, Part III, B. 13. http://dec.alaska.gov/spar/PPR/star/docs.htm
Exclusion Booming: Explain the different configurations for exclusion booming. **Activity:** If practical, conduct live demonstration with students.	Understand when you would use the different configurations for exclusion booming. Participate in activity.	Alaska STAR Manual: Section B, Part III, B. 12. http://dec.alaska.gov/spar/PPR/star/docs.htm
Passive Recovery: Explain how to set up a shoreline for passive recovery. **Activity:** If practical, conduct live demonstration with students.	Understand how to set up a shoreline for passive recovery. Participate in activity.	Alaska STAR Manual: Section B, Part III, B. 11. http://dec.alaska.gov/spar/PPR/star/docs.htm
Review: Periodically review material presented in tactics and strategy section as indicated in PowerPoint presentation.	Participate in review activities	
Final Review: Divide class in 2 and play Jeopardy Game for final review. Slide 2 is the main game board. Use it to identify topics and point values. Click the point value and it will direct you to the question. The following slide has the answer and the home icon will take you back to the main game board to select the next question. Have the students keep score on a flip chart or dry erase board.	Participate in Jeopardy game	

Alaska Department of Environmental Conservation
Spill Prevention and Response

Spill Tactics for Alaska Responders (STAR) Manual

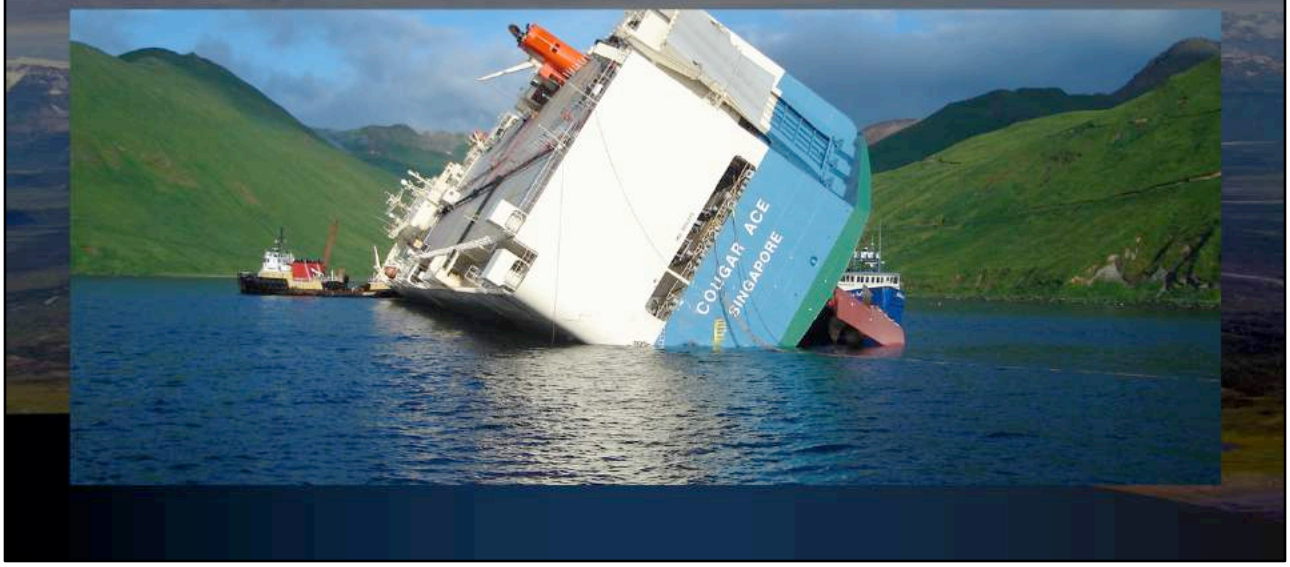
Safety Video



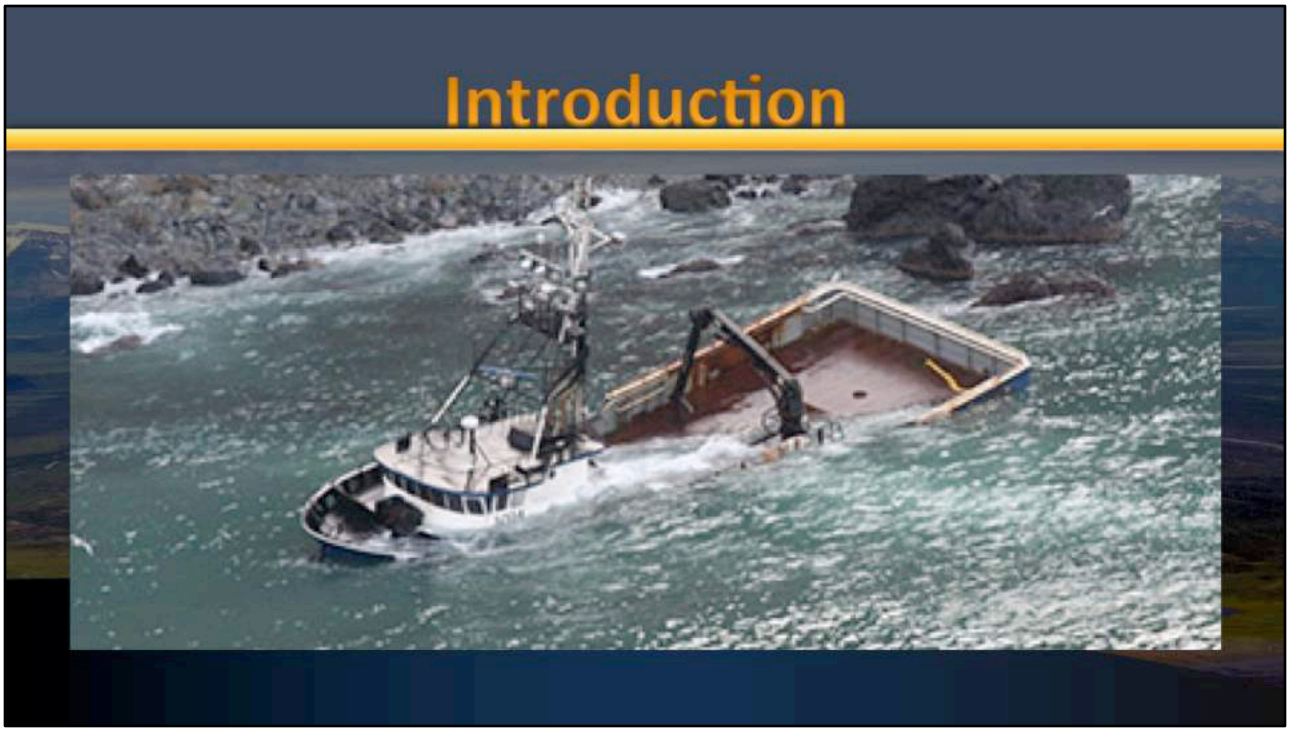
http://dec.alaska.gov/spar/PPR/star/docs.htm


Introduction

Introduction



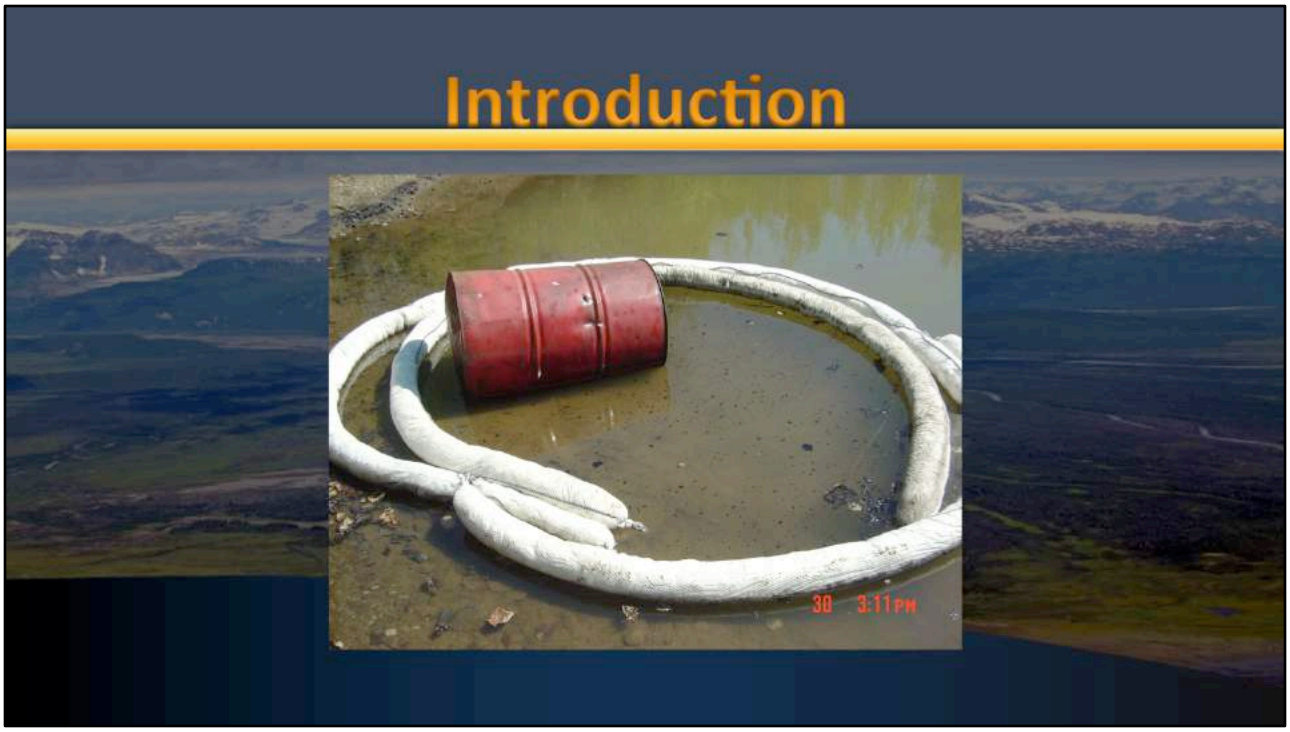
Nearly 2000 oil and hazardous substance spills are reported to the Alaska Department of Environmental Conservation or (DEC) every year. These are typically from freighters,



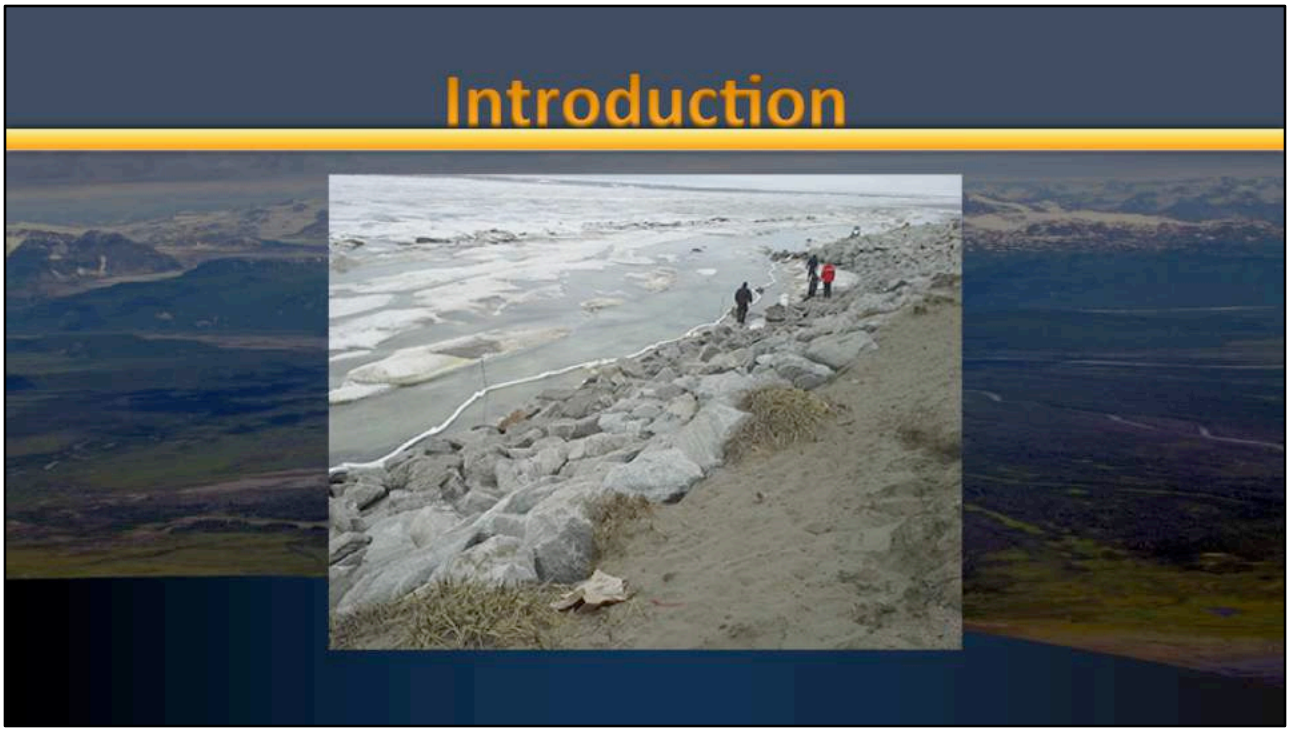
fishing boats,

leaking storage tanks,

discarded wastes,

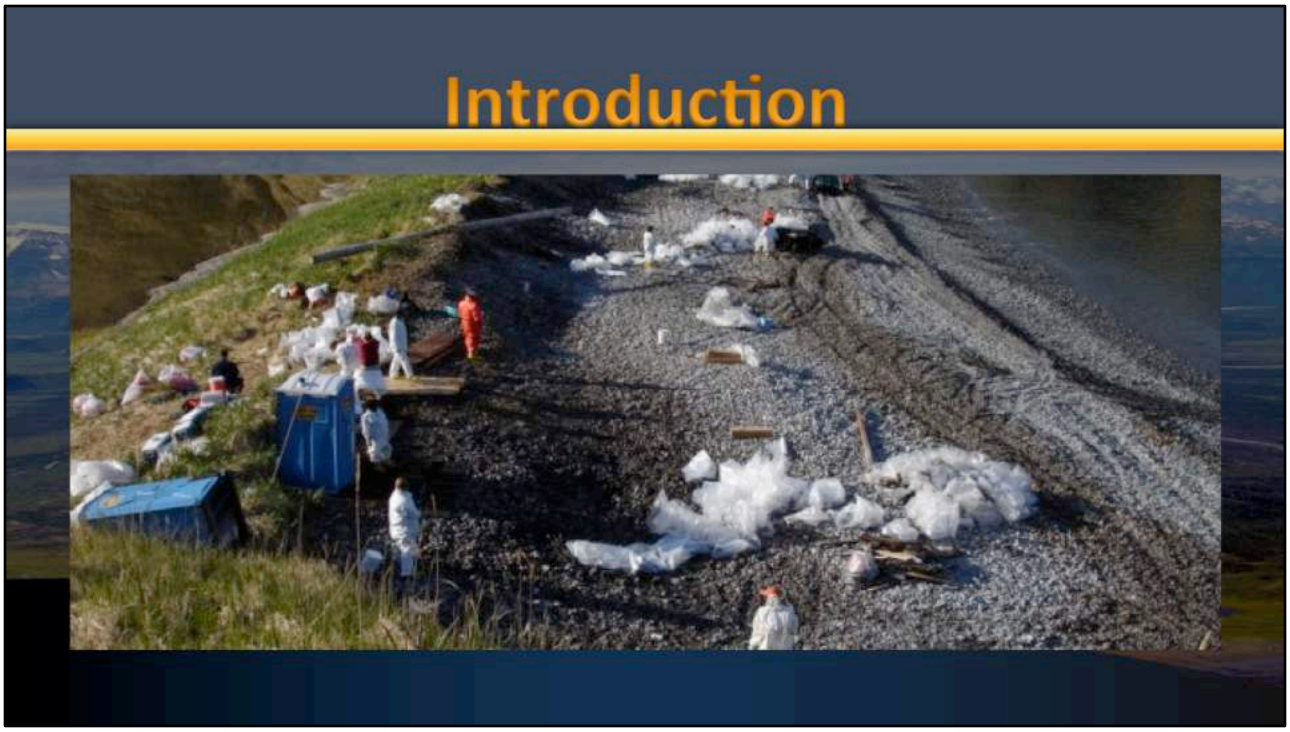


abandoned drums & mystery spills and can cause serious damage to public health, property and the environment.

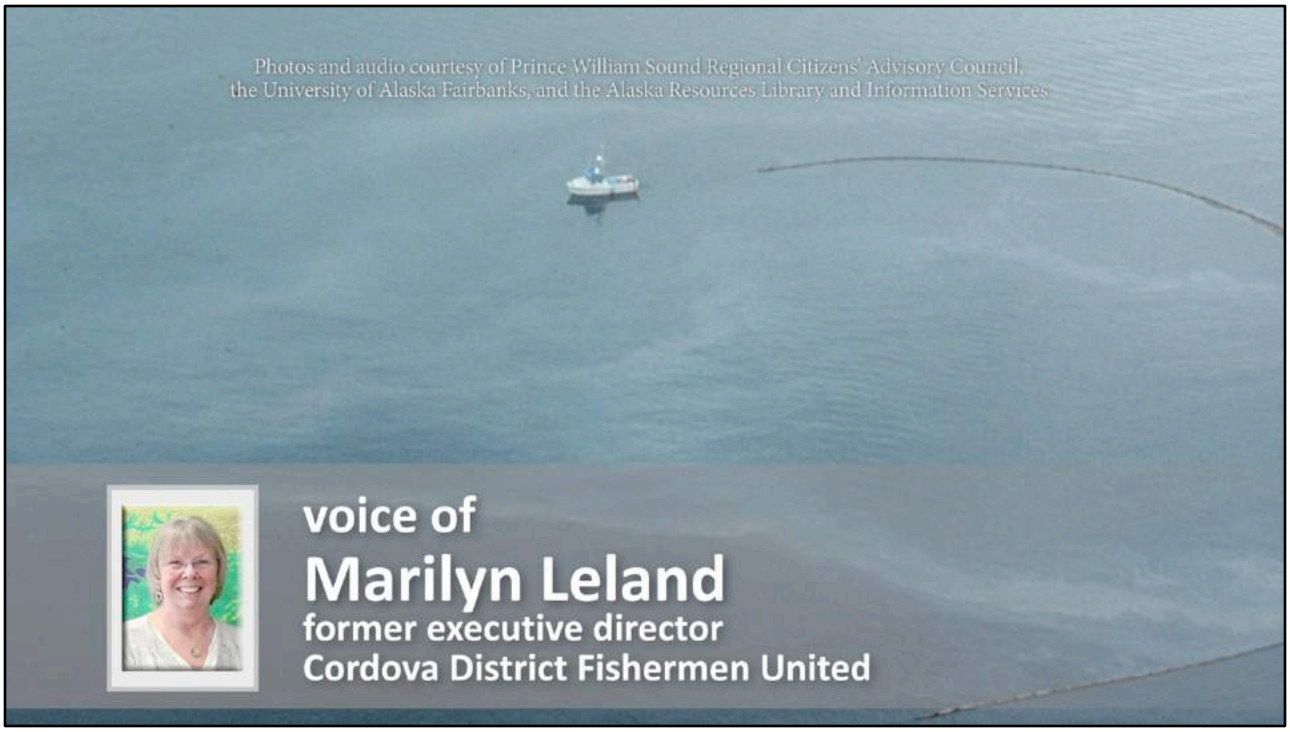


Because of the vast size of the state and the remote location of many of its communities, local residents are frequently the first line of defense in reporting and responding to oil or hazardous substance releases.

In many cases outside responders cannot arrive in time to deal with the immediate impact of a spill.



Alaska's communities can play an important role in minimizing the impact of oil and hazardous substance spills. Recognizing the importance of local involvement, the Alaska DEC is working with local communities to provide a coordinated and effective response and to expand the network of resources available to protect human health and the environment. By building capacity at the local level, both Alaska DEC and local residents will be better prepared to respond to these incidents.

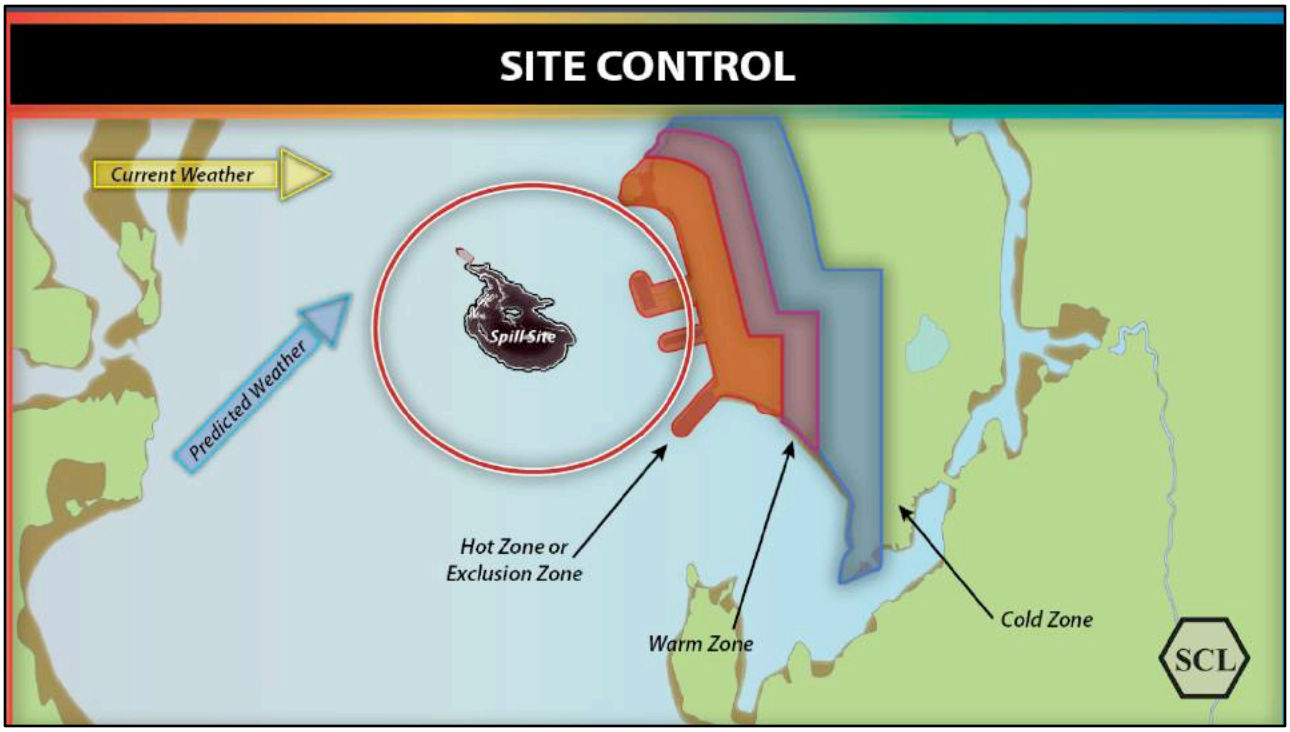

Photos and audio courtesy of Prince William Sound Regional Citizens' Advisory Council,
the University of Alaska Fairbanks, and the Alaska Resources Library and Information Services
voice of
Marilyn Leland
former executive director
Cordova District Fishermen United

This class is about safety. It will discuss what local first responders can do to protect their community in the event of an oil spill.

In this class, we are going to show you how to safely participate in an oil spill response and take initial actions to help safeguard precious local resources before professional responders arrive. These actions include:

- Reporting an oil spill.
- Accessing response equipment in an Alaska DEC Conex box.
- Allowing and excluding access to an oil spill site.
- Safely identifying the hazards associated with an oil spill.
- Conducting a safety brief and;
- Putting on and taking off personal protective equipment.

All of this information can be found in the Spill Tactics for Alaska Responder or STAR Manual which can be viewed and downloaded from the Alaska DEC website



During the course of the instruction, you will see symbols in the lower right corner of the screen that correspond to the sections of the STAR Manual where you can find more information on the topic being presented.

The Occupational Safety and Health Administration, or OSHA, has published training standards for marine oil spill response. The Hazardous Waste Operations and Emergency Response, or HAZWOPER training is published in the Code of Federal Regulations.

This training video is designed for people who have had, at a minimum, the 24-hour HAZWOPER training course.

Additional information regarding HAZWOPER training standards and requirements can be found at the OSHA website listed on the screen.

If you have not had this training and do not have professional oversight, you should cease all response activity upon seeing, smelling, or becoming aware of oil in the immediate area. Professionals will be responding as soon as possible and the protection of human health is paramount.

It is important to know that you don't have to have HAZWOPER training to assist or volunteer during oil spill response operations. You can take preventative actions before oil arrives. After oil shows up and when trained professional responders arrive, a Volunteer Coordinator can assist you in supporting response operations.

This training is also designed for people who do not have any training in the Incident Command System or ICS. ICS is a standard system for managing an oil spill or other hazardous material spill response. For more info on ICS training, please see the website listed on the screen.

Finally, this training is intended for use by people with experience in handling oil spill response equipment in the area where these tactics will be used. **Do not conduct field operations in environmental conditions beyond your level of training and experience.**


Reporting an Oil Spill

Reporting a Spill

IT'S THE LAW!

AS 46.03.755 and 18 AAC 75.300

REPORT
OIL AND HAZARDOUS SUBSTANCE SPILLS

During Normal Business Hours

call the nearest response team office:

Central Alaska: Anchorage	(907) 269-3063 Fax: (907) 269-7648
Northern Alaska: Fairbanks	(907) 451-2121 Fax: (907) 451-2362
Southeast Alaska: Juneau	(907) 465-5340 Fax: (907) 465-2237

Outside Normal Business Hours

Toll Free	1-800-478-9300
International	1-907-269-0667

Northern Alaska

Central Alaska

Southeast Alaska

Alaska Department of Environmental Conservation

Division of Spill Prevention and Response

Hazardous Substance

Any hazardous substance spill, other than oil, must be reported immediately.

Oil – Petroleum Products

To Water

- Any amount spilled to water must be reported immediately.

To Land

- Spills in excess of *55 gallons* must be reported immediately.
- Spills in excess of *10 gallons*, but *55 gallons* or less, must be reported within 48 hours after the person has knowledge of the spill.
- Spills of *1 to 10 gallons* must be recorded in a spill reporting log submitted to ADEC each month.

To Impermeable Secondary Containment Areas

- Any spills in excess of *55 gallons* must be reported within 48 hours.

Additional Requirements for Regulated Underground Storage Tank Facilities

Regulated Underground Storage Tank (UST) facilities are defined in 18 AAC 75.325 and do not include heating oil tanks.

If your release detection system indicates a possible discharge, or if you notice unusual operating conditions that might indicate a release, you must notify the ADEC UST Program within 7 days.

UST Program: (907) 269-3008 or 269-7679

In the State of Alaska, any hazardous substance spill, or any oil spill into a waterway, must be reported immediately by calling the Alaska DEC. There are specific reporting criteria for oil spills on land but to avoid potential fines for failure to notify, report all oil and hazardous substance spills.

Reporting a Spill

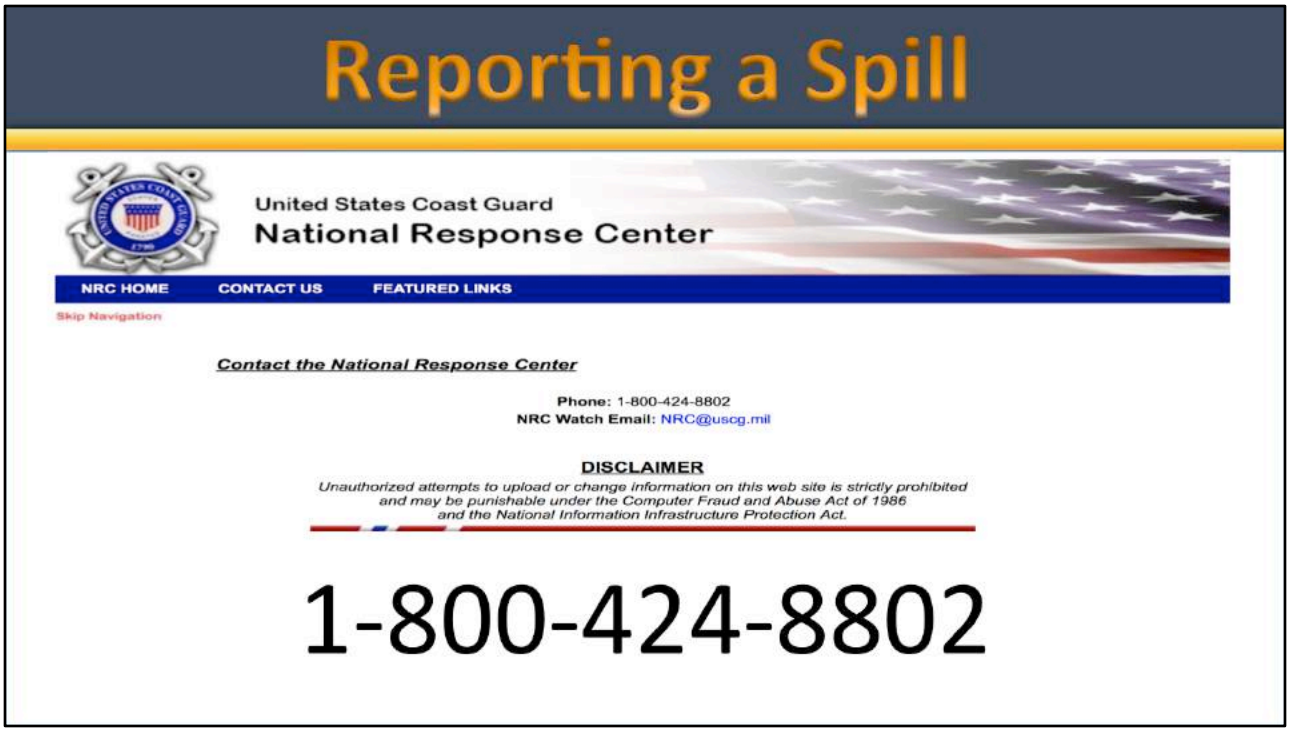
Area	Phone	FAX
Central (Anchorage)	(907) 269-3063	269-7648
Northern (Fairbanks)	(907) 451-2121	451-2362
Southeast (Juneau)	(907) 465-5340	465-2237

Outside normal business hours call: 1-800-478-9300

http://dec.alaska.gov/spar/spillreport.htm

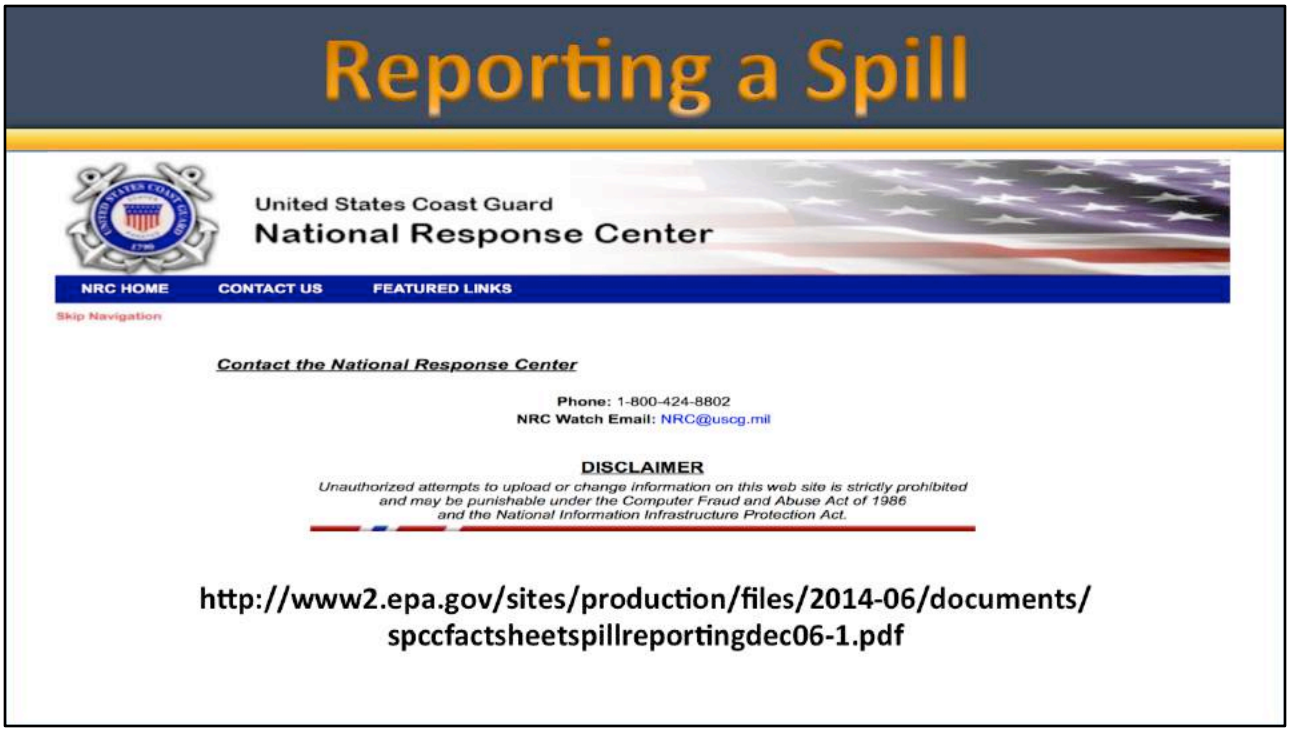
During normal business hours call the nearest Alaska DEC response team office to report a spill. The phone numbers for each area are listed on the screen.

Outside normal business hours call: 1-800-478-9300



There are also federal reporting requirements for oil spills that can be met by calling the National Response Center at 1-800-424-8802. Federal reporting requirements are in addition to – not in place of – State reporting requirements. For more information, see the web site listed on the screen.

Reporting a Spill



http://www2.epa.gov/sites/production/files/2014-06/documents/spccfactsheetspillreportingdec06-1.pdf

For more information, see the web site listed on the screen.

If you have any questions, see the procedures outlined on the Alaska DEC Oil and Hazardous Substance Spill Notification Form located at the website shown on-screen.

This form will prompt you to provide specific information about the spill including:

The location, date and time
What's been spilled
Source and cause of spill
Resources being threatened like water sources and wildlife
Cleanup actions being taken and;
Methods of disposing of contamination

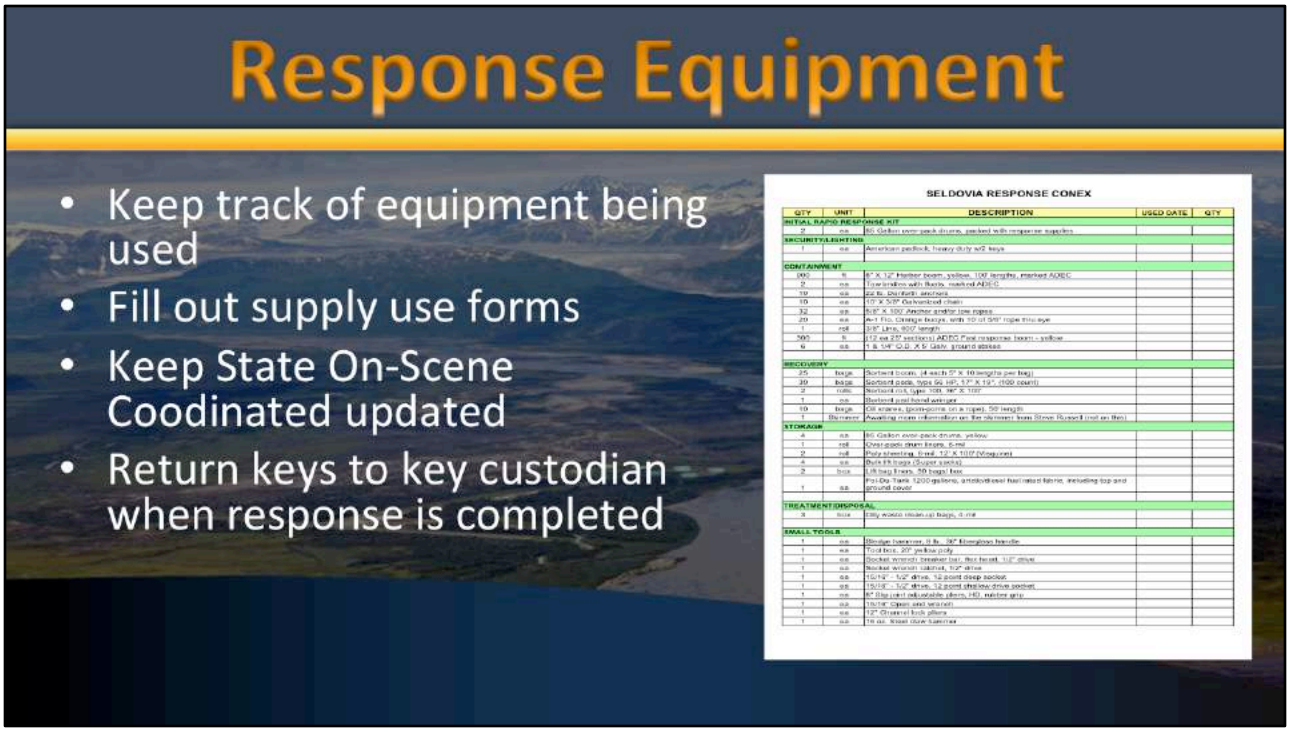

Response Equipment
Locations

The Alaska DEC maintains response equipment trailers or conex boxes in several communities across the state. After getting approval for use from the State On-Scene Coordinator or their representative, these resources are available to anyone responding to an oil spill.

To find out if your community has a conex box and to learn what's inside it, check DEC's website shown onscreen, or ask your local emergency response manager, harbormaster, or fire department personnel. Additional information about conex boxes, including access procedures, inventory lists, and phone numbers for key custodians is available at the same website.

If you need supplies from a conex box, ask to speak with a State On-Scene Coordinator or their representative after reporting the spill to Alaska DEC. Alaska DEC staff will collect essential facts and authorize the key custodian to allow use of the container's contents. This person will provide you with the key to the conex box.

Conex boxes are regional assets, so you can coordinate with neighboring communities if you don't have a container immediately available. If your region doesn't have a container nearby, equipment may be available from other sources such as your local health clinic, fire department, Village Public Safety Officer, or State Troopers' office.



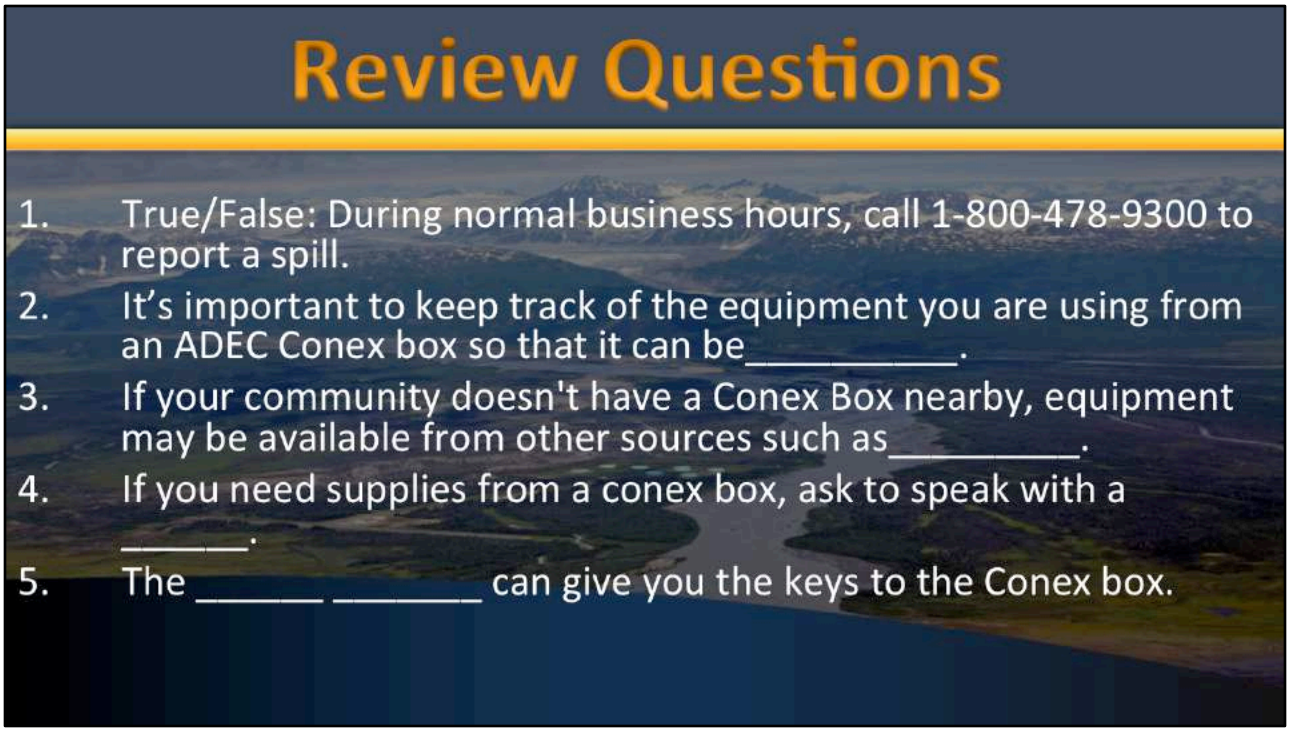
It's important to keep track of the equipment you are using so that it can be replaced before the next spill. Fill out the access forms and supply use forms that are located in the front, right corner of every conex box. Supplies may not be replaced if their use is not documented.

Once the initial response is complete, please update the State On-Scene Coordinator about spill status and supply use. And when the response is complete, please return keys to the local key custodian.

Alaska DEC Regional Offices

Area	Phone	FAX
Central (Anchorage)	(907) 269-3063	269-7648
Northern (Fairbanks)	(907) 451-2121	451-2362
Southeast (Juneau)	(907) 465-5340	465-2237

For more information, you can also contact your regional Alaska DEC office at the numbers listed on the screen.

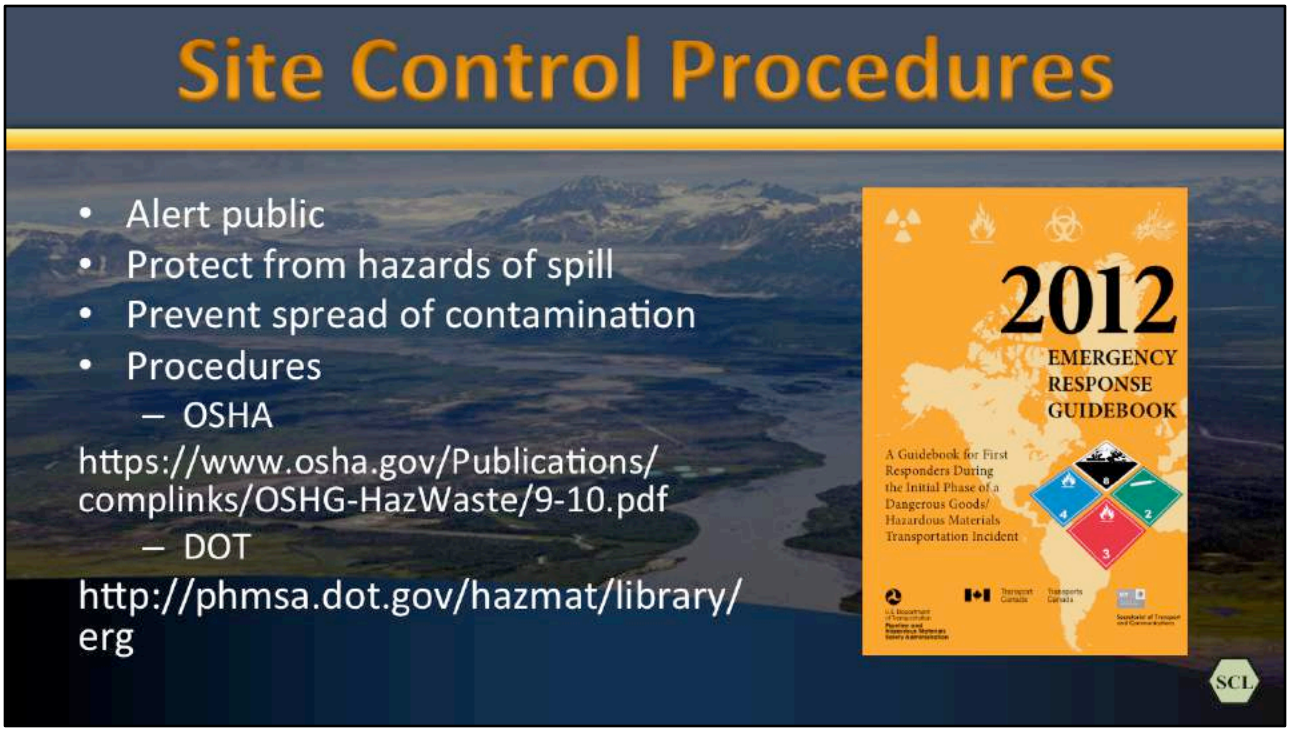


1. False – call the nearest DEC response team

3. your local health clinic, fire department, Village Public Safety Officer, or State Troopers

5. Key Custodian


Site Control



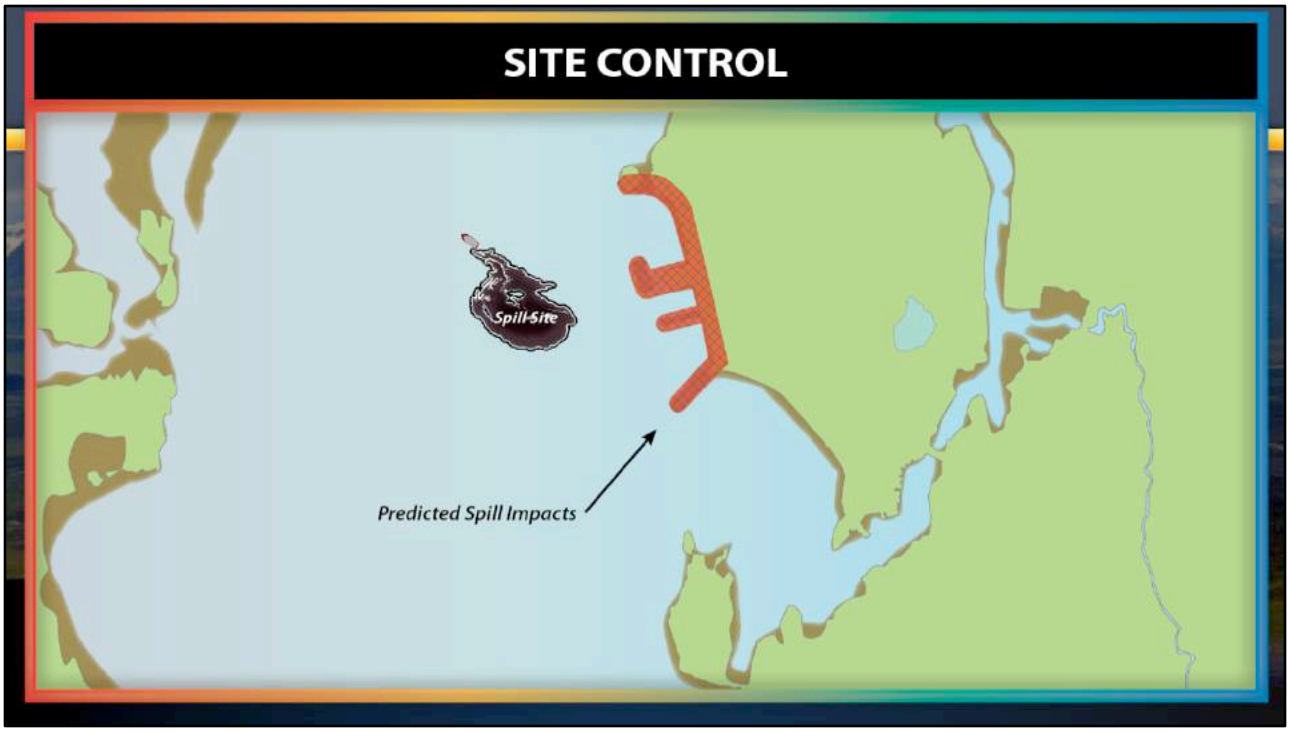
Immediately after a spill, it's important to alert the public of the hazard from the spill, and to take actions to keep people and pets out of the spill area to protect them from the hazards of the spill and prevent the spread of contamination.

To do this, boundaries need to be established around the spill site.

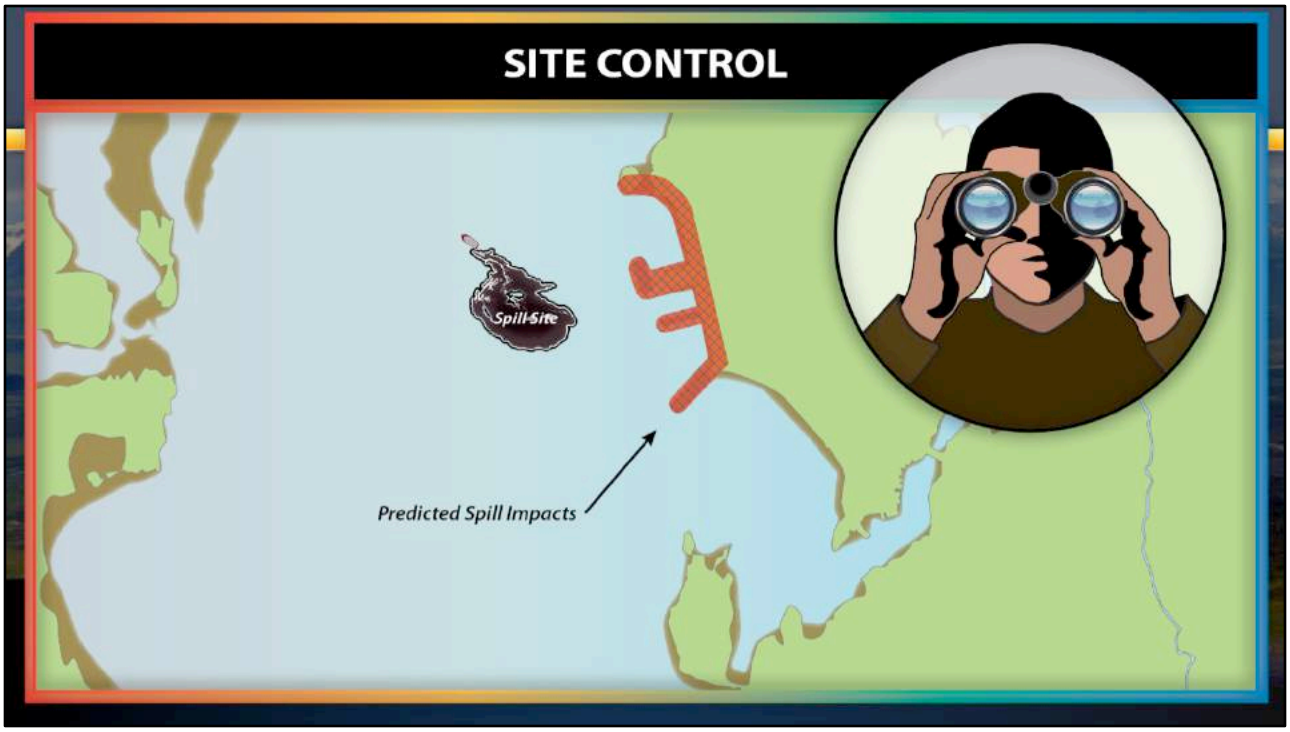
OSHA has published guidelines to control the activities and movements of people and equipment at a hazardous waste site. These procedures, which can be found at the website listed on the screen, will help you in establishing a preliminary work zone or exclusion zone in the early stages of a spill. Another option for determining emergency control zones is the Department of Transportation Emergency Response Guidebook. This resource is user friendly and is a resource for HAZWOPER training.

Site Control Procedures

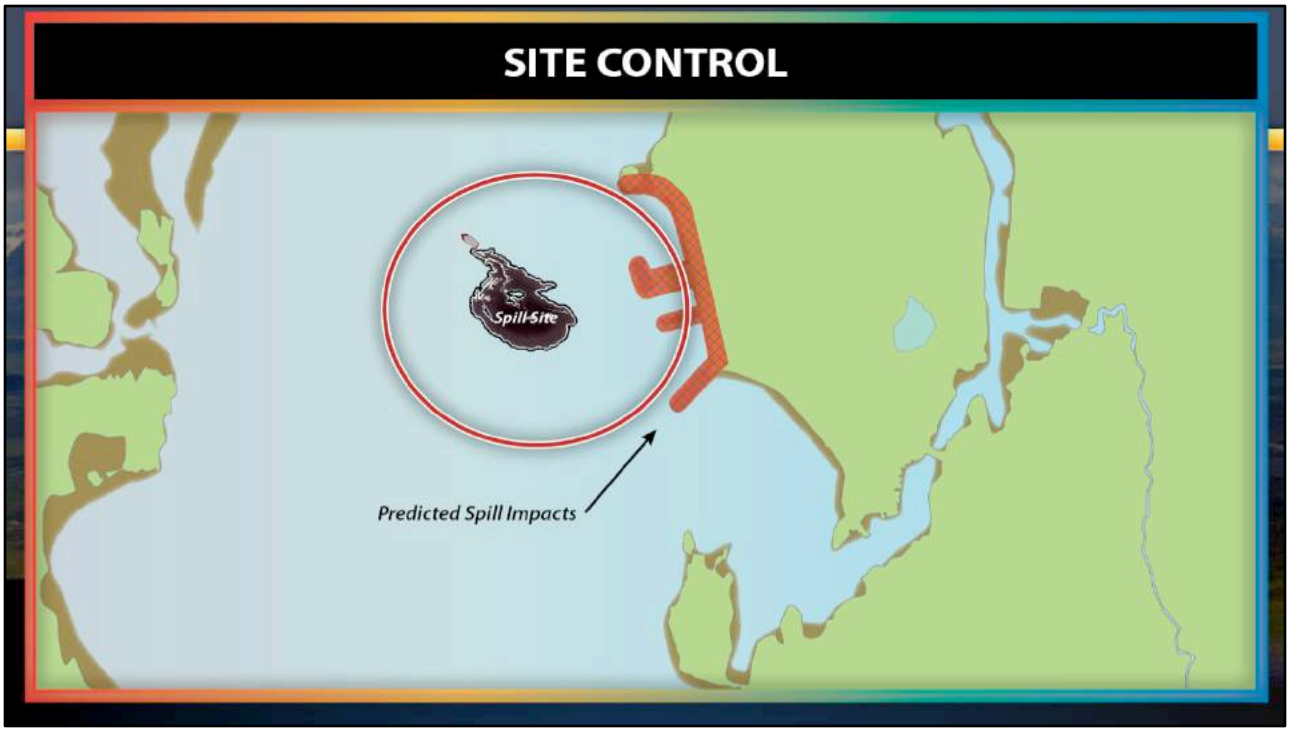
- Visually survey the site.
- Consider the distances to prevent an explosion or fire from affecting personnel.
- Consider the area necessary for response operations.
- Consider meteorological conditions (both current and predicted)
- Obtain a map of the spill area and draw the boundaries on it.
- Physically establish boundaries with:
  - Yellow tape
  - Rope
- Post people to keep unauthorized people out of the work zone.
- Modify boundaries as more information becomes available.



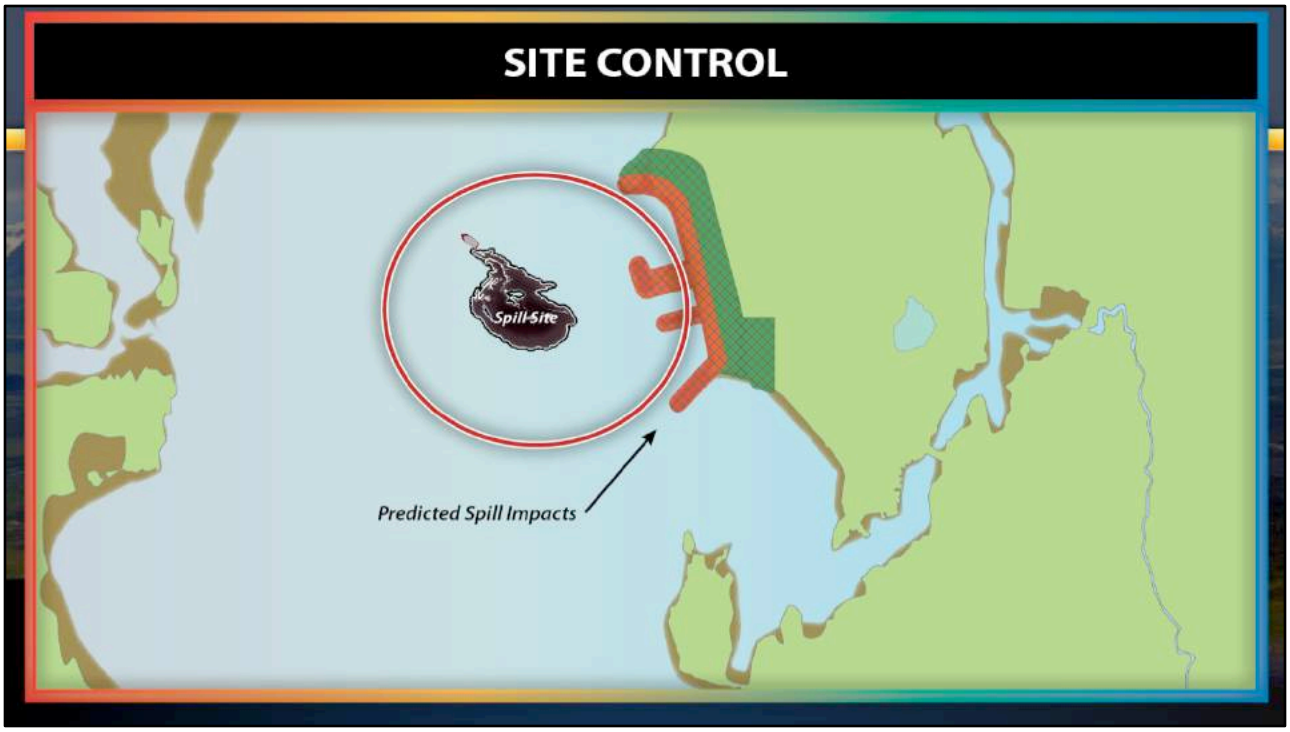
Since every spill site will be different, some general site control procedures should include:



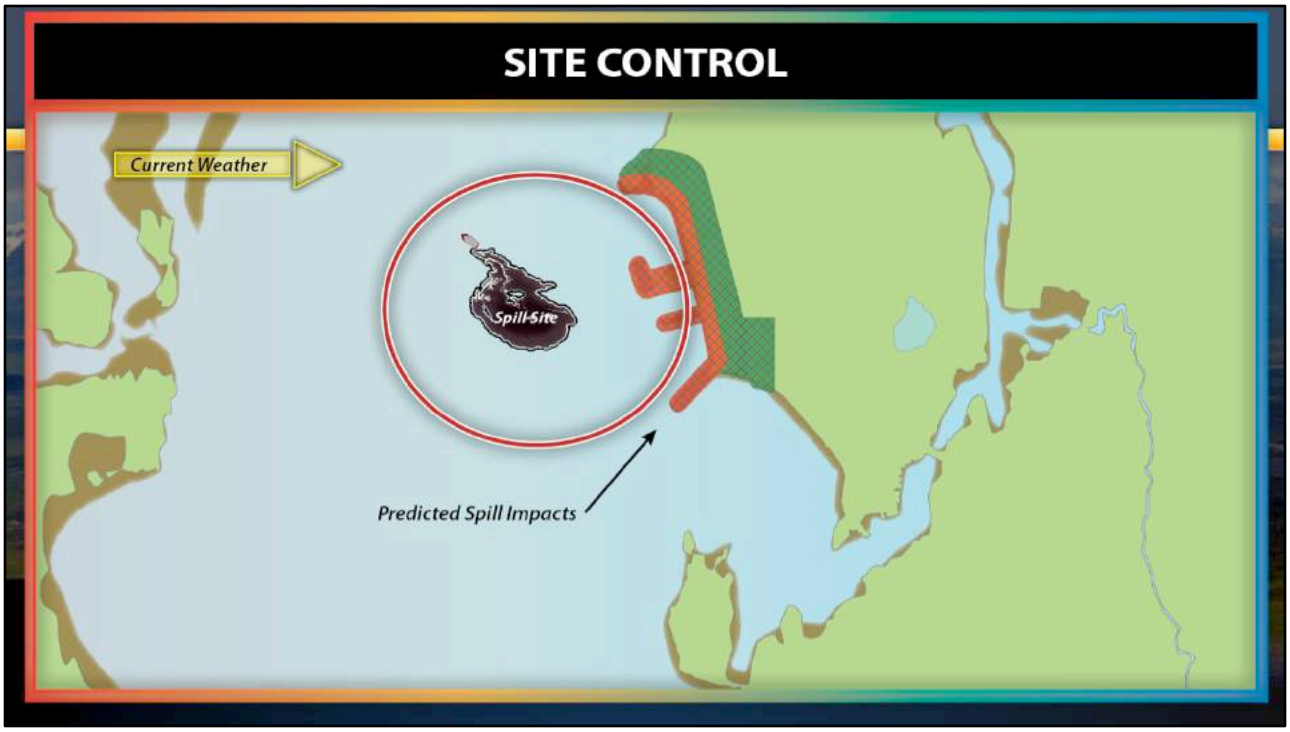
Visually survey the immediate site to identify the locations of spilled material.



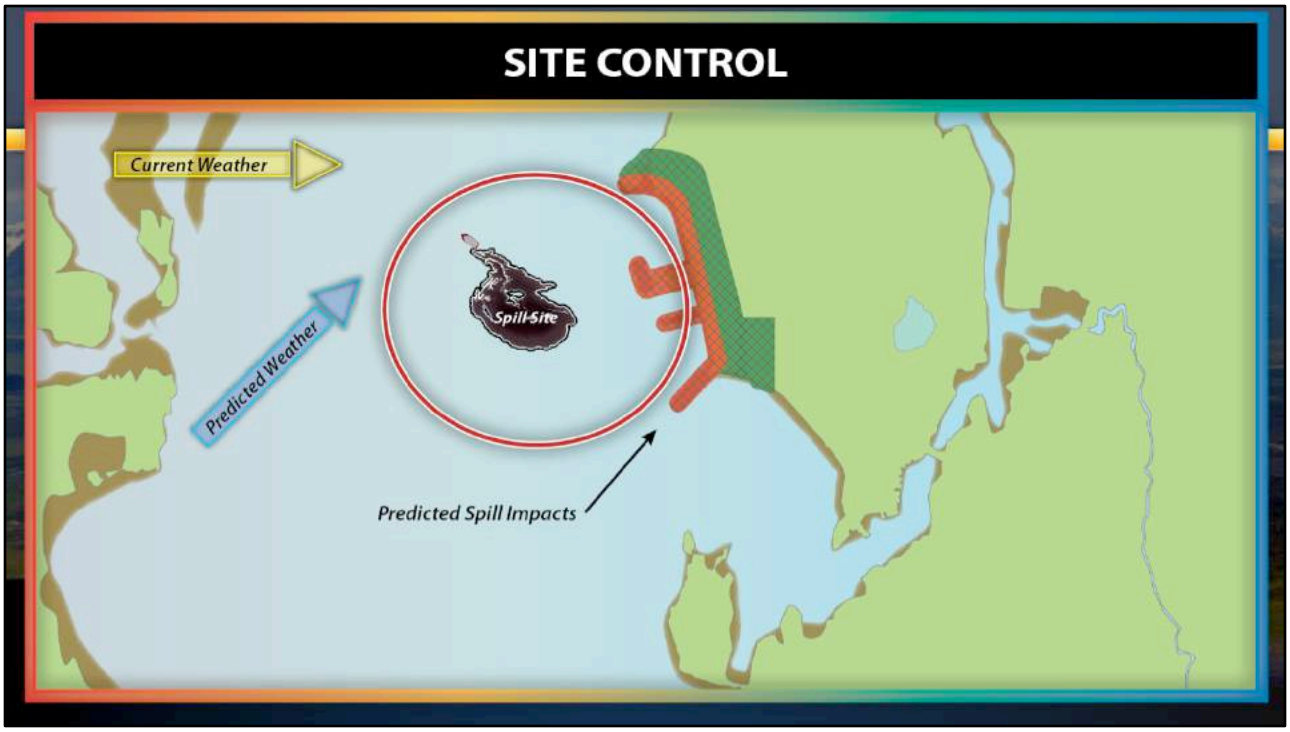
Consider the distances needed to prevent an explosion or fire from affecting personnel outside the Work Zone.



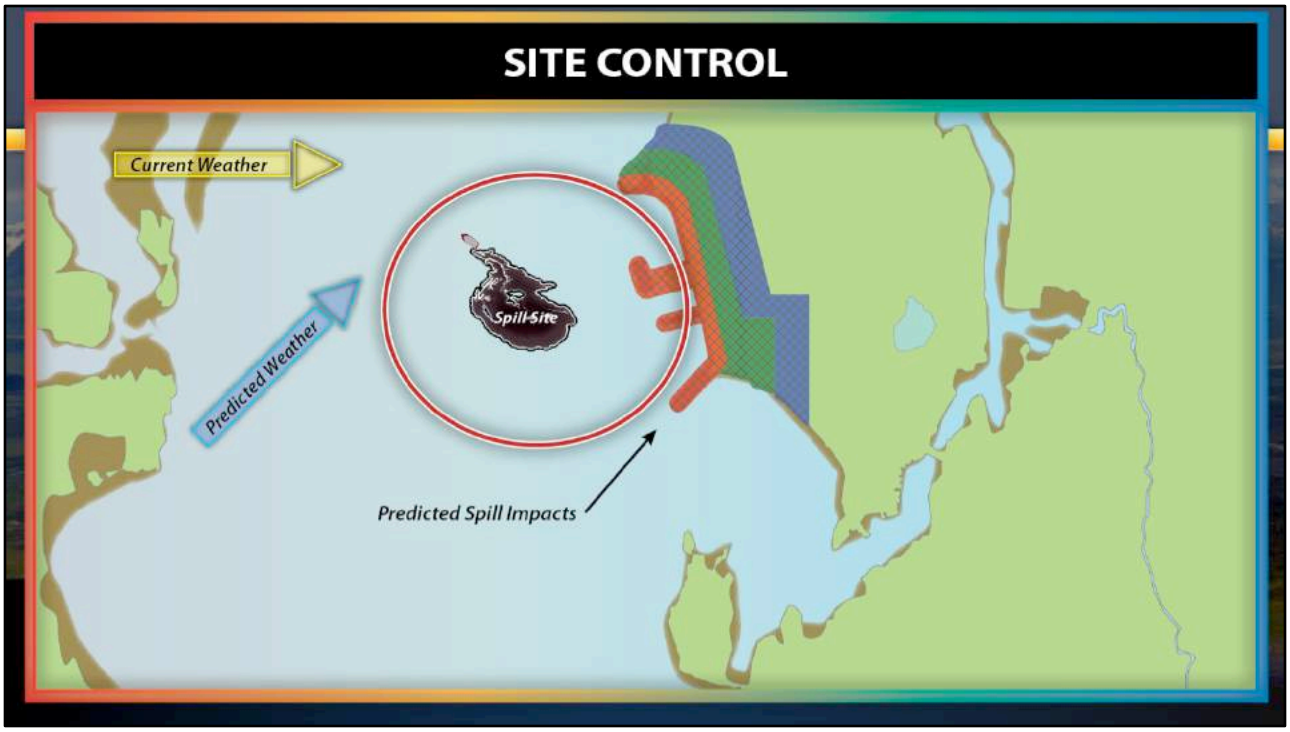
Consider the physical area necessary for response operations.



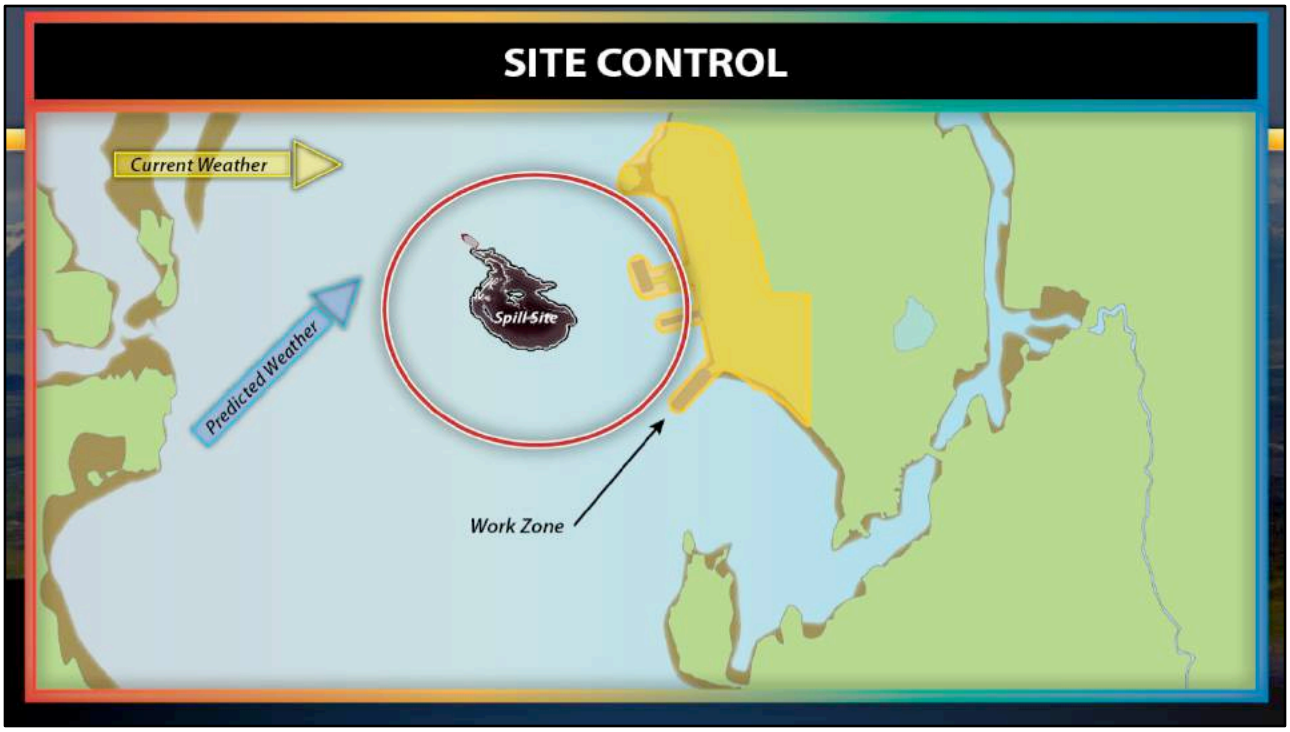
Consider meteorological conditions (both current…



and predicted) …



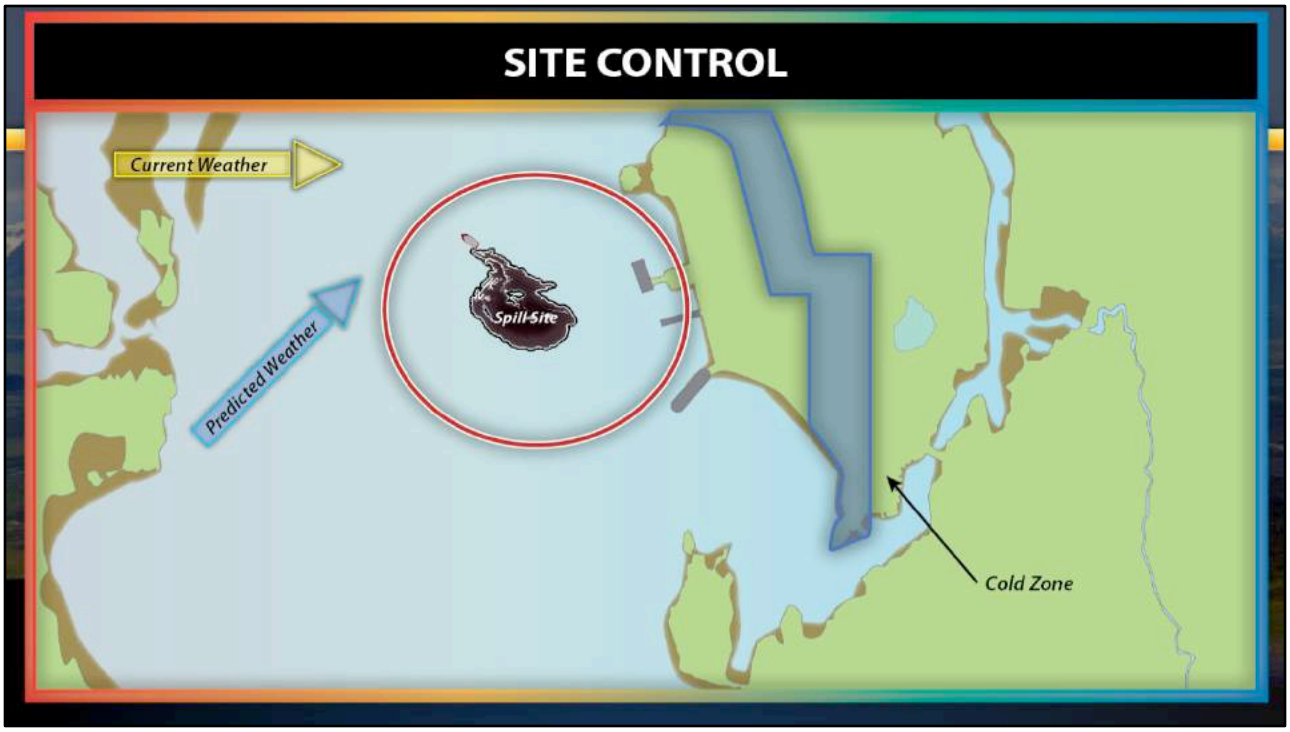
and the potential for contaminants to be blown from the spill area.



Obtain a map of the spill area and place the boundaries of the work zone on it. (hoping to have video of this)
Identify those boundaries of the work zone using the yellow caution tape provided in the Alaska DEC Conex boxes or, if unavailable, use rope or other suitable material to clearly indicate a boundary through which the public should not pass. (Hoping to have vide of this)
If necessary, post people to keep unauthorized people out of the work zone. (Hoping to have video of this too)

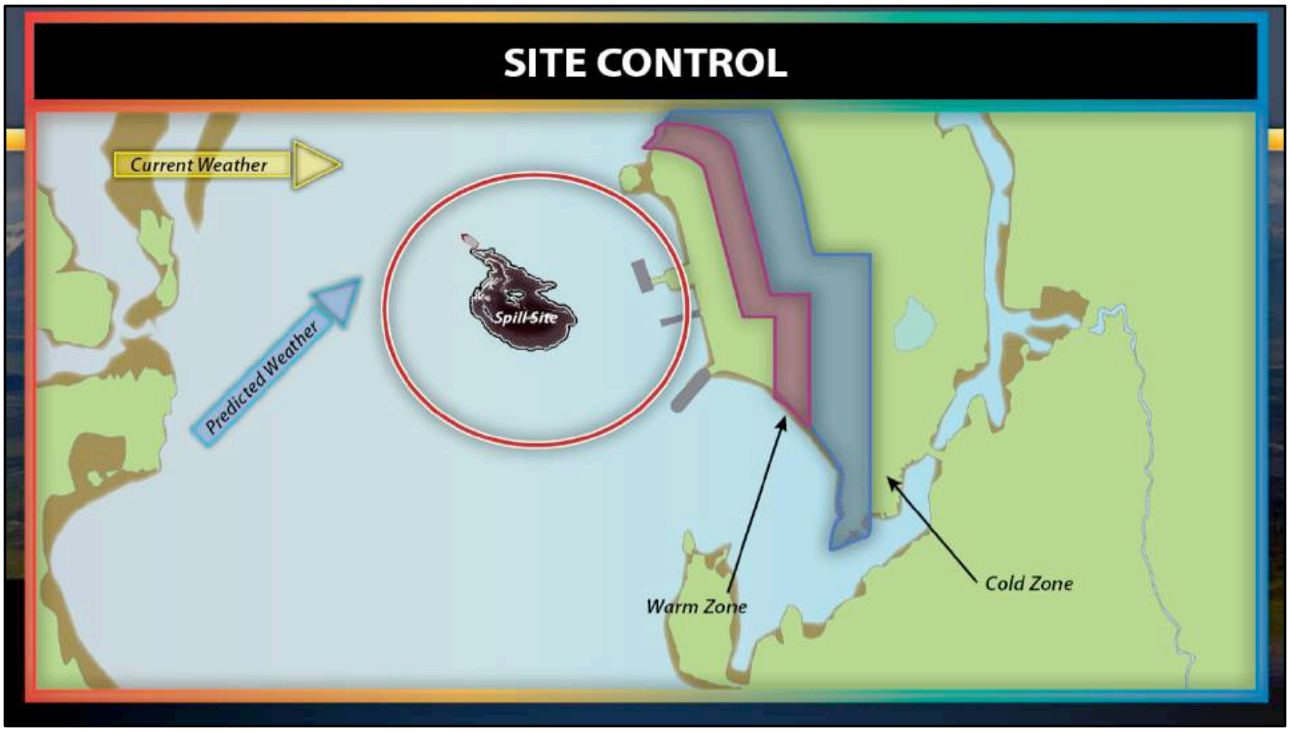
Modify the work zone location, as necessary, as more information becomes available.

This perimeter you create will become the work zone where cleanup operations will occur. The work zone or exclusion area should be as small as possible to prevent the spread of contamination, but large enough to accommodate emerging conditions, such as migration of the spilled oil or changes in the direction of the wind or tide.

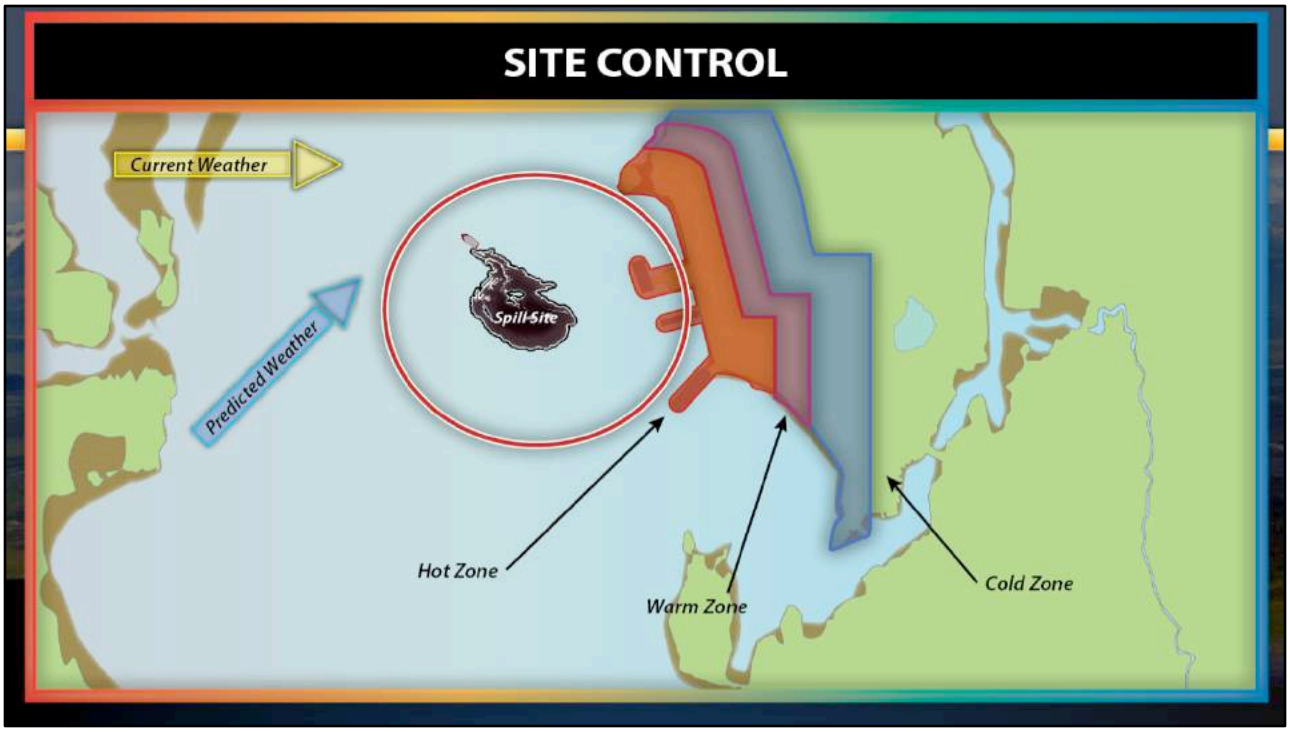


When professional responders arrive, they will likely set up three distinct zones within, around, or instead of the preliminary work zone you have already set up. They are known as:

The Cold Zone

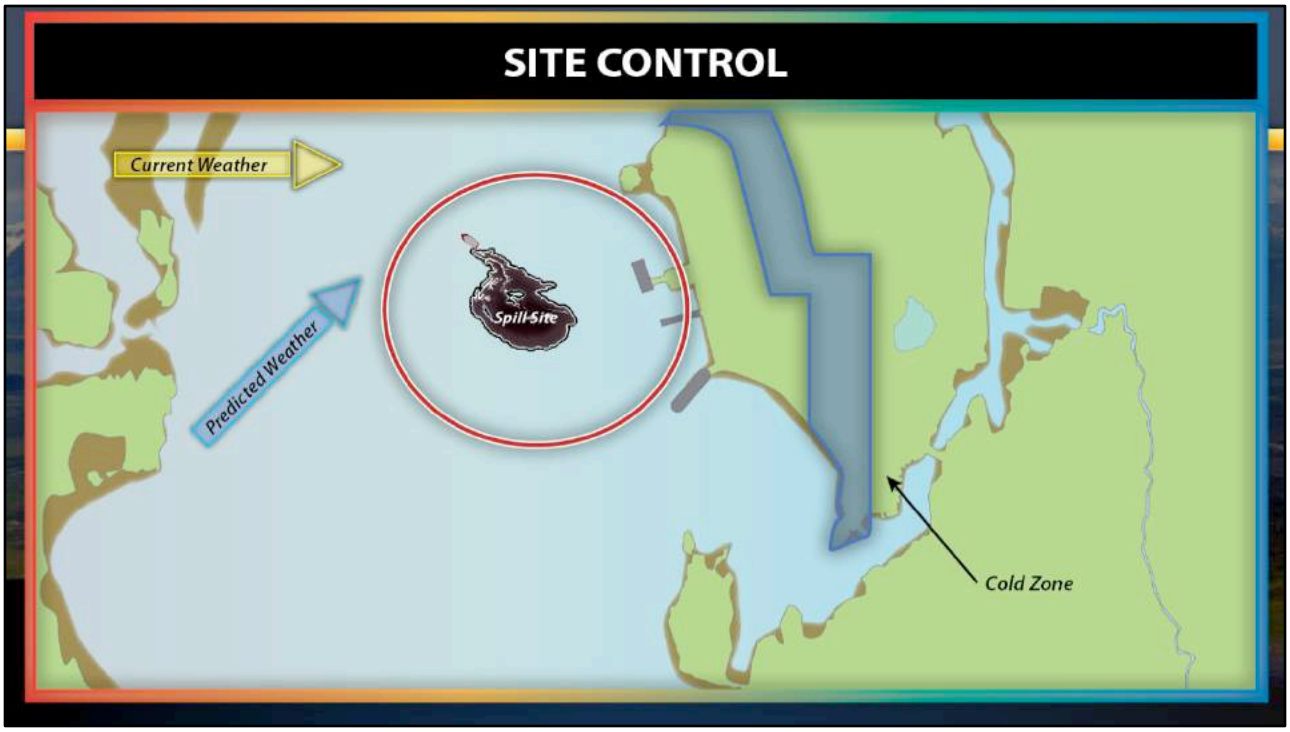


The Warm Zone and

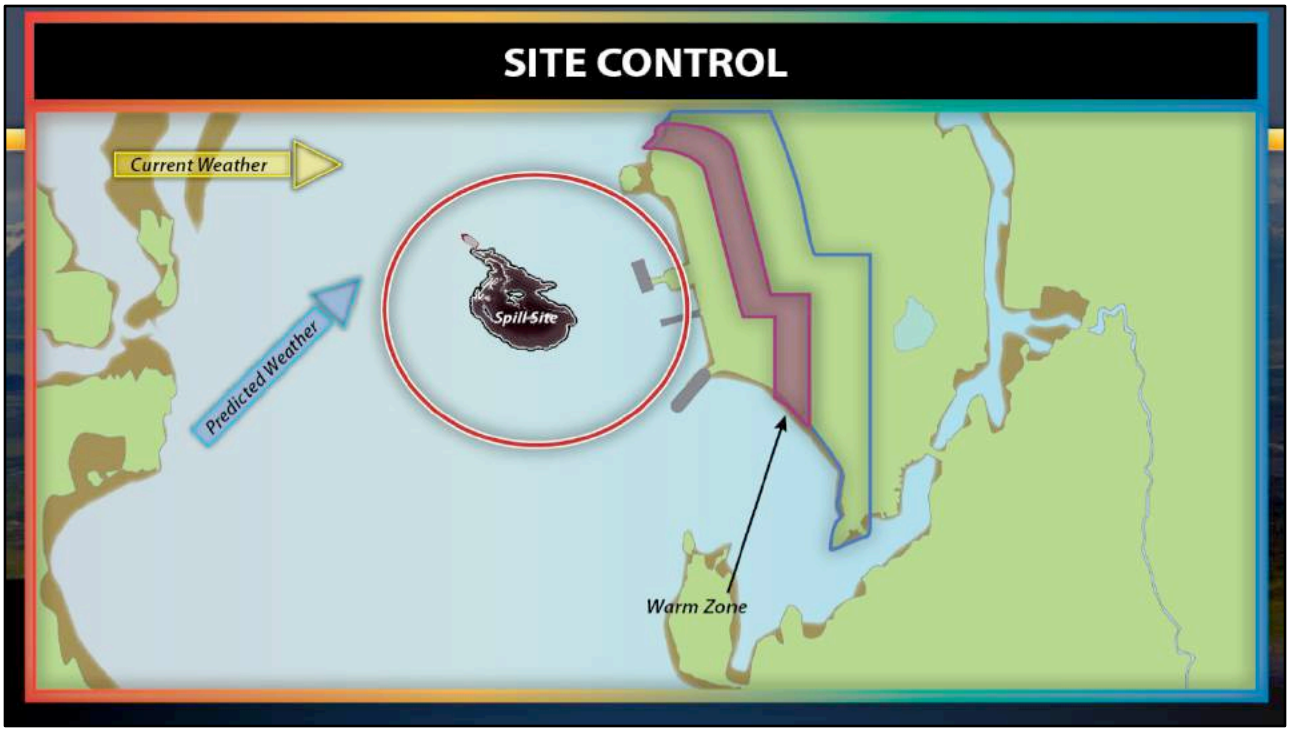


The Hot Zone

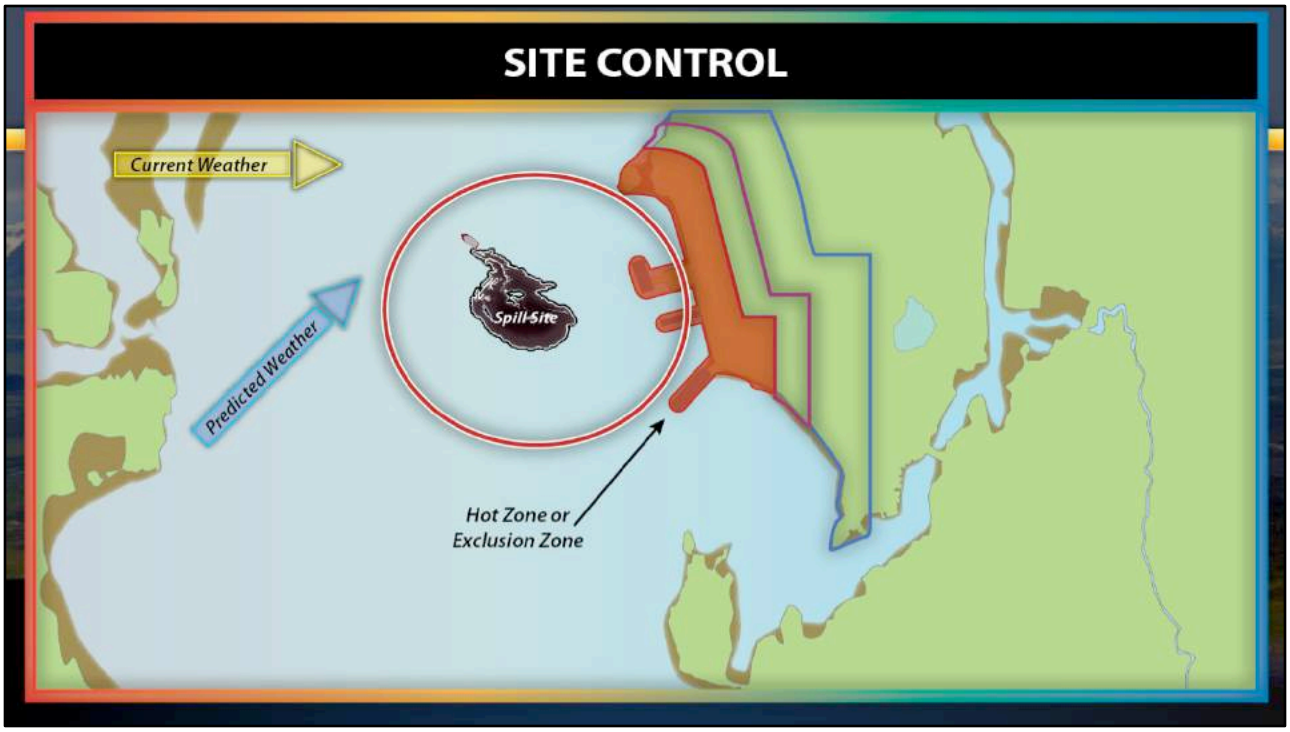
Configuration of these three zones should be taken into consideration when setting up a preliminary work zone at any given sight. Having an understanding of the activity that will take place in each of these zones will help to ensure that a preliminary work site can more easily be restructured to accommodate hot, warm, and cold zones when and if it becomes necessary to expand on-site operations.



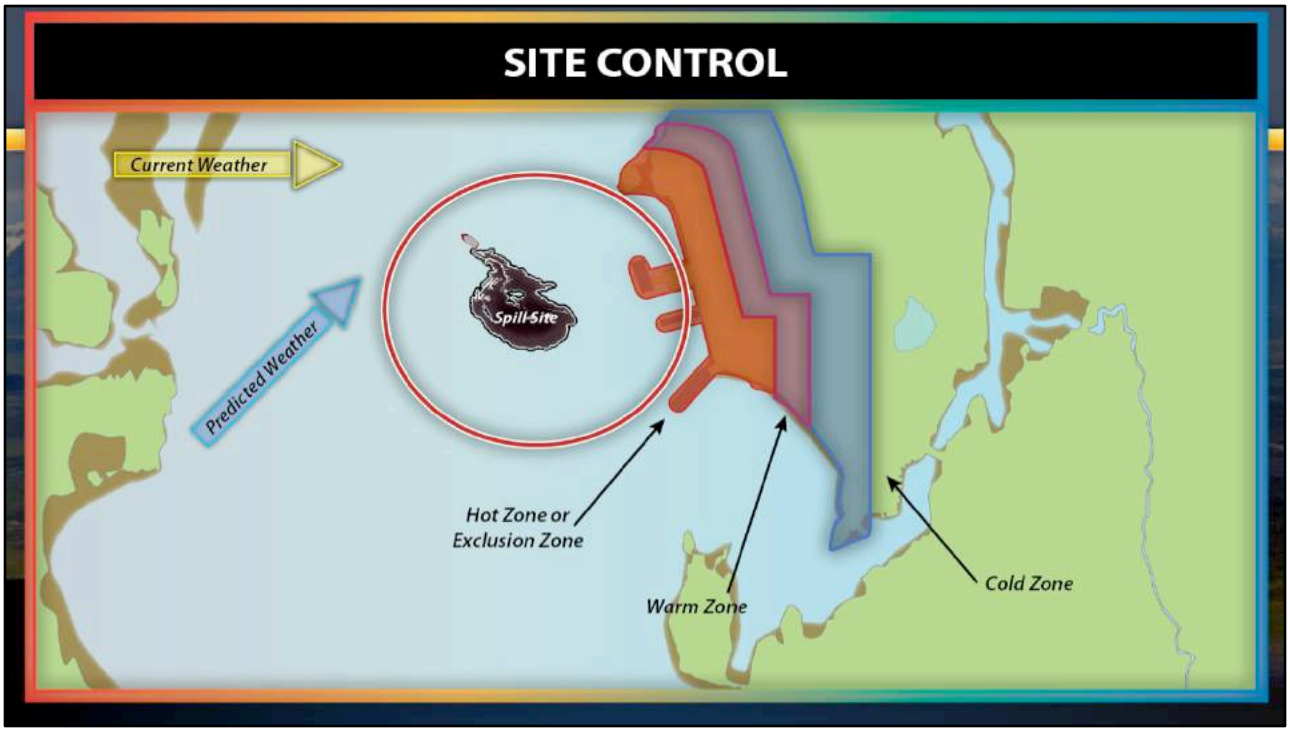
The Cold Zone or Support Zone is an area free of contamination. It contains all support facilities, the staging area, bathroom facilities, and the command post. All eating and living areas must be kept in the Cold Zone.



Warm Zone or Contamination Reduction Zone — allows for an orderly transition from the Hot Zone to the cold zone: workers put on PPE and shed contaminated clothing, equipment and personnel are decontaminated.



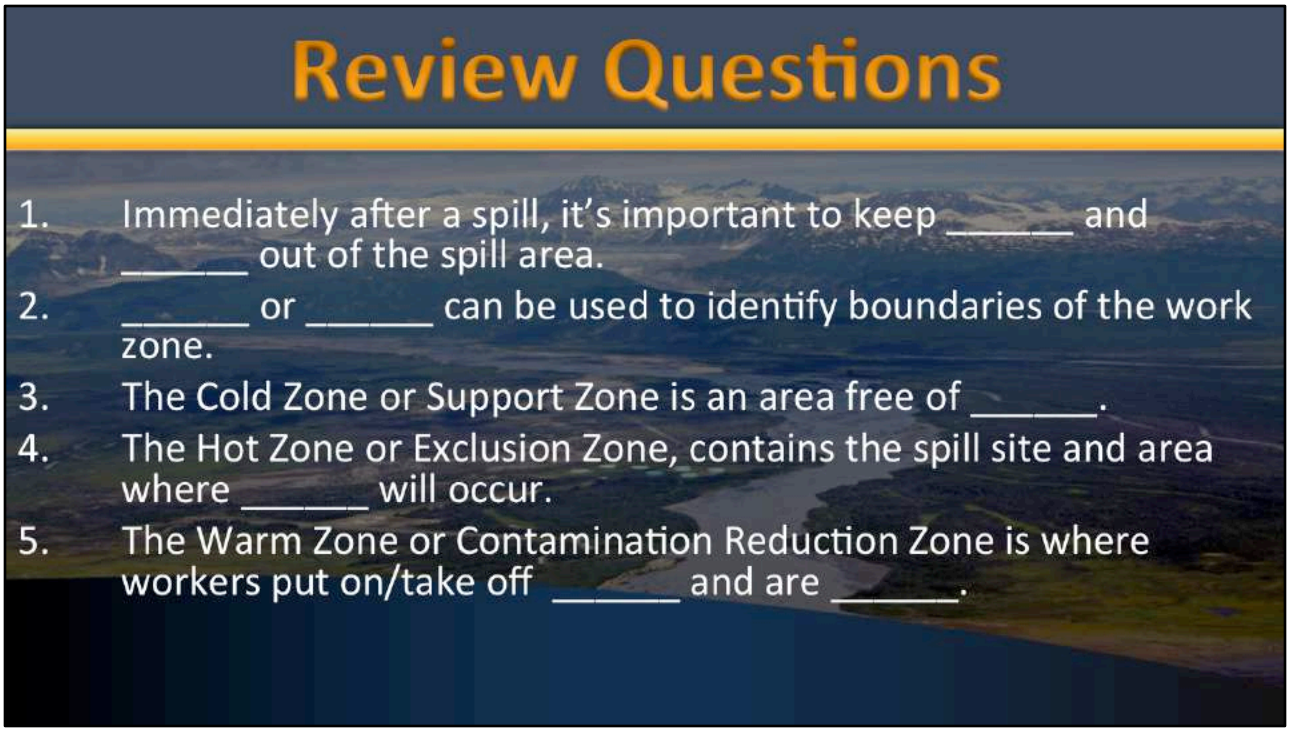
The **Hot Zone or Exclusion Zone,** contains the spill site and area where clean-up operations will occur. Typically, this area will be the area you set up as your work zone.



If you have not had HAZWOPER training, and are at a spill site where Hot, Warm, and Cold zones have been established, you should not enter the warm or hot zones without proper PPE and without being specifically directed to do so by the site supervisor.

Site Control Procedures

- Visually survey the site.
- Consider the distances to prevent an explosion or fire from affecting personnel.
- Consider the area necessary for response operations.
- Consider meteorological conditions (both current and predicted)
- Obtain a map of the spill area and draw the boundaries on it.
- Physically establish boundaries with:
  - Yellow tape
  - Rope
- Post people to keep unauthorized people out of the work zone.
- Modify boundaries as more information becomes available.



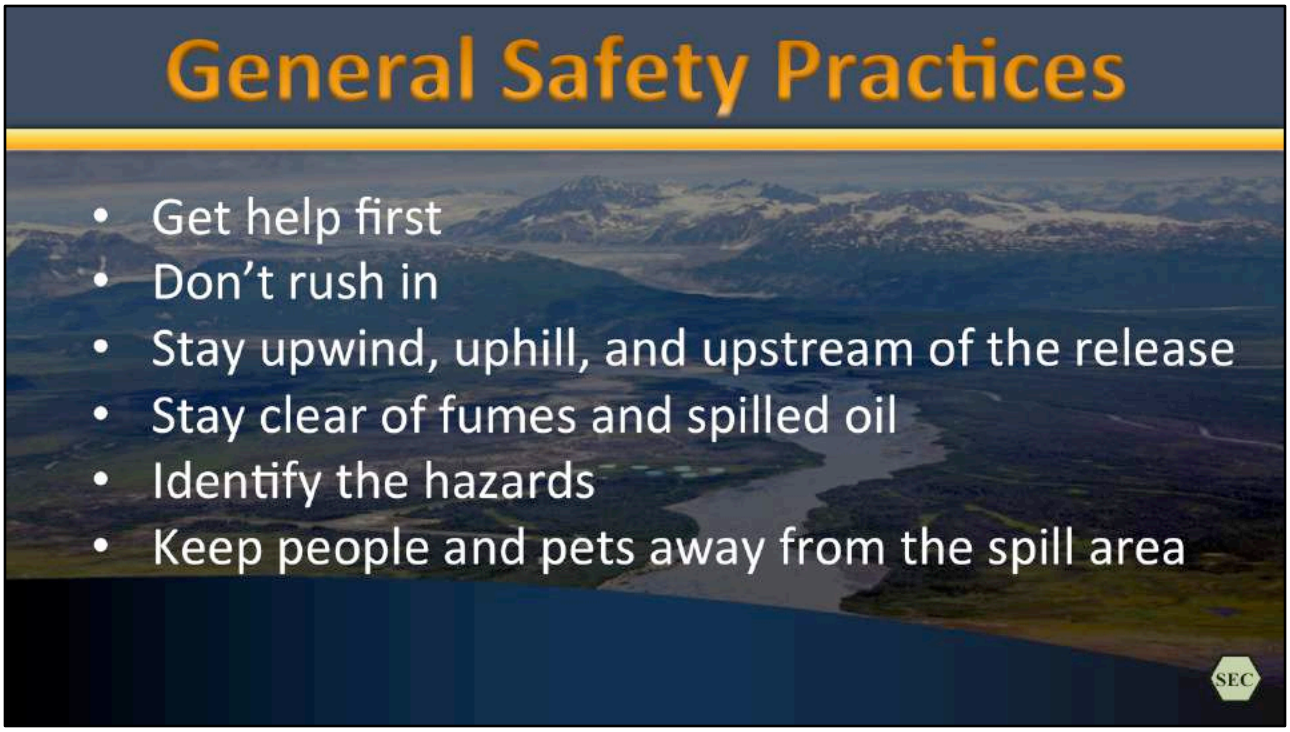
1. People and pets
2. Yellow tape or rope
3. Contamination

5. PPE, decontaminated


Safety Assessment

If you are involved in the early stages of an oil spill, a Site Safety Plan may not be available. If one exists, you should become familiar with the information in it. If not, it will be important to start one as soon as possible. To help get one started, Form 201-5 on the Alaska DEC web site can help you identify all the information you need to create an initial safety assessment.

Once completed, the form essentially serves as the initial Site Safety Plan. If there are others to help you, a site safety assessment should be completed at the same time as you are carrying out site control procedures.



As you implement site control procedures and complete the safety assessment, keep these general practices in mind:

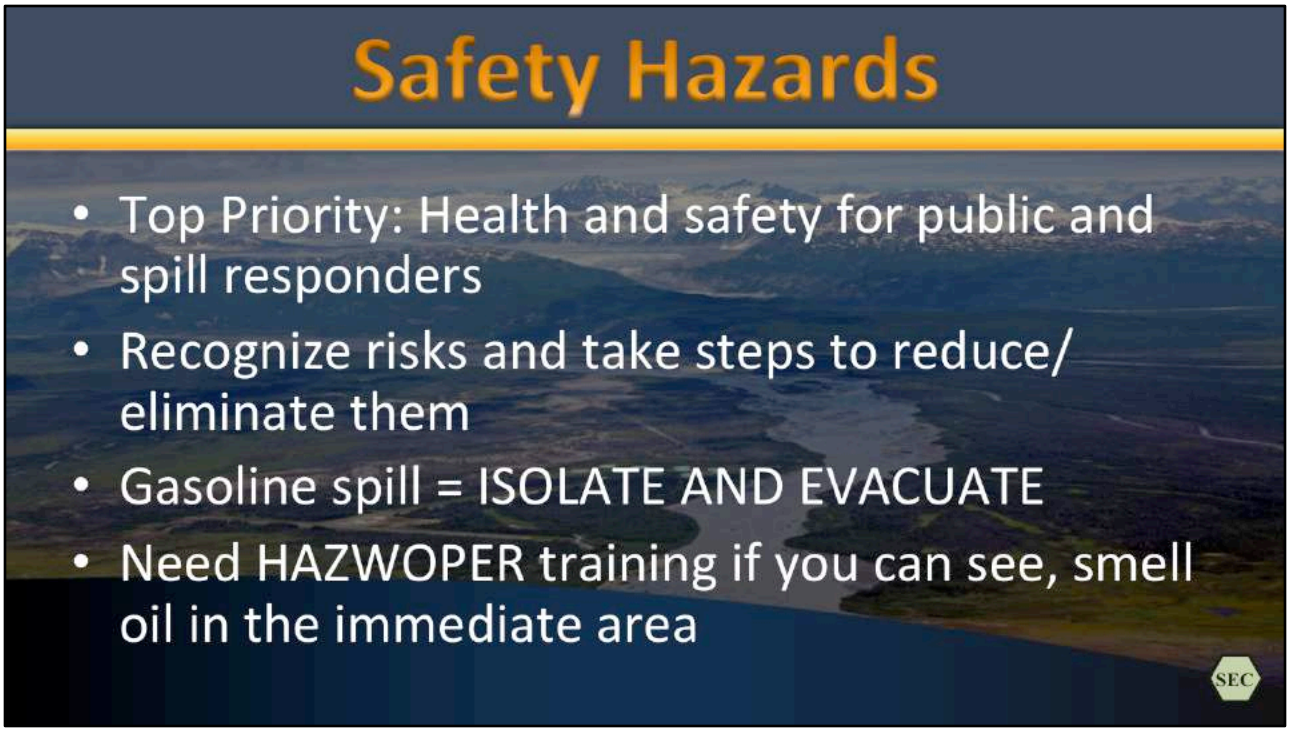
- If you are alone, get help before doing anything.
- Don't rush in to the affected area without knowing the risks.
- Stay upwind, uphill, and upstream of the release.
- Stay clear of fumes and spilled oil because toxic substances like benzene and hydrogen sulfide can enter the body through your eyes, skin, mouth and lungs and can negatively impact your short term and long-term health.
- Identify all hazards including those associate with the spilled product and specific work-site hazards
- Keep uninvolved people and pets out of the spill area.

In addition to completing an initial site safety plan, responders who are first on-scene should also consider the following:

- The safety of personnel in the immediate area first, including your own safety.
- Use of the Buddy System – especially at night or under adverse weather conditions, and in remote areas. Do not wander into unknown areas alone.
- Enter impacted areas only when wearing appropriate protective gear.
- Rescue attempts and protecting property must be weighed against not only your safety and the safety of other initial responders but also your ability to respond to the situation. Do not take any actions that may unnecessarily endanger you or anyone else or magnify the problem at hand.
- Establish a command post and lines of communication.
- Continually reassess the situation and modify response accordingly.

The safety of every responder is of the utmost importance and every precaution must be taken to reduce or eliminate health and safety hazards prior to beginning response operations.


Safety Hazards

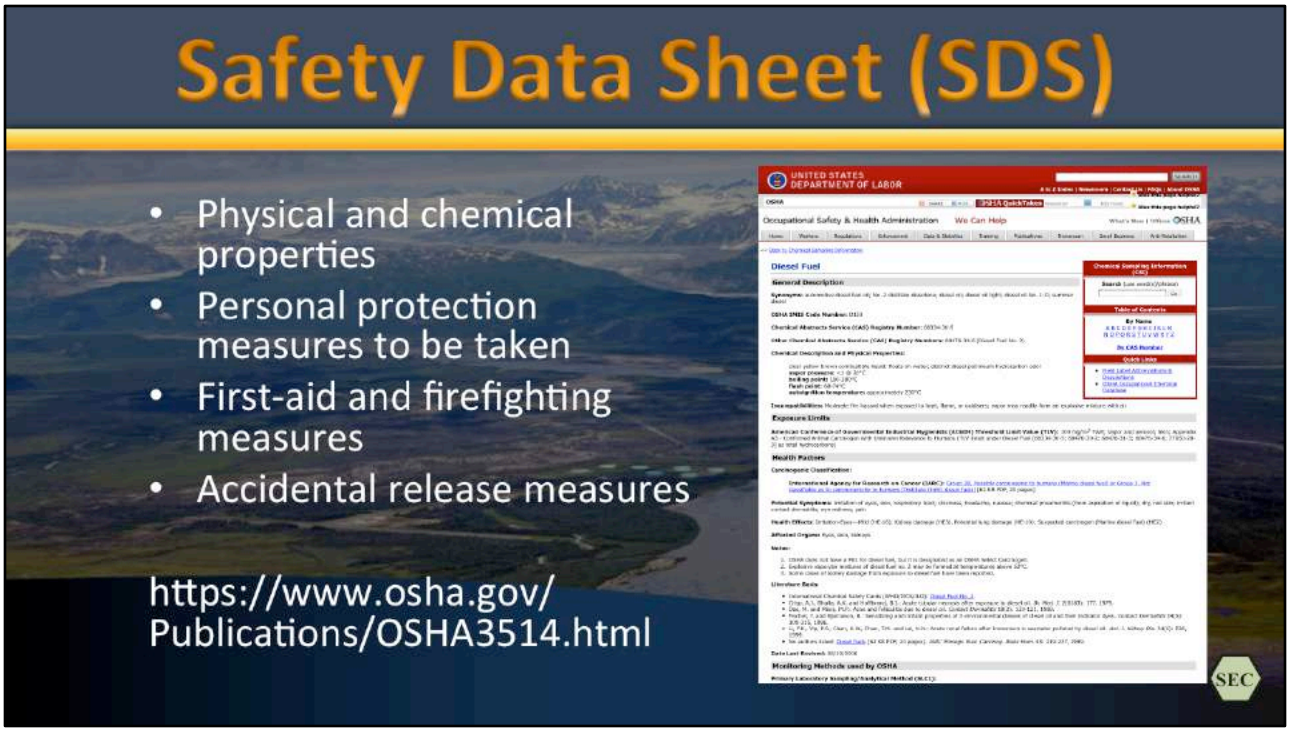


When an oil spill occurs, the issue of health and safety, both for the public and oil spill responders, is the most critical consideration. Because cleanup activities are usually conducted in the open air, the hazards from vapors and gases are relatively low but they still exist and need to be addressed.

Protective clothing is also important for responders to reduce contact with oil and minimize exposure to hazardous substances like oil. The spilled oil and the working environment can introduce other hazards. The key to safety is to recognize the risks ahead of time and take measures to reduce or eliminate them.

Every effort must be made to identify existing hazards at a spill site, evaluate the risks these hazards present, and implement control measures that will eliminate or control them. A comprehensive overview of Hazard Communication including hazard recognition, evaluation, and control is included in HAZWOPER training.

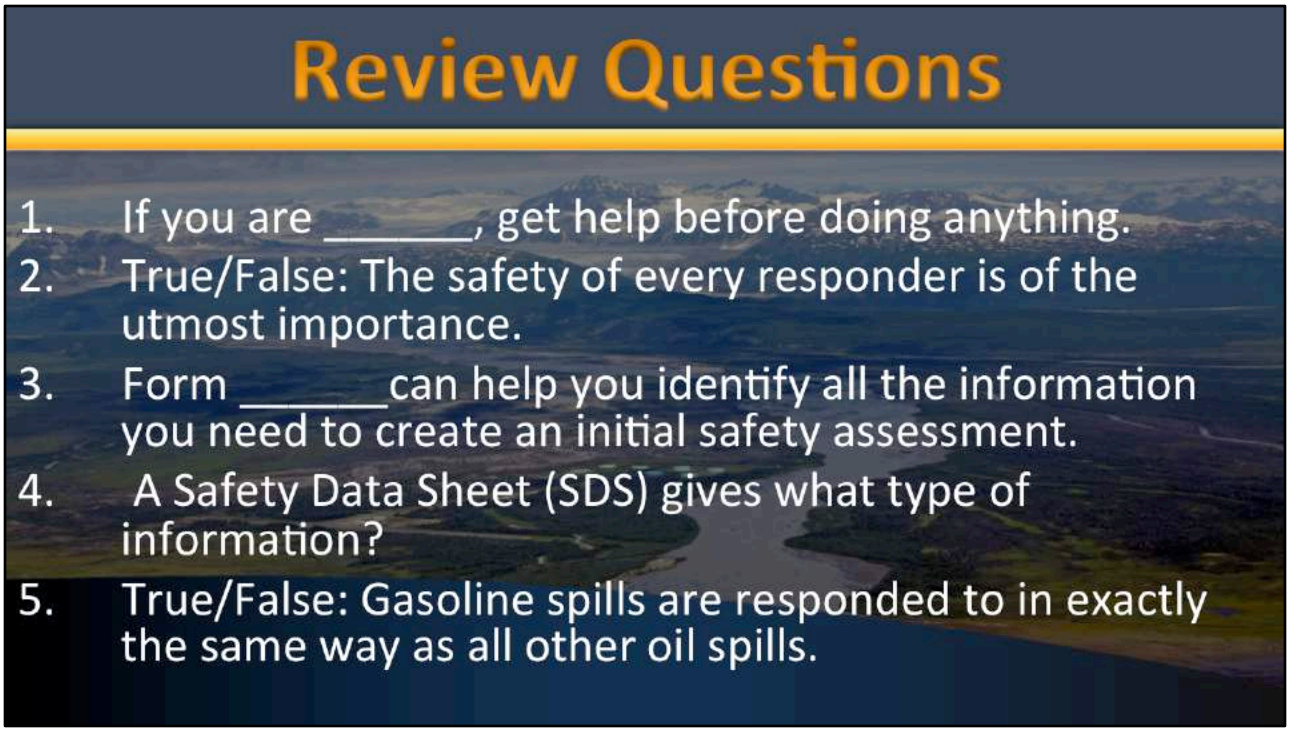
It's important to note that oil spills are treated much differently from gasoline spills. Gasoline is extremely volatile and poses significant explosion and exposure risks. If you are involved in a situation where gasoline has been spilled, isolate the area and evacuate until the gasoline evaporates into the atmosphere or until professional responders arrive.



Upon arrival at a spill site, every effort should be made to determine the type of spilled oil. Ideally, a Safety Data Sheet or SDS – formerly referred to as a Material Safety Data Sheet is available for the specific spilled product. The SDS contains valuable information about the spilled product including:

Physical and chemical properties
Personal protection measures to be taken
First-aid and firefighting measures
Accidental release measures

For more information on safety data sheets, see the website listed on the screen.



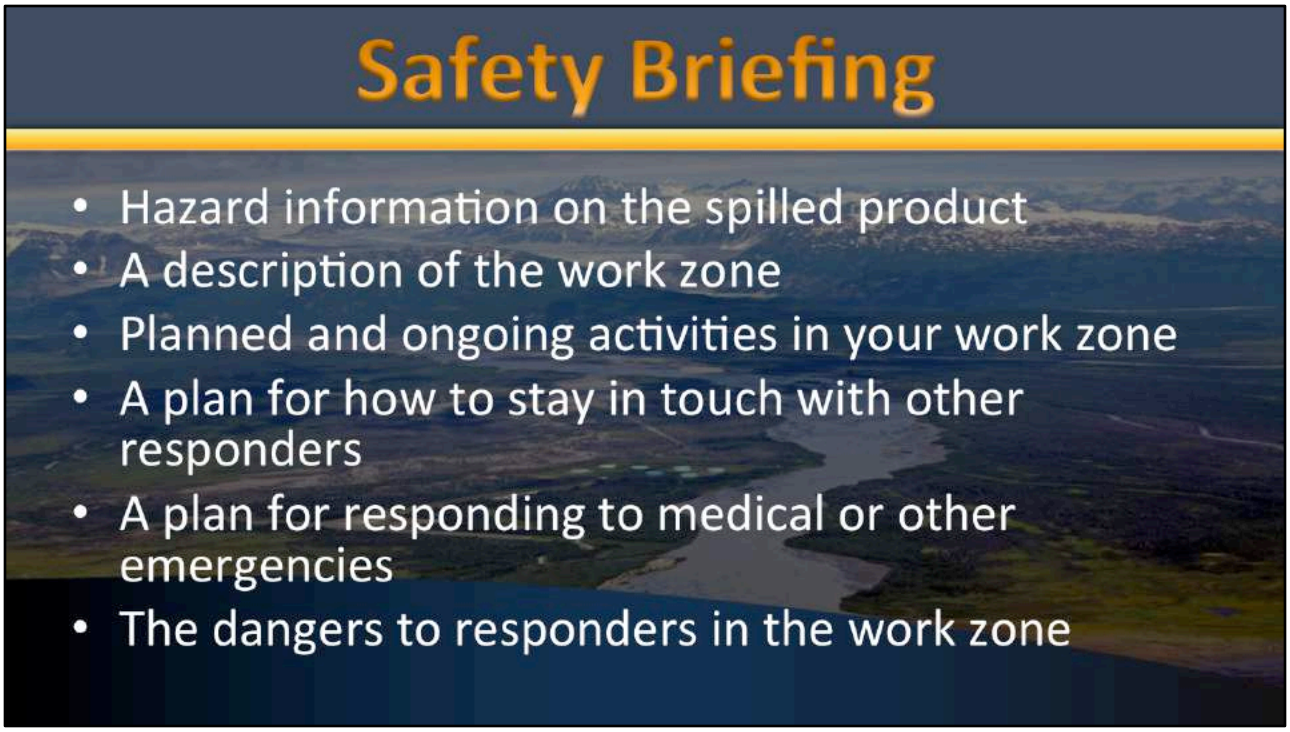
1. Alone
2. True
3. Form 201-5. Once completed, the form essentially serves as the initial Site Safety Plan.
4. Physical and chemical properties, Personal protection measures to be taken, First-aid and firefighting measures, Accidental release measures
5. False: isolate the area and evacuate until the gasoline evaporates into the atmosphere or until professional responders arrive.


Safety Briefing

An important element in keeping responders safe during an incident is ensuring that everyone is aware of safety hazards that may occur during response operations. This information is passed along to all responders during a **safety briefing** that should be held prior to beginning response activities. A safety briefing is a discussion lead by a team leader or safety officer that outlines the hazards at the site.

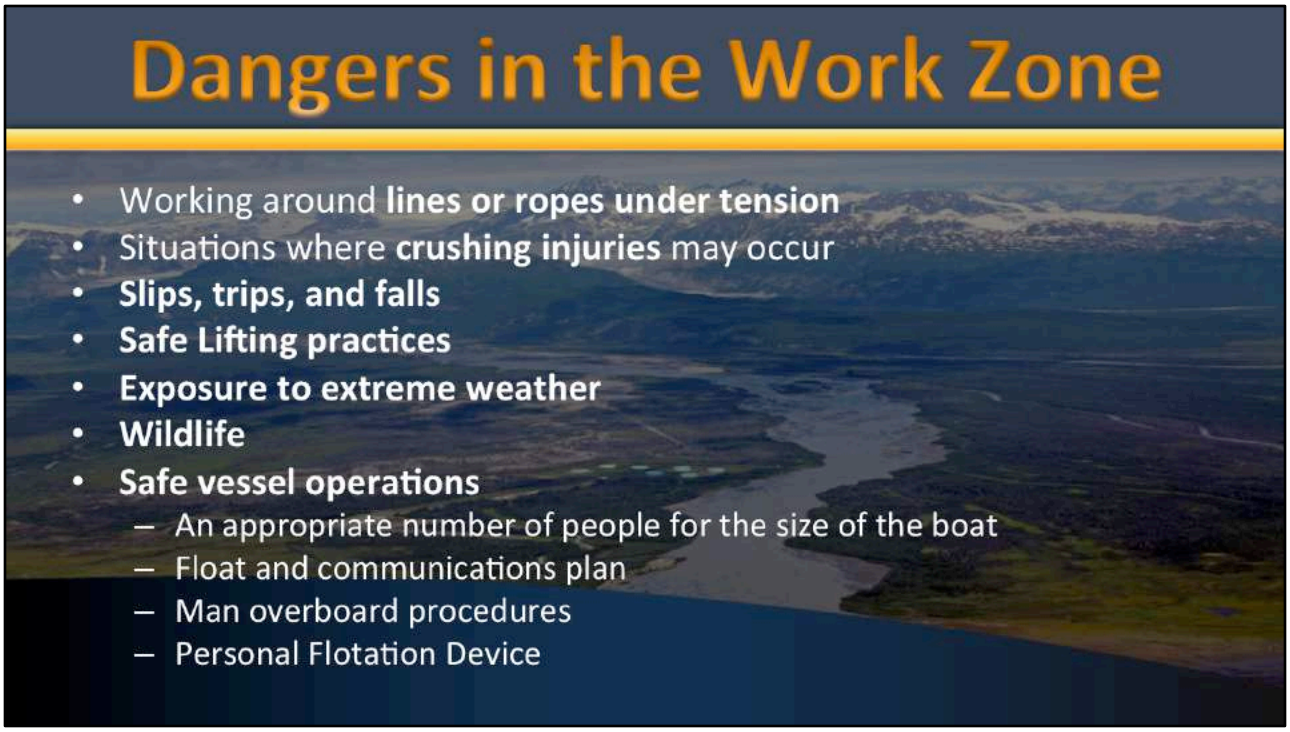
Safety briefings should cover the important issues that will be encountered in the field, but they should not be a class in safety. They should be brief, directive and concise.

To ensure everyone's safety, never assume responders are aware of the hazards and risks that are present during operations.



Each spill response is unique and will have a variety of issues that will require attention and action. Topics and procedures that may need to be covered in a briefing are:

Hazard information on the spilled product
A description of the work zone
Planned and ongoing activities in your work zone
A plan for how to stay in touch with other responders.
A plan for responding to medical or other emergencies
The dangers to responders in the work zone including the following:



Working around **lines or ropes under tension, and the entanglement** of a person in ropes, rigging or booms.

Situations where **crushing injuries** may occur

Slips, trips, and falls. Responders need to exercise caution in wet, muddy, icy and rocky areas. Especially when working on elevated areas.

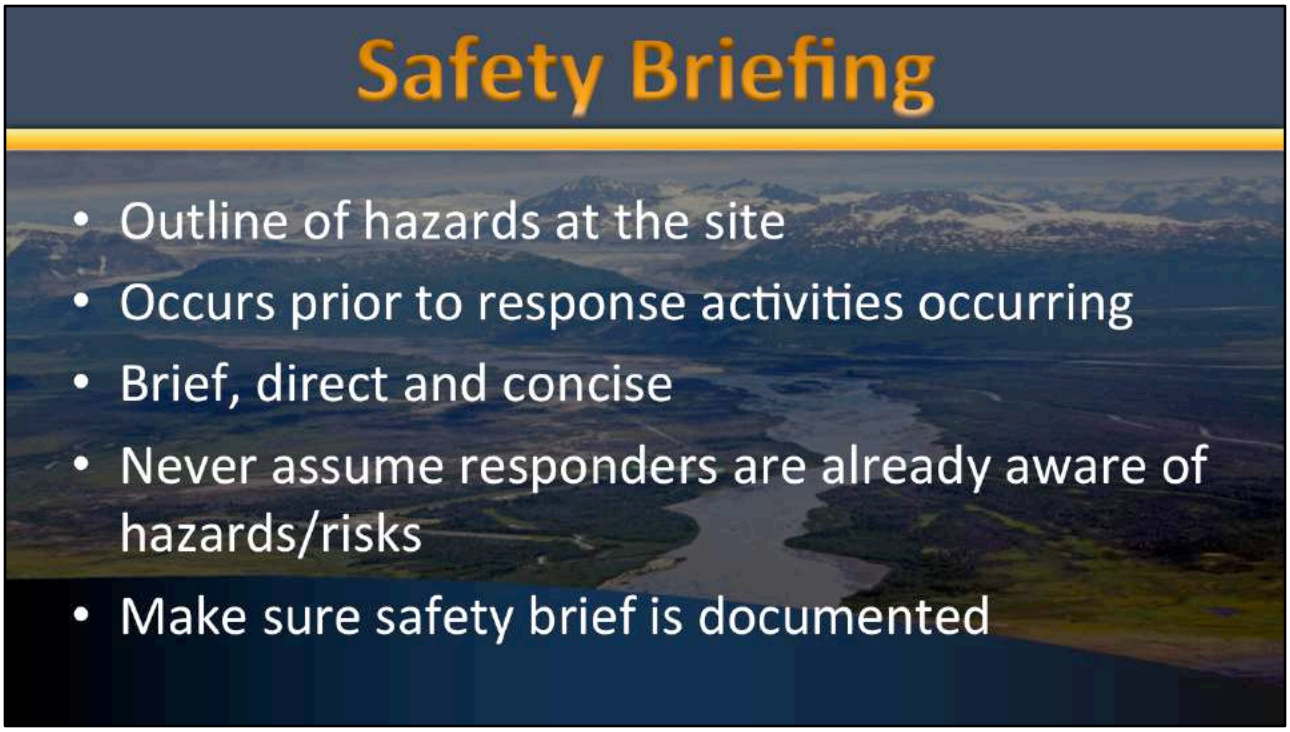
Safe Lifting practices for heavy items that will be encountered.

Exposure to extreme weather. Dependent upon air temperature and humidity responders may experience **Heat Stress, Hypothermia or Frostbite**.

Wildlife may also present dangers. The presence of bears, moose or marine mammals may require a spotter or guard**.**

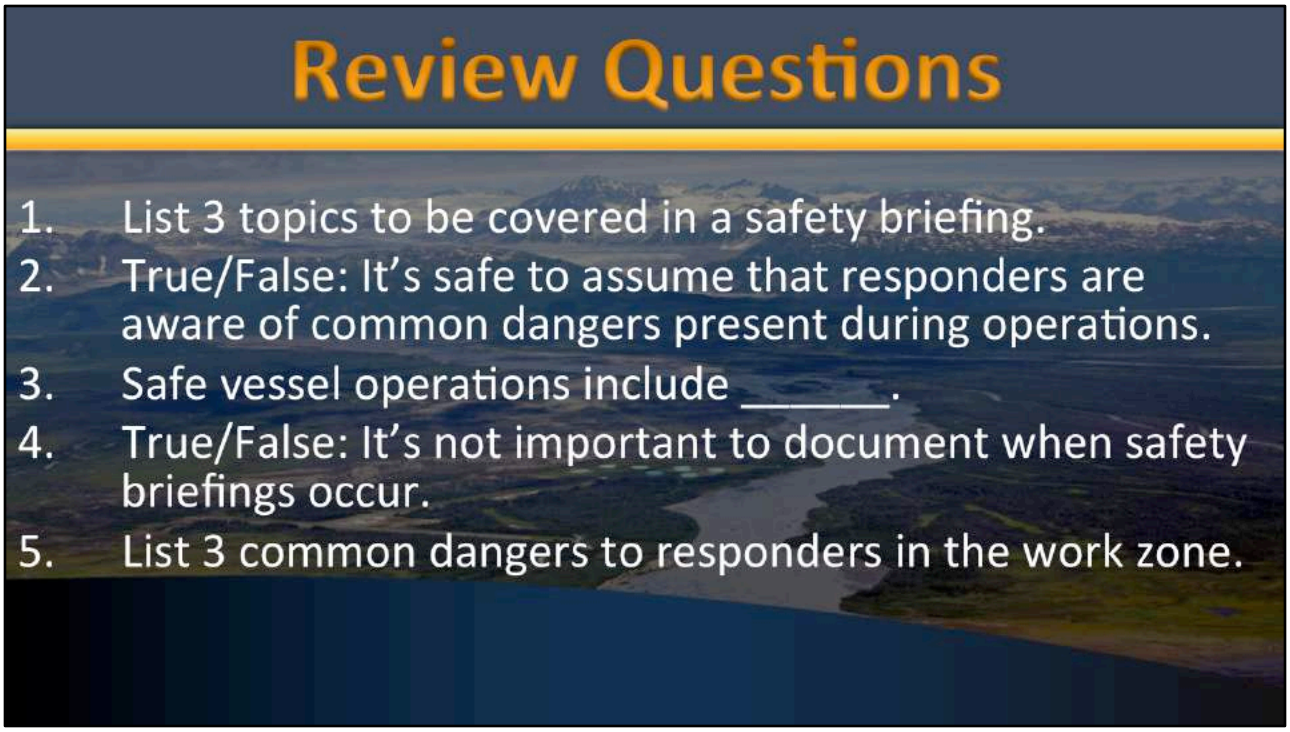
Safe vessel operations should be outlined and include:

- An appropriate number of people for the size of the boat.
- Float and Communications Plan
- Man overboard procedures



Finally, it's important to document that a safety briefing occurred.

A brief log of what transpired will be very helpful to professional responders when they arrive on scene and assume responsibility for the spill so they can build on what you have started.



1. Hazard information on the spilled product, A description of the work zone, Planned and ongoing activities in your work zone , A plan for how to stay in touch with other responders., A plan for responding to medical or other emergencies, dangers to responders in the work zone.
2. False
3. An appropriate number of people for the size of the boat., Float and Communications Plan, Man overboard procedures, Personal Floatation Device and other safety equipment to meet Coast Guard and State boating requirements
4. False
5. Any of the following:

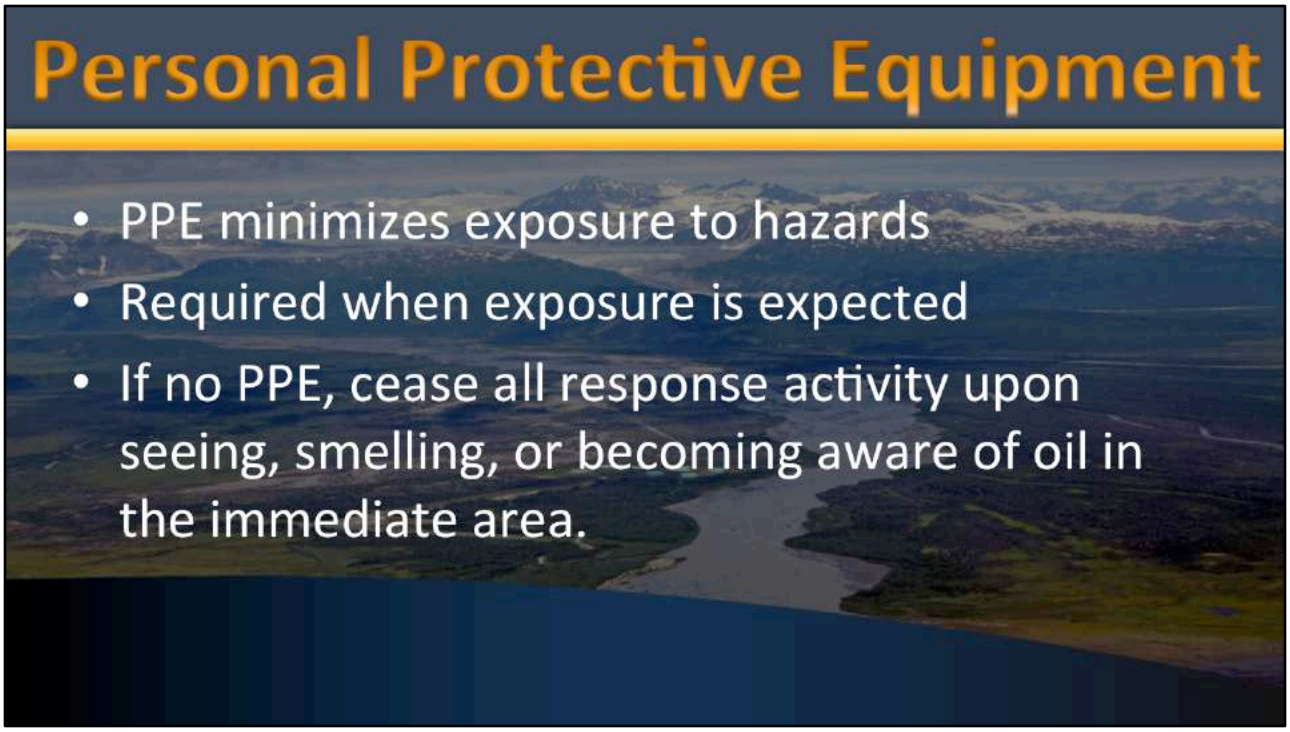
Working around **lines or ropes under tension, and the entanglement** of a person in ropes, rigging or booms.

Situations where **crushing injuries** may occur

Slips, trips, and falls. Responders need to exercise caution in wet, muddy, icy and rocky areas. Especially when working on elevated areas.

Safe Lifting practices for heavy items that will be encountered.

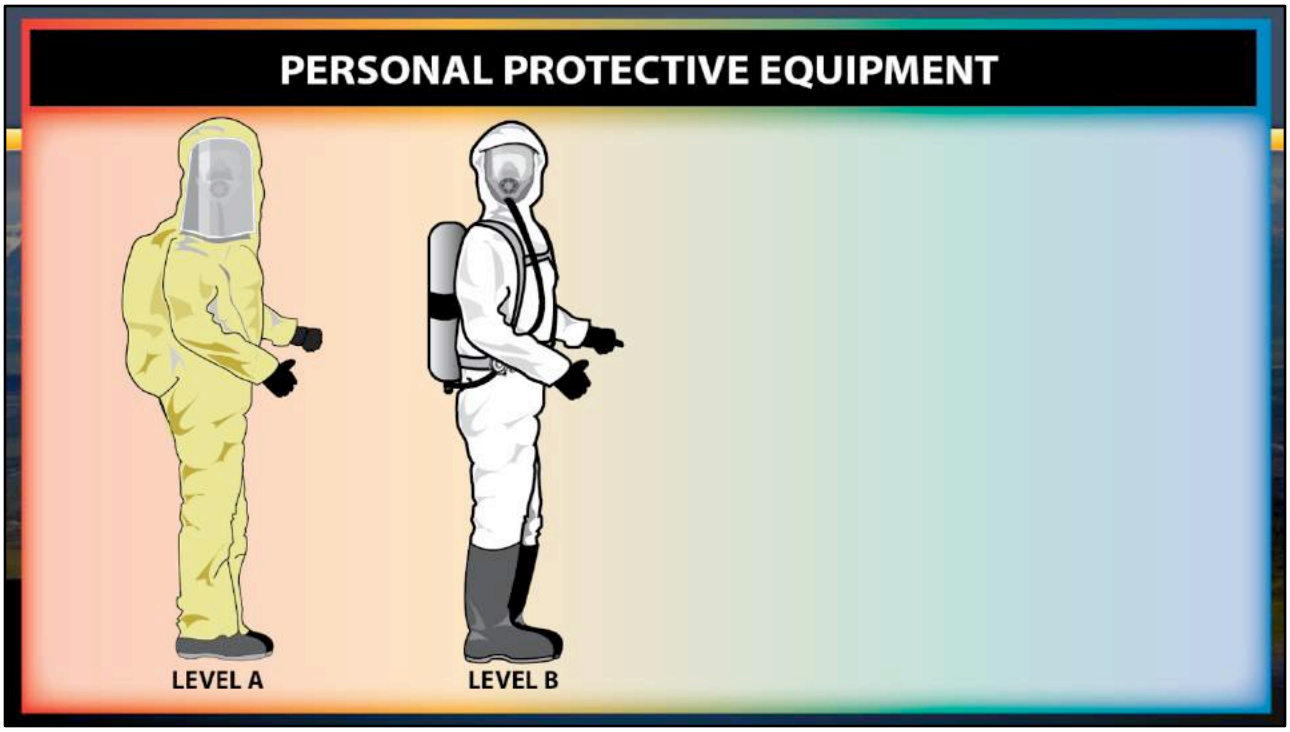

Personal Protective
Equipment (PPE)



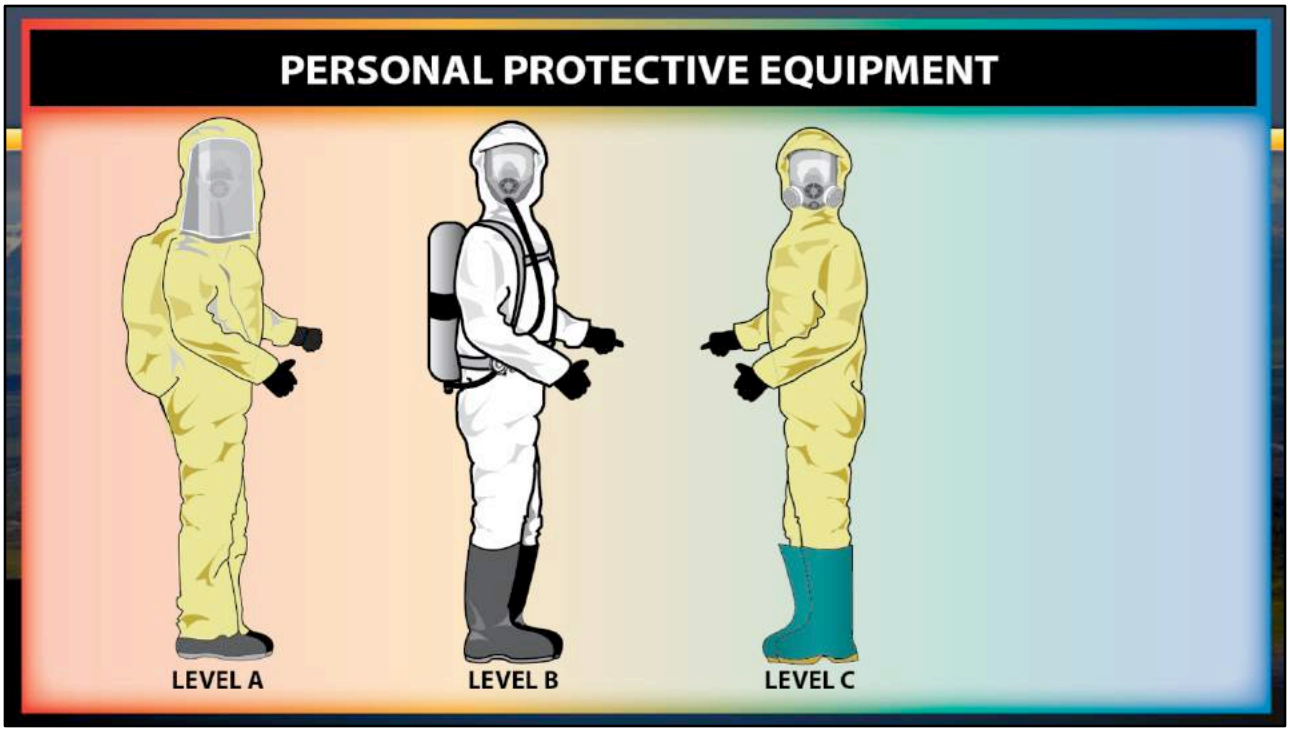
Personal Protective Equipment or PPE is equipment worn to minimize exposure to hazards. Crude oil, diesel, and other petroleum products have health and safety hazards associated with them and exposure can have immediate and cumulative long-term impact to your health.

During an oil spill response, PPE is required when exposure to these substances is expected. If you do not have personal protective equipment available, you should cease all response activity upon seeing, smelling, or becoming aware of oil in the immediate area.

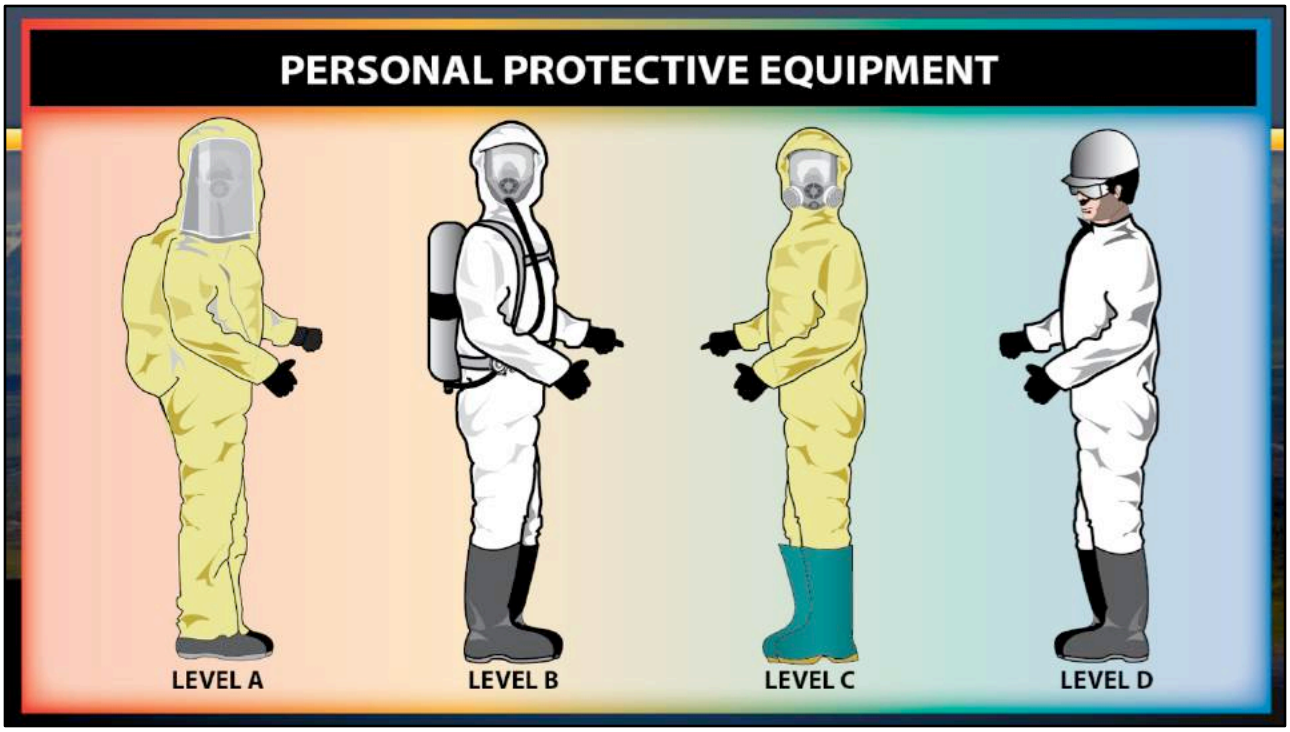
PPE is divided into four categories based on the level of protection afforded:
Level A provides the greatest level of skin, respiratory and eye protection.

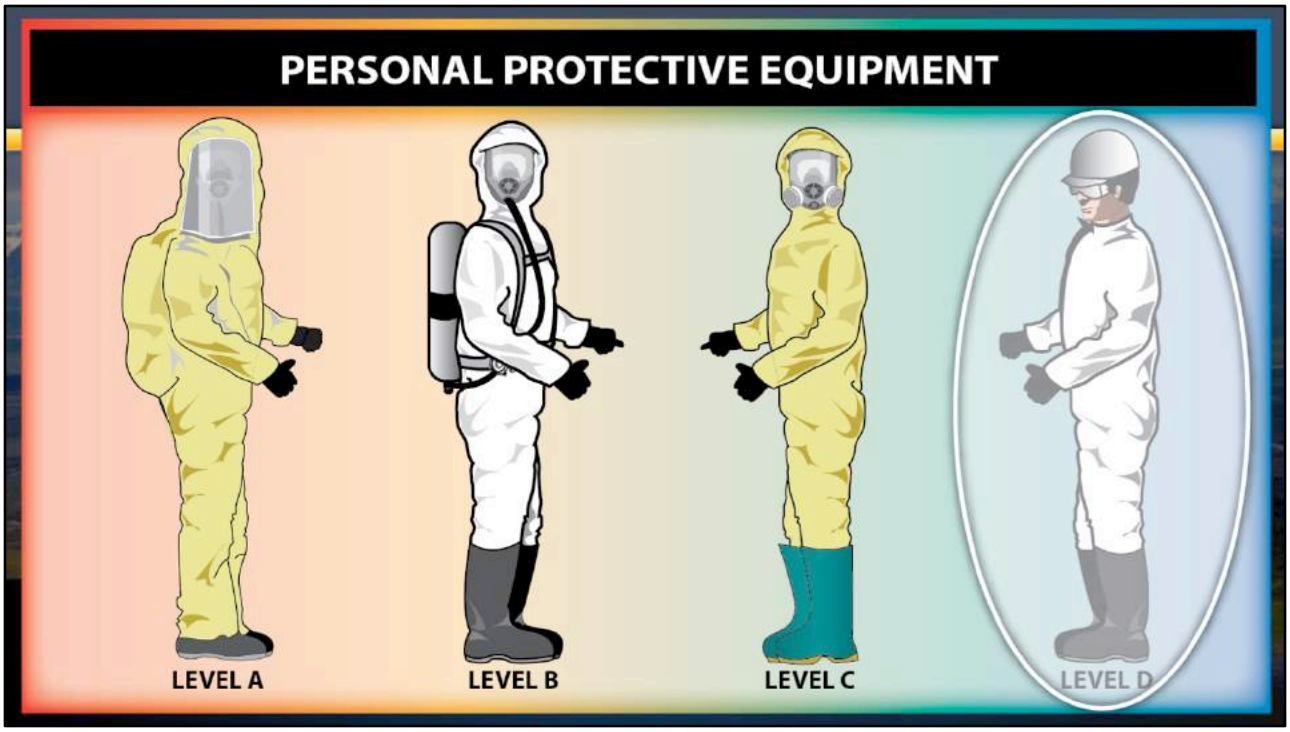


Level B offers the highest level of respiratory protection but lesser level of skin protection



Level C is used when concentrations and types of airborne substances are known and the criteria for using air-purifying respirators are met.


PERSONAL PROTECTIVE EQUIPMENT
LEVEL A
LEVEL B
LEVEL C
LEVEL D



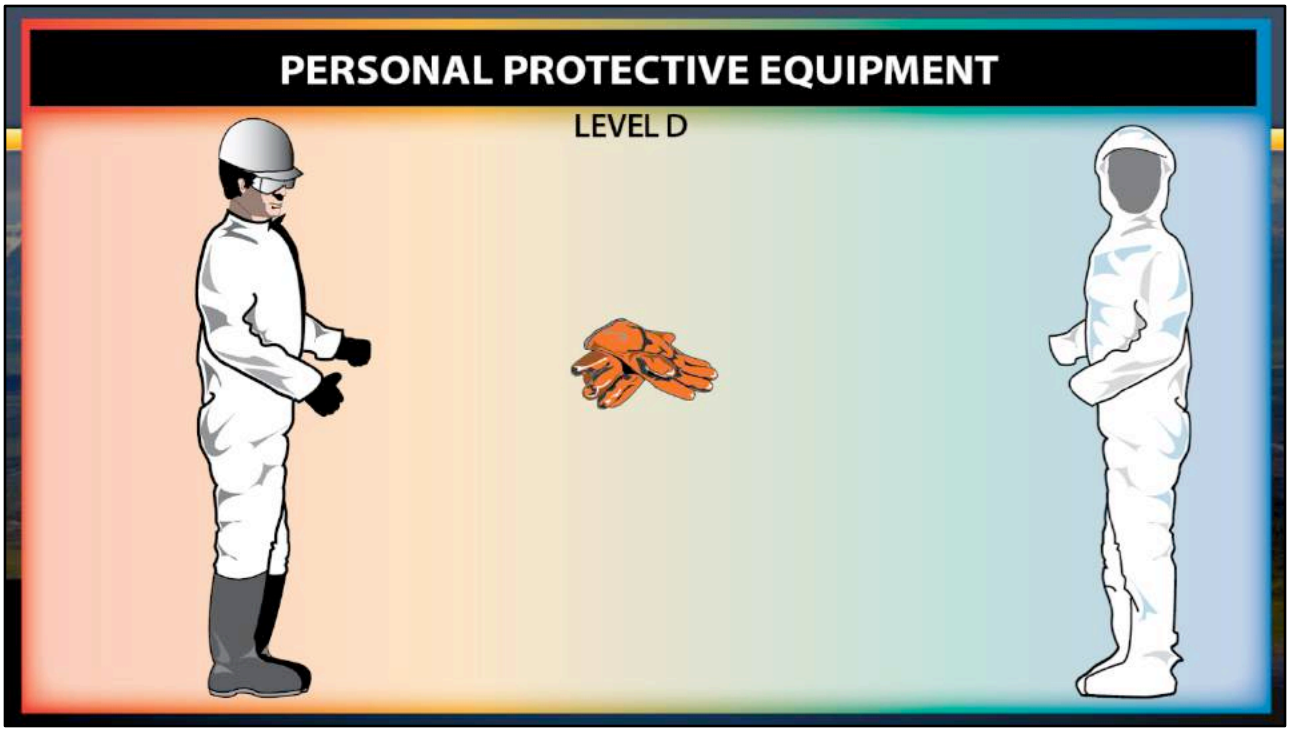
Level D consists of work clothing affording minimal protection, used for situations like an oil spill. Tyvek coveralls may also be provided and should be worn over work clothing if available. Each Alaska DEC CONEX box includes Tyvek coveralls.

People responding to petroleum spills normally use Level D equipment for diesel spills and Level C equipment for gasoline spills.

Again, you should not respond to a gasoline spill. If you are involved in a situation where gasoline has been spilled, isolate the area and evacuate until the gasoline evaporates into the atmosphere or until professional responders arrive. Any attempt to clean up gasoline will concentrate volatile vapors and increase the likelihood of an explosion.

This instruction will focus on the correct use and wear of Level D PPE. Level D PPE consists of:

Coveralls, raingear or other impermeable outerwear including Tyvek coveralls.



Gloves including work gloves and Nitrile [Ny-trial] or rubber gloves

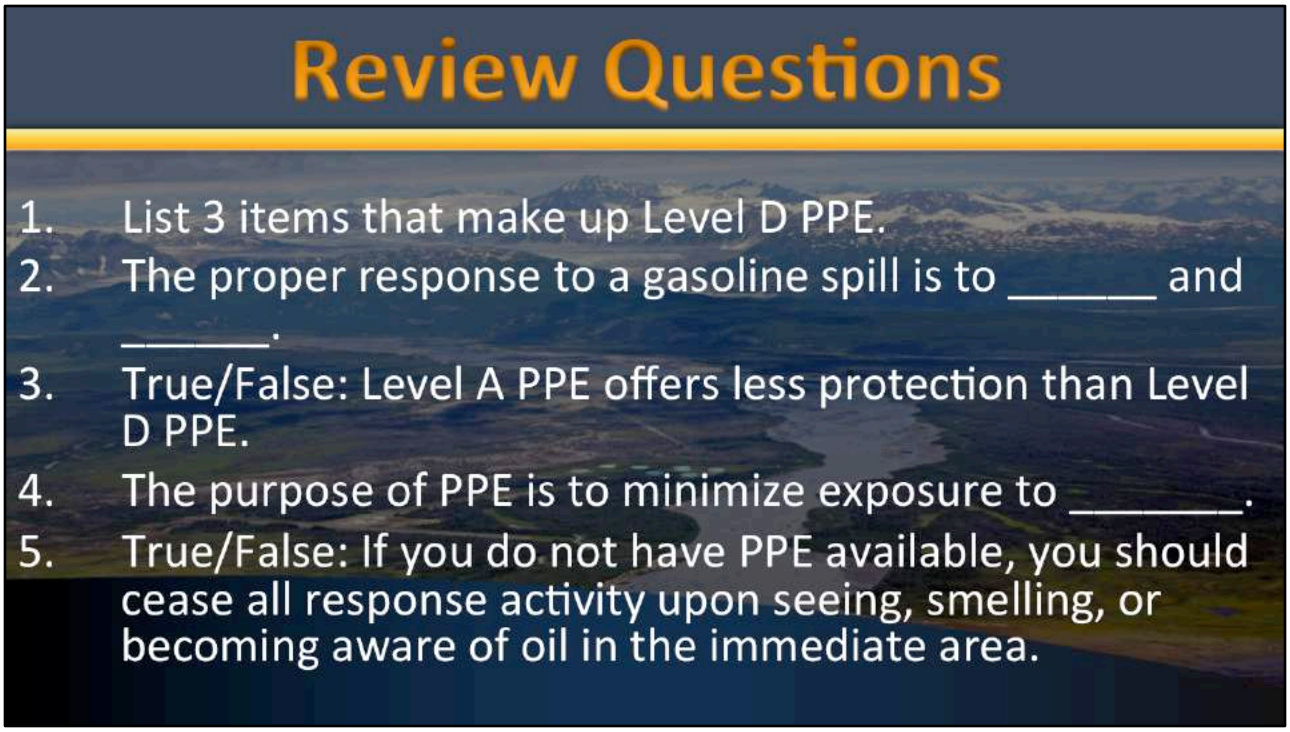
Boots and boot covers

Safety glasses or face shields

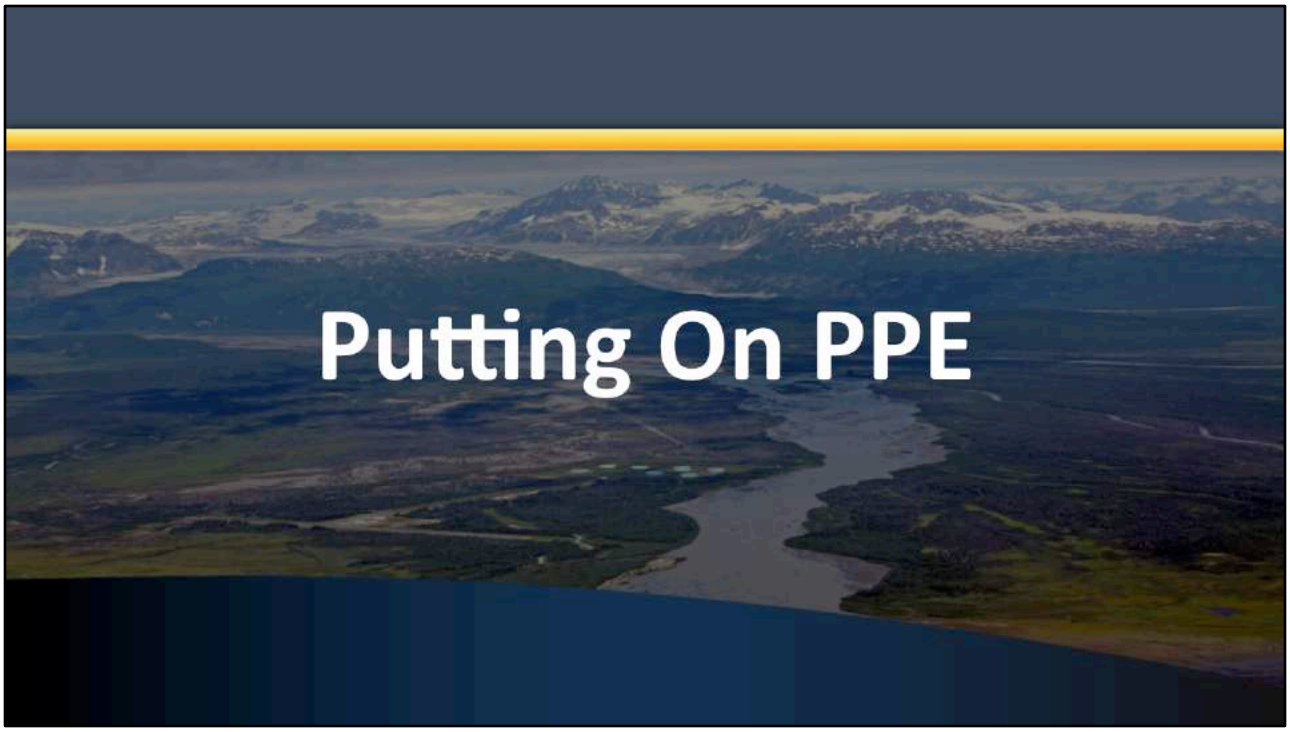
Hearing protection should be worn when working around noise producing equipment

Personal Flotation Devices, called PFDs , should be worn if you are working on boats, along a shoreline, or on bulkheads or piers or ice.

If respirators are introduced at a work site, responders not trained in their use should immediately seek guidance from the site supervisor. Use of respiratory protection in a hazardous work environment should only be used by responders participating in a program that includes regular training, fit testing, medical monitoring, inspection and other activities required by OSHA regulations.



1. Coveralls, gloves, boots, boot covers, safety glasses, hearing protection, PFD
2. Isolate and Evacuate
3. False
4. Hazards
5. True



The Alaska DEC conex boxes contain the necessary PPE to initiate a local response to a small oil spill. This equipment is usually contained in an over pack drum called a Perryville Response Drum.

When putting on and taking off PPE it is best to use the buddy system to ensure that there is no damage in the equipment and that is properly fitted.

- Coveralls, raingear or other impermeable, disposable outerwear should be loose enough to allow enough movement for you to do your job in the work zone.
- Safety glasses should be worn at all time during operations.
- Hardhats should be snug fitting to ensure they stay in place.
- Gloves should be impermeable in situations where oil contact is expected.
- Boot covers should be used for maximum protection.
- If heavy exposure to oil is expected the overlapping areas between the gloves, boot covers and the coveralls should be taped to ensure there is no contact with oil.

If there is no oil in the immediate area, Level D PPE can be modified to exclude Tyvek coveralls, boot covers, and rubber gloves.

Hearing protection should be worn when working around noise producing equipment

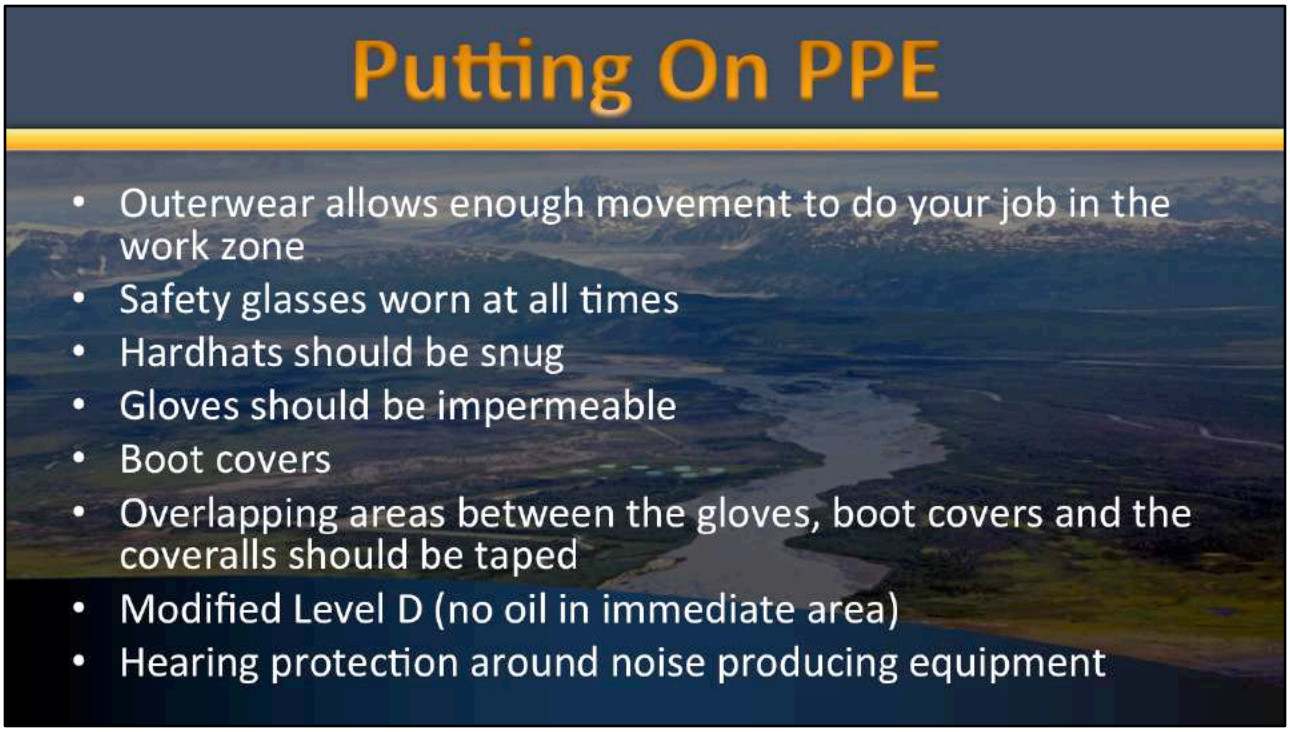
The Alaska DEC conex boxes contain the necessary PPE to initiate a local response to a small oil spill. This equipment is usually contained in an over pack drum called a Perryville Response Drum.

When putting on and taking off PPE it is best to use the buddy system to ensure that there is no damage in the equipment and that is properly fitted.

- Coveralls, raingear or other impermeable, disposable outerwear should be loose enough to allow enough movement for you to do your job in the work zone.
- Safety glasses should be worn at all time during operations.
- Hardhats should be snug fitting to ensure they stay in place.
- Gloves should be impermeable in situations where oil contact is expected.
- Boot covers should be used for maximum protection.
- If heavy exposure to oil is expected the overlapping areas between the gloves, boot covers and the coveralls should be taped to ensure there is no contact with oil.

If there is no oil in the immediate area, Level D PPE can be modified to exclude Tyvek coveralls, boot covers, and rubber gloves.

Hearing protection should be worn when working around noise producing equipment



The Alaska DEC conex boxes contain the necessary PPE to initiate a local response to a small oil spill. This equipment is usually contained in an over pack drum called a Perryville Response Drum.

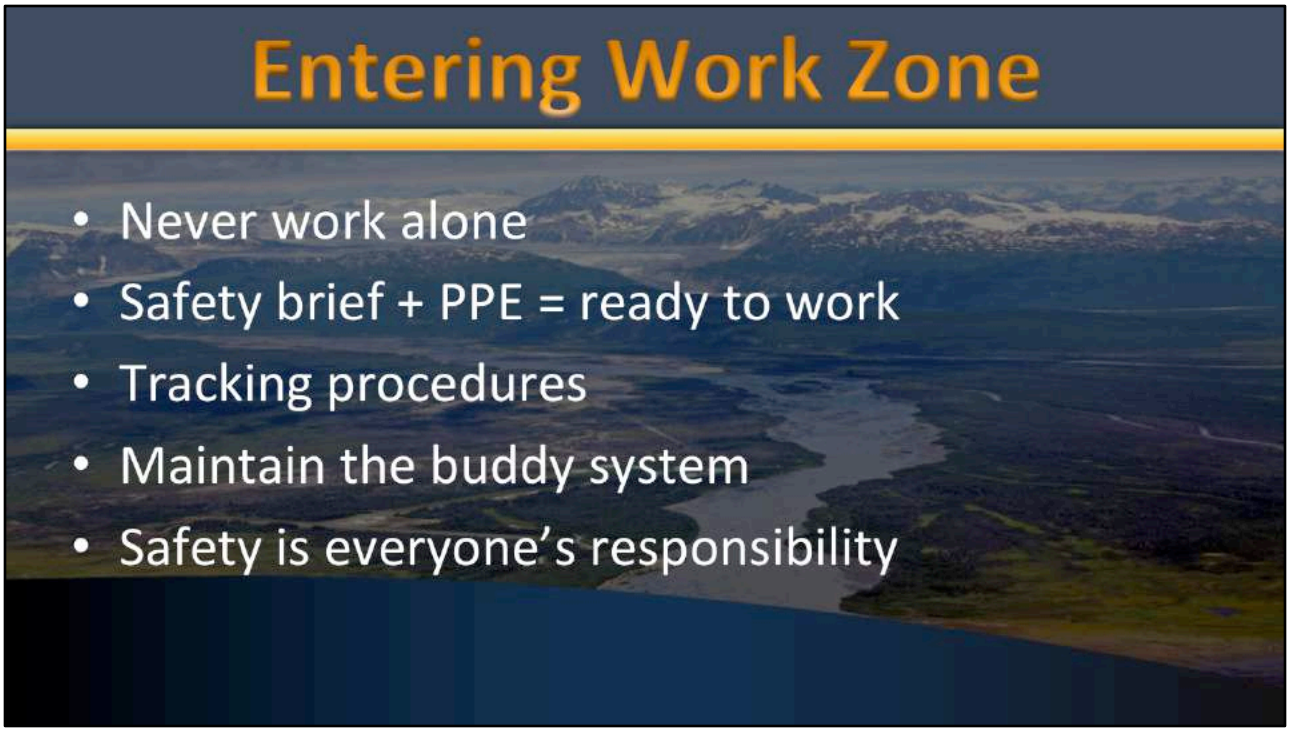
When putting on and taking off PPE it is best to use the buddy system to ensure that there is no damage in the equipment and that is properly fitted.

Coveralls, raingear or other impermeable, disposable outerwear should be loose enough to allow enough movement for you to do your job in the work zone.
Safety glasses should be worn at all time during operations.
Hardhats should be snug fitting to ensure they stay in place.
Gloves should be impermeable in situations where oil contact is expected.
Boot covers should be used for maximum protection.
If heavy exposure to oil is expected the overlapping areas between the gloves, boot covers and the coveralls should be taped to ensure there is no contact with oil.

If there is no oil in the immediate area, Level D PPE can be modified to exclude Tyvek coveralls, boot covers, and rubber gloves.

Hearing protection should be worn when working around noise producing equipment and Personal Flotation Devices (PFDs) should be worn if you are working on or near


Entering the Work Zone



You should never work alone as part of an oil spill response. Prior to entering the work zone you should be assigned to a team. Each team will have specific orders and tasks to complete under the direction of a team leader.

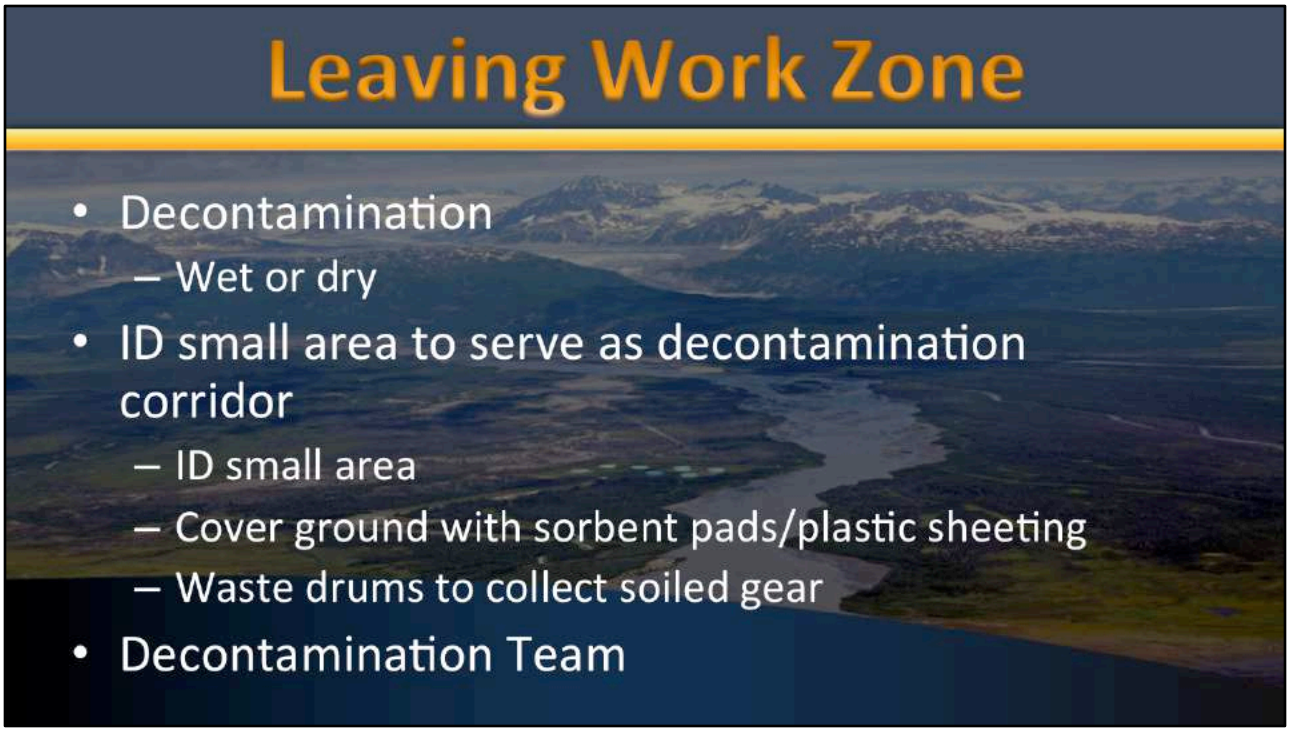
After receiving an operations and safety briefing and putting on the appropriate PPE, you may enter the work zone with your team to assist with the response.

Procedures should be established to track people entering and leaving the work zone. This will allow the site supervisor to know who is in the work zone and ensure responder safety.

While in the work zone you should continue to maintain a "buddy system" within the team to ensure safe operations. You should always know the location of your buddy; monitor the integrity of their PPE and watch for any other problems that may arise. PPE and other equipment may be compromised during operations, and may need to be fixed.

Remember, all responders are responsible for safe operations. When you notice an unsafe situation, it's your responsibility let someone know so that operations can be stopped until the necessary corrections have been made.


Leaving Work Zone/
Decontamination



If you encounter oil while in the work zone or hot zone, you will need to go through a decontamination process to prevent oil from spreading to clean areas and exposing others to it.

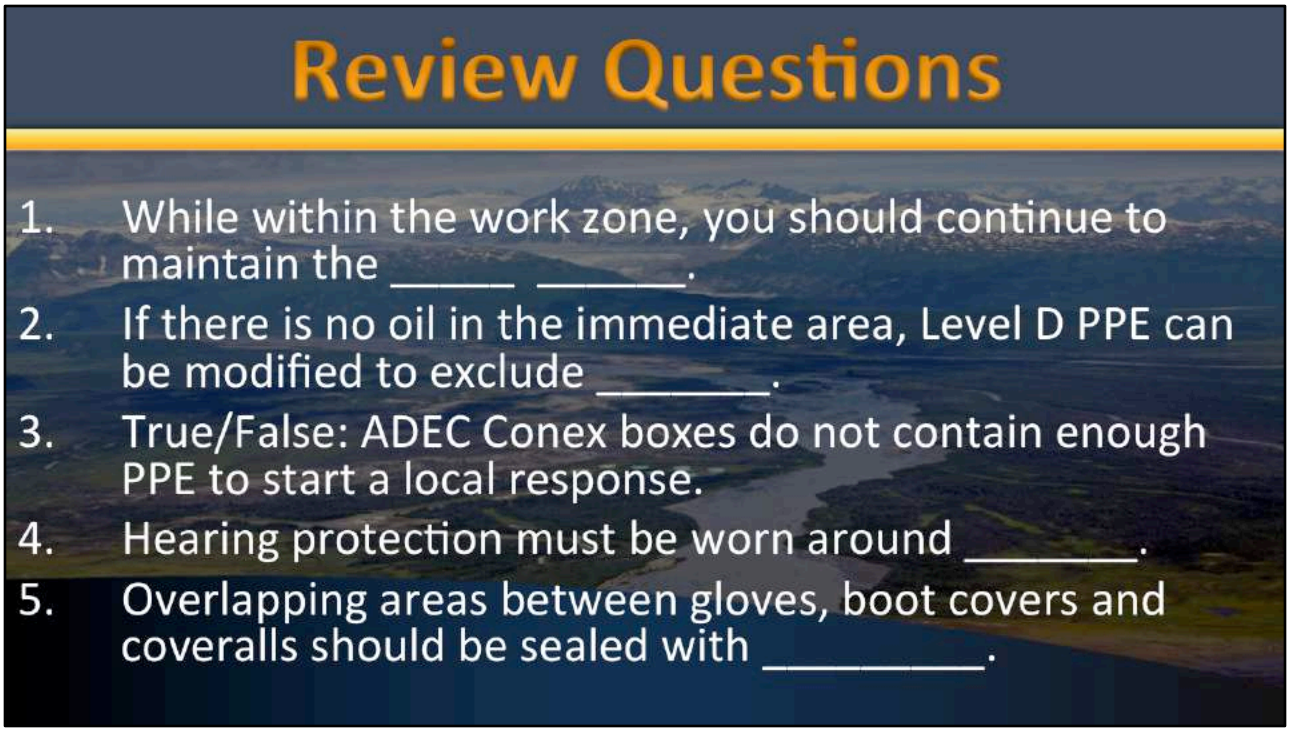
Decontamination can be accomplished using either a wet or a dry process. For the purposes of this training class, only the dry process will be described. The wet process, while important, is beyond the scope of this training video.

To begin, identify a small area near the perimeter of the work zone to serve as the decontamination corridor.

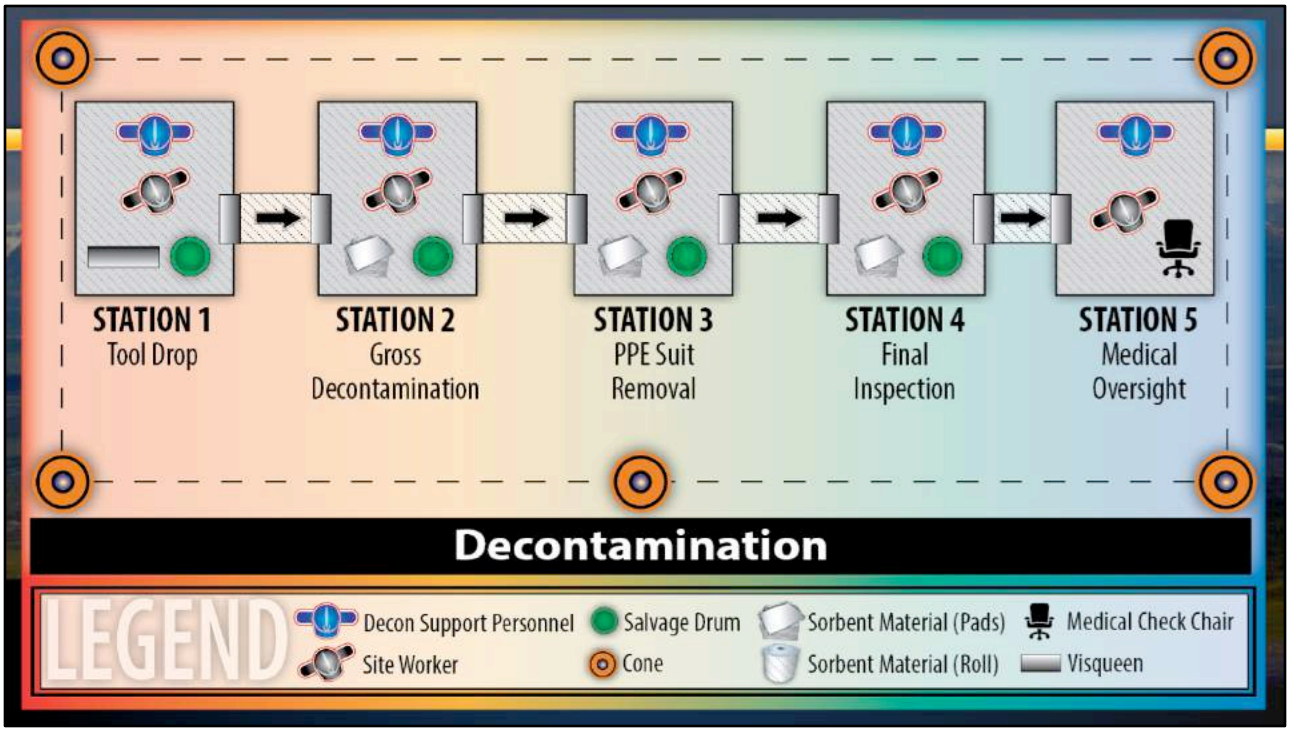
Cover the ground with plastic sheeting and/or sorbent rolls or pads. Position waste drums and tubs as necessary to collect oiled tools, outer garments, and used sorbent material.

This all should be set-up prior to beginning any response activity within the work zone.

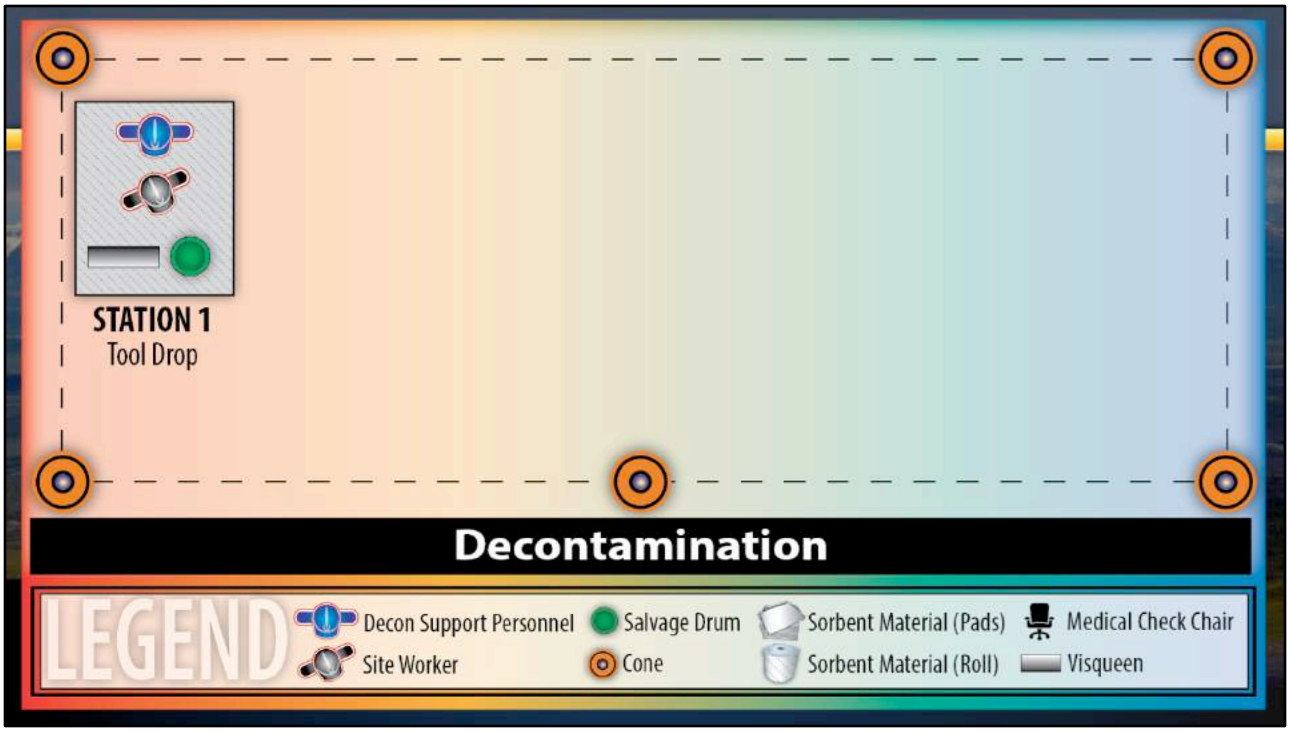
Ideally, a decontamination team should be assigned to this area to help manage the process and these people should also wear Level D PPE.



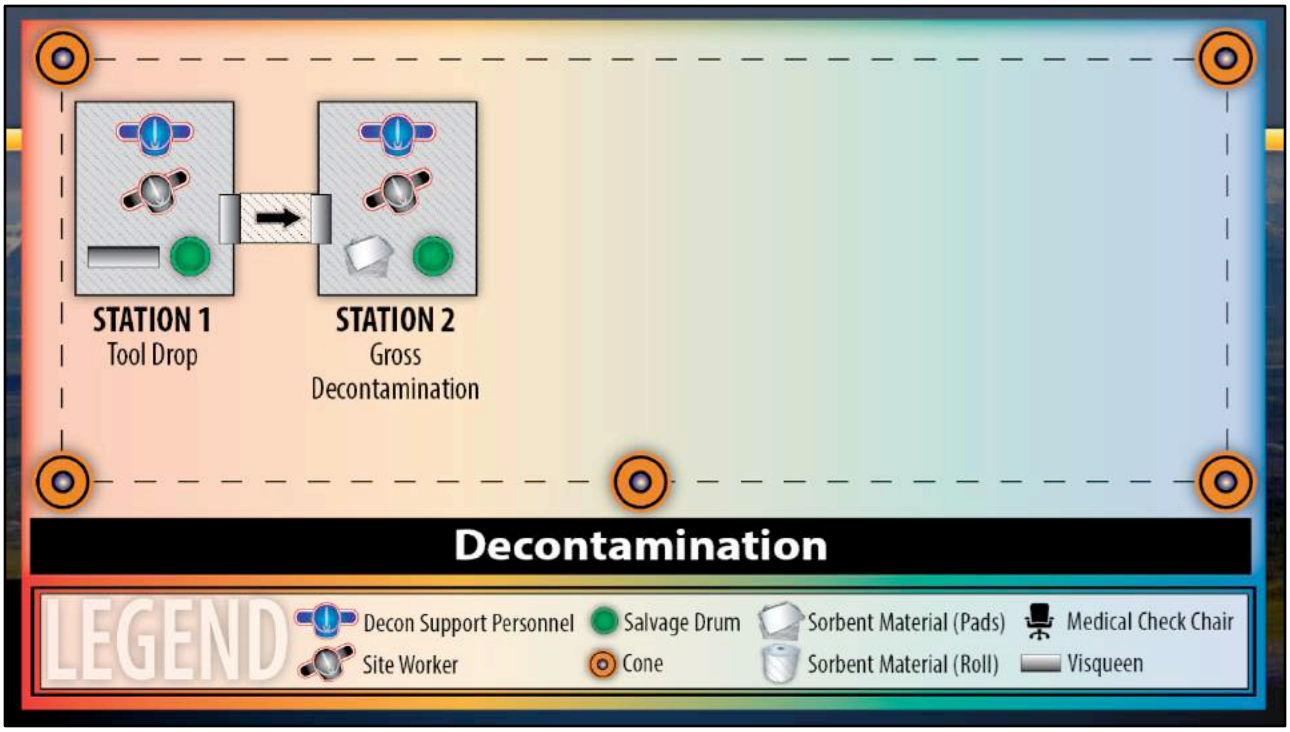
1. Buddy System
2. Tyvek coveralls, boot covers, rubber gloves
3. False
4. Noise producing equipment
5. Duct tape



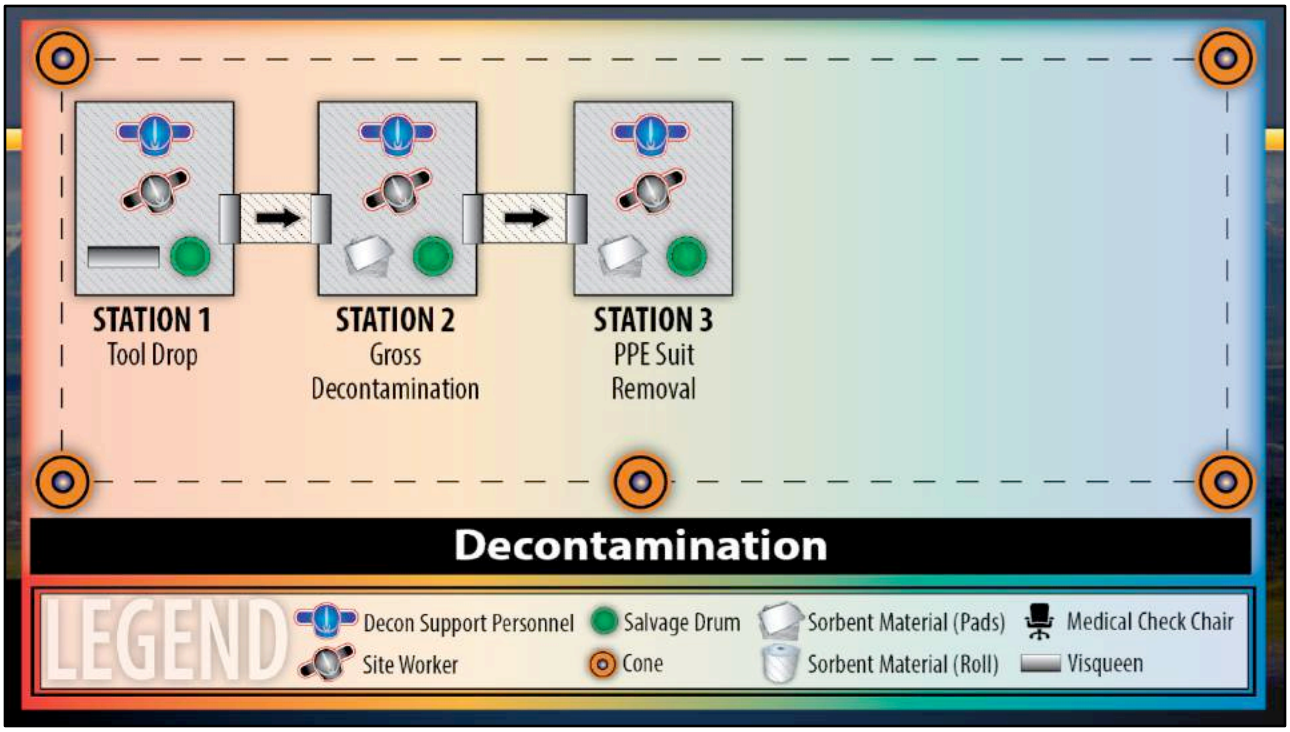
You should move through the dry decon corridor in 5 clearly marked stations:



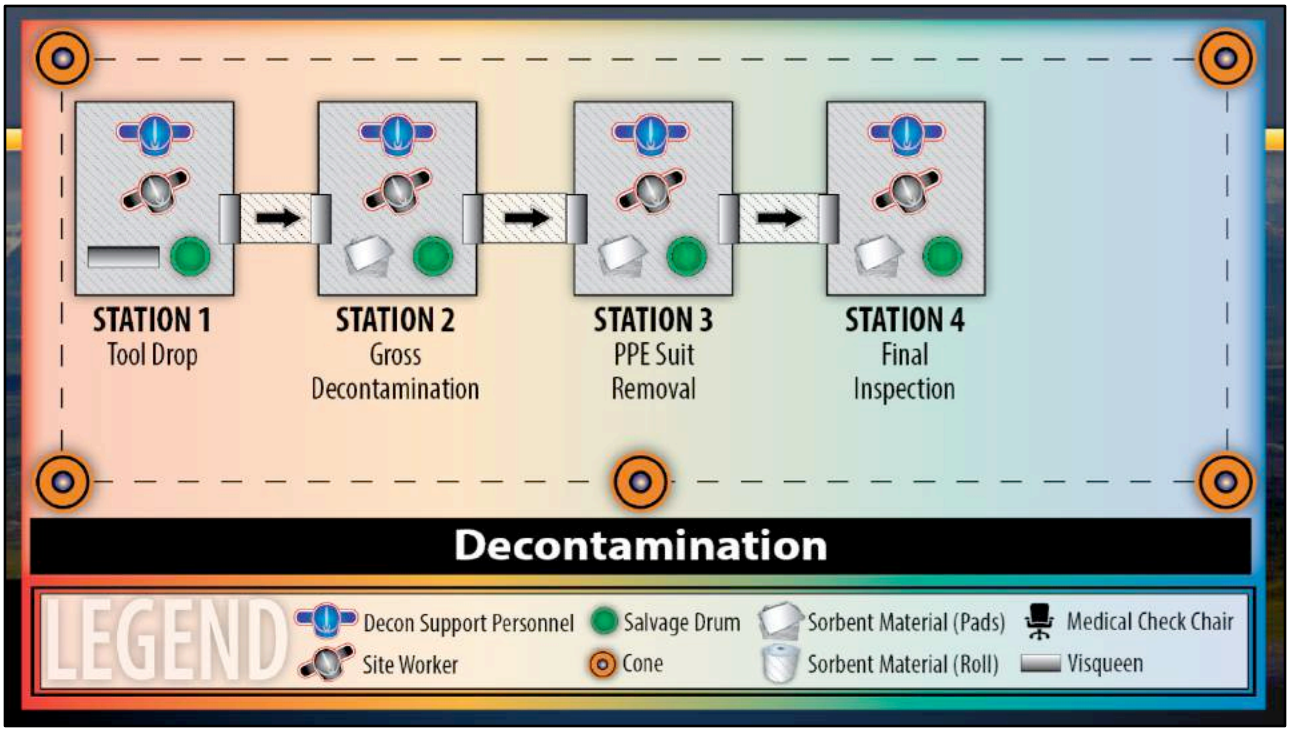
Station 1 – Tool Drop: Contaminated equipment and hand tools should be dropped in a lined container. The equipment can be either be cleaned or reused if necessary.



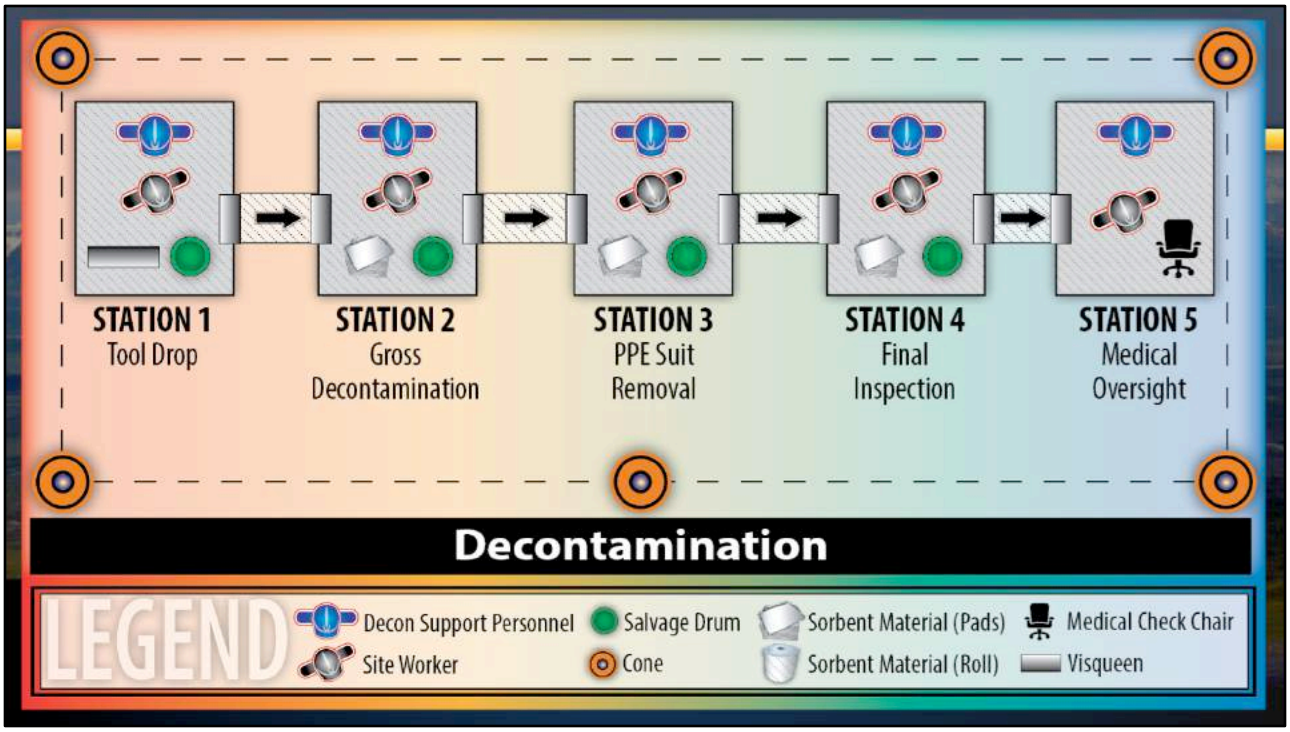
Station 2 – Gross Decon: Decon team members should wipe down all outer garments with sorbent pads to remove large amounts of oil.

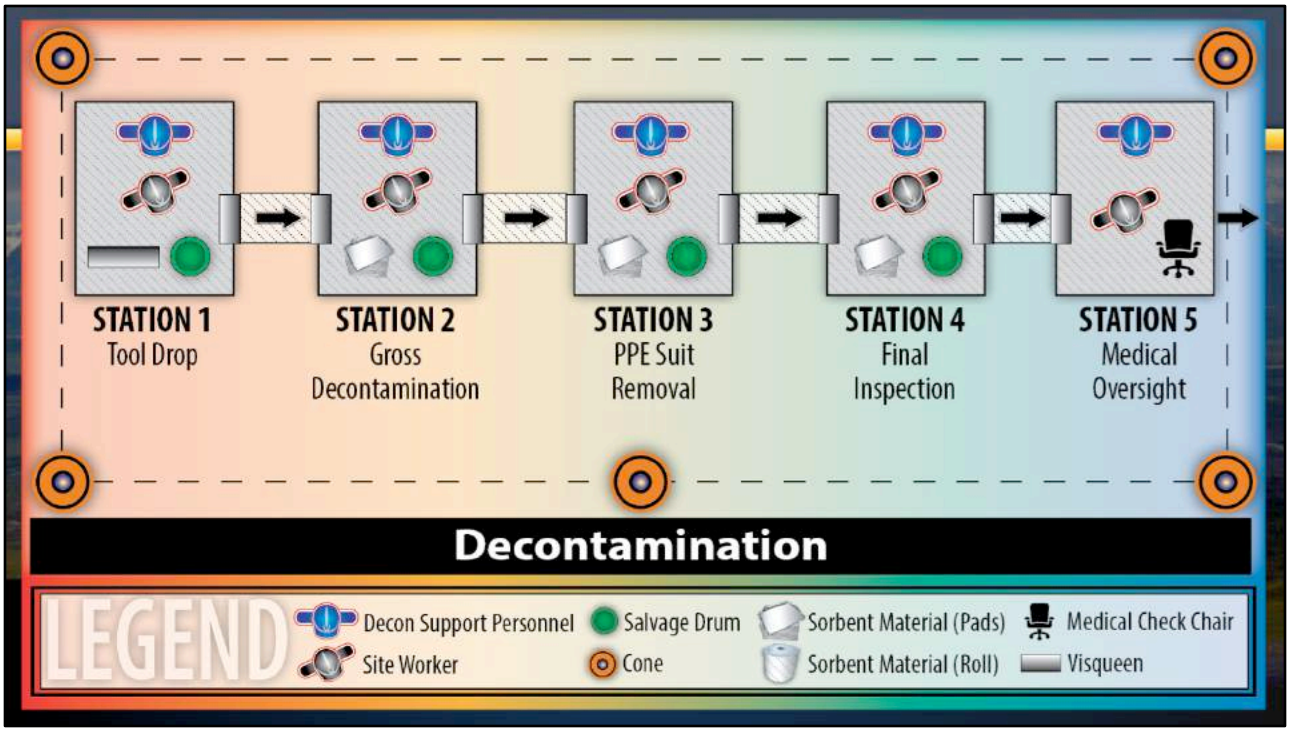


Station 3 – PPE Suit Removal: Removal and disposal of duct tape, outer gloves and boots, and Tyvek coveralls or other oiled outer garments. It's a good idea to have several sharp pairs of scissors handy tool at this station.



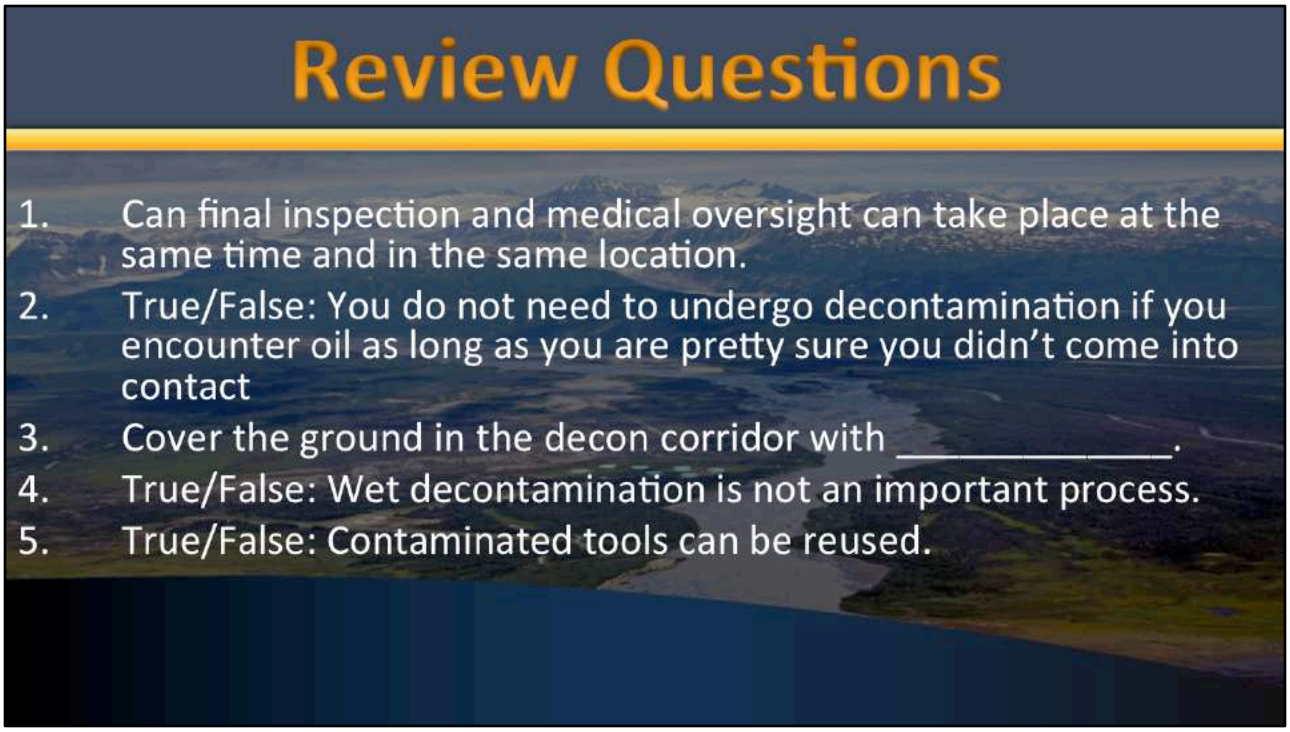
Station 4 – Final Inspection: Removal of inner gloves and boot covers (if worn) and final inspection for any remaining contamination.


STATION 1
Tool Drop
STATION 2
Gross
Decontamination
STATION 3
PPE Suit
Removal
STATION 4
Final
Inspection
STATION 5
Medical
Oversight
Decontamination
LEGEND
Decon Support Personnel
Site Worker
Salvage Drum
Cone
Sorbent Material (Pads)
Sorbent Material (Roll)
Medical Check Chair
Visqueen



Station 5 – Medical Oversight: Brief examination by on-site medical personnel (if available) or site supervisor to determine if the responder is showing any signs of exposure to oil or requires further medical aid or assistance.

Final inspection and medical oversight can take place at the same time and in the same location. Following this, each responder can exit the work zone into an area free from contamination.



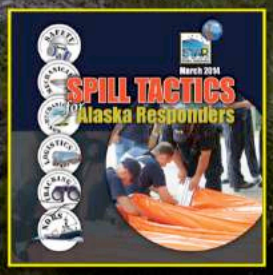
1. Yes
2. False
3. Sorbent pads and/or plastic sheets
4. False
5. True


Break

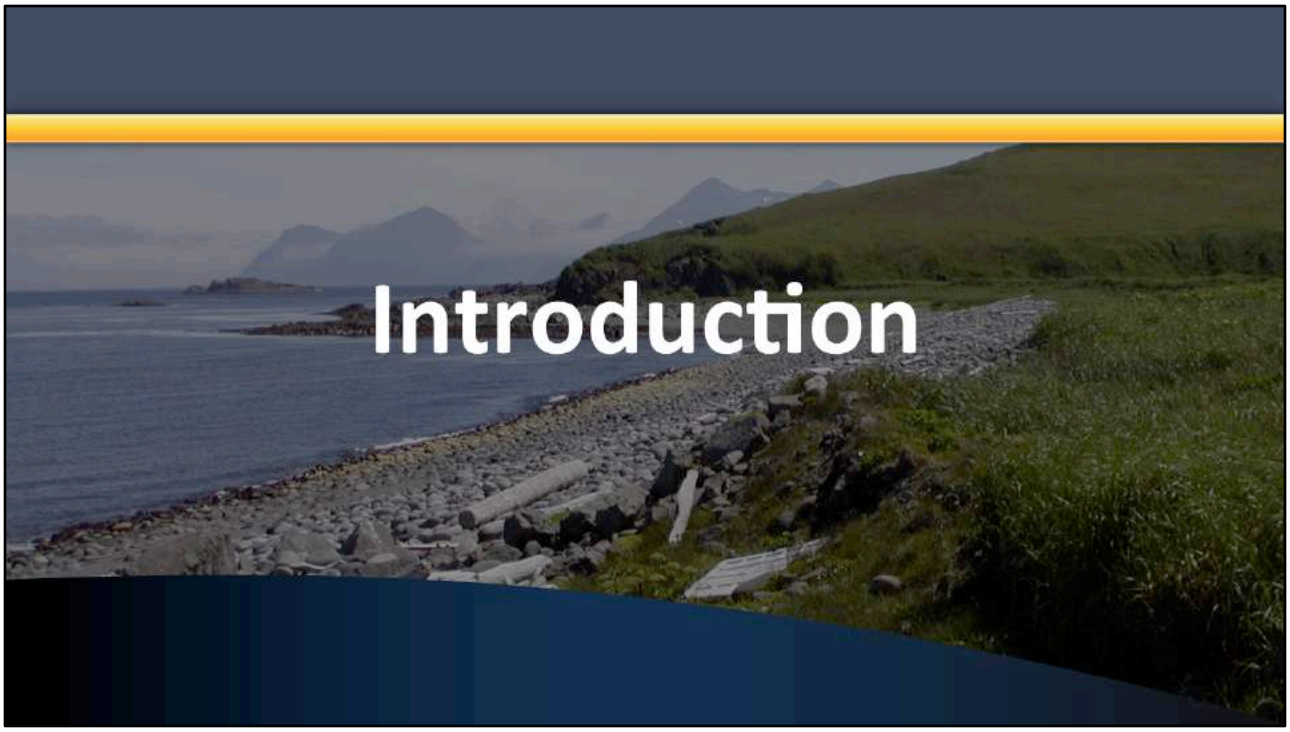
Alaska Department of Environmental Conservation
Spill Prevention and Response

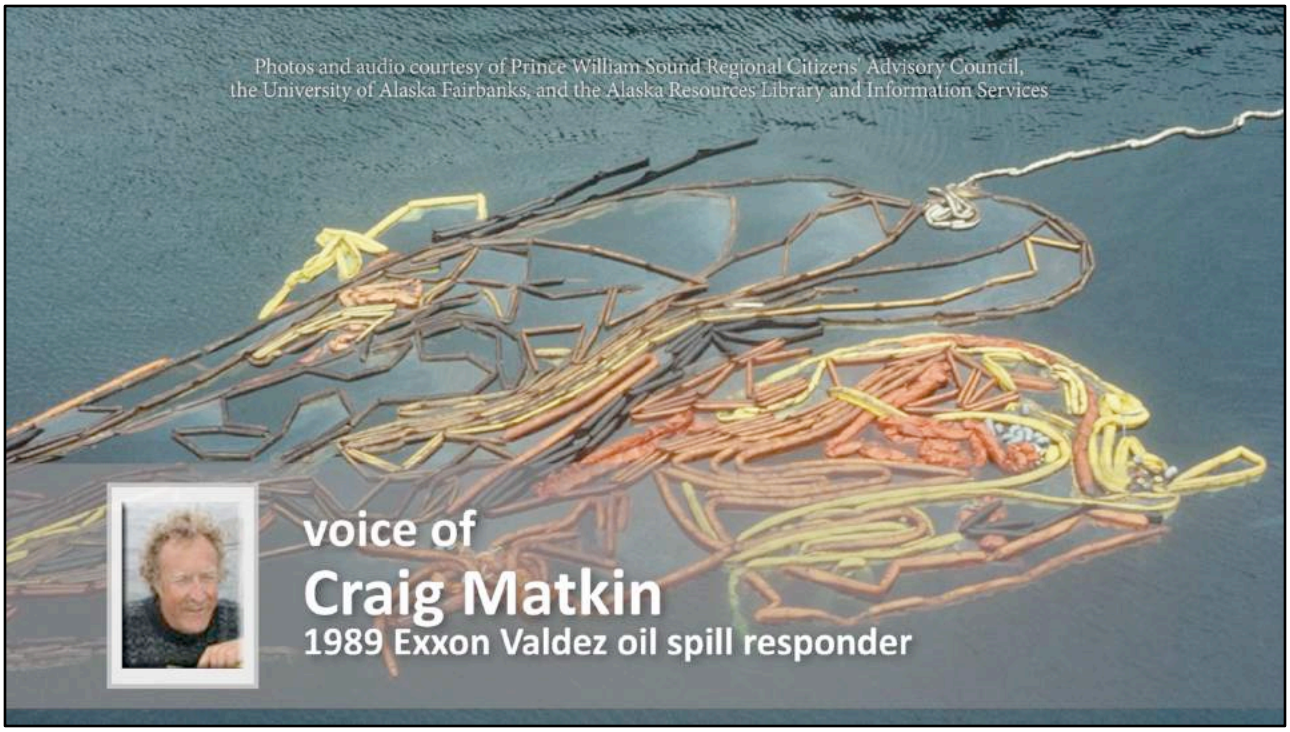
Spill Tactics for Alaska Responders (STAR) Manual

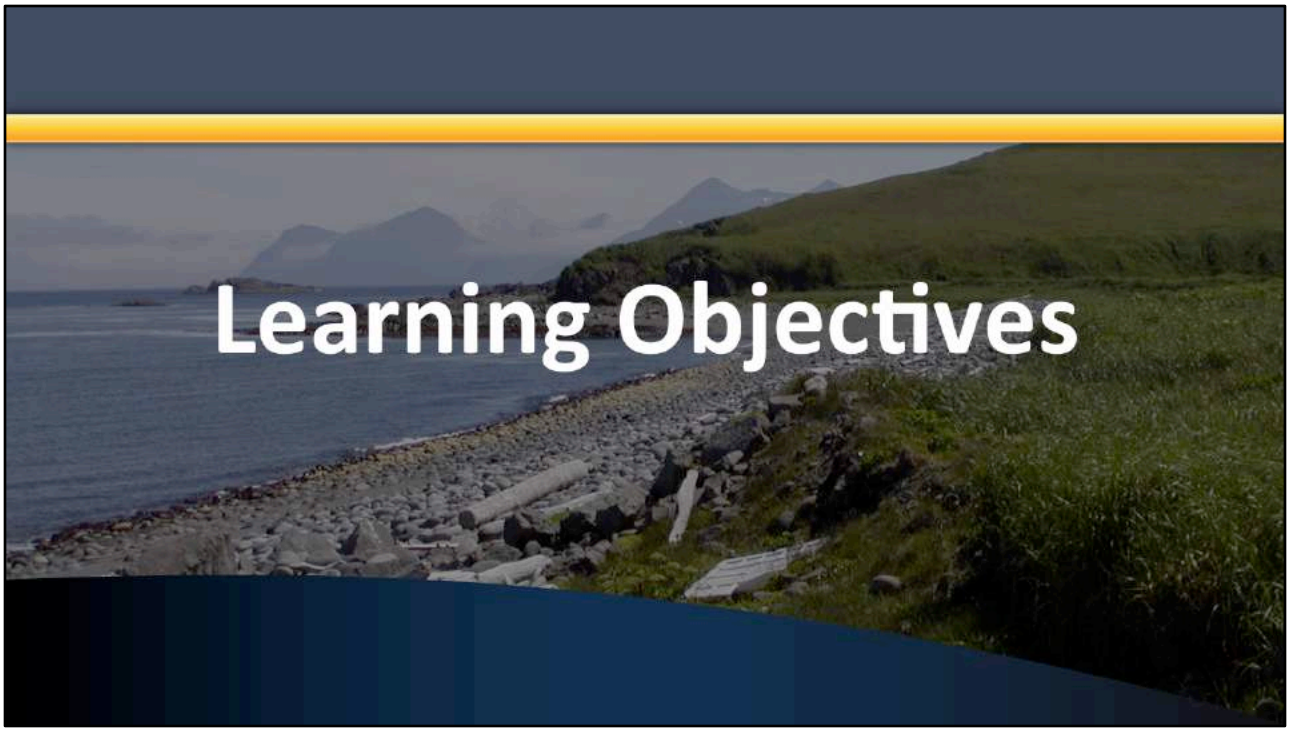
Oil Spill Boom and Response Equipment

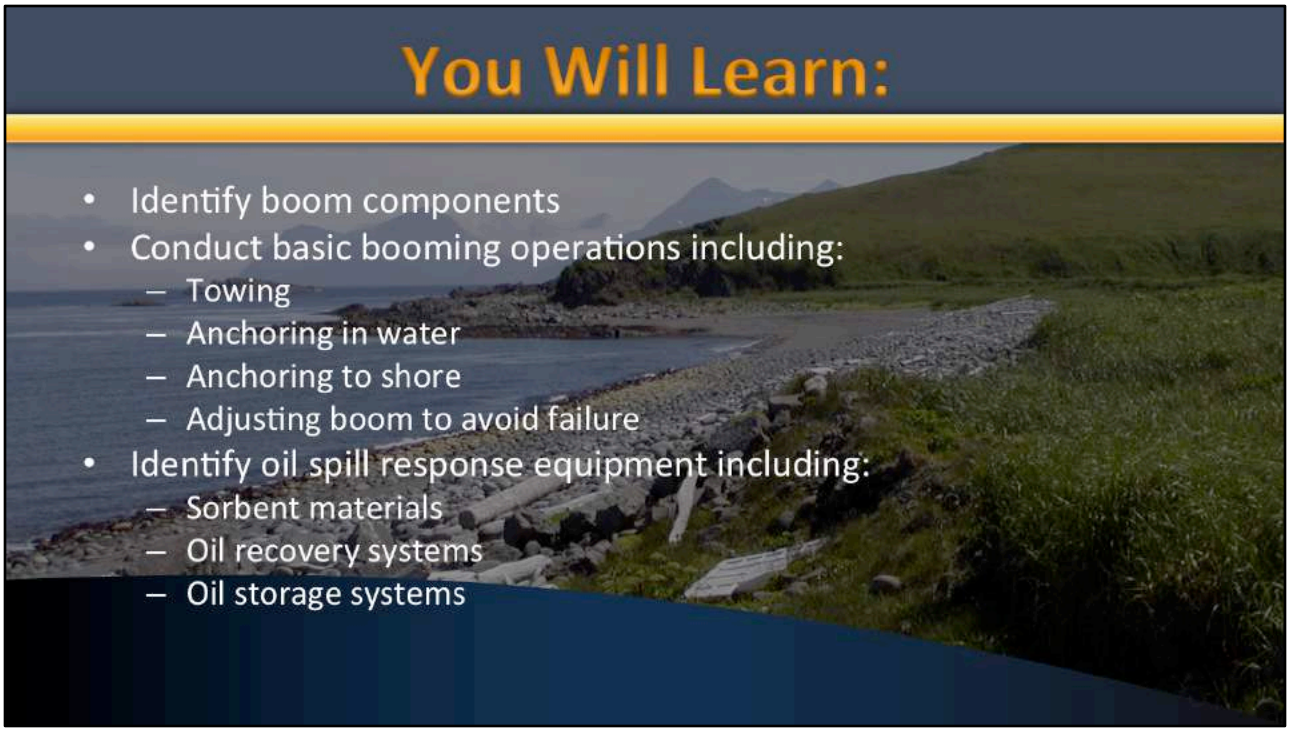


http://dec.alaska.gov/spar/PPR/star/docs.htm


Introduction


Photos and audio courtesy of Prince William Sound Regional Citizens' Advisory Council,
the University of Alaska Fairbanks, and the Alaska Resources Library and Information Services
voice of
Craig Matkin
1989 Exxon Valdez oil spill responder


Learning Objectives



This video will focus on the use of equipment used to respond to an oil spill.

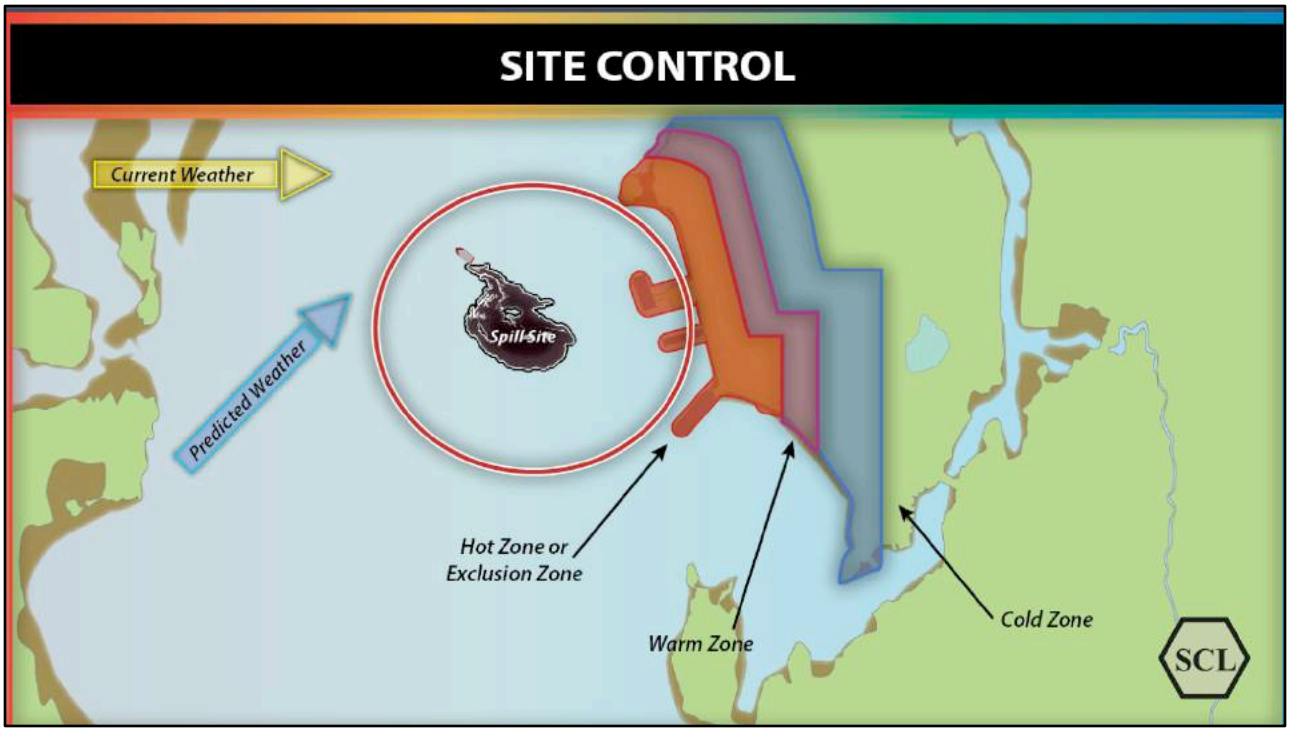
Learning Objectives for this video include:

Identify boom components
Conduct Basic booming operations including:
- Towing
- Anchoring in the water
- Anchoring to shore
- Adjusting boom to avoid common failures

Identify Oil Spill Response Equipment including:
- Sorbent Materials
- Oil Recovery Systems

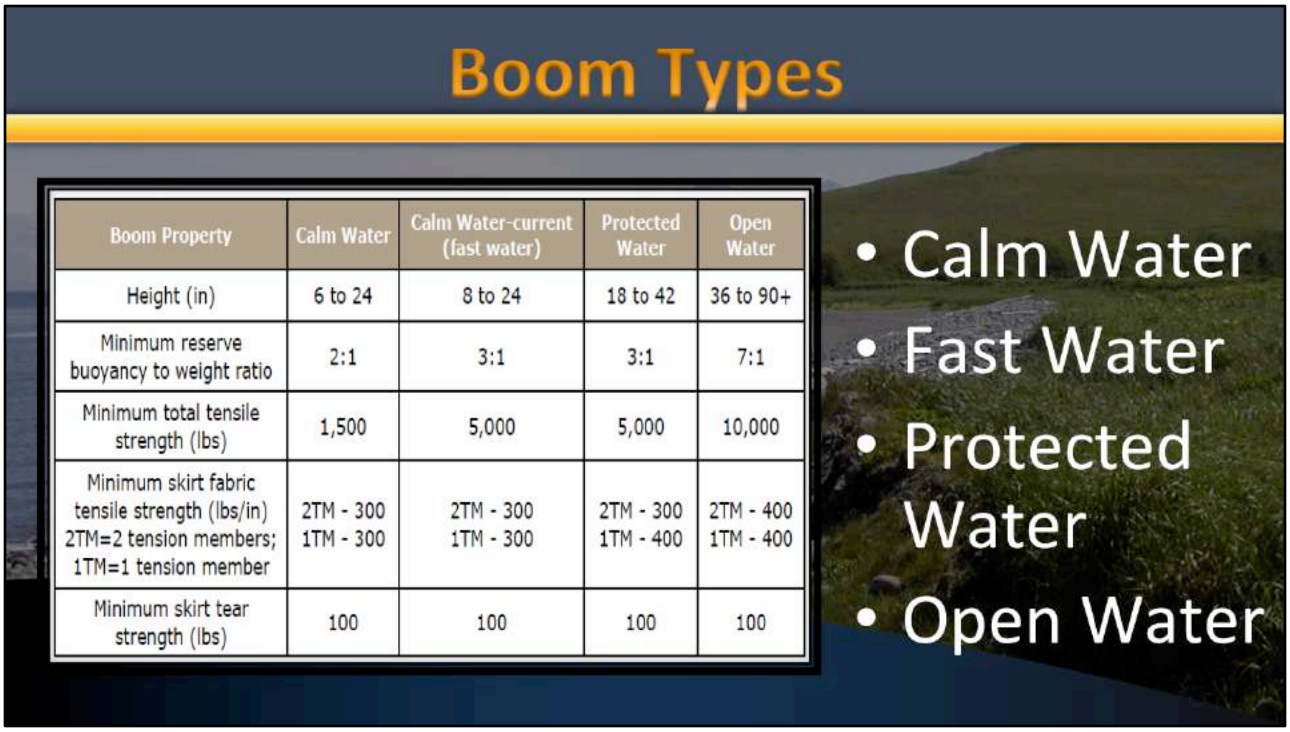
Oil Storage Systems

All of this information can also be found in the Spill Tactics for Alaska Responder or STAR Manual which can be viewed and downloaded from the Alaska DEC website listed on the screen.



During the course of the instruction, you will see symbols in the lower right corner of the screen that correspond to the sections of the STAR Manual where you can find more information on the topic being presented.


Boom Components

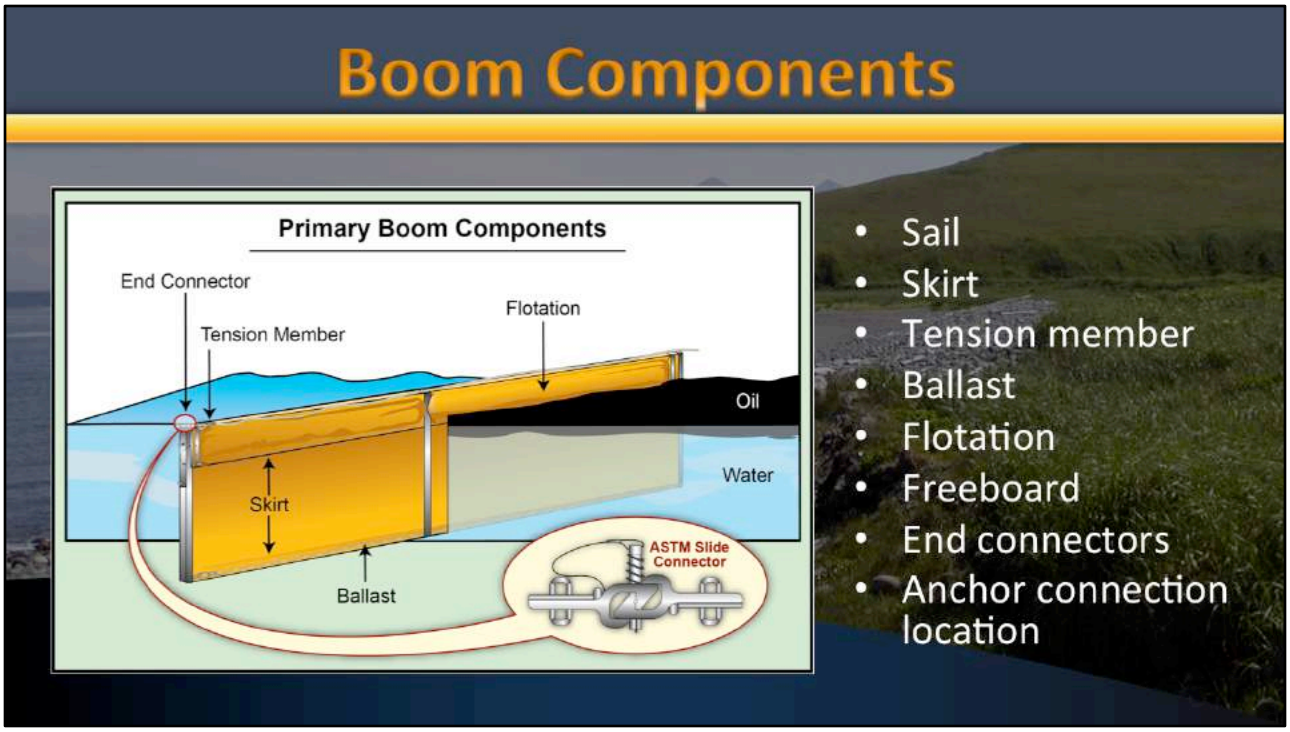


The primary piece of equipment used in a response to an on-water oil spill is boom. It is essentially a floating barrier used to intercept, control, contain and concentrate oil spreading on water.

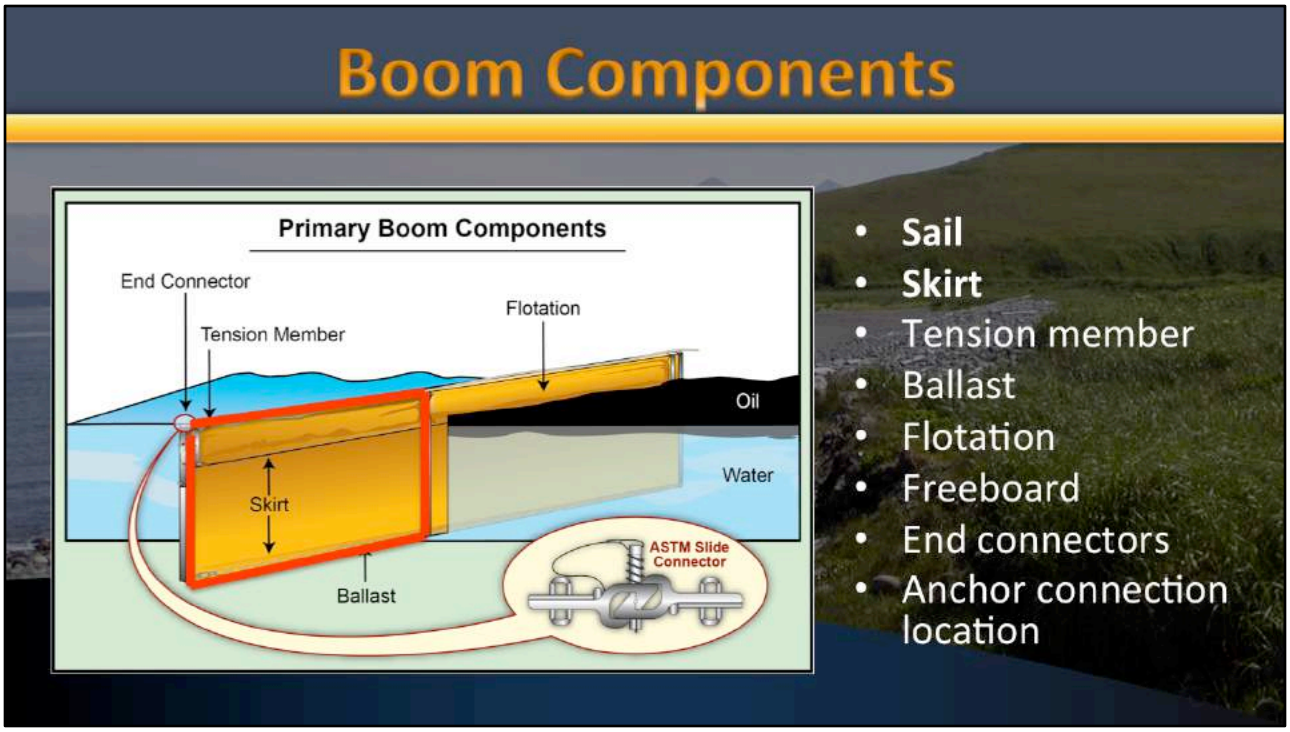
Boom can be divided into four categories, based on the operating environment in which it may be used. These are

- Calm water boom (sometimes referred to as “harbor boom”)
- Fast water boom (calm water/fast current boom)
- Protected water boom
- Open water boom (sometimes referred to as “ocean boom”)

This instruction will focus on the use of calm water or harbor boom because that is the type of boom pre-staged in communities throughout Alaska. The principles taught, however do apply to all types of boom.

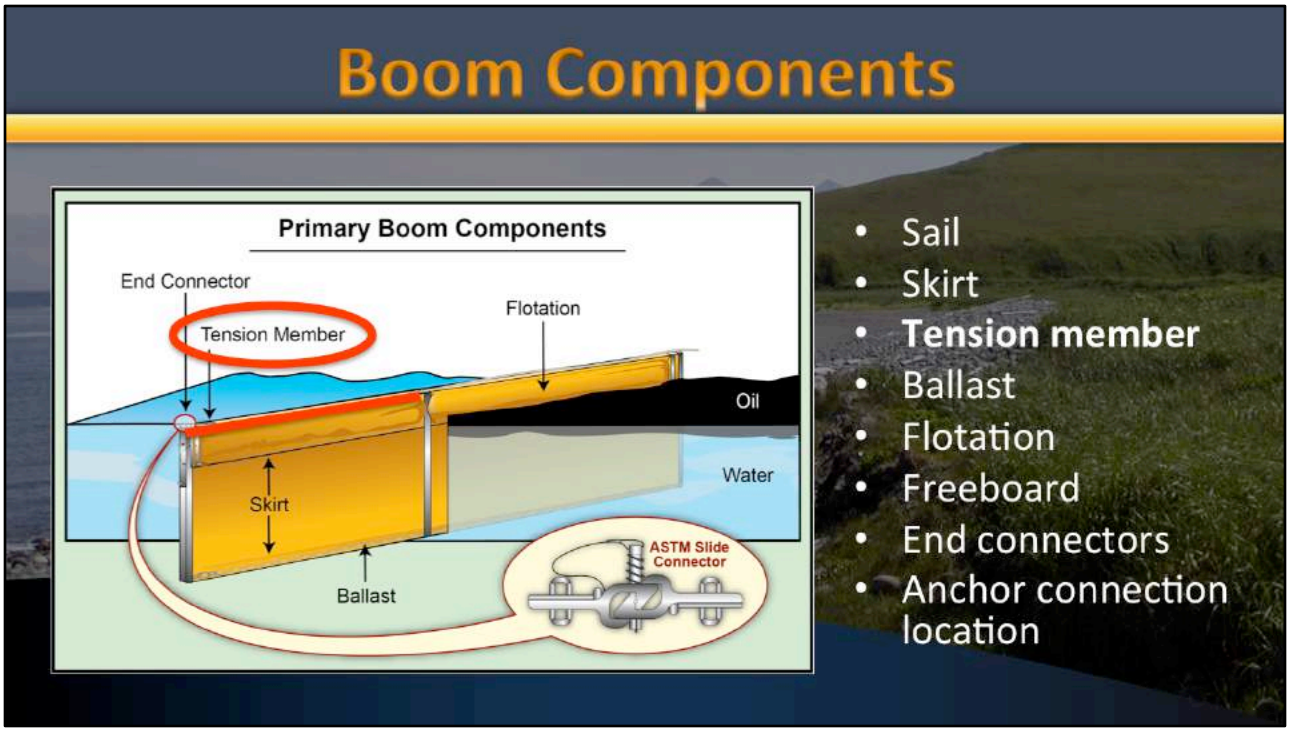


By understanding the basic components of boom, responders will become familiar with the function of each component and the terminology used during response operations.

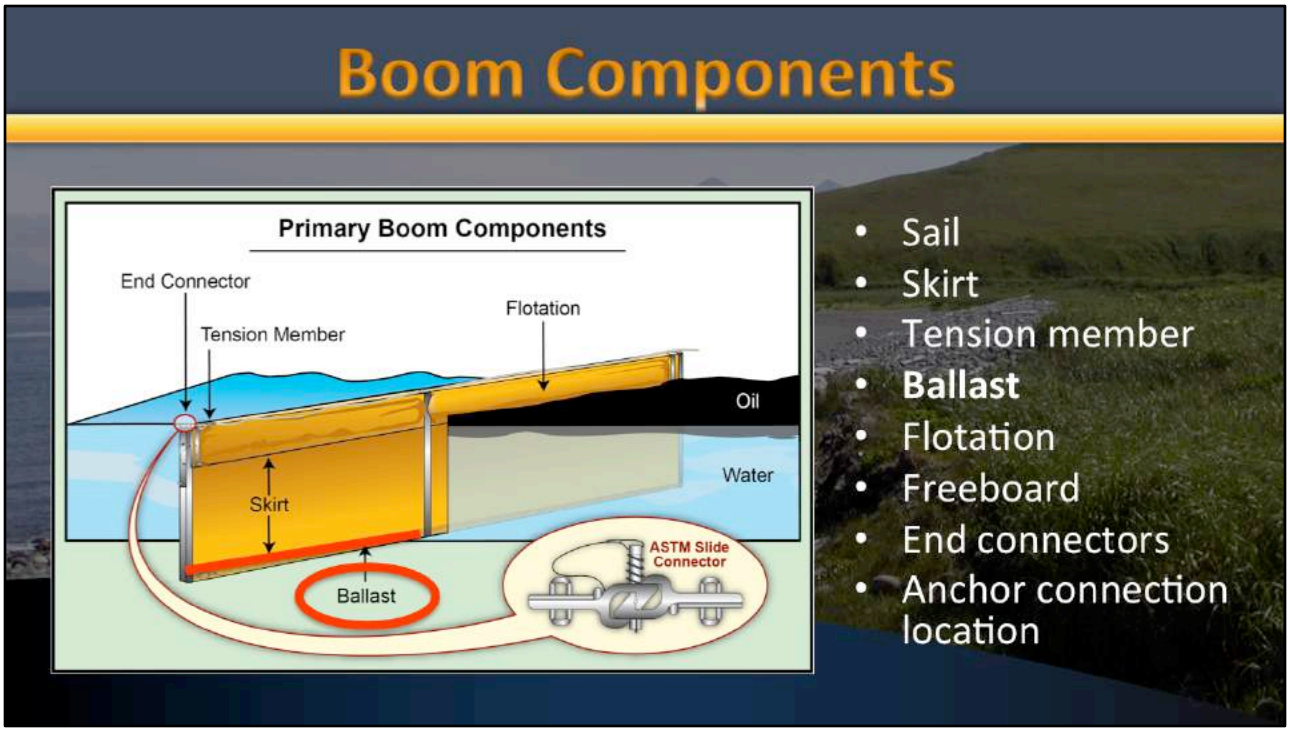


The two primary boom components are the **sail** and the **skirt. These** comprise the main body of the boom. The portion of the boom above the water surface is referred to as the **sail** and provides flotation; the portion below the surface is referred to as the **skirt**.

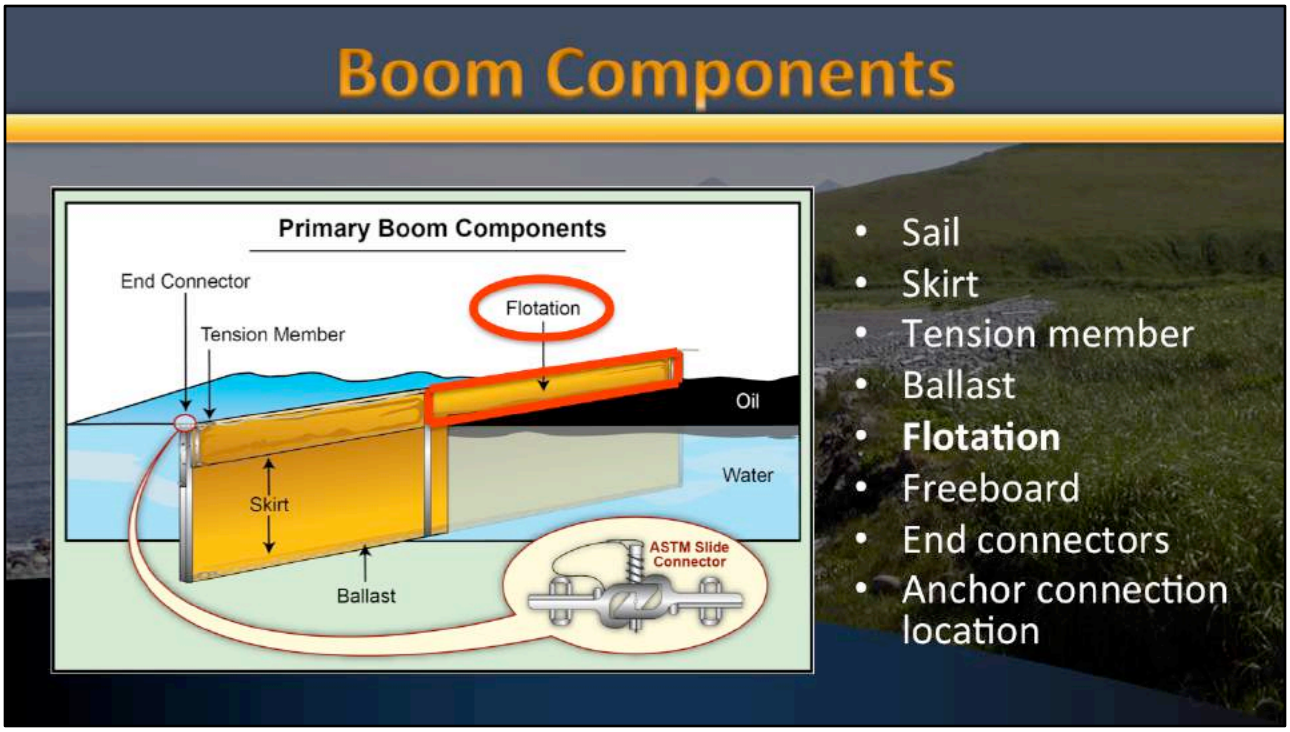
The **skirt** acts as the physical barrier to floating oil and, when deployed properly, prevents oil from being swept underneath the boom.



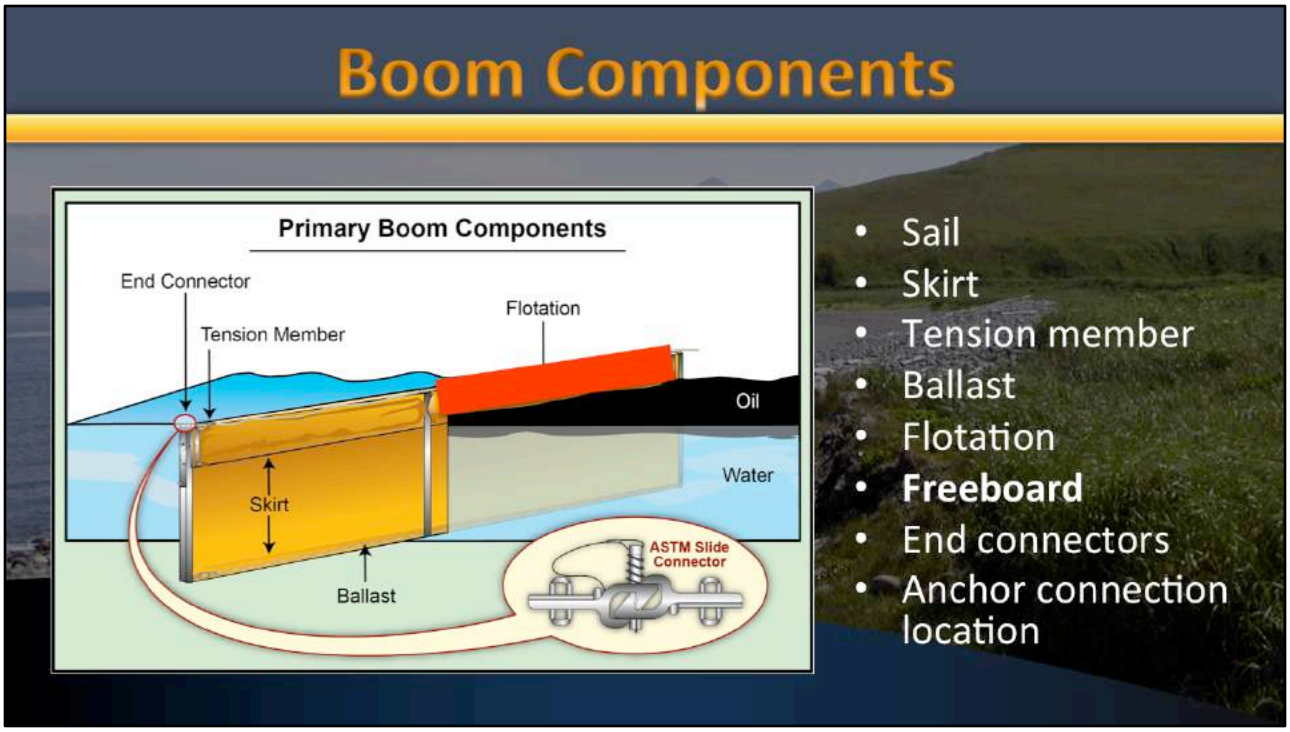
A **tension member** (such as cable) of greater strength than the fabric helps to maintain the structural integrity of the boom and prevents the fabric from tearing under stress.



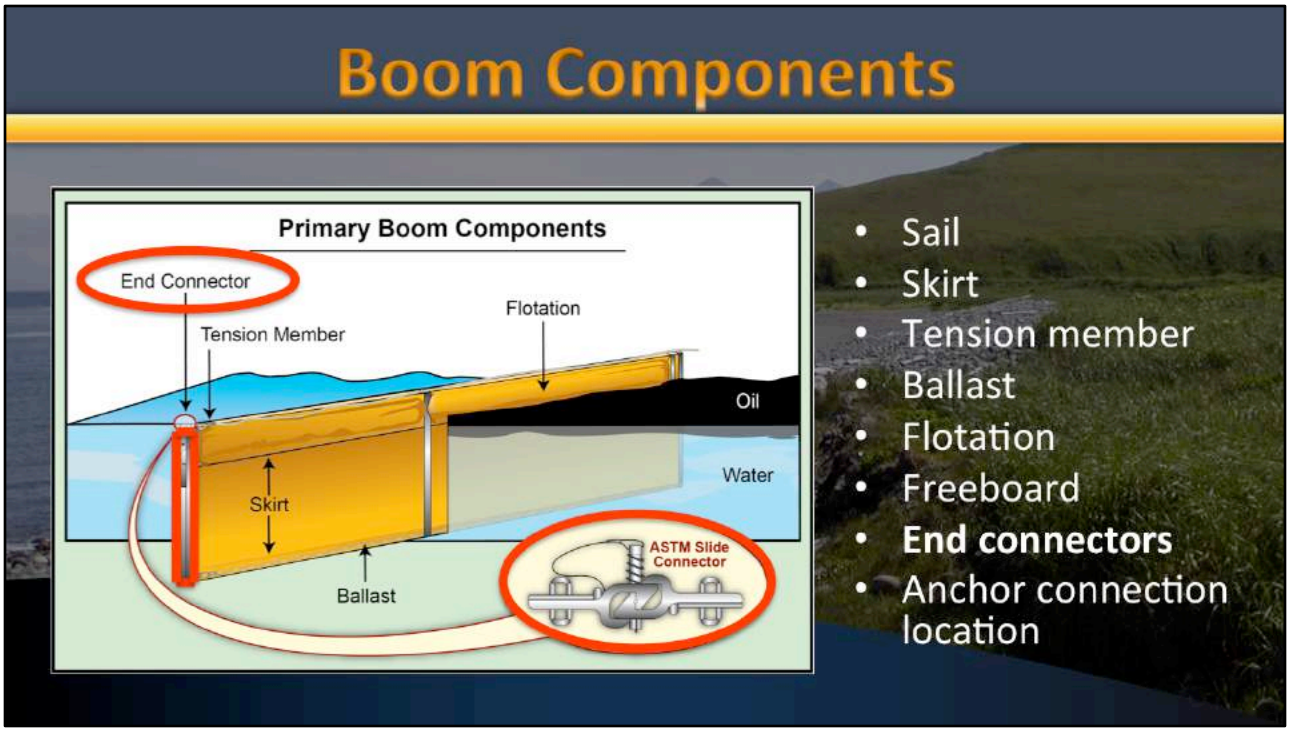
Ballast, such as chain or weights, is attached to the bottom of the skirt to keep the boom vertical in the water column.



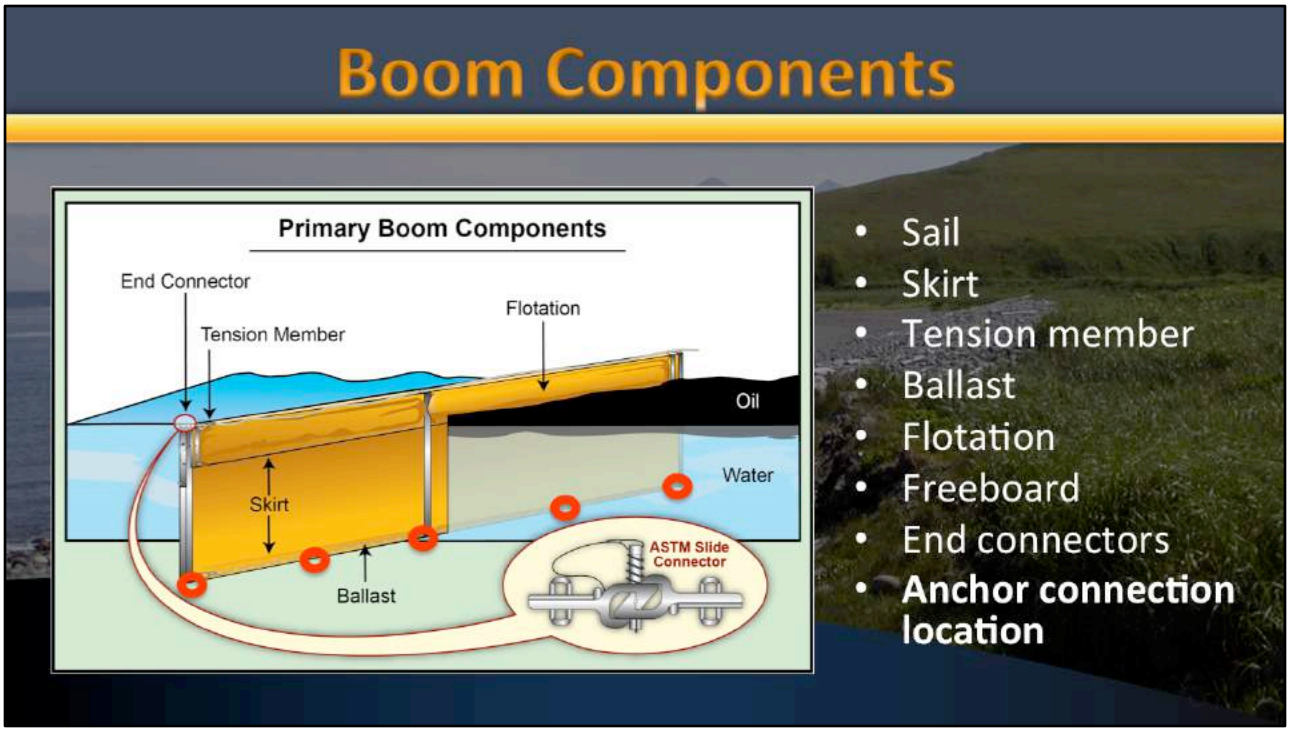
Flotation material keeps the boom afloat. Flotation may be rigid or flexible. There are several different types of flotation including various types of foam as well as air inflation chambers.



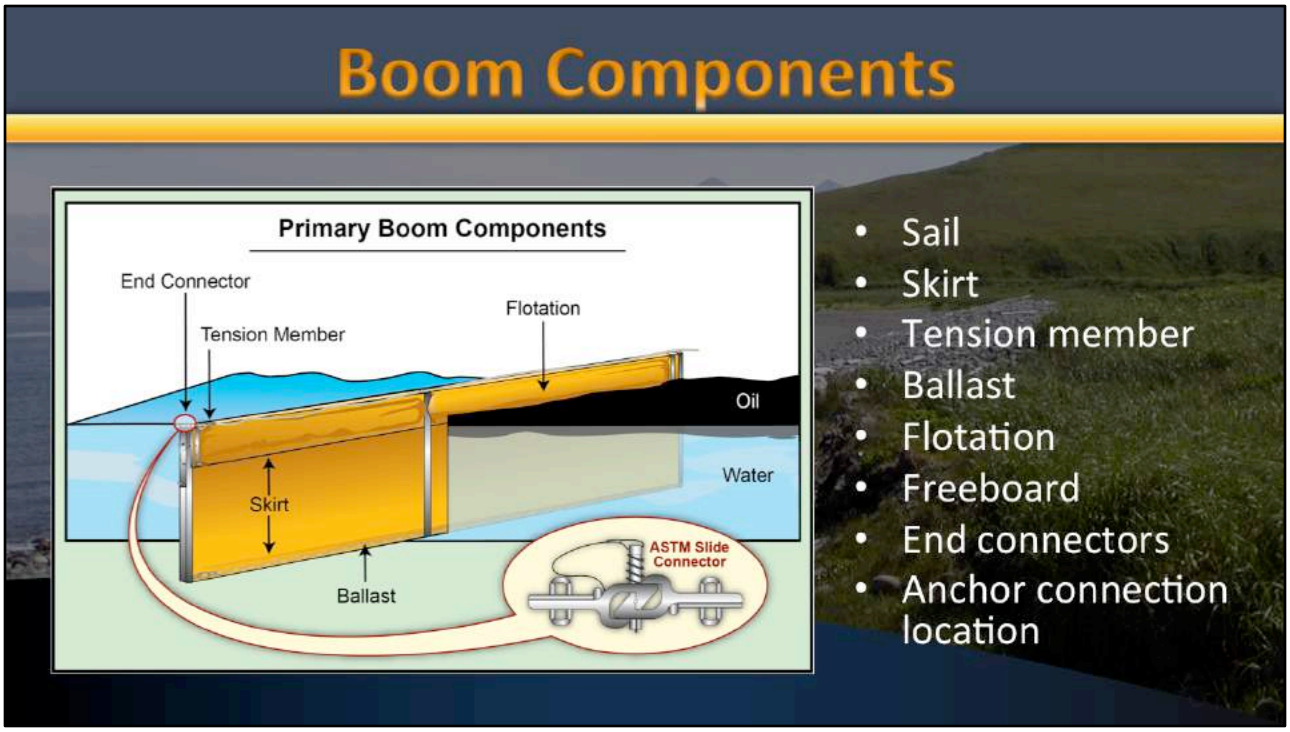
Freeboard, often used interchangeably with the term sail, is the vertical height of boom above the water line. Freeboard prevents oil from washing over the top of the boom. If there is too much freeboard, however the boom may be pushed over in high winds.



End connectors are used to connect sections of boom together. Since there are many different types of boom, there are many different end connectors, with the vast majority of end connectors being standard American Society for Testing and Materials (ASTM) slide connectors.



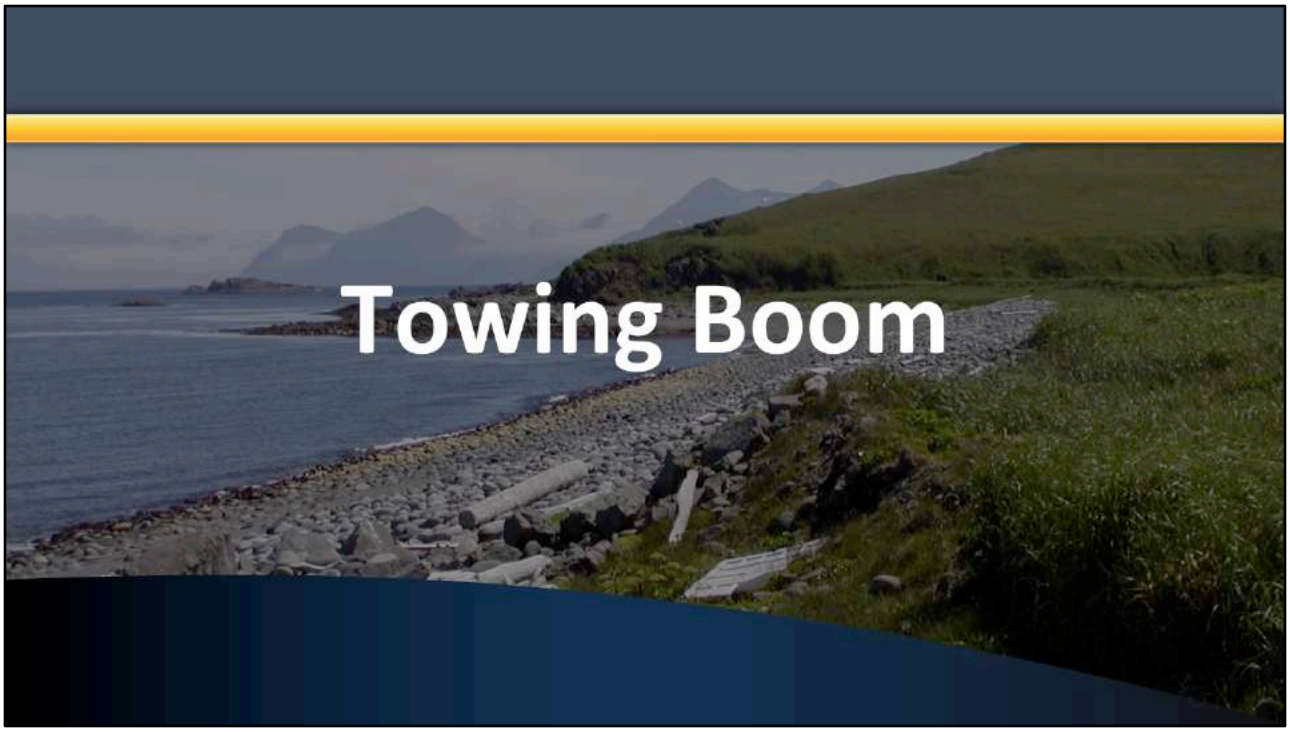
Anchor connection location: Most boom identifies locations where the anchor system should be connected to the boom. These locations are reinforced with a shackle or wire loop to facilitate boom readjustments.

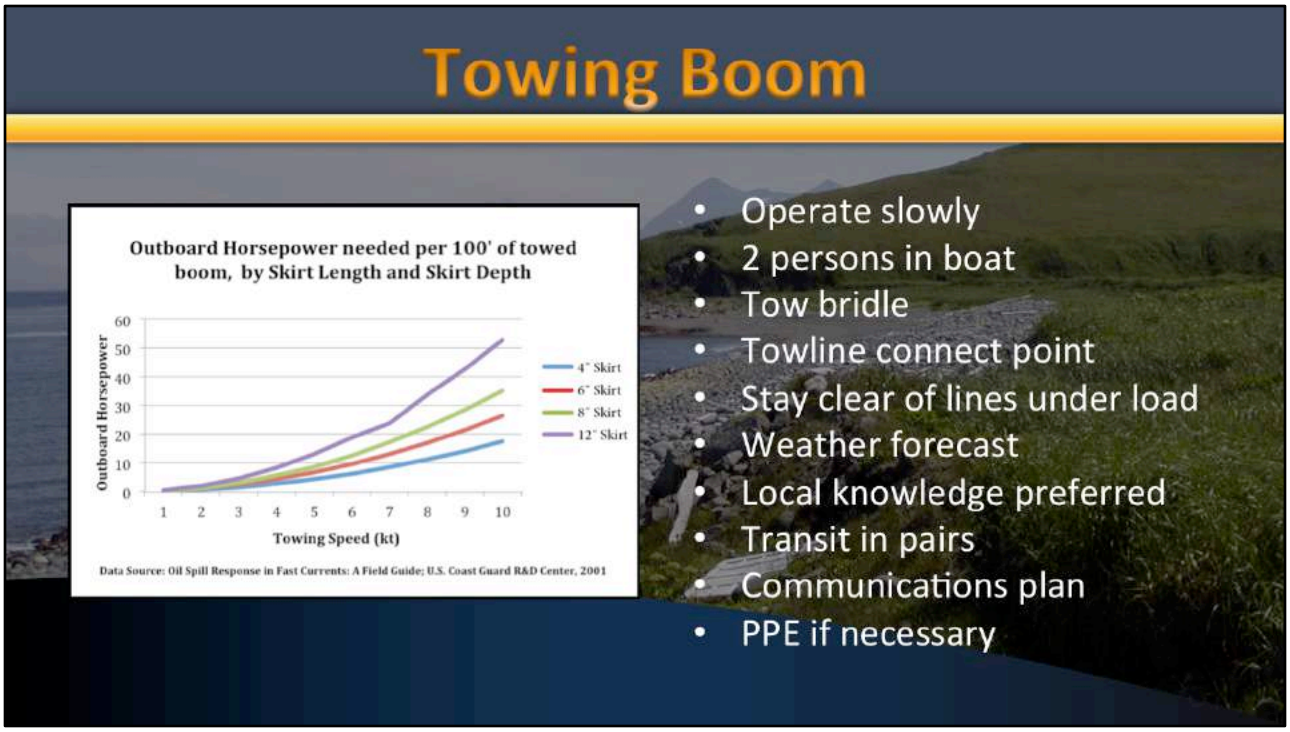


Boom comes in sections of typically 50 to 100 feet long. To make the boom the necessary length sections are fastened together using the end connectors. Usually a length of boom is assembled onshore and slowly towed into position. For tactics that call for longer boom deployments, smaller sections may towed to the deployment site and connected to other sections on the water to make the specified length.

Review Questions

1. The type of boom pre-staged in communities throughout Alaska is of _____ or _____ boom.
2. The _____ acts as the physical barrier to floating oil.
3. _____ are used to connect sections of boom together.
4. _____ is attached to the bottom of the skirt to keep the boom vertical in the water column.
5. Boom comes in sections of typically _____ to _____ feet long.


Towing Boom

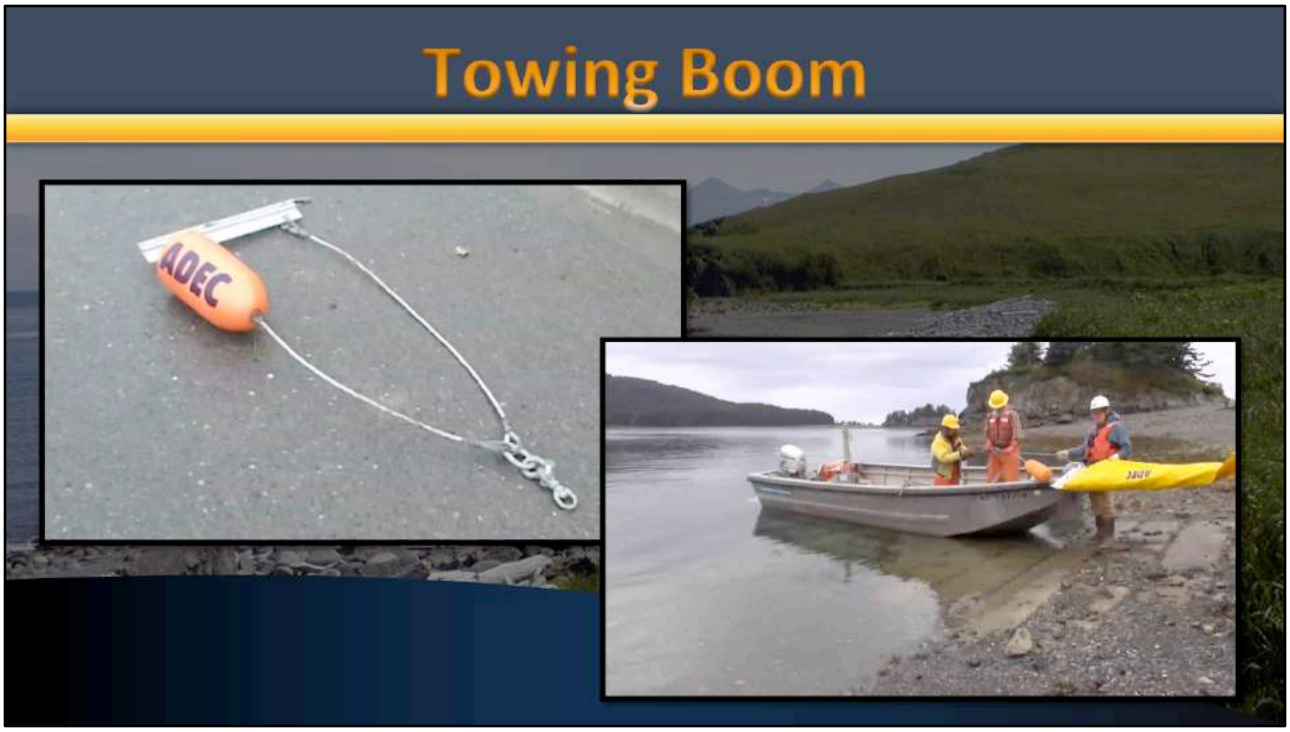


Most response tactics involve towing boom. This requires experienced operators and appropriately powered vessels to manage the boom. The figure on screen provides a rule-of-thumb reference to make sure vessels are appropriately powered to tow boom at various towing speeds.

Towing speeds for active booming tactics are typically much slower. Vessels towing boom should operate slowly and must have at least one crewmember in addition to the operator, to keep an eye on the boom. When practical, it's recommended to perform multiple tows of shorter sections over towing longer sections.

500' is the recommended maximum boom length for towing. Towing speed should never exceed 7 ktns.

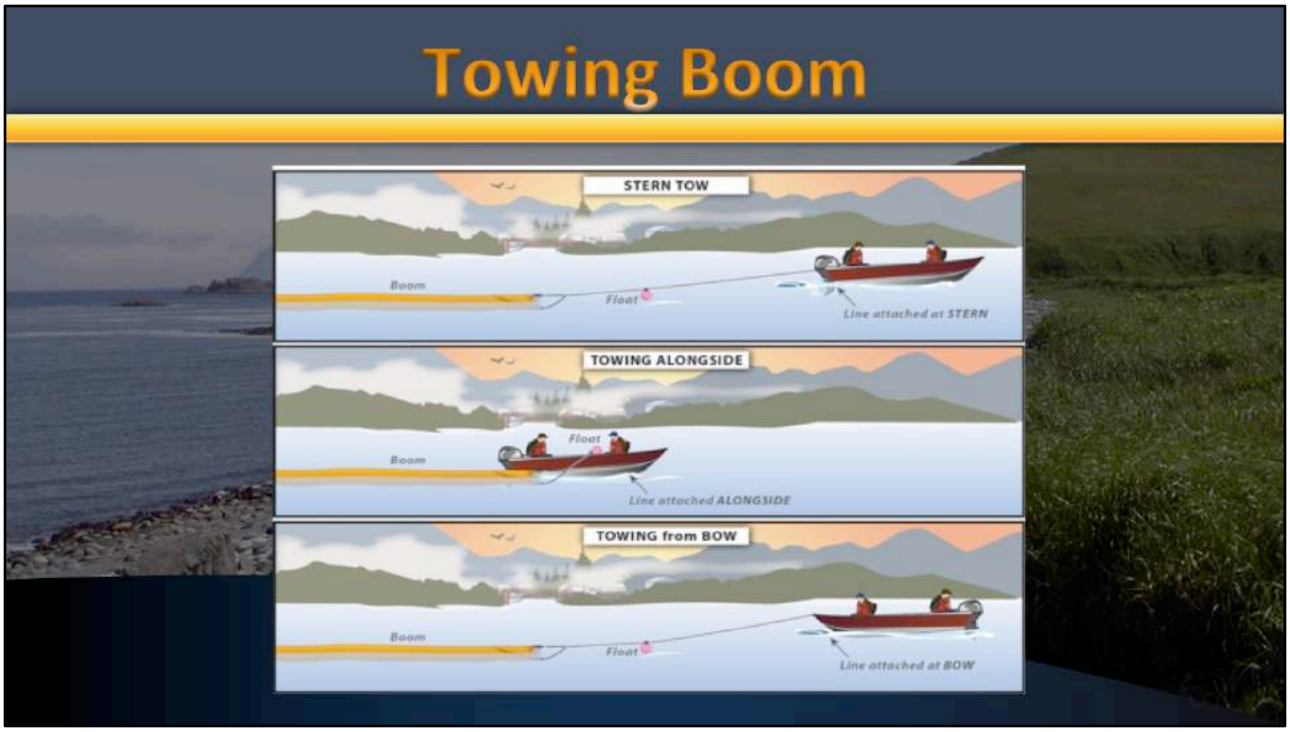
Particular care should be taken in areas with navigational hazards such as fishing floats or mooring buoys.



To prevent damaging boom, it is best to tow it using a tow bridle. These are usually located in the Alaska DEC Conex boxes near the boom.

The bridle is attached to the end of the boom using the same connectors that connect boom segments together. Once secure, a towline can be attached to the bridle.

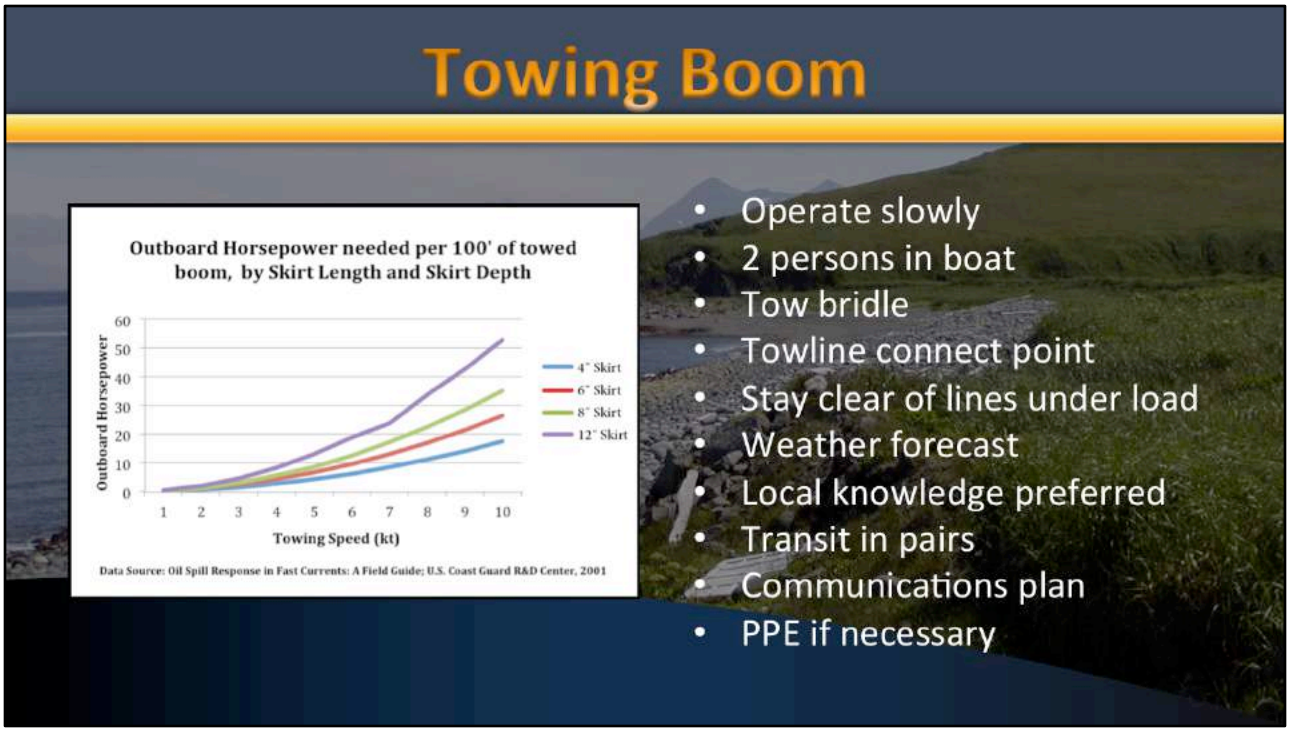
If a tow bridle is unavailable, securing the towing line to an anchor point is an option. You need to reduce your tow speed by 50% when towing from this point.



There are basically three ways to tow boom. Either from the stern, alongside your boat or by the bow. The ideal location for attaching boom to the boat depends on the vessel, your experience level and the conditions in which you are operating. This may require some experimentation to find the right location.

Only tow from the bow position (reverse) for short distances. Most outboard prop hubs are not designed to tow under load in reverse and will result in damage (slippage) to the hub.

During towing operations extreme force may be exerted on the towline and care should be taken to ensure the attachment point has sufficient strength. It's important to stay clear of lines under load or potentially under load and to not conduct field operations beyond your level of training and experience.



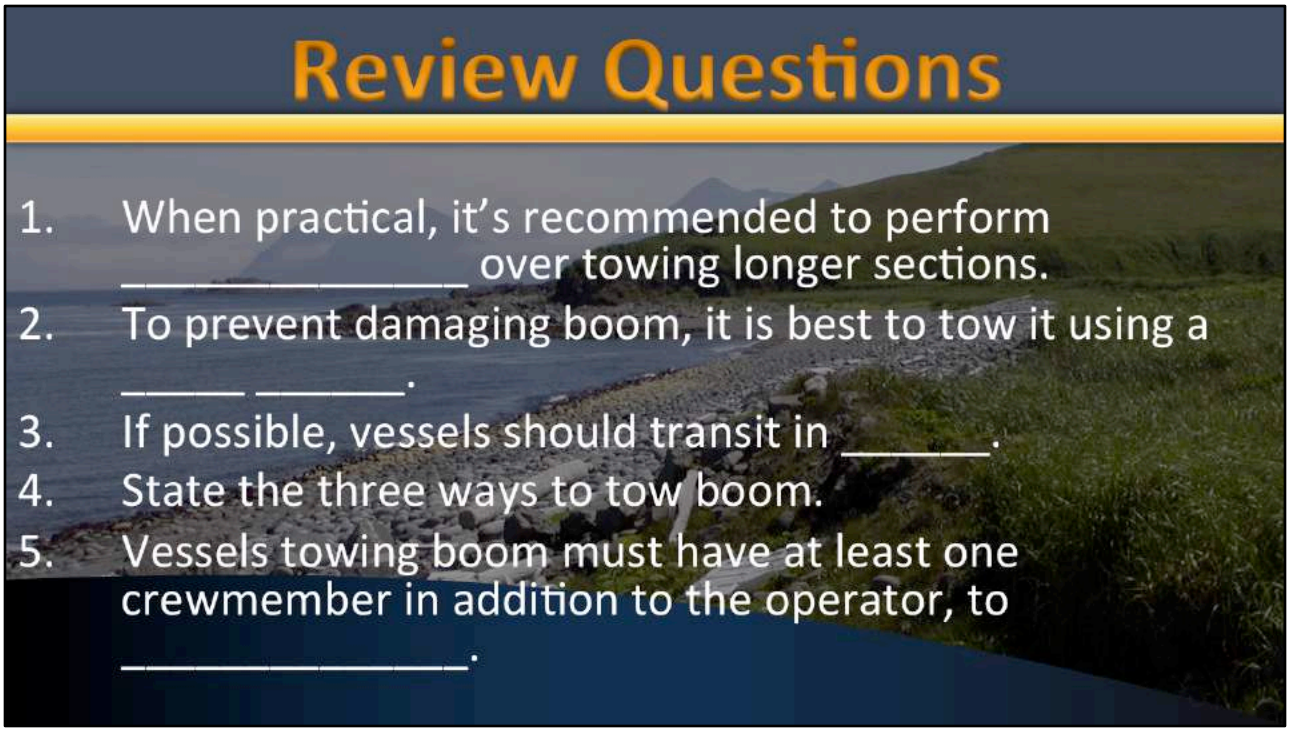
Prior to getting on the water an evaluation of the weather is recommended, and should take into account currents, **sea state**, distance to safe harbor, transit times and exposure of vessels.

Vessel masters should have experience in their operating environment. Crews with local knowledge are preferred.

If possible, vessels should transit in pairs.

A communications schedule should be established and followed, between vessels and the Site Supervisor, Operations Section or Radio Dispatcher.

Response personnel should wear PPE as required by the incident-specific Site Safety Plan.

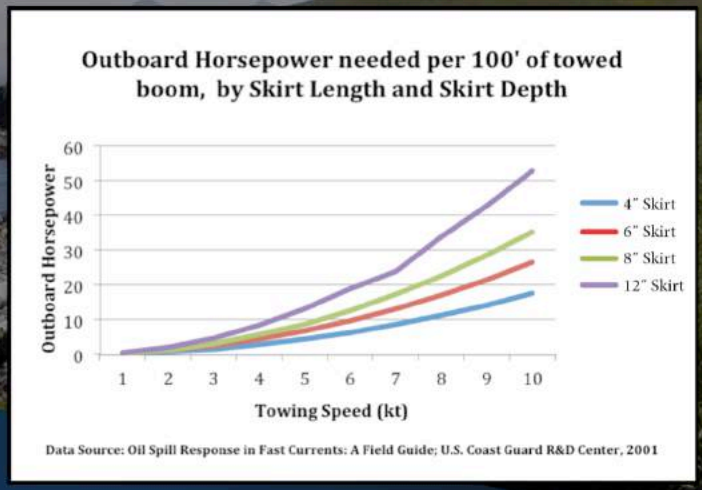


2. tow bridle.

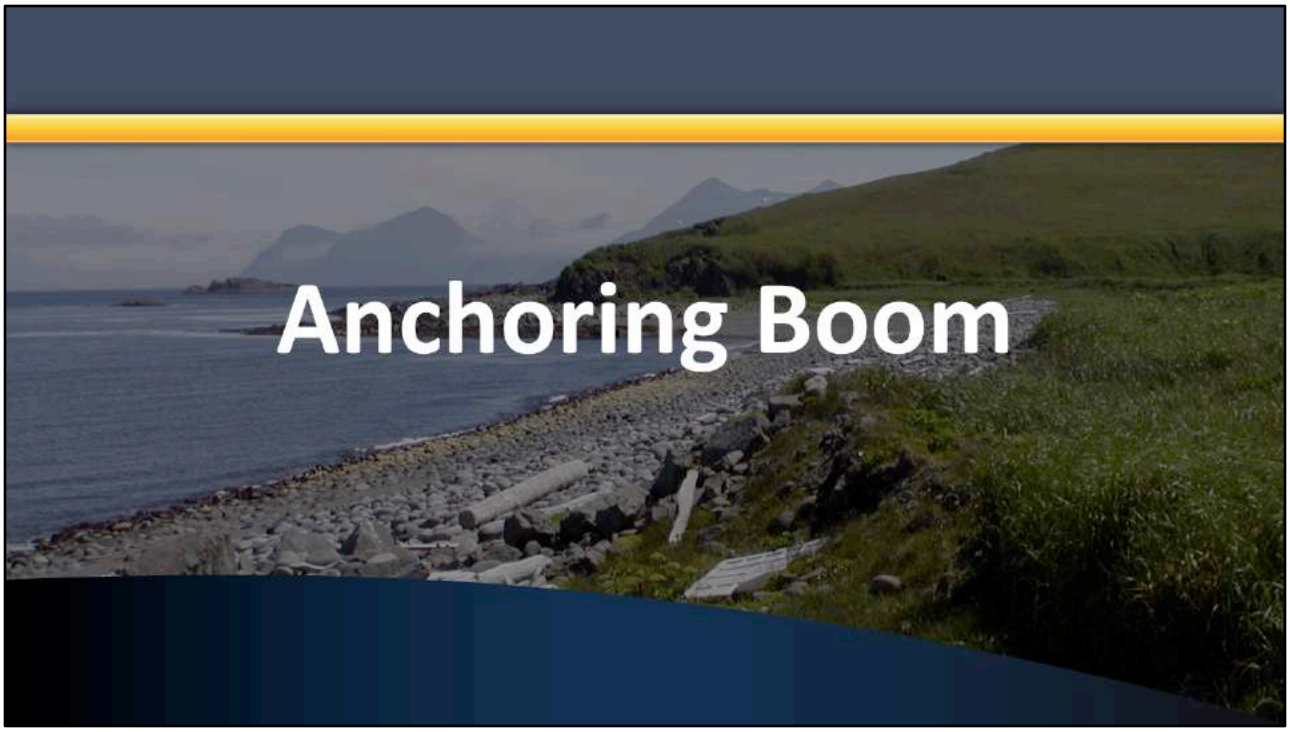
4. from the stern, alongside your boat or by the bow. The ideal location for attaching boom to the boat depends on the vessel, your experience level and the conditions in which you are operating.

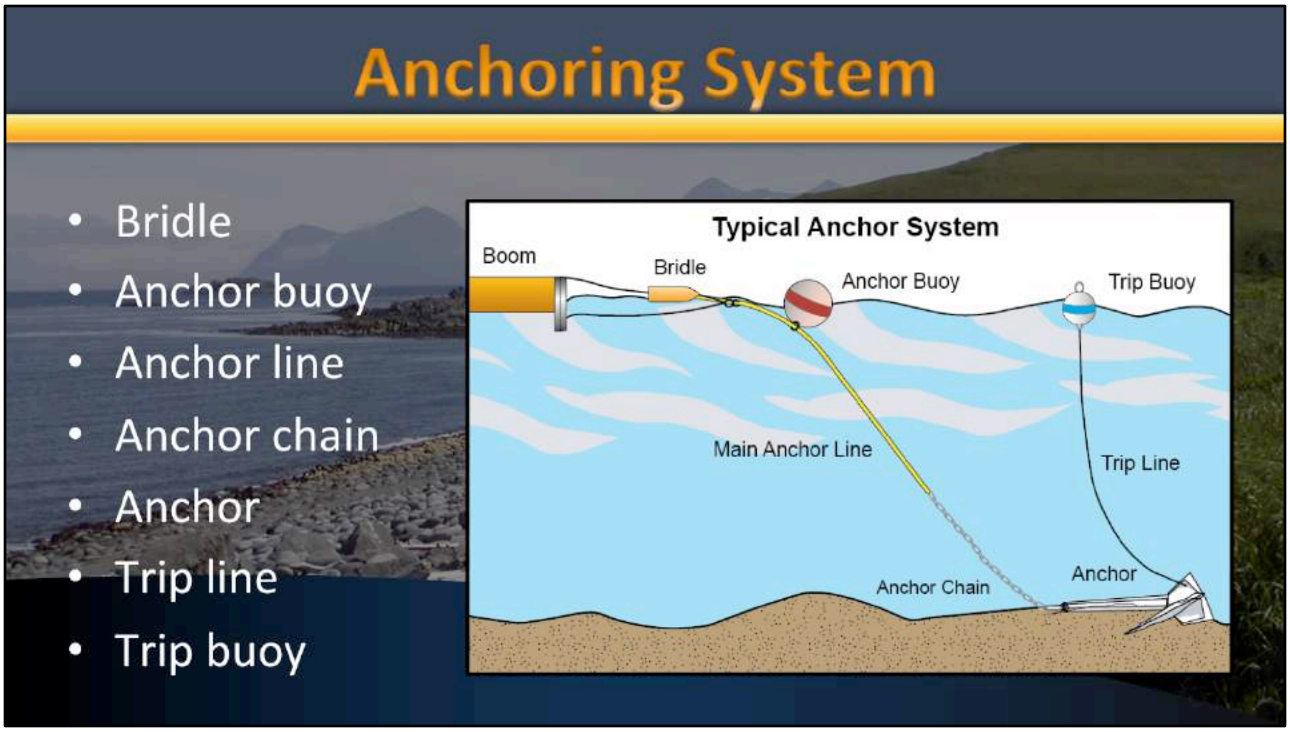
Review Questions

6. How much horsepower is needed to tow boom with a 12” skirt at 6 kts?



owing speeds for active booming tactics are typically much slower.


Anchoring Boom



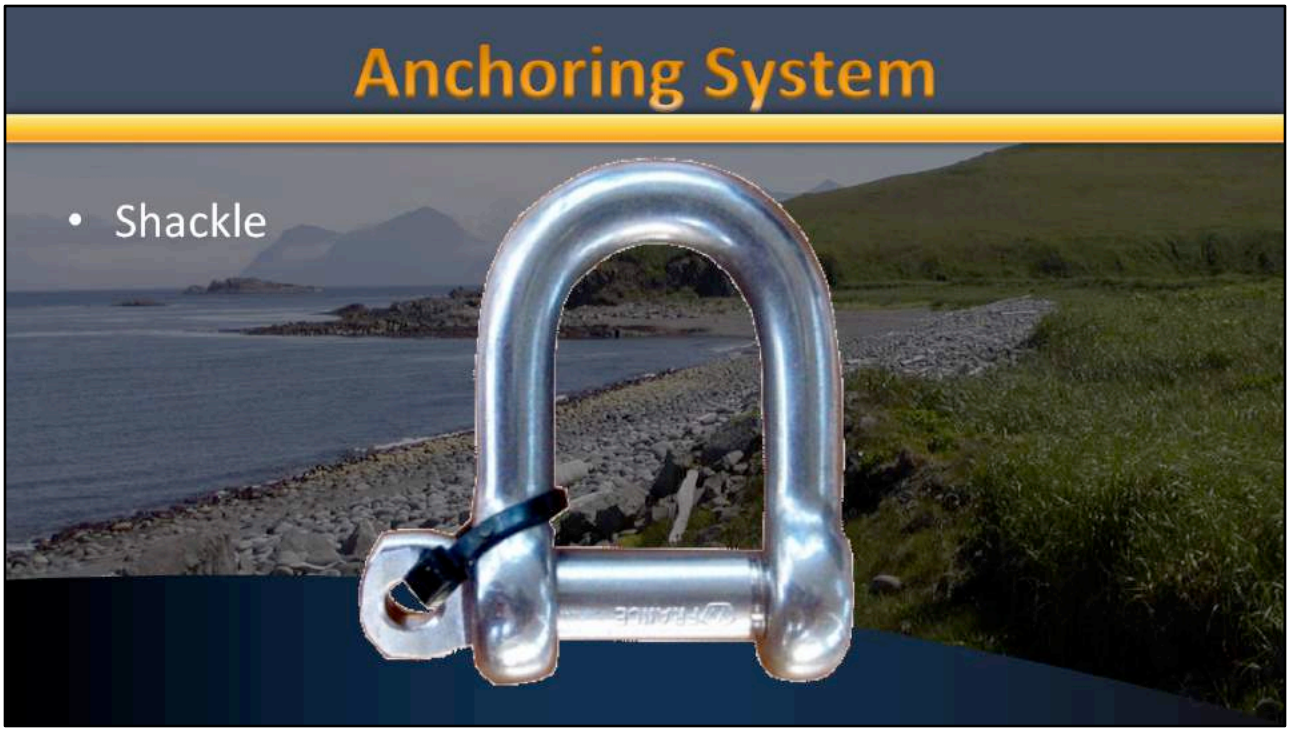
Boom is secured in place using standard anchoring systems as shown here. Anchor sizes should vary depending on the boom type, bottom type, and the operating environment. Anchor systems must be selected based on the maximum stress that might be expected to occur on the boom array, considering the potential for stronger currents and winds than when the anchor was initially set.

An anchoring system consists of a bridle, anchor buoy and the main anchor line. The anchor line is connected to chain, which is, in turn connected to the anchor. A trip line is attached to the anchor and a trip buoy to allow you to locate and adjust the anchor position.

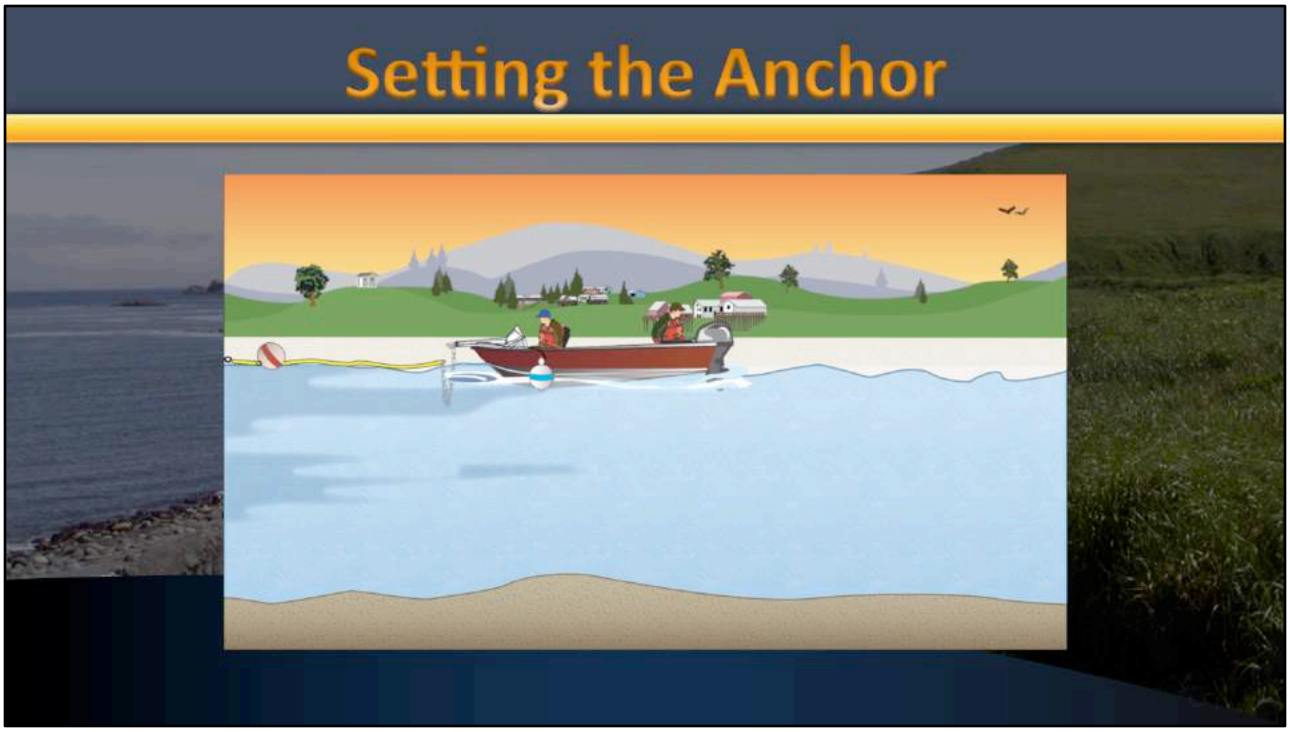
The length of the anchor line should be at least three times the depth of the water to account for tide cycles. Similarly, the trip line depicted here should also be of adequate length to account for tide cycles and to ensure that the trip buoy remains at the surface without dislodging the anchor.

If the anchor does not hold, you should try increasing the line scope to five times the depth of the water and/ or double the length of the anchor chain.

Finally, if additional anchor holding is required, anchors can be combined or set in series.



Shackles should always be “moused” to prevent shackle pins from working loose. Mousing is accomplished by using plastic wire ties or wire to secure the shackle pin to the shackle as depicted on screen."



Before deploying an anchor, consider the effect the wind and currents will have in moving the position of the boom prior to setting the anchor. Prepare the anchor system in the boat by ensuring the lines are not tangled and are able pay out of the boat easily. When ready, follow these steps:

Attach the anchor line to the bridle or the boom

Place the trip buoy in the water, keeping the trip line secured to your boat.

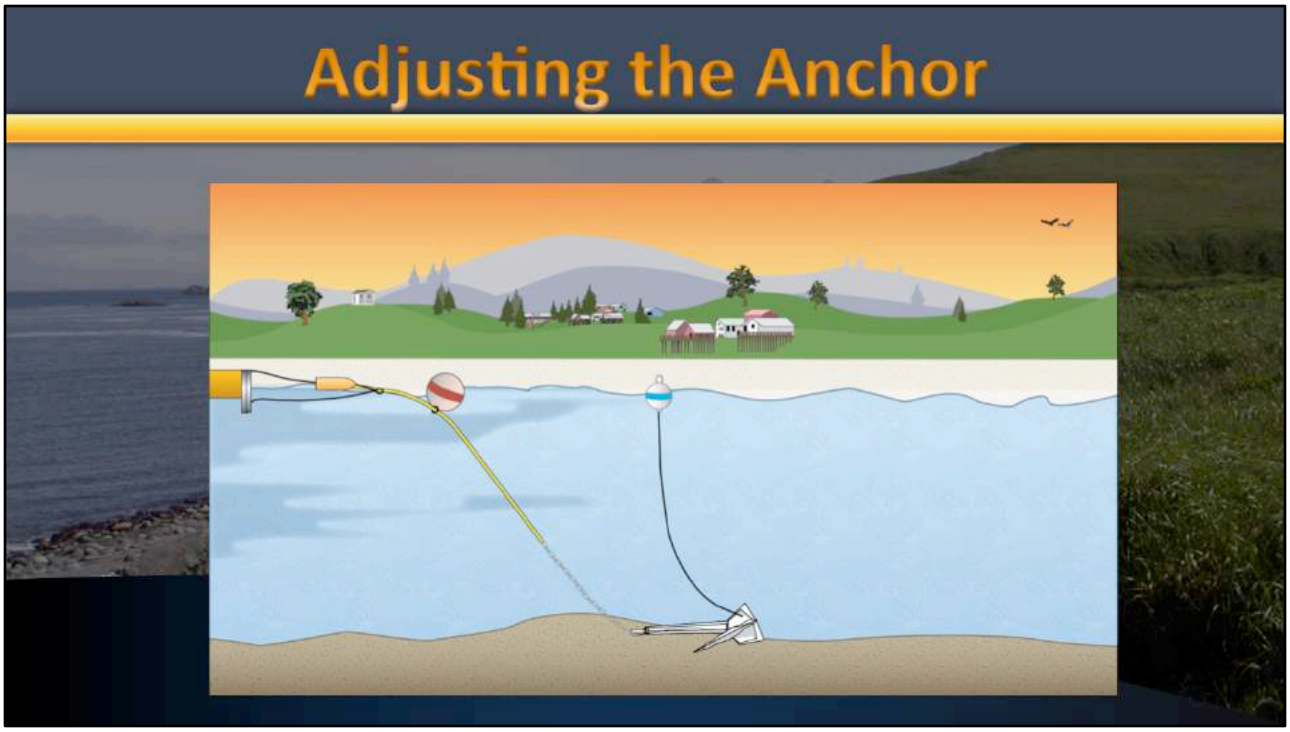
With the anchor in the boat, pay-out the anchor line while backing away from the boom.

Prior to dropping the anchor, the anchor line may be secured to the boat and the boom towed to adjust the position.

Once in position, drop the anchor and pay out the trip line.

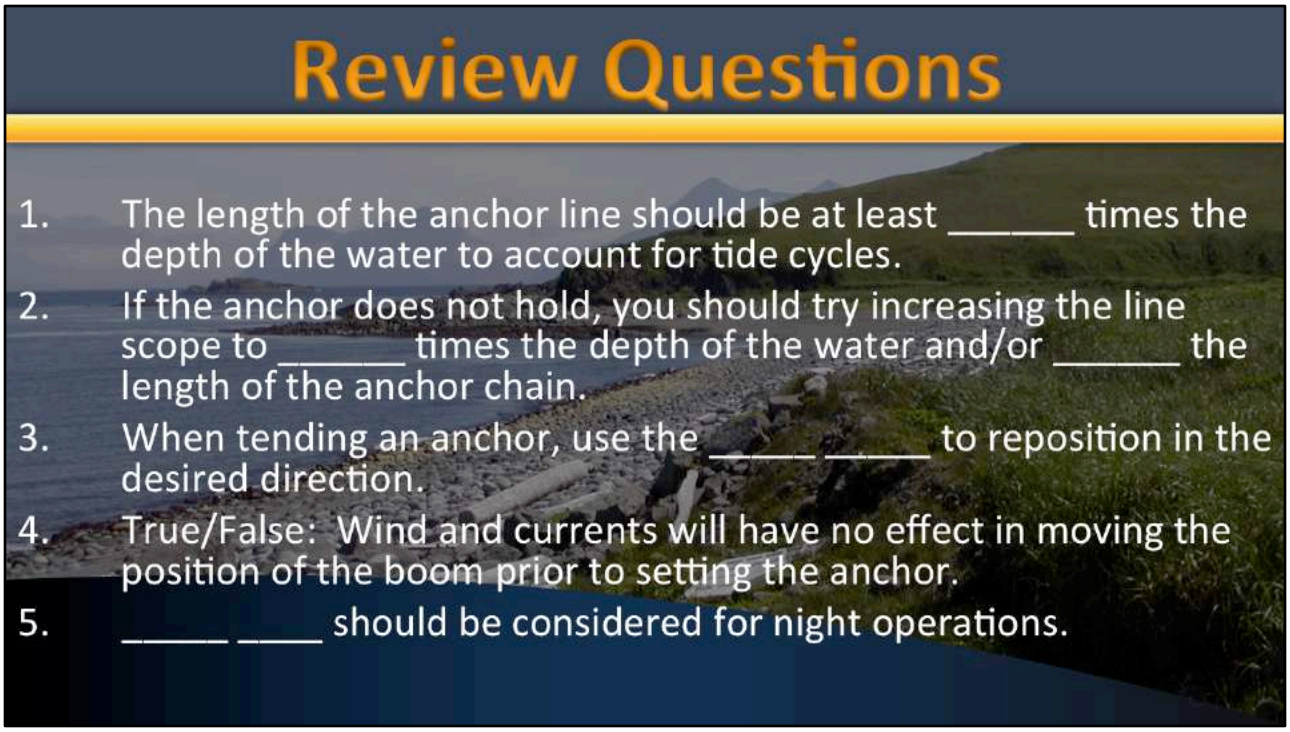
Observe the boom and ensure that the position is correct.

Buoy lights should be considered for night operations.



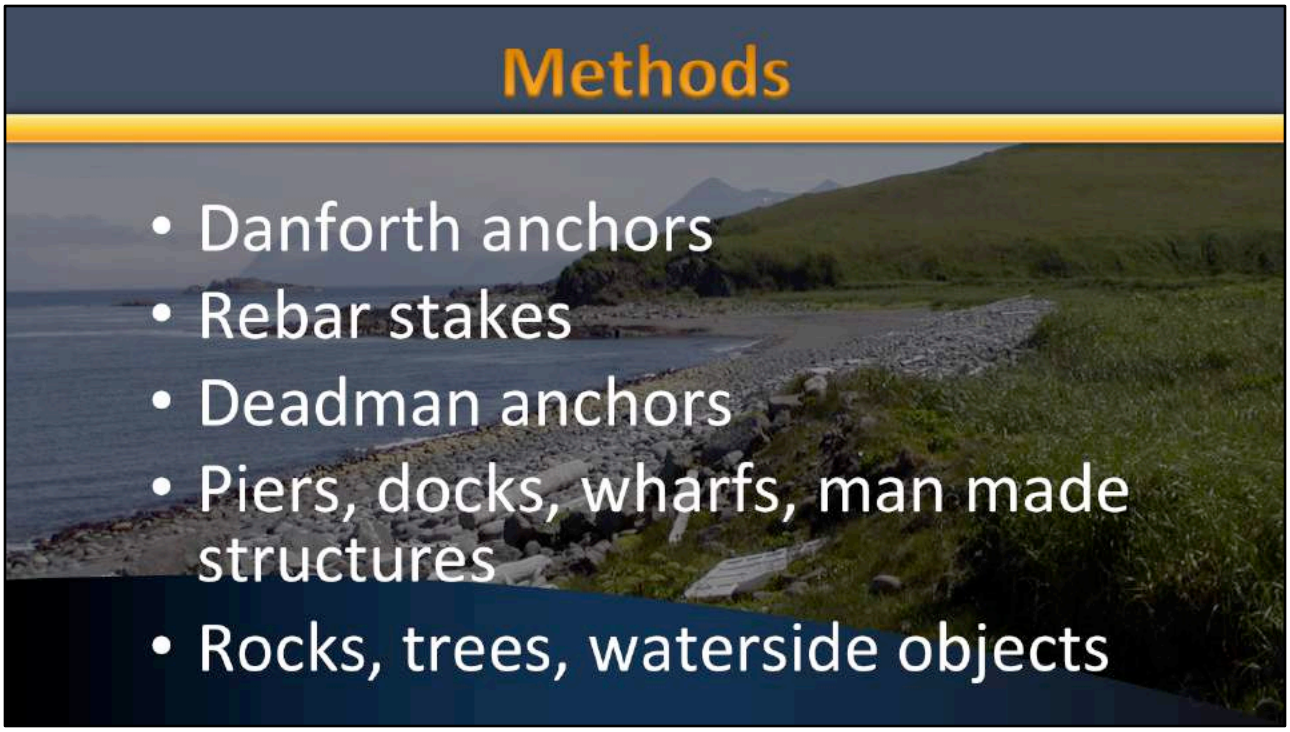
When tending an anchor, use the trip line to reposition in the desired direction.

- Use a boat hook to pick up the trip buoy
- Attach the trip line to a cleat on your boat
- For short distances, maneuver your boat to drag the anchor to the desired position. Often times this is done by backing toward the desired location with the trip line tied to the bow of your boat.
- For longer distances, you can pick up the anchor with the trip line, bring it onboard your boat and reset the anchor in the new position.



1. Three
2. Five double. if additional anchor holding is required, anchors can be combined or set in series.


Connecting Boom to Shore

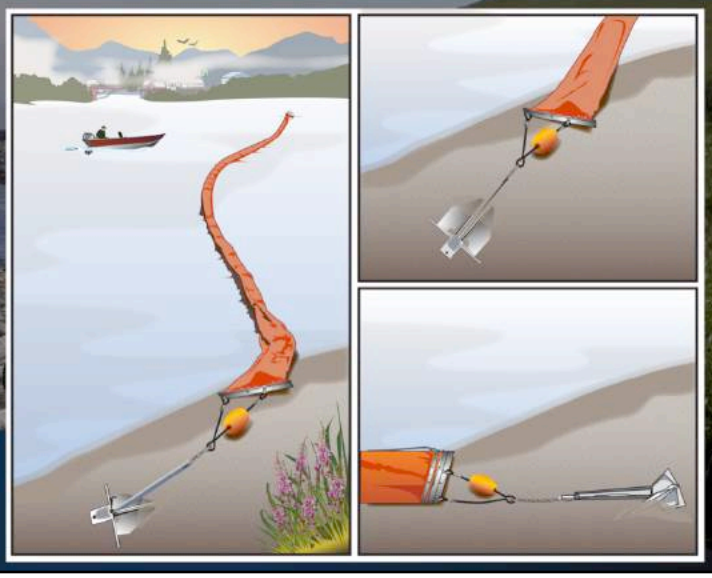


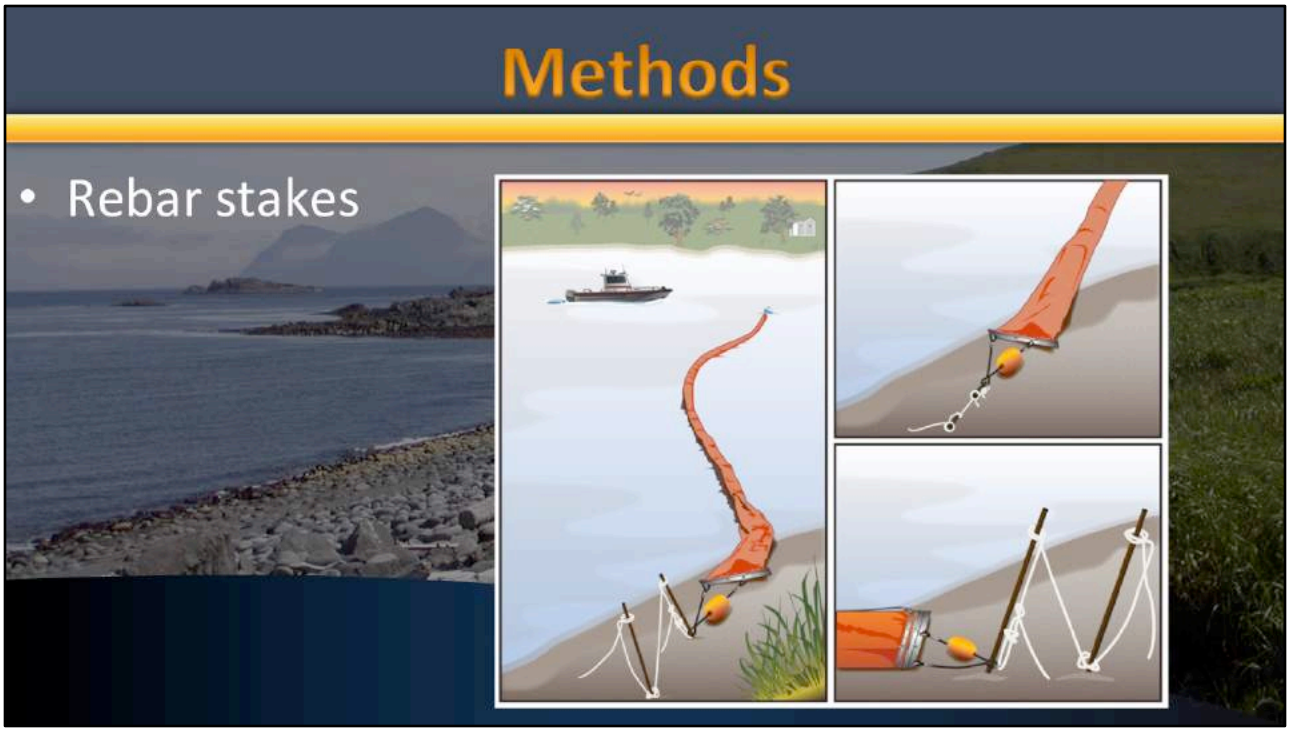
Several different methods can be used to connect boom to the shoreline including:

Traditional Danforth anchors
Rebar **stakes**
Deadman anchors
Piers, docks, wharfs and other man-made structures
Rocks, trees or other waterside objects strong enough to hold the boom segment.

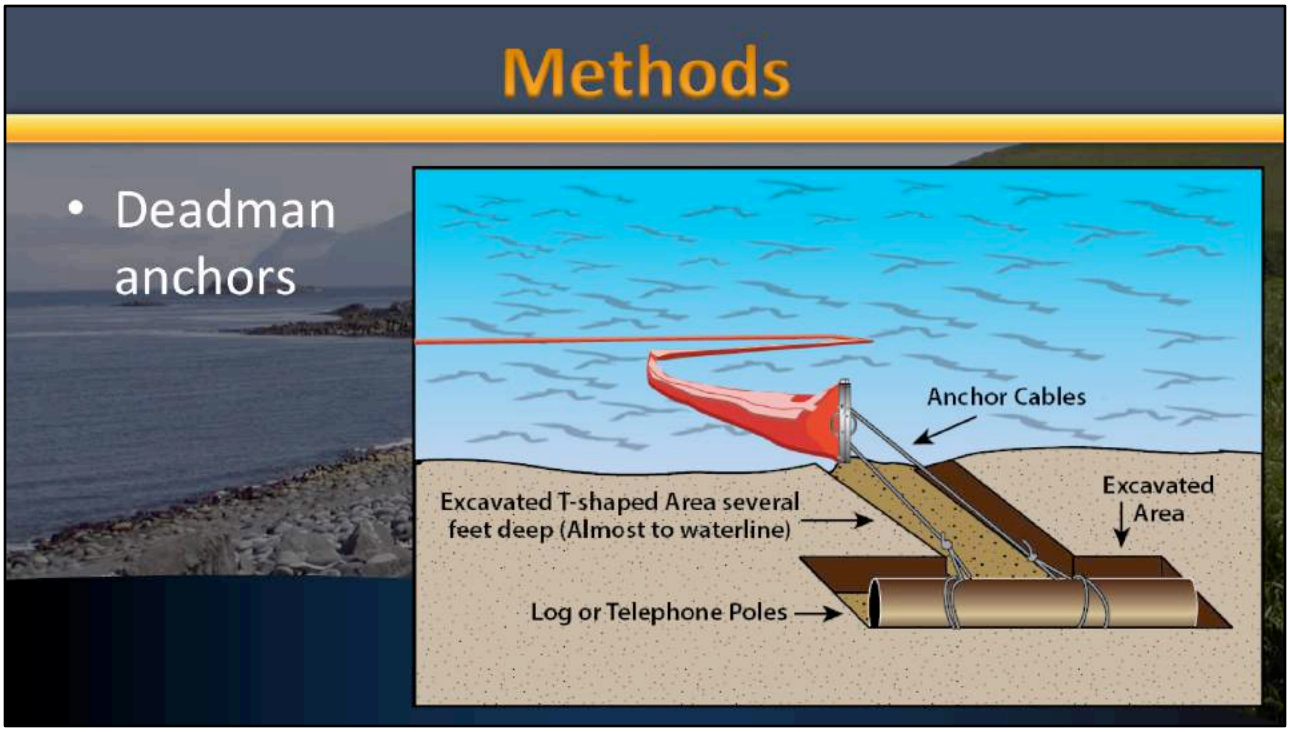
Methods

- Danforth anchors

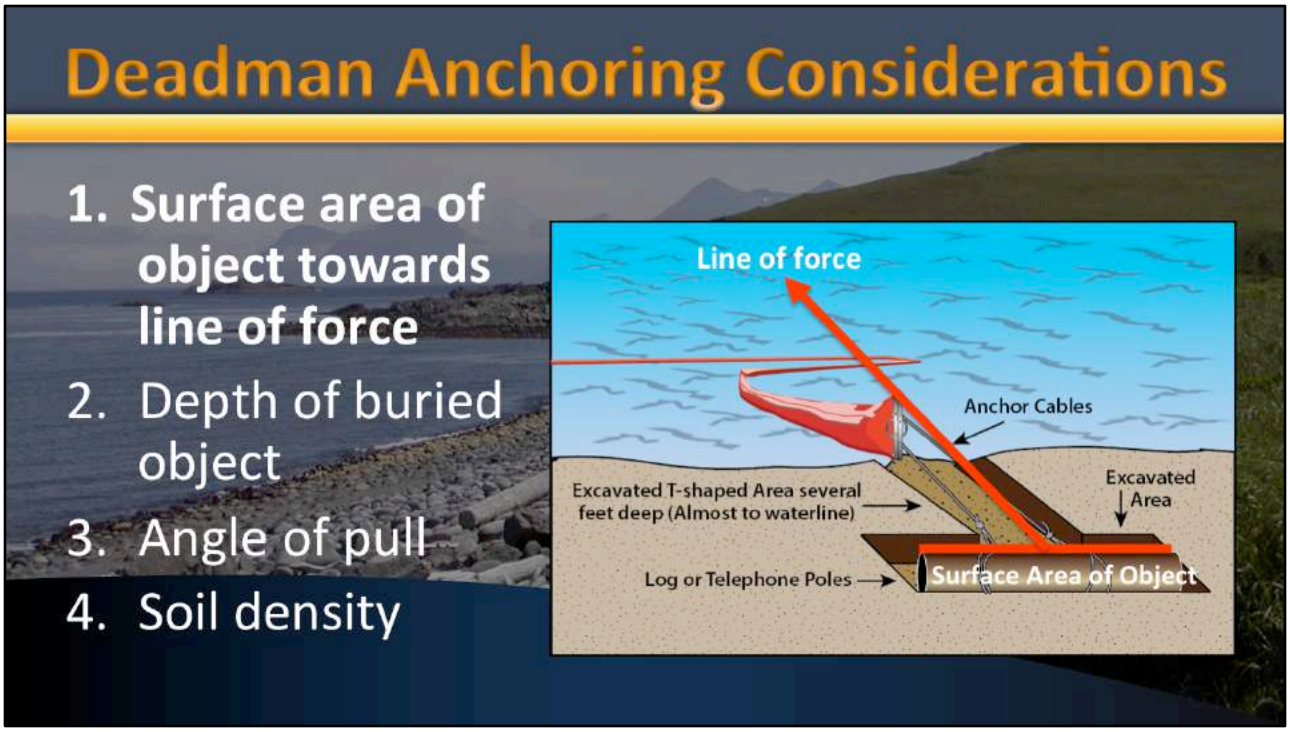




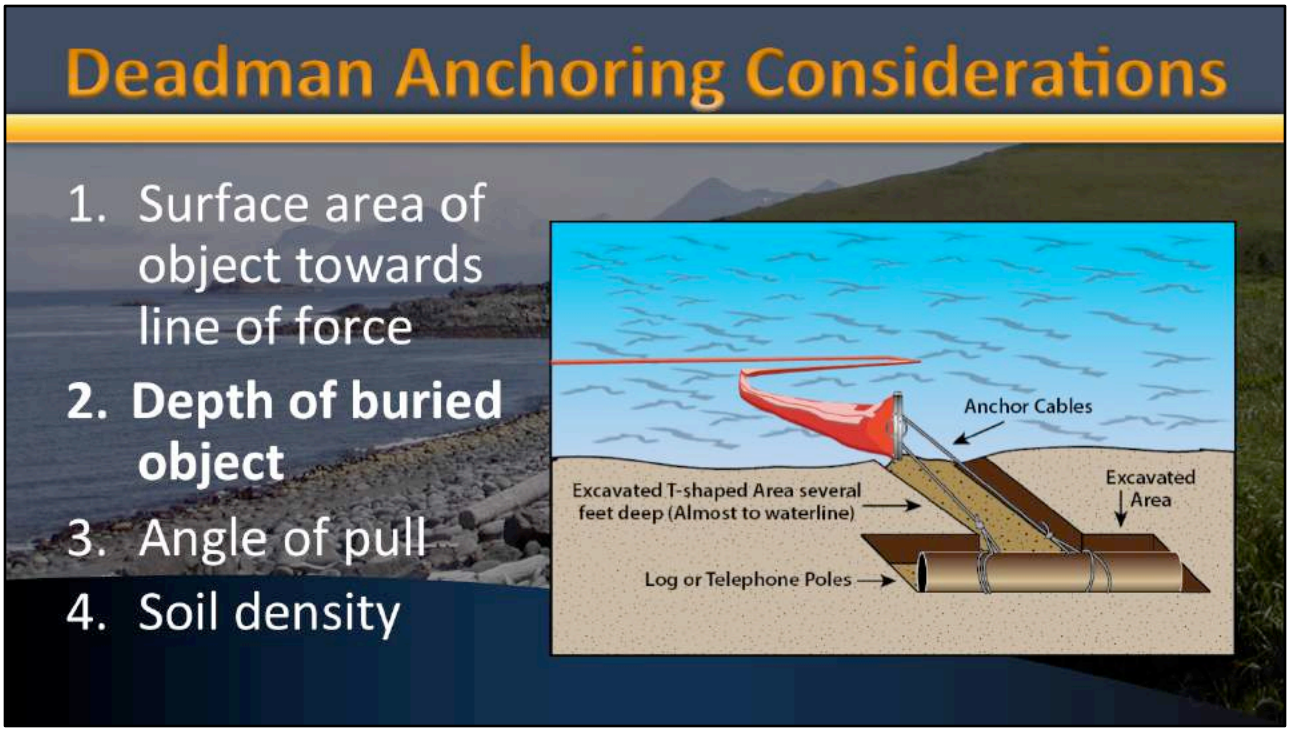
Rebar can be used as an effective anchor system and can be set-up quickly with minimal effort. As shown in this image, an effective anchoring point can be created using two appropriate sized sections of rebar driven into the ground and tied off in the manner depicted. Care should be taken to clearly mark these anchor points so site workers avoid injury from tripping or falling onto the rebar.



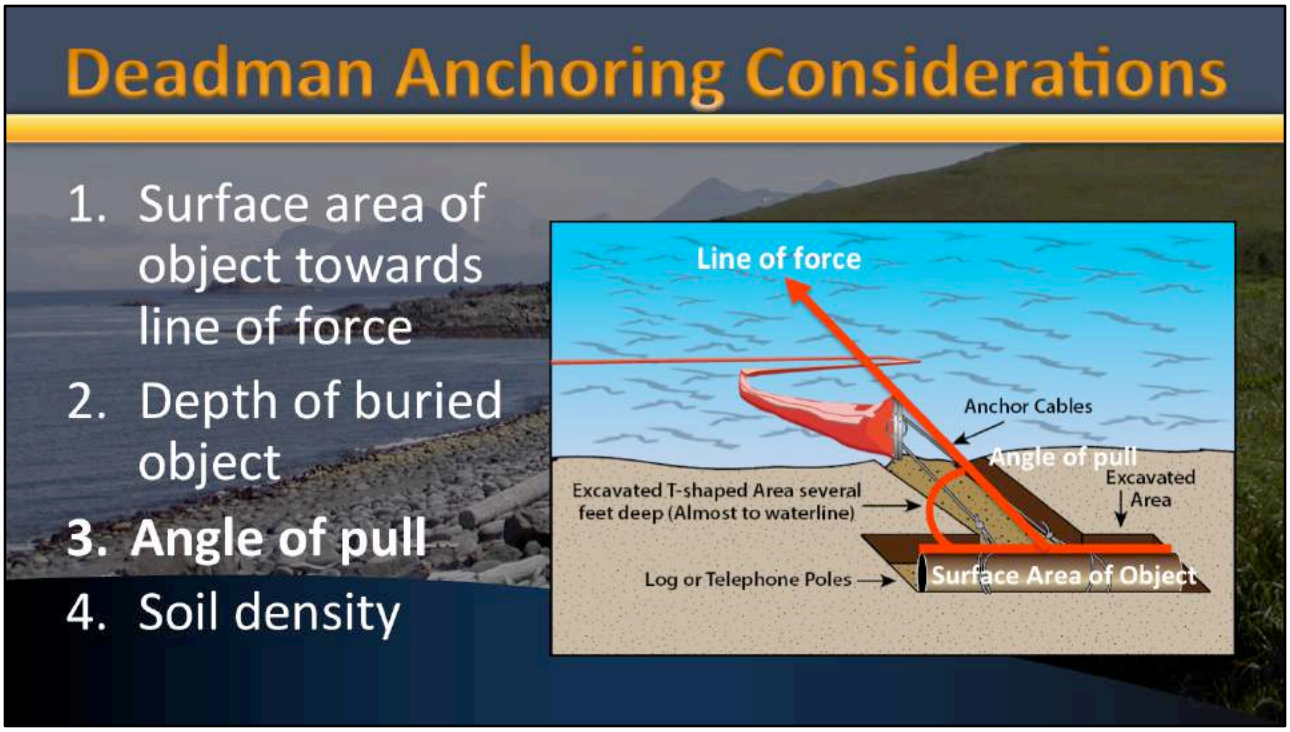
Deadman anchoring – A deadman is a buried object, typically a rock or log, used as an anchor point. Deadman anchors should be buried horizontally and perpendicular to the applied load.



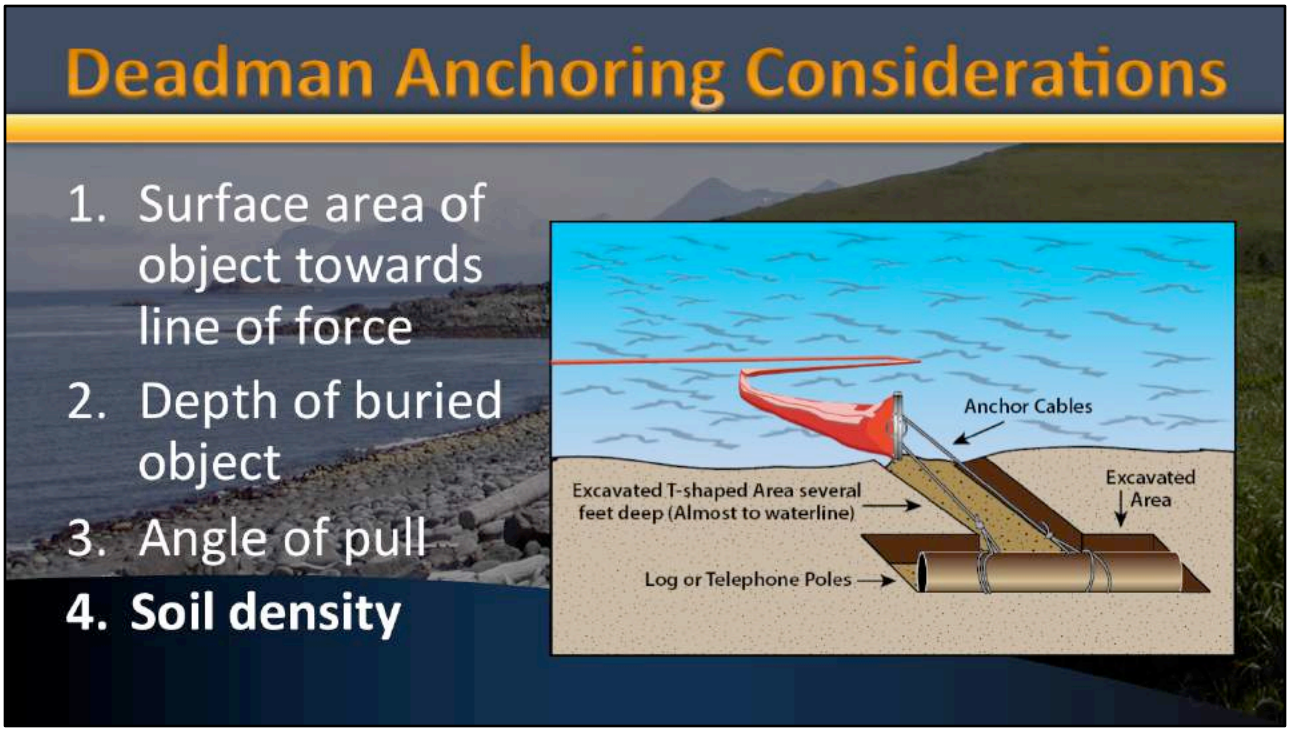
Holding power depends on four variables: (1) the surface area of the object projected towards the line of force.



(2) the depth at which the object is buried



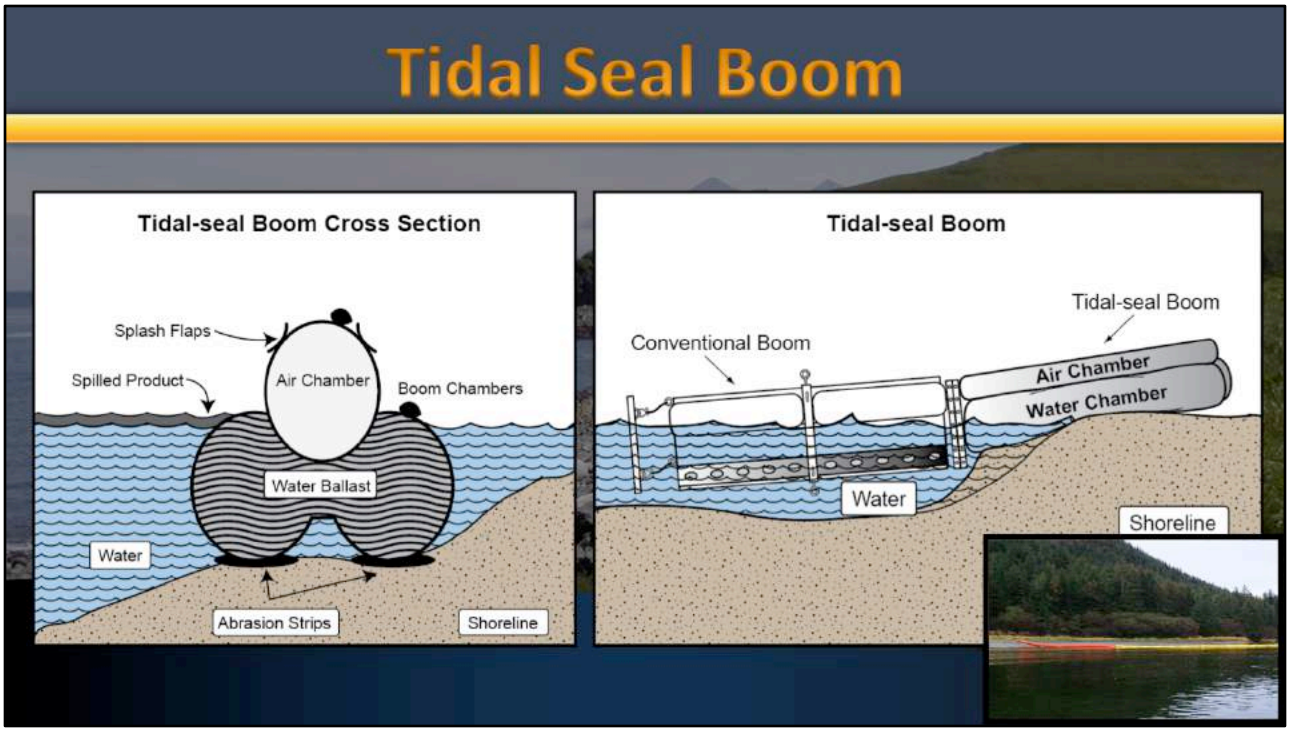
(3) the inclination angle of pull, and…



(4) the quality/density of soil material.

Keep in mind that setting up a deadman anchor point may require significant time and manpower, and sometimes requires heavy equipment.

Shoreside anchor points should be placed or selected at locations above the high tide mark to ensure site workers can access each anchoring point at any time during the tide cycle.



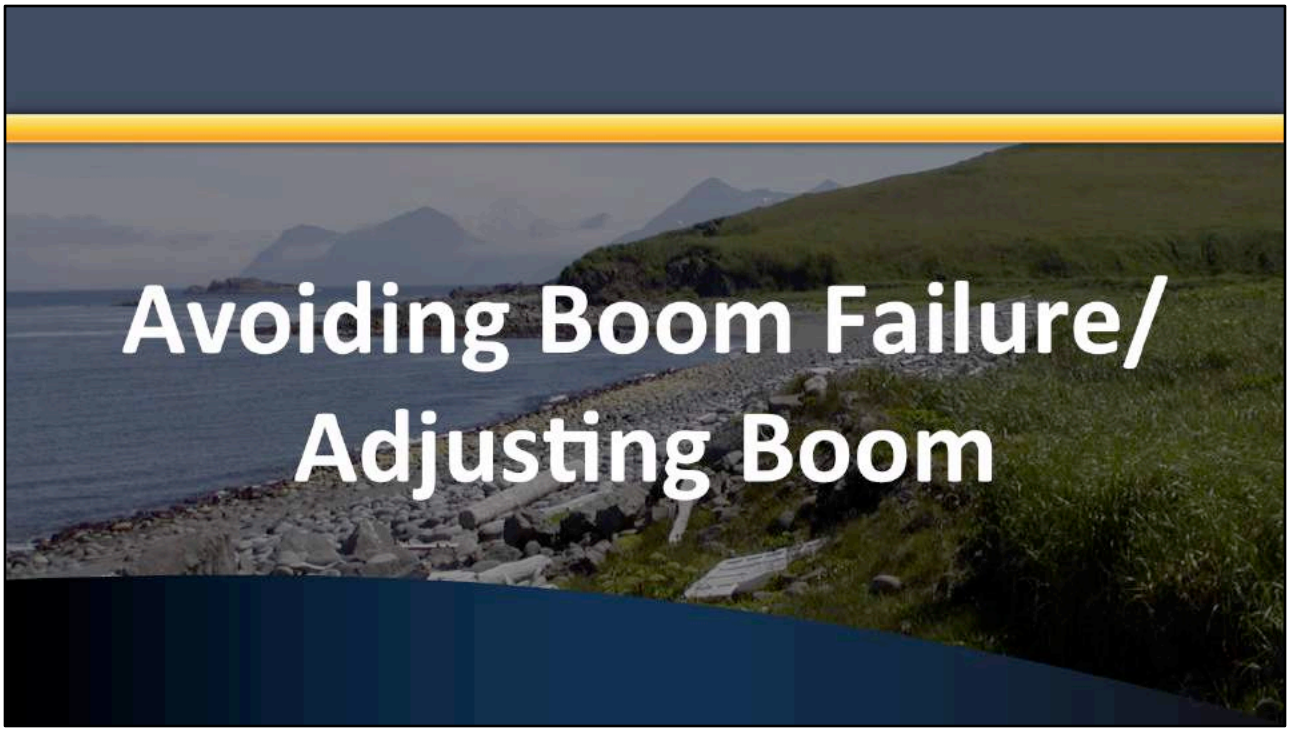
Specialty boom like Tidal Seal Boom can also be used at the shoreline anchor point to aid in containing and collecting oil.

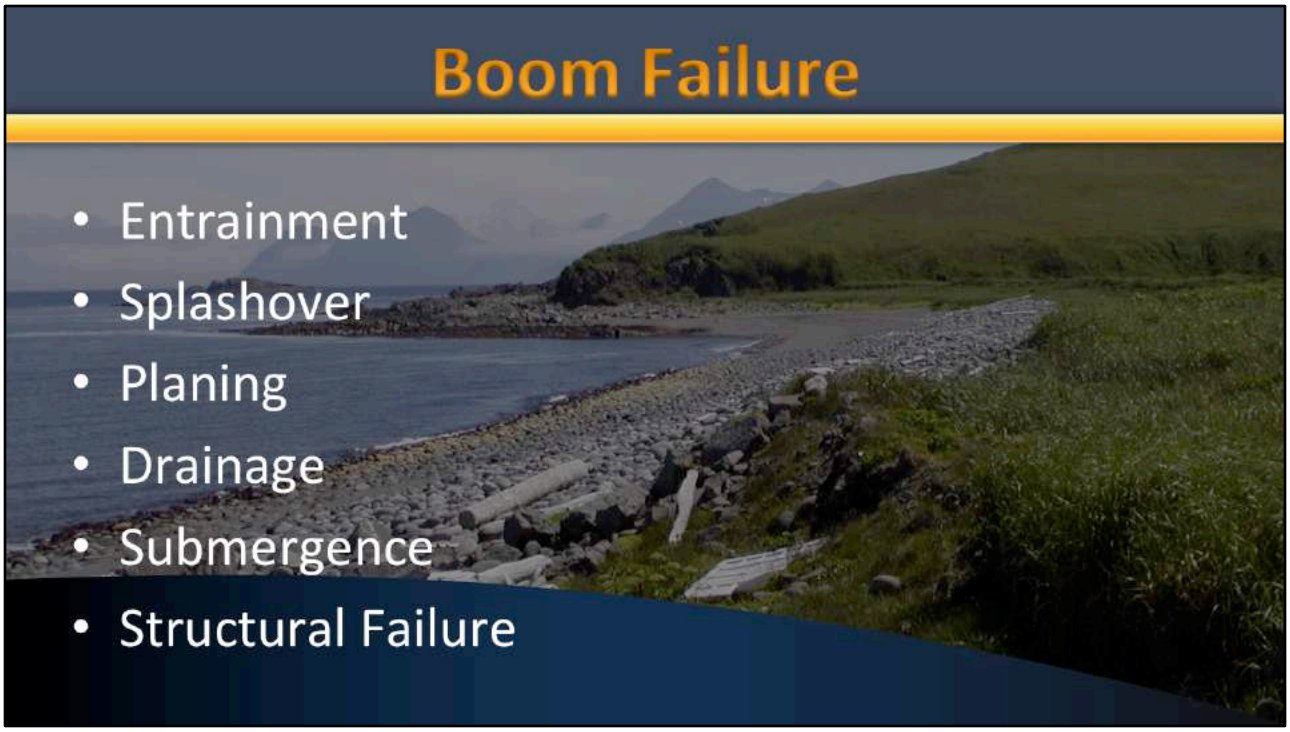
Tidal-seal boom may be useful where boom arrays contact the shoreline and are useful in preventing oil from escaping within the intertidal zone. Tidal-seal boom typically contains three chambers as shown in the figure on the screen. Two of the chambers are filled with water, and contact the shoreline in shallow water and shoreline areas. The third chamber is usually filled with air, and provides flotation as the water level rises.

It's important to place tidal seal boom in position BEFORE filling the water chambers because once they are filled, the boom will be too heavy to move without damaging it.

Review Questions

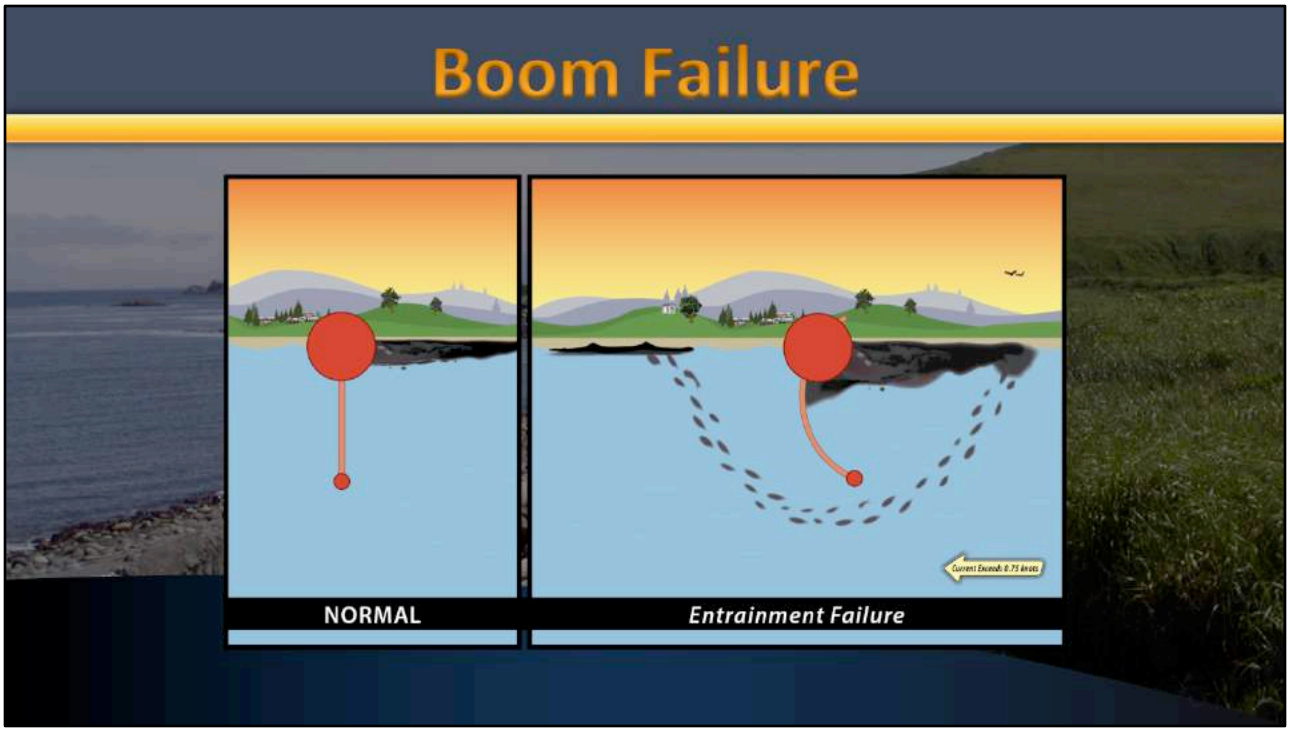
1. A deadman anchor point may require significant _____ and _____.
2. Shoreside anchor points should be placed or selected at locations above the _____ _____ mark.
3. True/False: It's easy to move tidal seal boom in position after filling the water chambers.
4. Tidal-seal boom should be used in areas with a _____ _____ of gradual slope

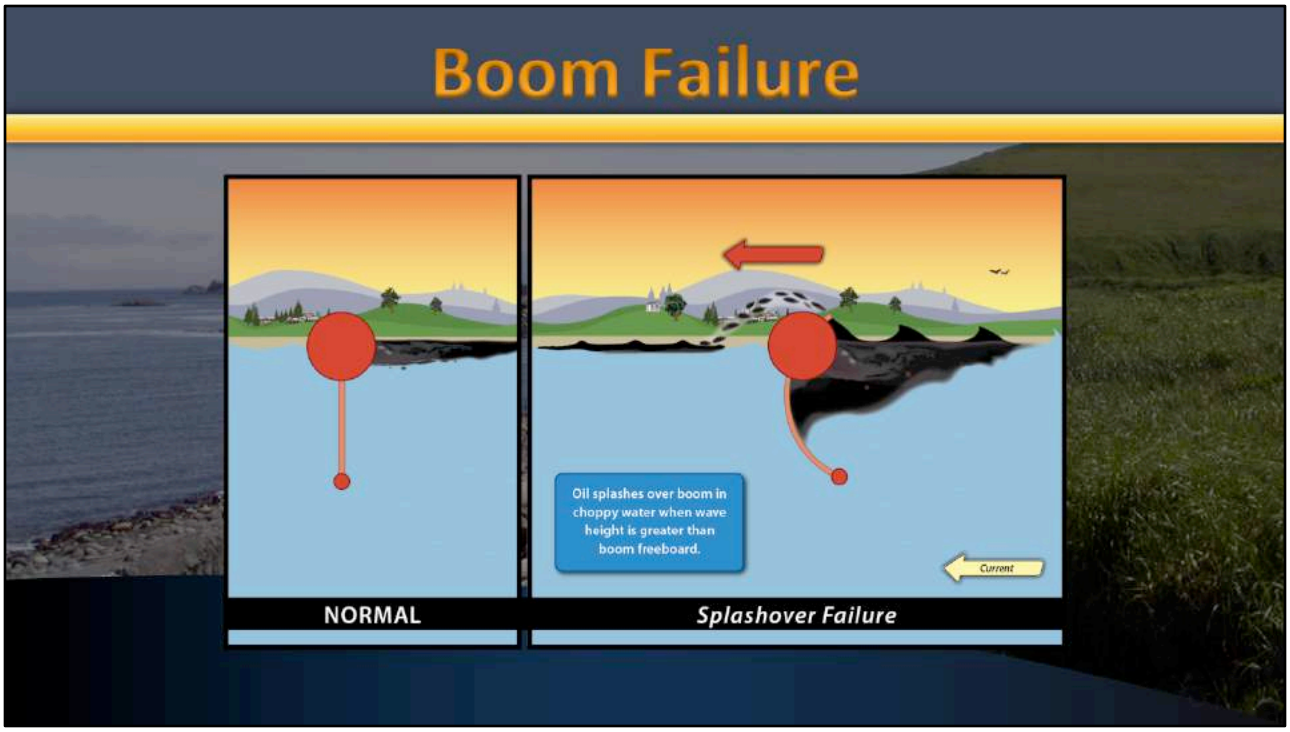

Avoiding Boom Failure/
Adjusting Boom



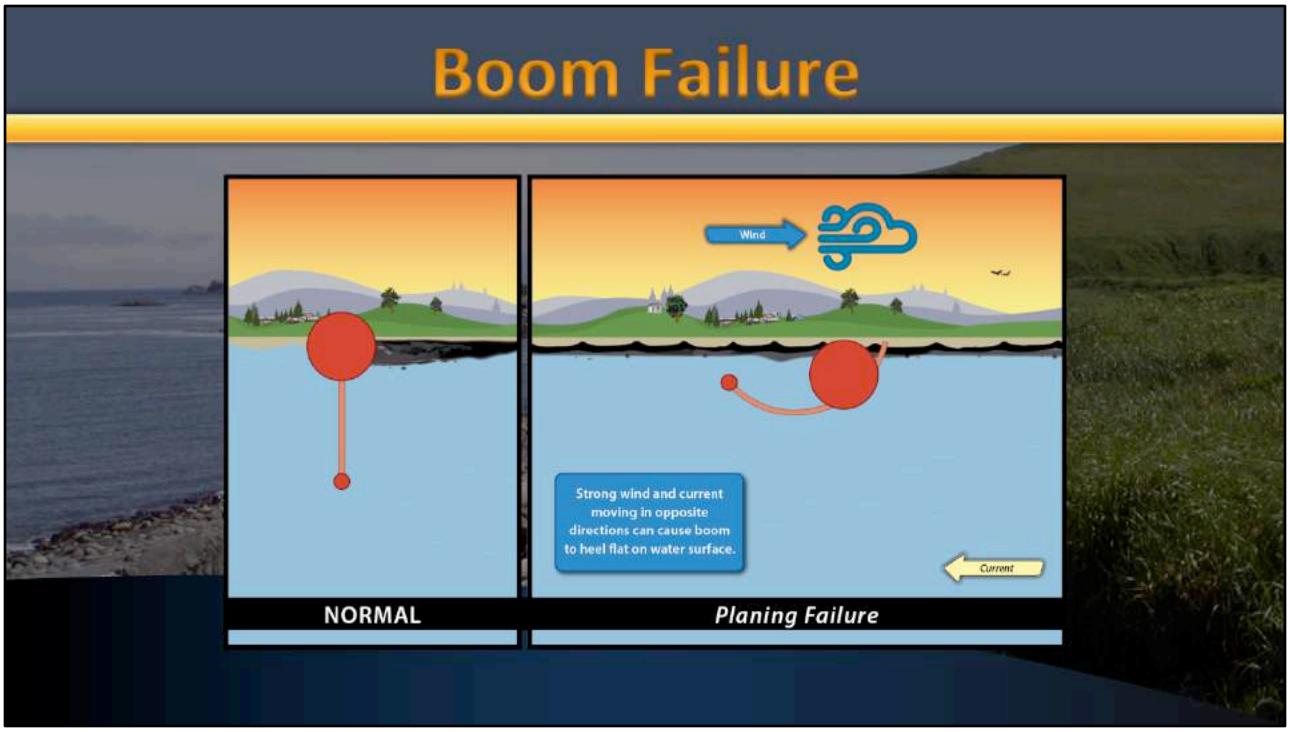
Boom failure can occur in a number of ways including:
- Entrainment
- Splashover
- Planing
- Drainage
- Submergence
- Structural Failure

Entrainment is a form of boom failure when oil flows under the boom skirt in a strong current. As you can see from this animation, as the oil builds up behind the boom, the current stirs up the oil and propels it under the boom. When boom is placed perpendicular to the current at speeds exceeding three-quarters of a knot, entrainment will most likely occur, regardless of the size of the boom or the length of the skirt.


Boom Failure
NORMAL
Entrainment Failure

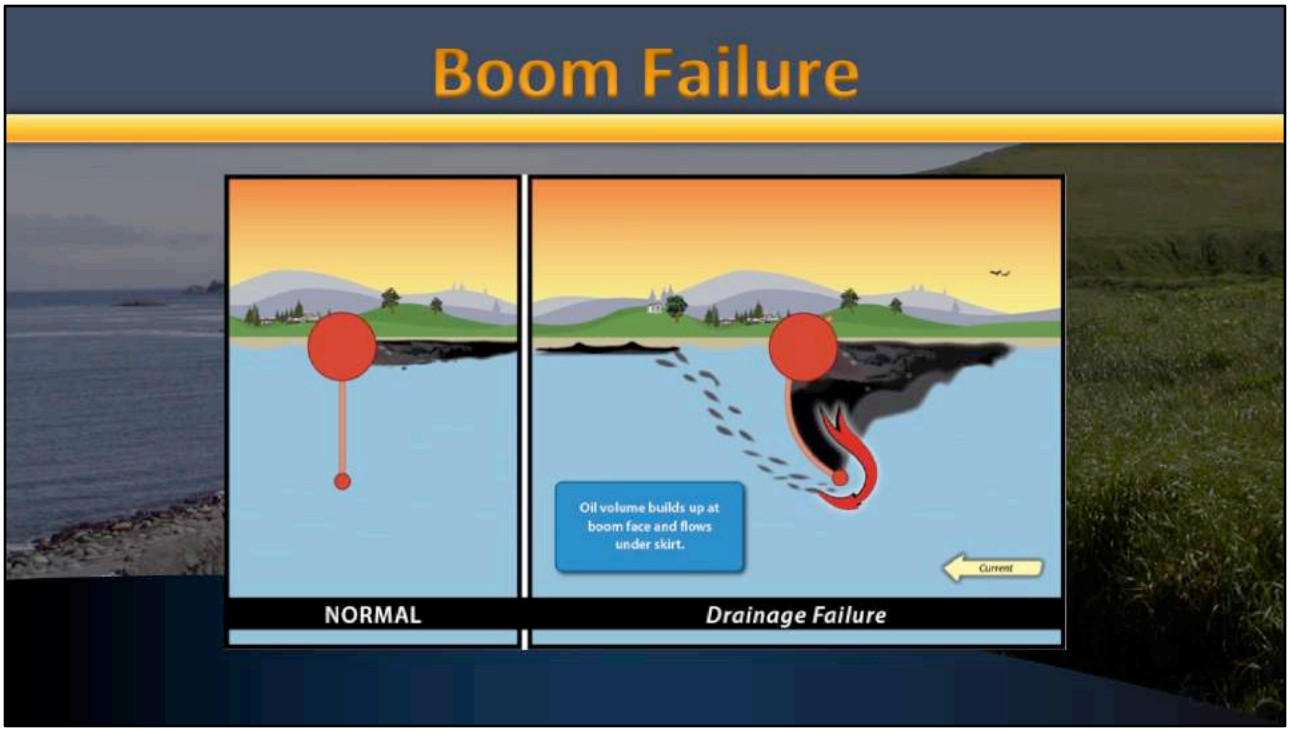


Splashover may occur in choppy water when the wave height is greater than the freeboard of the boom, causing oil to be carried over the top of the boom.



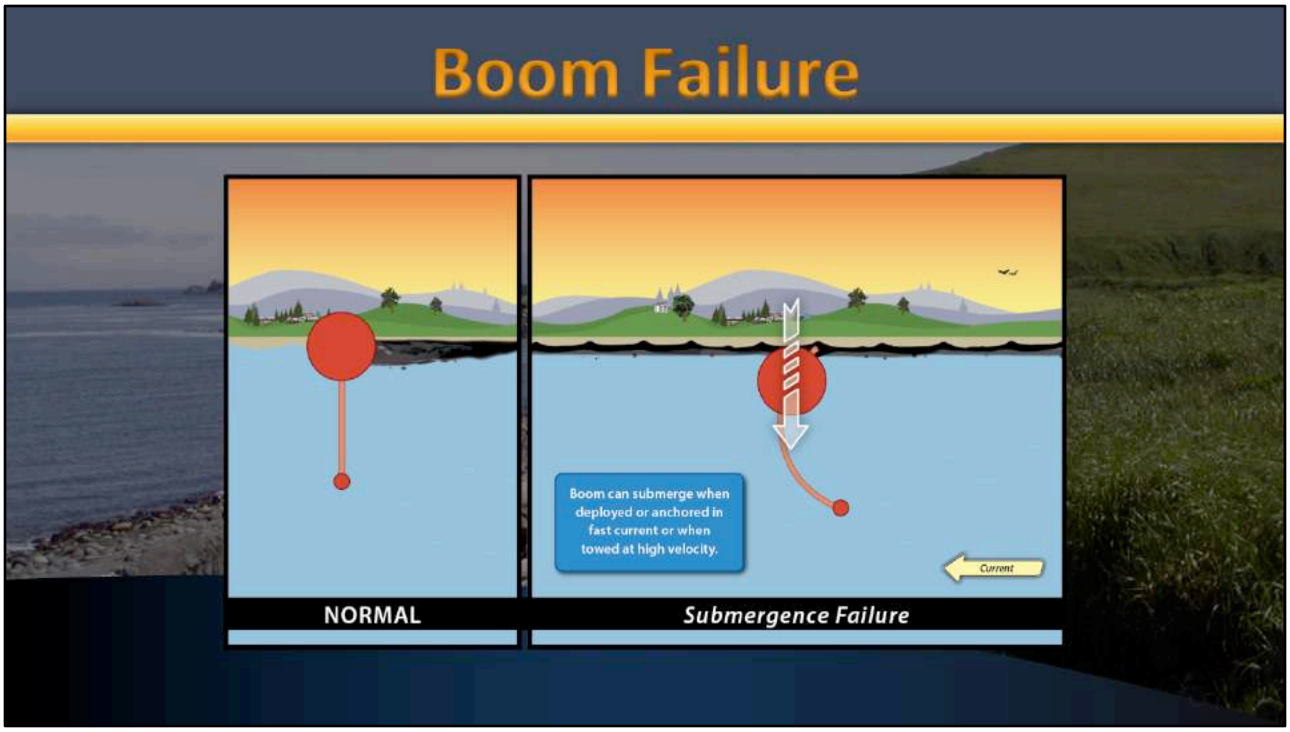
Planing failure is common when strong winds and currents occur in opposite directions. This failure is most likely to occur when oil spill containment boom has inadequate ballasting or when internal tension member is near or above the waterline.

Planing can be prevented by adjusting the boom angle or using a different size or type of boom with more robust ballast or tension member material.



Drainage typically occurs when small diameter boom is used and oil builds up at the boom face, then oil flows over a section of boom. Similar to entrainment, drainage failure involves leakage from large pools of oil that are collected by the containment boom.

In order to prevent drainage failures, oil should be removed where it collects or diverted to shore for collection.

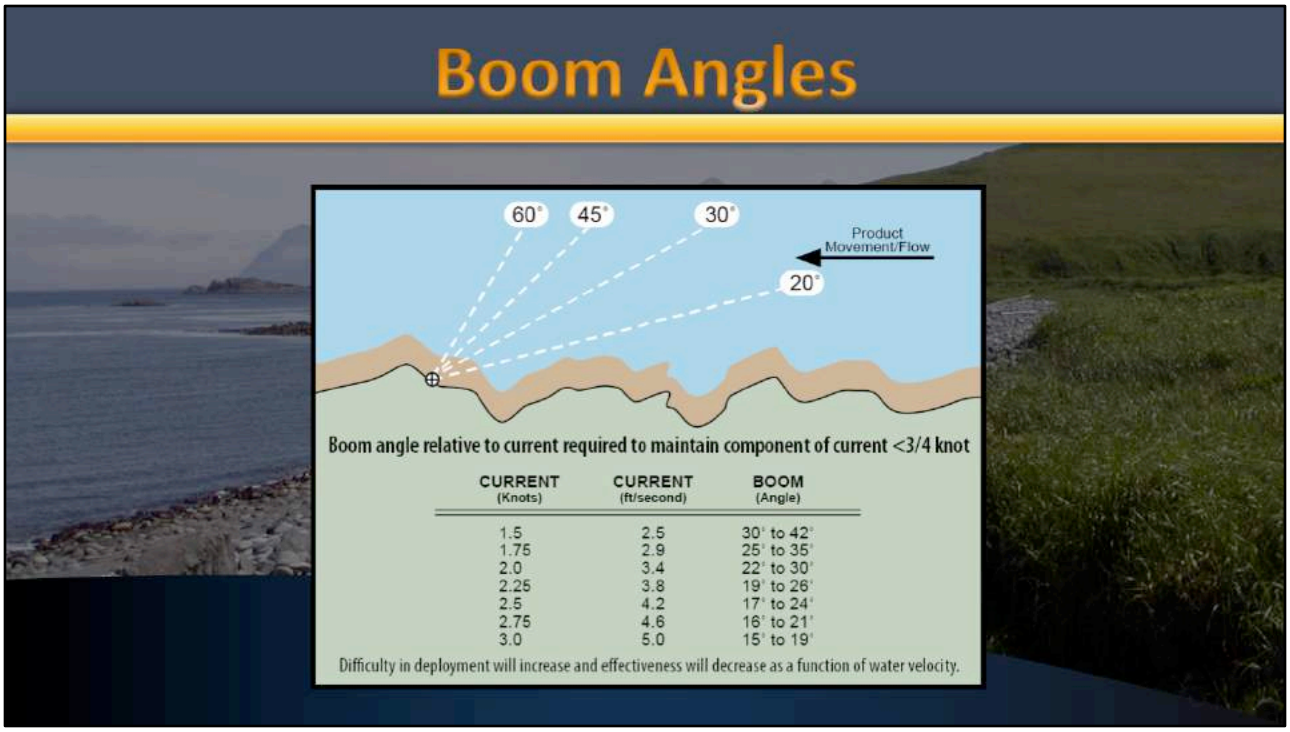


Submergence may occur when a boom is deployed or anchored in fast current or is being towed at a high velocity. Submergence is not as common as other types of boom failures since entrainment failure usually occurs prior to the speed needed for submergence. Submergence can also occur when anchor lines are too short, causing the boom to submerge at high tide.

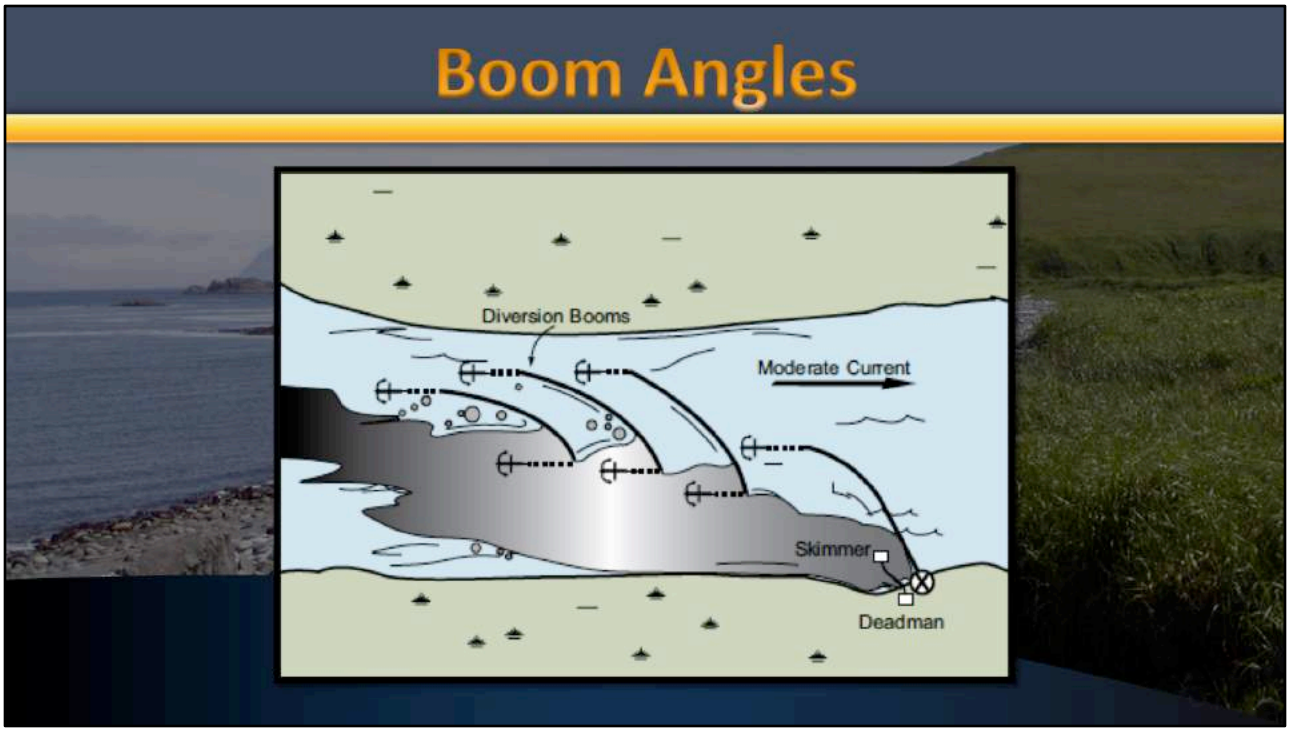
Submergence can be prevented by adjusting the angle or configuration of the boom and by lengthening the anchor lines.

Structural failure can occur when any of the boom components fail allowing oil to escape. It can also be caused by stress placed on the boom or it's components due to high winds and currents or by the presence of debris that is swept through the boom.

Structural failure can be prevented by adjusting the boom angle or configuration, replacing the boom or boom components with those that are more suitable for the conditions, and by removing debris if present.



Most boom failures can be prevented by properly adjusting the boom angle and configuration based on the prevailing current speed and on-scene weather conditions. The table shown here can be used to select the appropriate boom angle that keeps oil from entraining under the boom and prevents other boom failures. As you can see, the effective angle relative to the current decreases rapidly as the current increases.



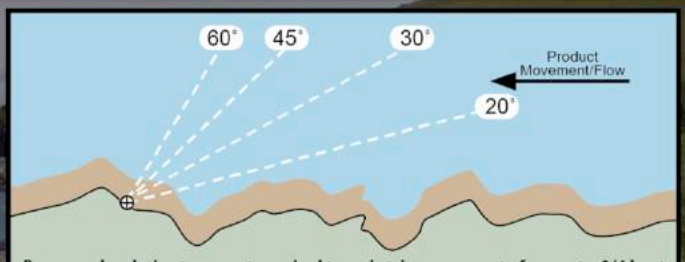
Where currents exceed three knots, the boom must be almost parallel to the current to prevent entrainment. In currents exceeding three knots, a cascade of boom arrays may be used; the first array will slow the velocity of the slick and allow subsequent arrays to deflect the oil. This advanced tactic is typically only performed by professional responders.

Review Questions

1. Most boom failures can be prevented by properly adjusting the _____ _____.
2. Entrainment is a form of boom failure when oil flows under the boom skirt in a _____ _____.
3. True/False: Drainage typically occurs when small diameter boom is used and oil builds up at the boom face, then oil flows over a section of boom.
4. _____ can occur when anchor lines are too short, causing the boom to submerge at high tide.
5. _____ _____ is common when strong winds and currents occur in opposite directions.

Review Questions

6. What angle must the boom be, relative to the shoreline in 2 knots of current?

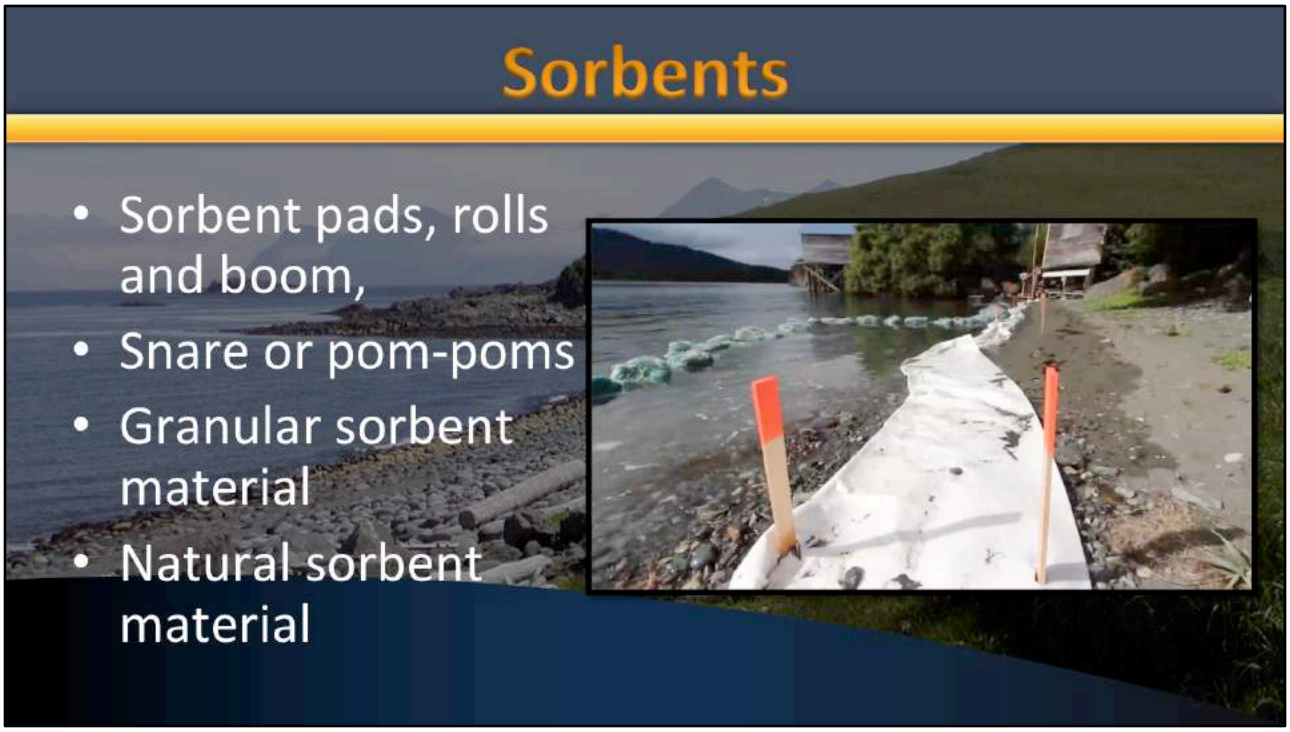


Boom angle relative to current required to maintain component of current <3/4 knot

CURRENT (Knots)	CURRENT (ft/second)	BOOM (Angle)
1.5	2.5	30° to 42°
1.75	2.9	25° to 35°
2.0	3.4	22° to 30°
2.25	3.8	19° to 26°
2.5	4.2	17° to 24°
2.75	4.6	16° to 21°
3.0	5.0	15° to 19°

Difficulty in deployment will increase and effectiveness will decrease as a function of water velocity.


Sorbents



Sorbent material is an effective oil recovery tool that can be used on its own or in conjunction with boom. Sorbents are made of materials that are oleophilic or oil attracting and hydrophobic or water repelling. When placed in contact with an oily water mixture, they will absorb many times their own weight in oil while absorbing very little water.

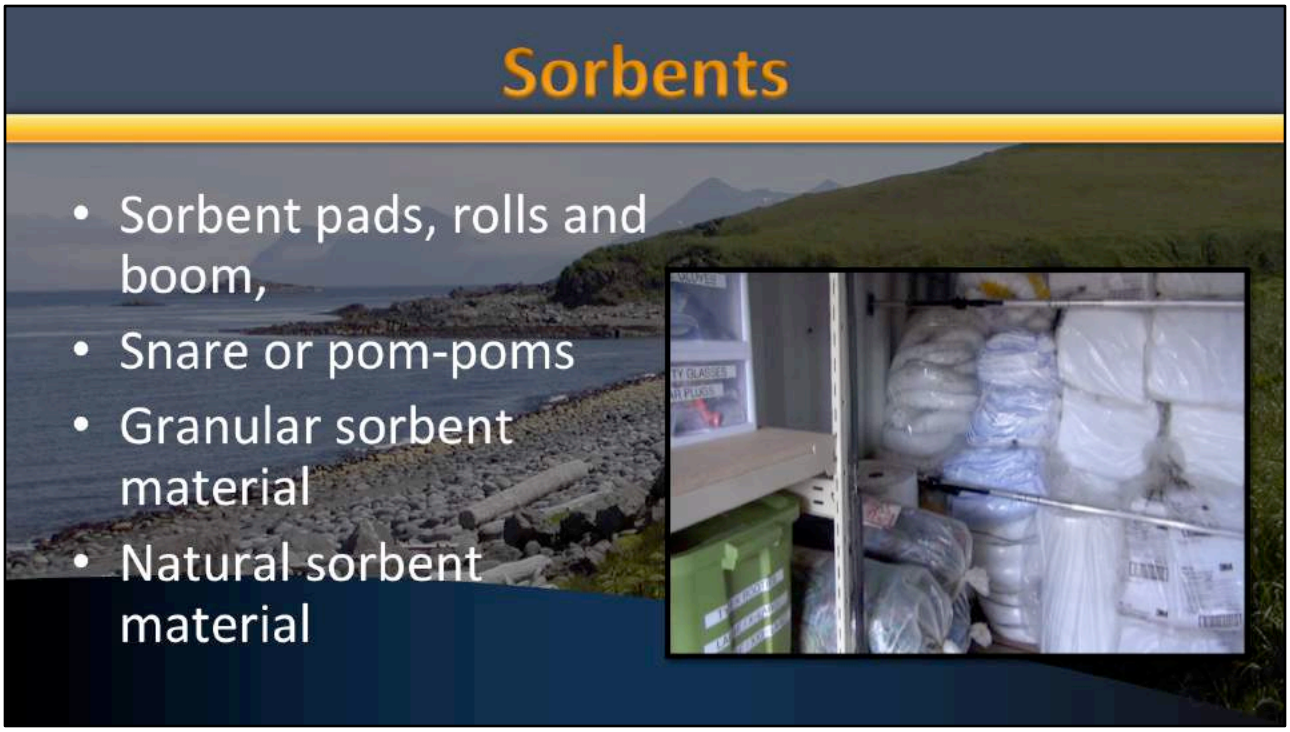
Sorbent material comes in many forms including:

Fibrous polypropylene sorbents including sorbent pads, rolls and boom,
Polypropylene strips more commonly referred to as snare or pom-poms
Granular sorbent material, and
Natural sorbent material like peat

Pads, rolls, and sorbent boom, work well on lighter oil such as diesel. These sorbents can recover approximately 15:1 oil to sorbent by weight.

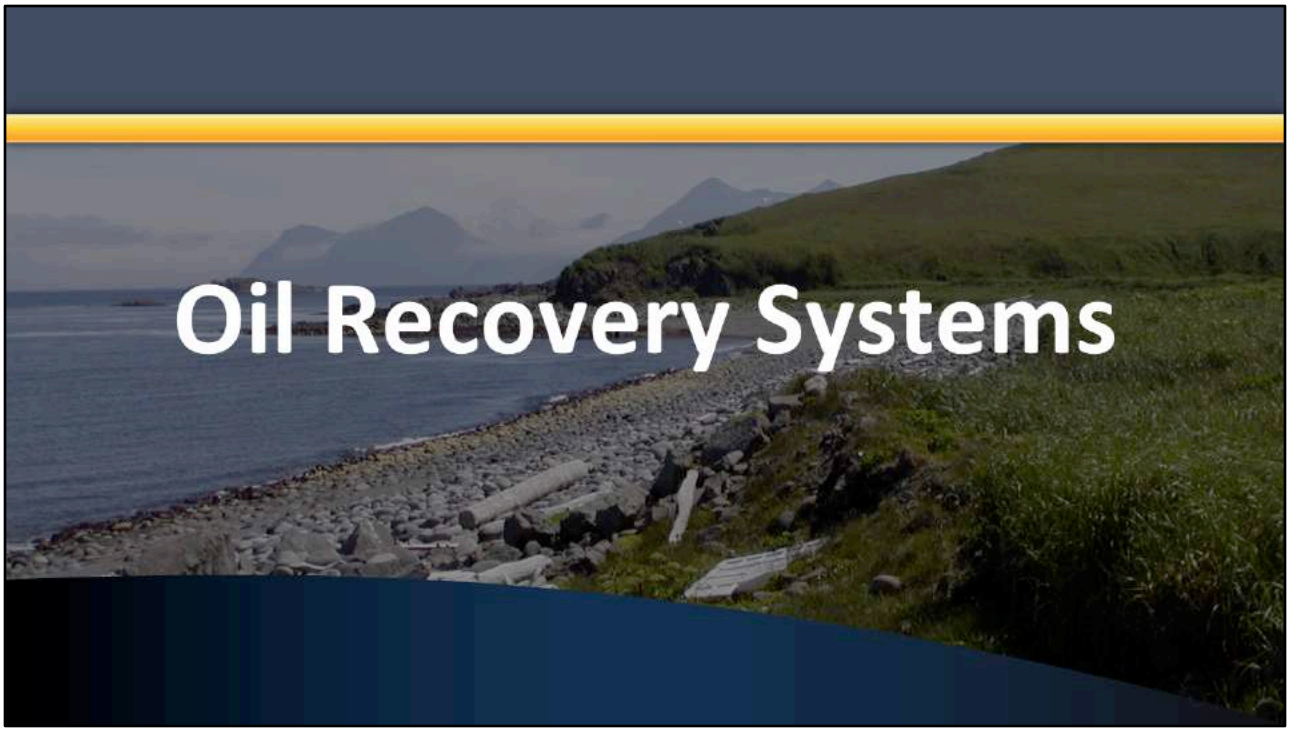
Polypropylene strips, such as pom-poms, work best in heavier oil and may recover up to 20:1 oil to sorbent by weight.

Granular and natural materials, such as peat, are effective sorbents, but are difficult to recover from the environment once oiled.

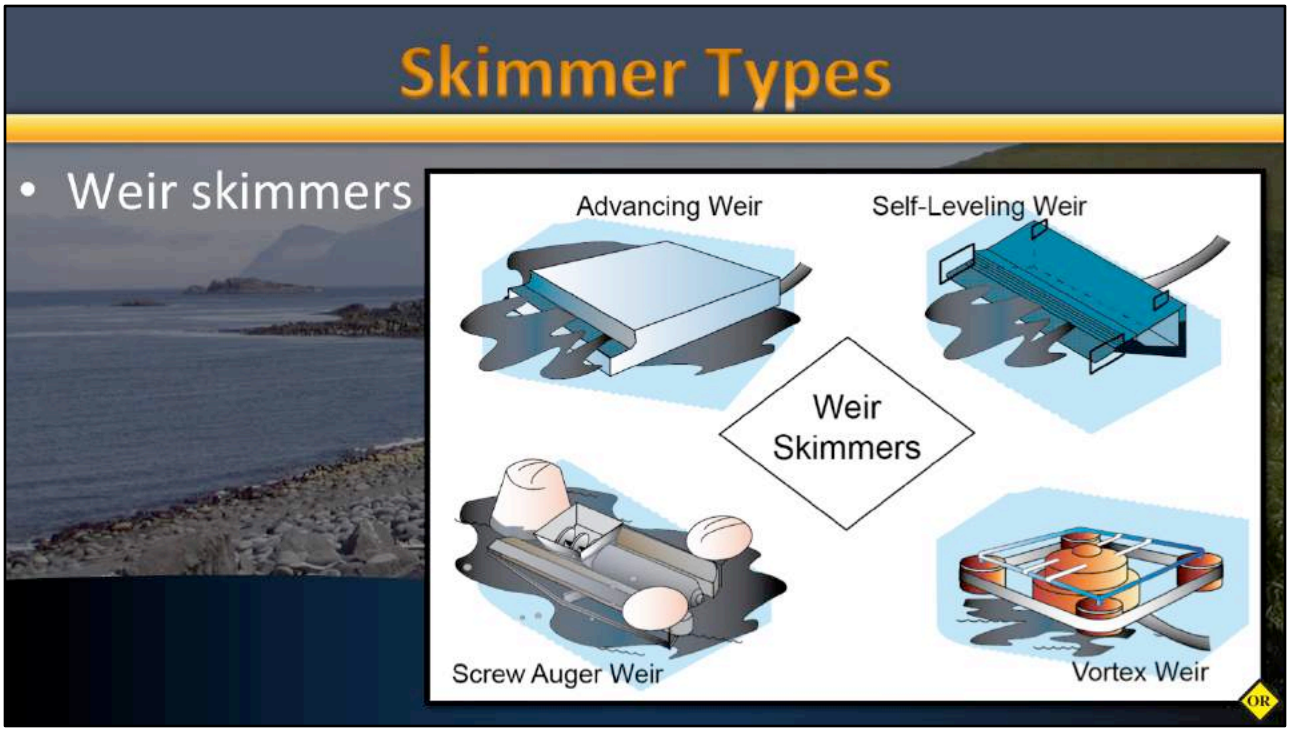


The Alaska DEC Conex boxes contain sorbent material including sorbent pads, boom, and rolls as well as sorbent snare, or “pom-poms”.

It is important to keep in mind that when considering the use of sorbent material, a waste storage and disposal plan should be developed to temporarily store oiled sorbent must be available at the spill site or GRS deployment site. The Alaska DEC Conex boxes contain the necessary equipment to facilitate limited temporary storage of oily waste and sorbent material.


Oil Recovery Systems

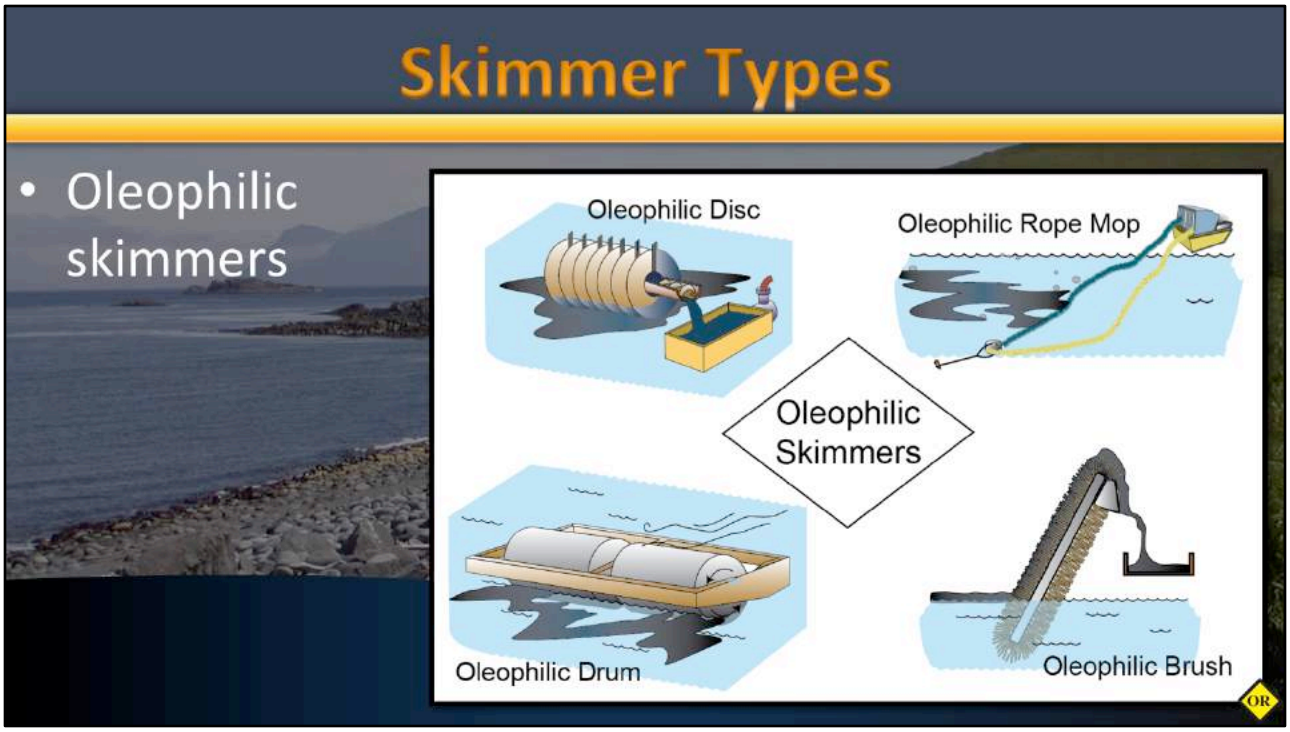
Shoreside recovery requires at least one portable skimming system to remove spilled oil. There are many models of skimmers to choose from, but they all fall into these three basic categories:



Weir skimmers draw liquid from the surface by creating a sump in the water into which oil and water pour. The captured liquid is pumped from the sump to storage.

Weir skimmers can recover oil at high rates, but they can also recover more water than oil, especially when the oil is in thin layers on the surface of the water.

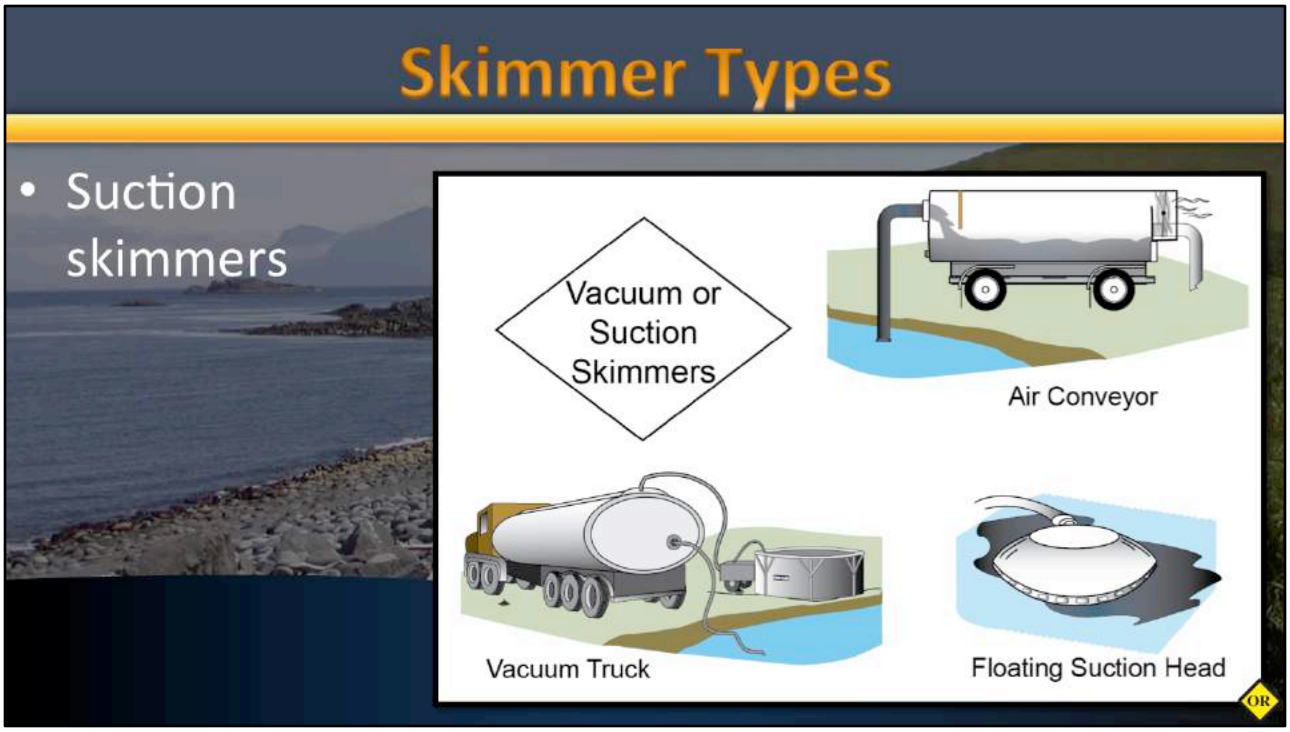
Weir skimmers are best employed where oil has been concentrated into thick pools or where there are very large volumes of oil and recovered liquid storage capacity.



Oleophilic skimmers pick up oil that adheres to a collection surface, leaving most of the water behind. The oil is then scraped from the collection surface and pumped to a storage device.

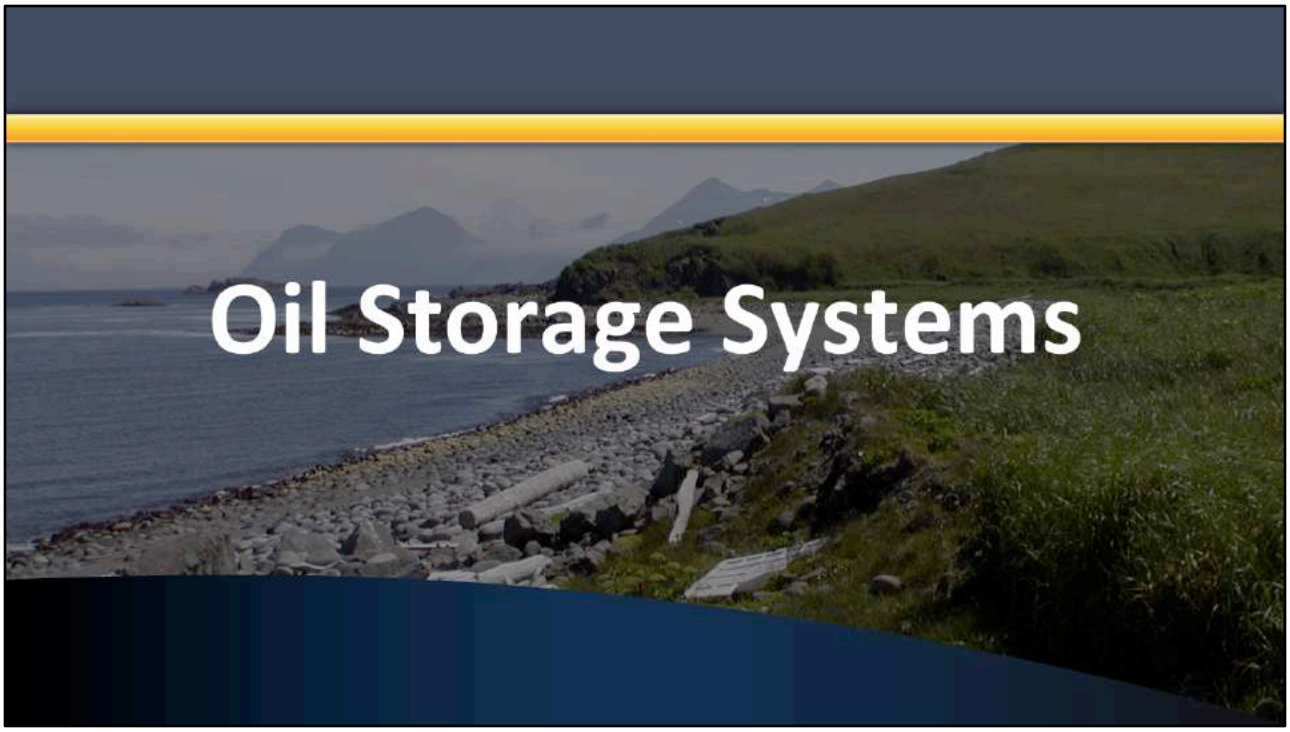
The collection surfaces in oleophilic skimming systems include rotating disks, brushes and drums; or endless belts or ropes. Belt, brush and rope skimmers can be used in any type of oil, while disk and drum skimmers are best in fresh oil.

Oleophilic skimmers do not recover oil as fast as weir skimmers, but they have the advantage of recovering very little water. They may be used where oil is very thin on the surface and are a good choice where liquid storage capacity is limited.



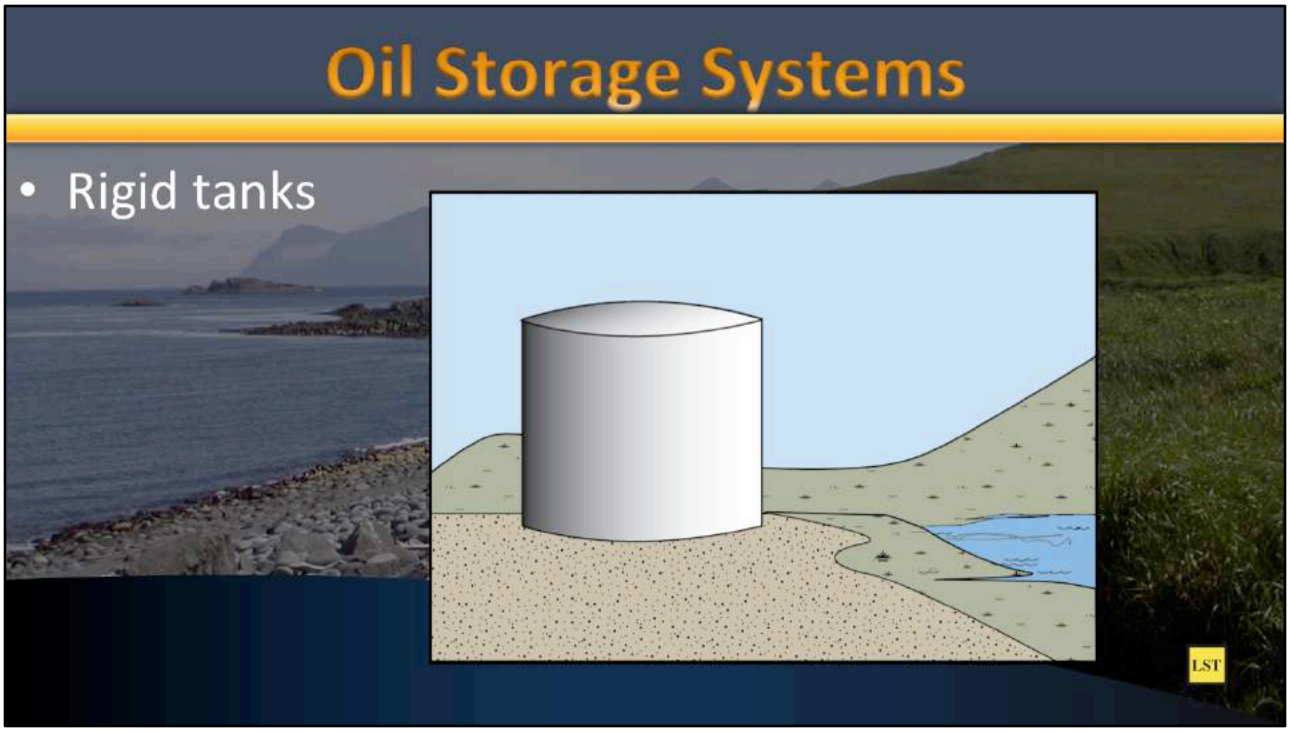
Suction skimmers use a vacuum to lift oil from the surface of the water.

It's recommended that you become familiar with any oil recovery systems being stored or used in your community prior to a spill taking place. Professional responders will most likely bring their additional recovery systems to supplement the equipment in your community.


Oil Storage Systems

Adequate land-based storage and proper transfer of liquids is a critical link in recovery operations. Oil recovery may be disrupted if storage containers are unavailable or undersized.

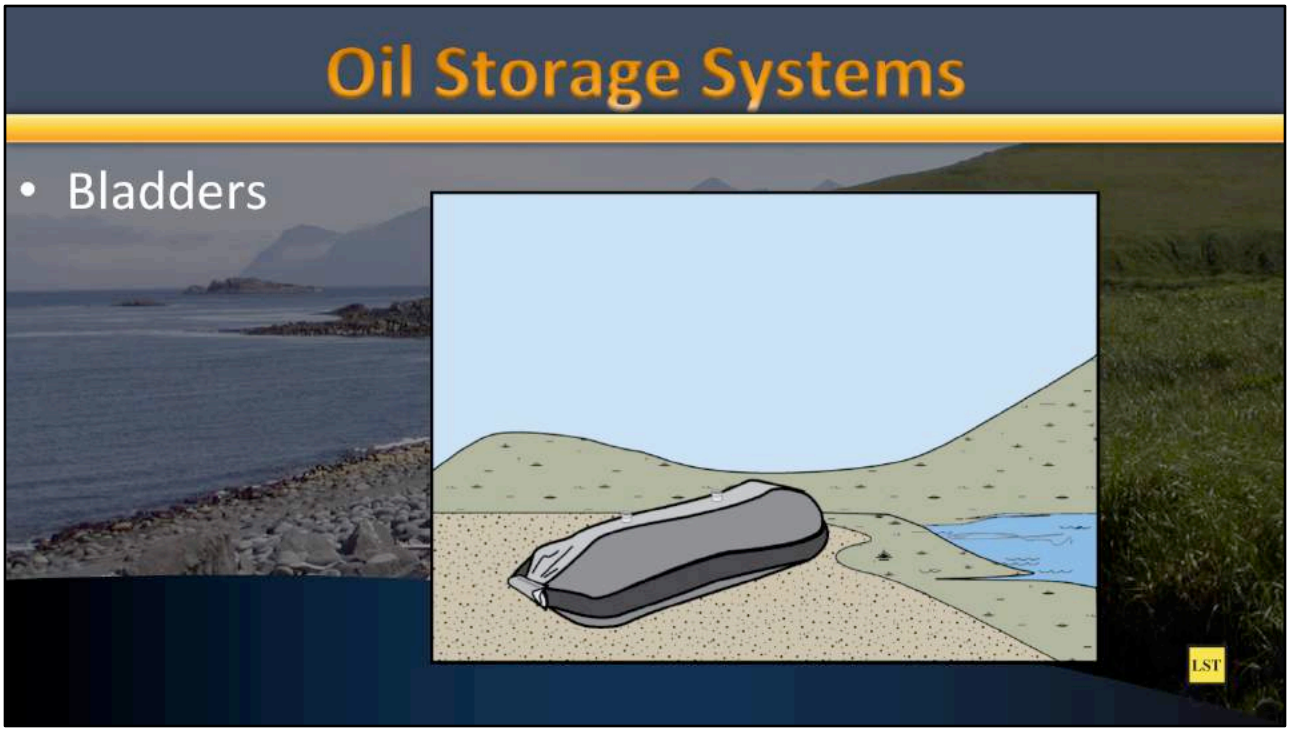
Selection of storage containers depends on the size of the spill, the location of the recovery site, expected recovery rate, and time that the waste will be stored before final disposal



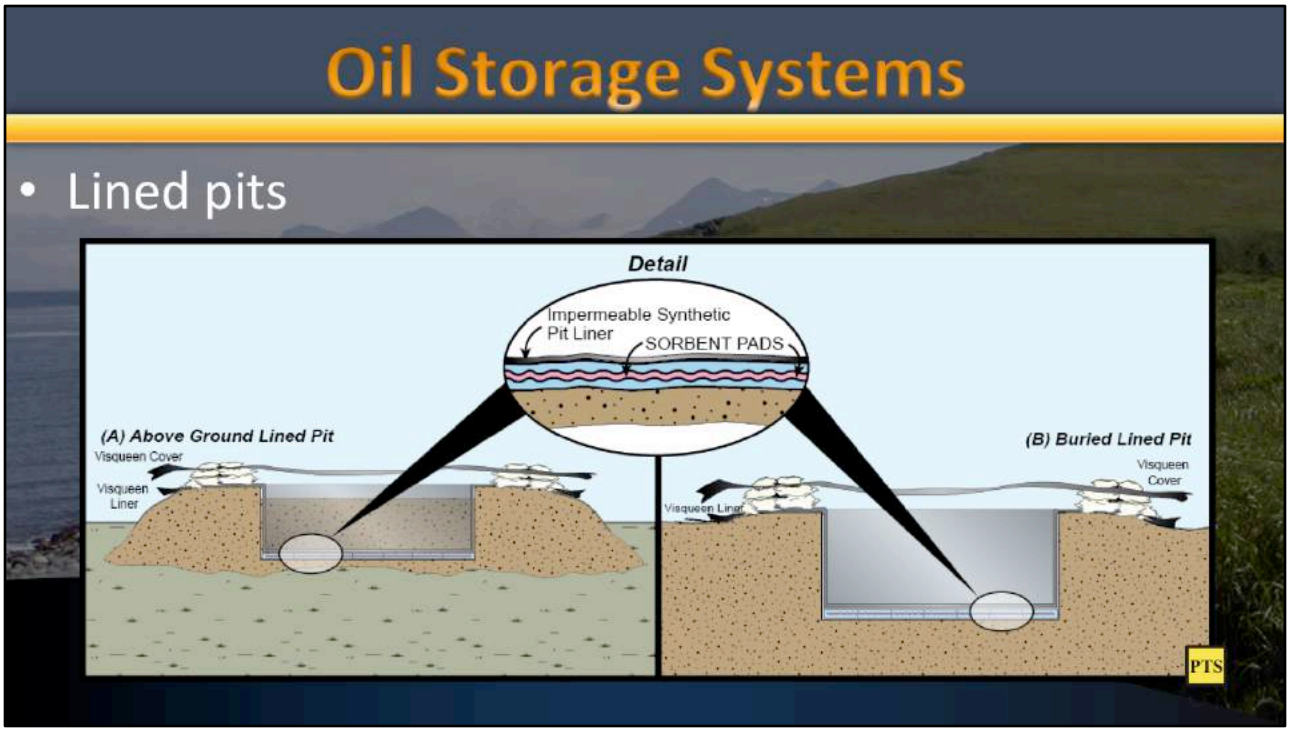
Primary oil storage devices for shoreside recovery can be rigid tanks, portable tanks, bladders, **oil drums** or truck-mounted tanks if the recovery site is accessible by road.

Small barges can also be anchored just offshore or beached at low tide if possible.

portable tanks,

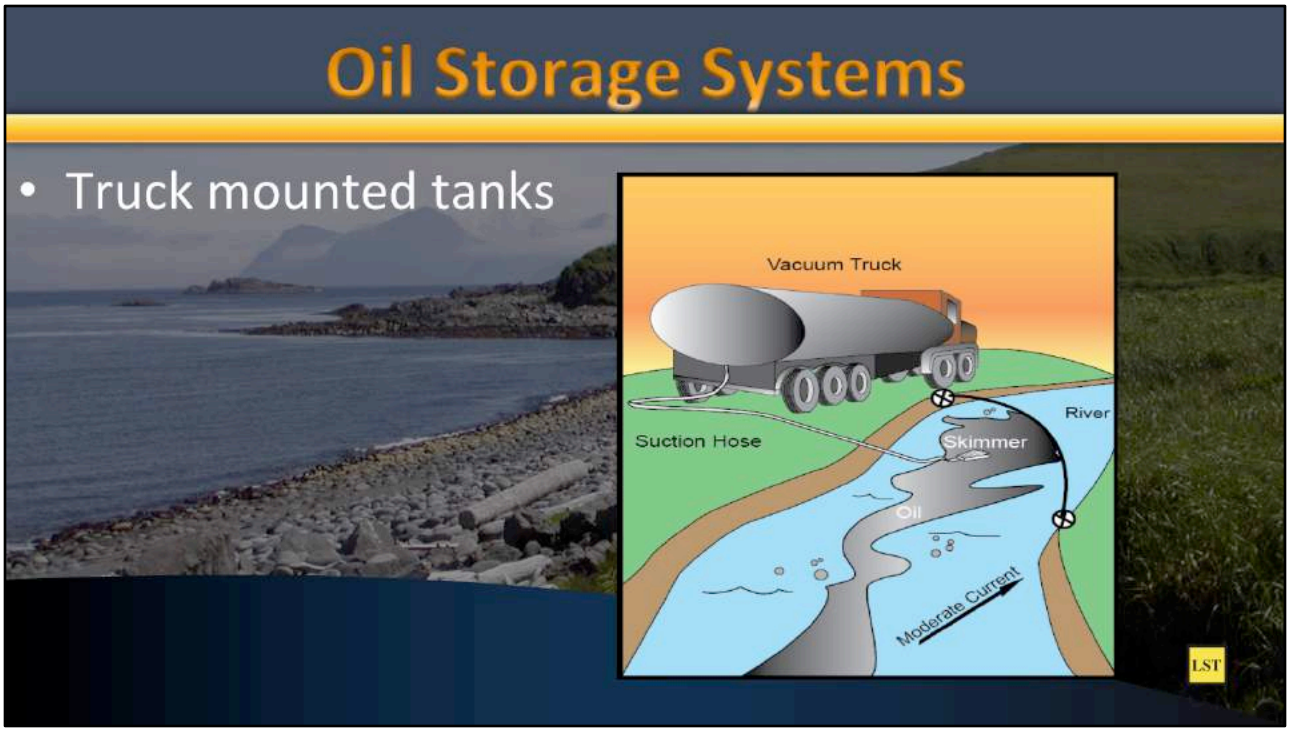


Bladders,



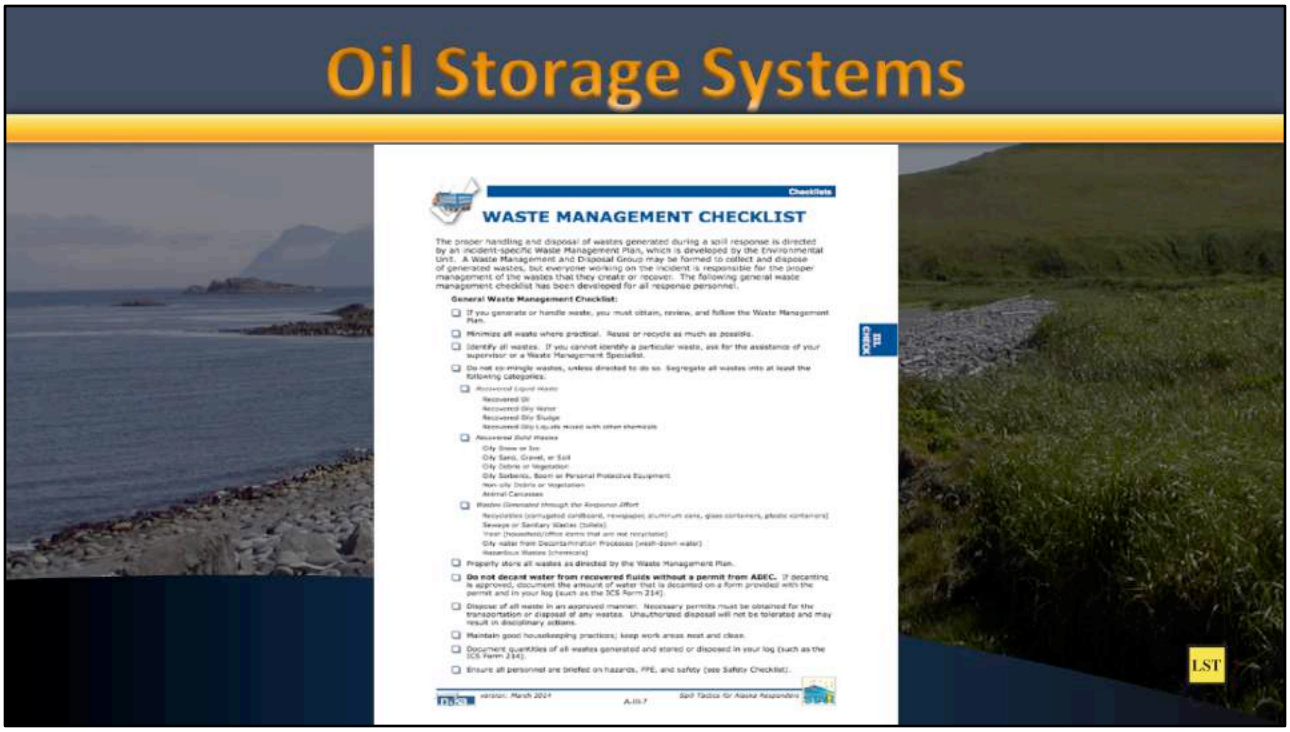
Lined pits, either excavated or built-up above ground, can also be used for emergency storage of oily liquids, debris, and solid wastes.

If used, they should be covered to prevent accumulation of rain and snow and inspected regularly for leaks.
Lined pits should only be used for temporary storage and wastes should be removed as soon as possible. After using it, the pit will need to be decontaminated.



oil drums or truck-mounted tanks if the recovery site is accessible by road.

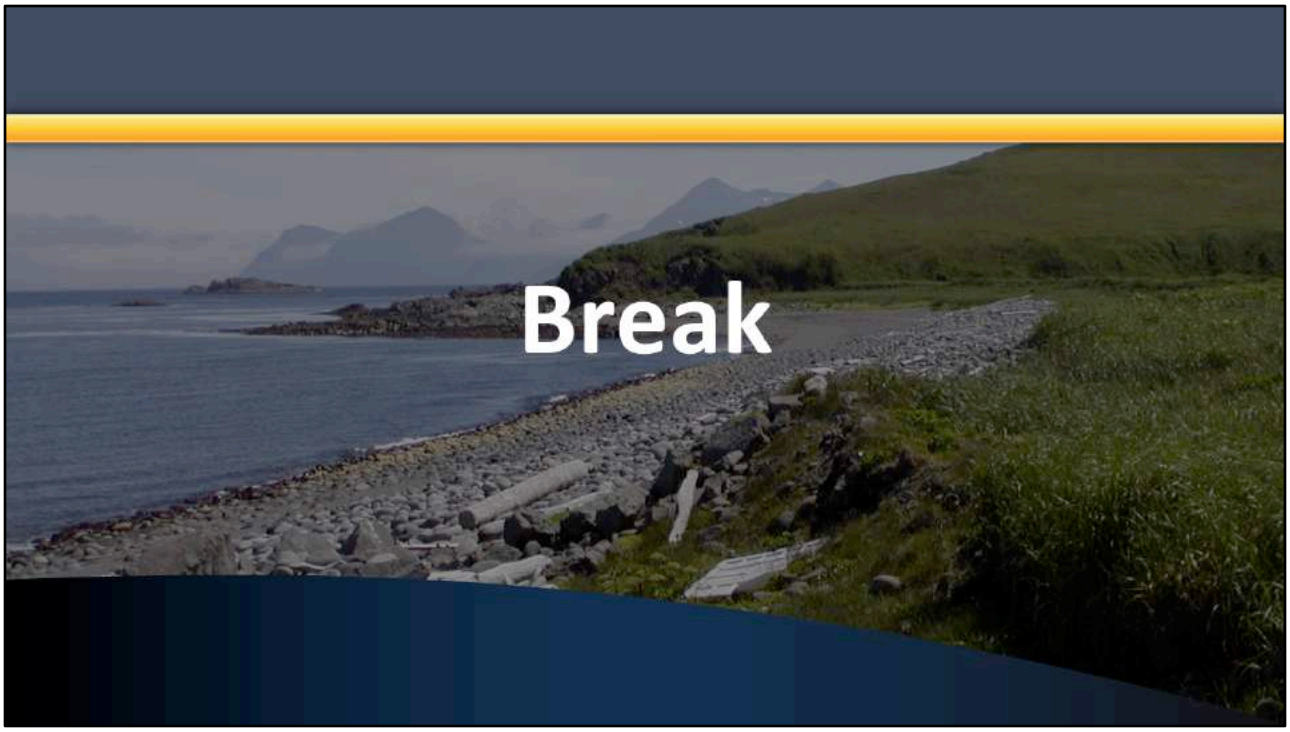
Small barges can also be anchored just offshore or beached at low tide if possible.



Before you begin setting up storage systems for recovered oil, review the Waste Management Checklist in Section A of the STAR Manual.

Review Questions

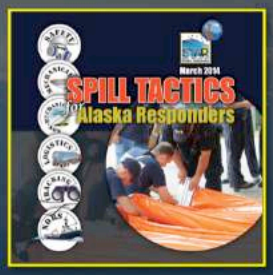
1. True/False: Pads, rolls, and sorbent boom, work well on lighter oil such as diesel.
2. Polypropylene strips, such as pom-poms, work best in _____oil.
3. True/False: Weir skimmers are best employed where there are very large volumes of oil.
4. Oleophilic skimmers do not recover oil as fast as weir skimmers, but they have the advantage of recovering _____ _____water.
5. Before you begin setting up storage systems for recovered oil, review the _____ _____ Checklist in Section A of the STAR Manual.
6. After using a lined pit, it will need to be _____.


Break

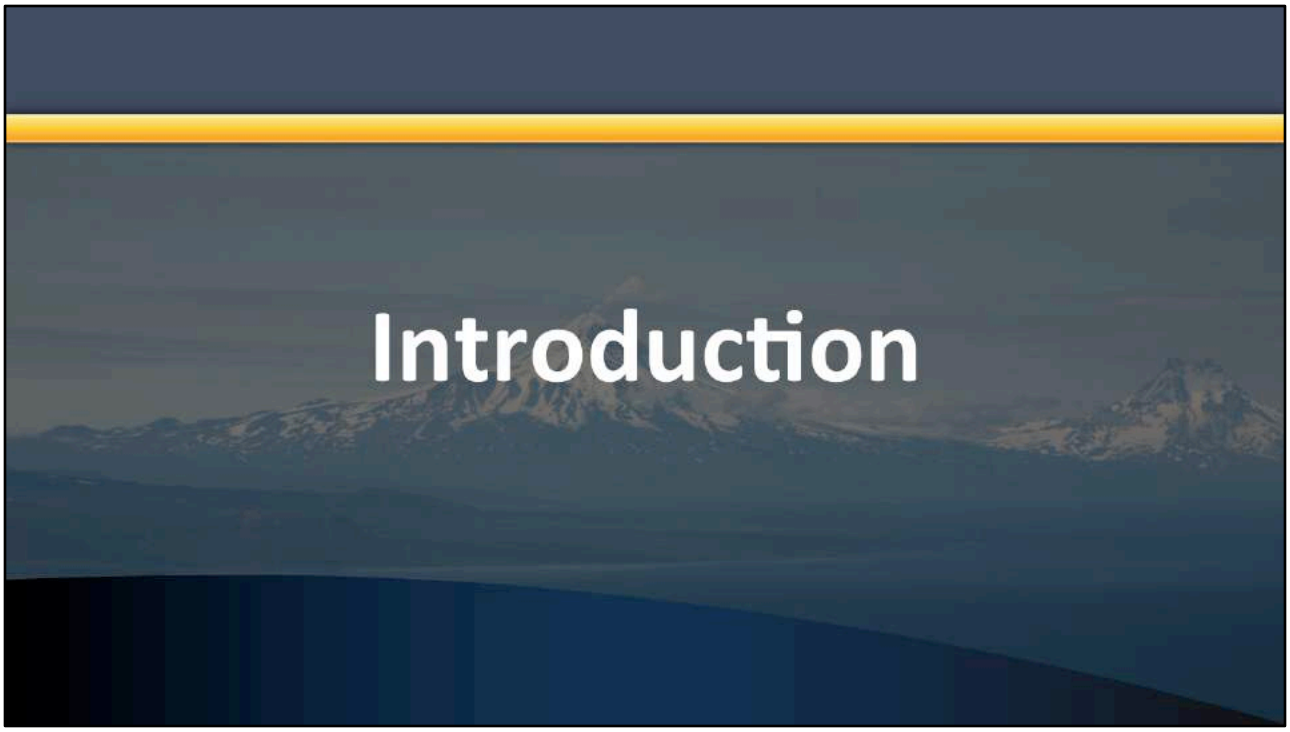
Alaska Department of Environmental Conservation
Spill Prevention and Response

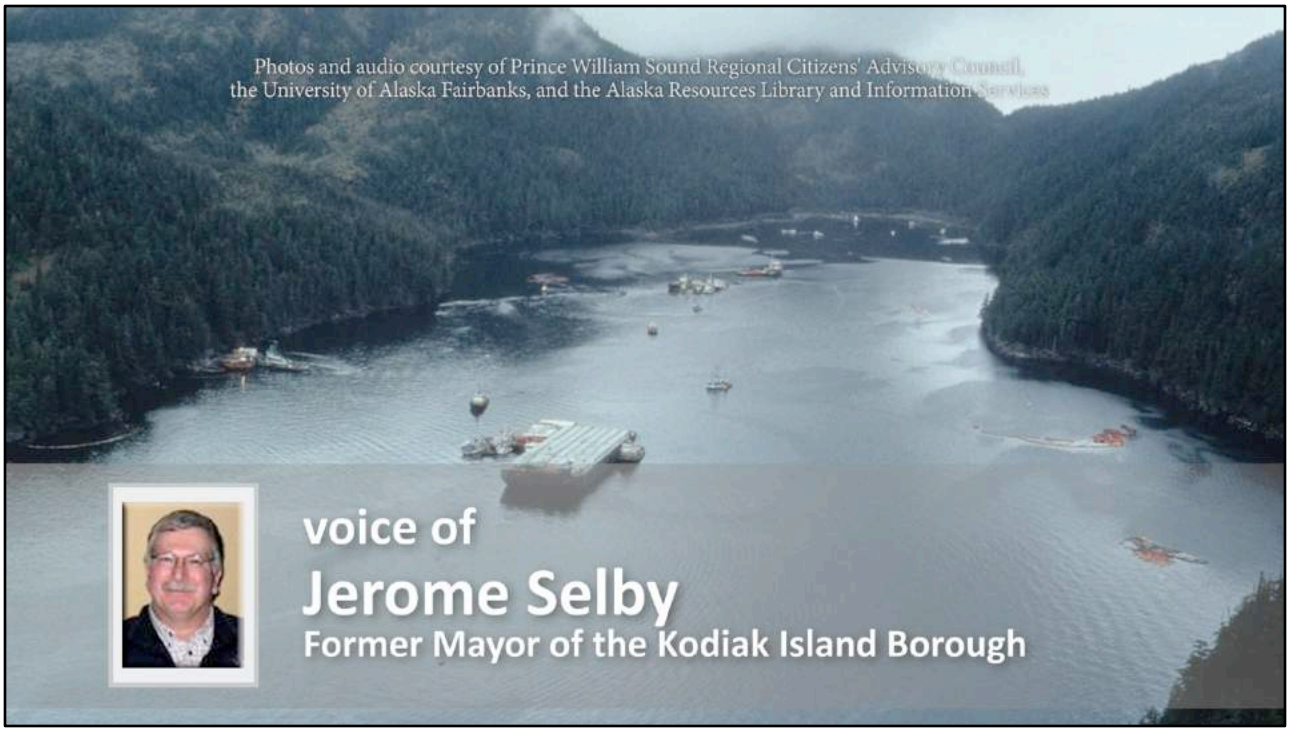
Spill Tactics for Alaskan Responders (STAR) Manual

Oil Spill Response Tactics and Strategy



http://dec.alaska.gov/spar/PPR/star/docs.htm


Introduction


Photos and audio courtesy of Prince William Sound Regional Citizens' Advisory Council,
the University of Alaska Fairbanks, and the Alaska Resources Library and Information Services
voice of
Jerome Selby
Former Mayor of the Kodiak Island Borough


Learning Objectives

This video will focus on how local responders can use oil spill response tactics and strategies to protect environmentally sensitive areas and recover spilled oil from the water.

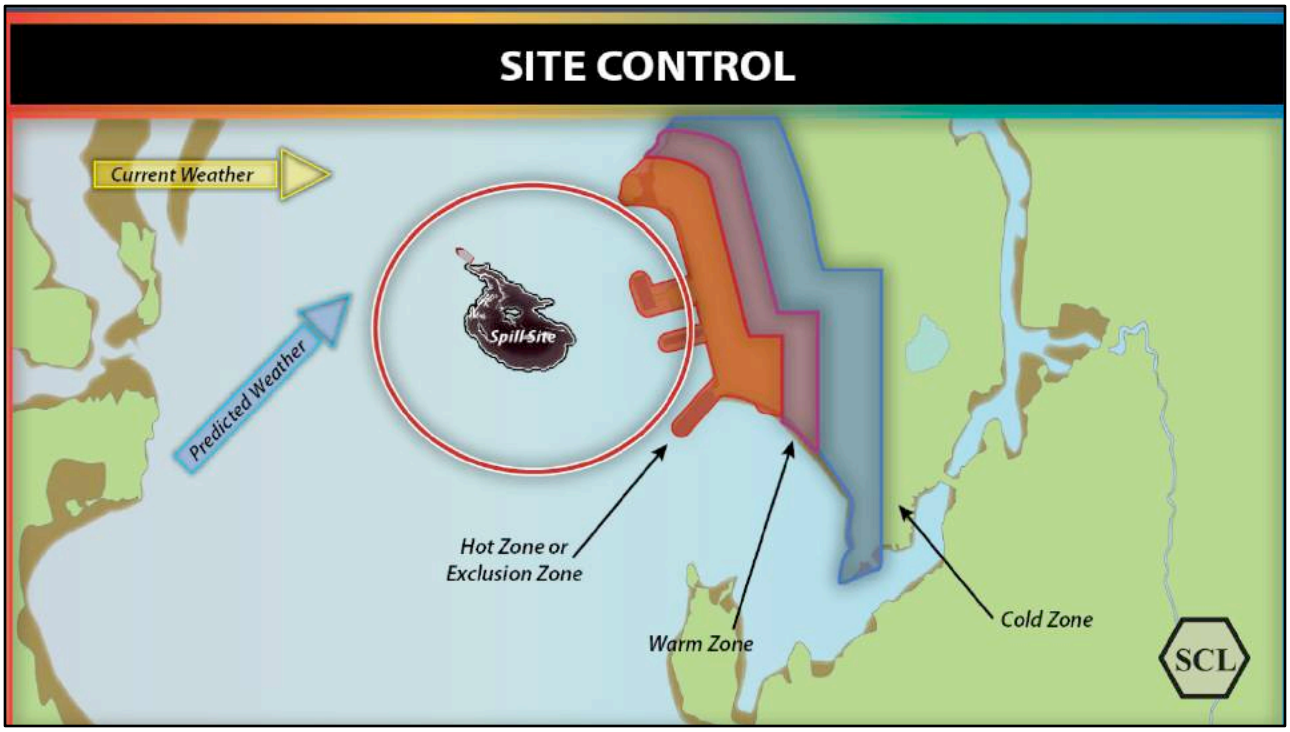
Learning Objectives for this video include:

Develop a strategy to respond to an oil spill using
The tactics in the Alaska STAR Manual,
Local knowledge
and Pre-existing Geographic Response Strategies created by work groups sponsored by Alaska DEC

Using the following tactics to protect sensitive areas including:
Deflection Booming
Exclusion Booming Tactic
Passive Recovery Techniques

Using the following tactics to recover spilled oil from water including:
Diversion booming tactics
Preparing a site for Shoreside recovery
Preparing a shoreline to minimize contamination

All of this information can be found in the Spill Tactics for Alaska Responder or STAR Manual which can be viewed and downloaded from the Alaska DEC website listed on the screen.



During the course of the instruction, you will see symbols in the lower right corner of the screen that correspond to the sections of the STAR Manual where you can find more information on the topic being presented.


Oil Spill Response
Strategies

Individuals living in Alaska's communities play an important role in minimizing the impact of oil and hazardous substance spills. You have first hand knowledge of winds, currents, navigational hazards and other factors that are important in determining how a response should proceed. And you may be most familiar with sensitive resources that need protection.

There are many ways to respond to an oil spill. For local responders, it helps to have plans in place BEFORE a spill occurs that provide clear direction on how to respond. This will reduce the time it takes to employ effective protection strategies with immediately equipment.

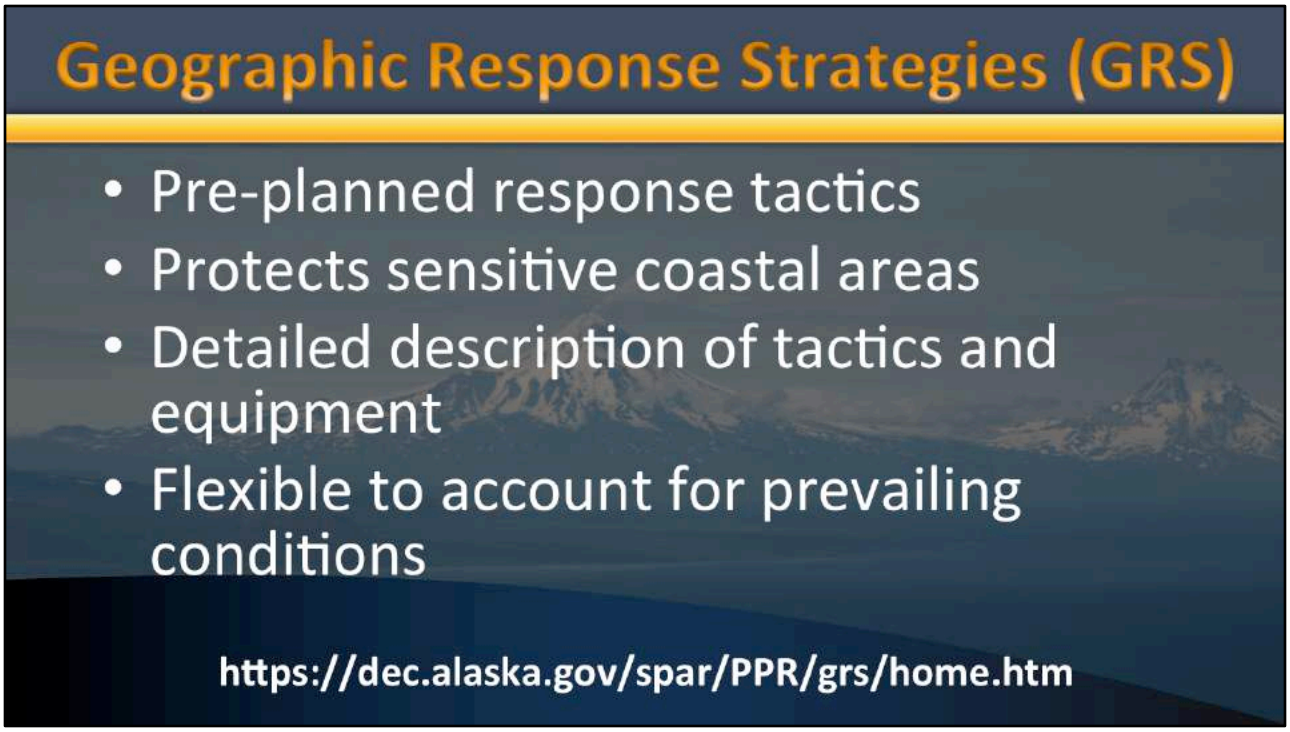
For coastal oil spills there are typically 4 opportunities to mitigate the effects of spilled oil.

First: Stop the source of the spill before it impacts lands and waters.

Second: If you can't prevent a spill, contain and recover the released oil in the immediate area.

Third: collect and remove the oil as it is freely floating on the water.

And the fourth is to protect sensitive coastal areas that are at risk of being impacted by deploying protective strategies.

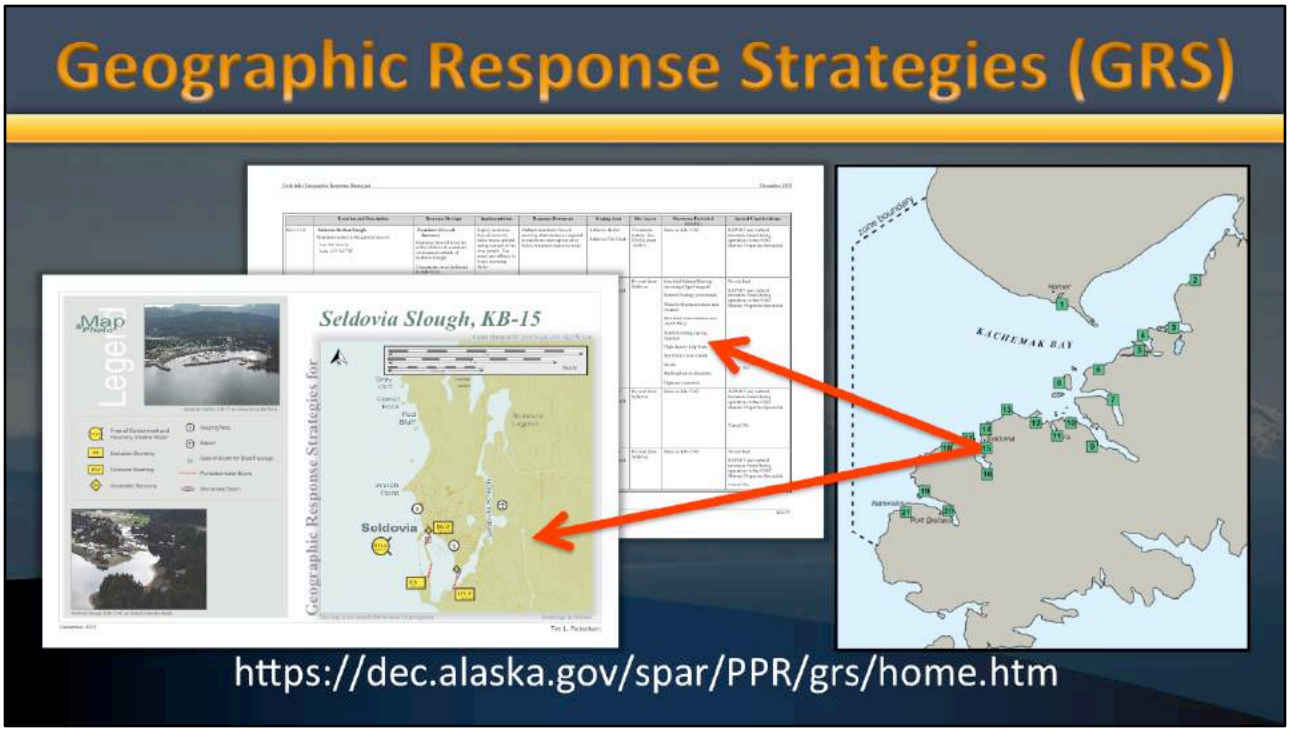


Over the past 15 years, a multi-agency project led by Alaska DEC has focused on the development of Geographic Response Strategies, referred to as GRS's, for many of Alaska's coastal areas.

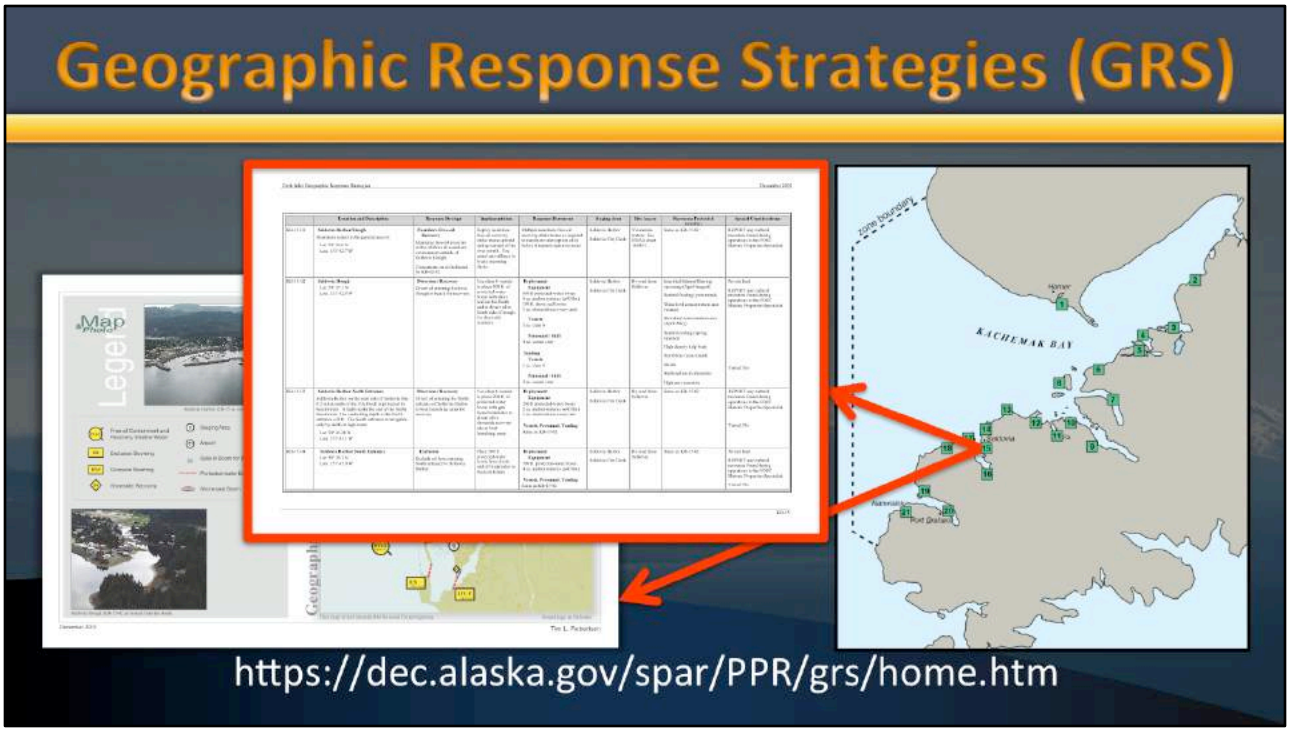
GRS's are pre-planned oil spill response tactics tailored to protect specific sensitive coastal areas from oil impacts following a spill. These response plans are implemented in the fourth step during a water-based spill.

The GRS's have detailed descriptions of the tactics and the response equipment that may be needed to protect specific resources as well as a map that shows a specific location of the strategies and how the tactic could be implemented.

The circumstances of each oil spill are unique and site features can change between seasons, years and even after severe weather events. For that reason GRS's are intended to be flexible, allowing spill responders to modify them as prevailing conditions dictate.

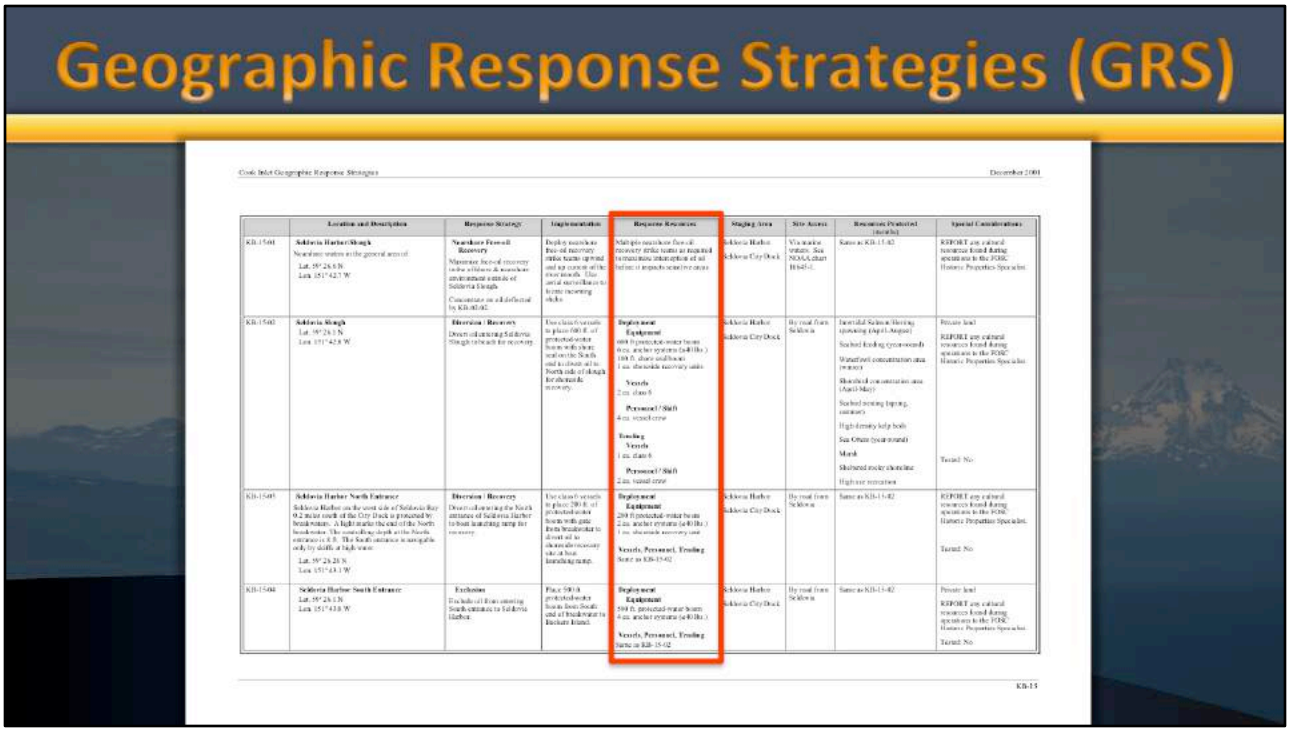


A list of all GRS's in the State of Alaska can be found on the Alaska DEC website at the link shown on screen.



The equipment to carry out particular GRS tactics is typically available at the facilities that buy, sell and store petroleum, at Oil Spill Response Organizations or OSRO equipment caches and in the Alaska DEC Conex boxes that are pre-positioned throughout the state. Alaska DEC equipment may be available for public use during emergencies with state approval.

Alaska DEC Conex boxes are regional assets, so you can coordinate with neighboring communities if you don't have a container immediately available. If your region doesn't have a container nearby, equipment may also be available from other sources such as your local health clinic, fire department, Village Public Safety Officer, or State Troopers' office.



The equipment to carry out particular GRS tactics is typically available at the facilities that buy, sell and store petroleum, at Oil Spill Response Organizations or OSRO equipment caches and in the Alaska DEC Conex boxes that are pre-positioned throughout the state. Alaska DEC equipment may be available for public use during emergencies with state approval.

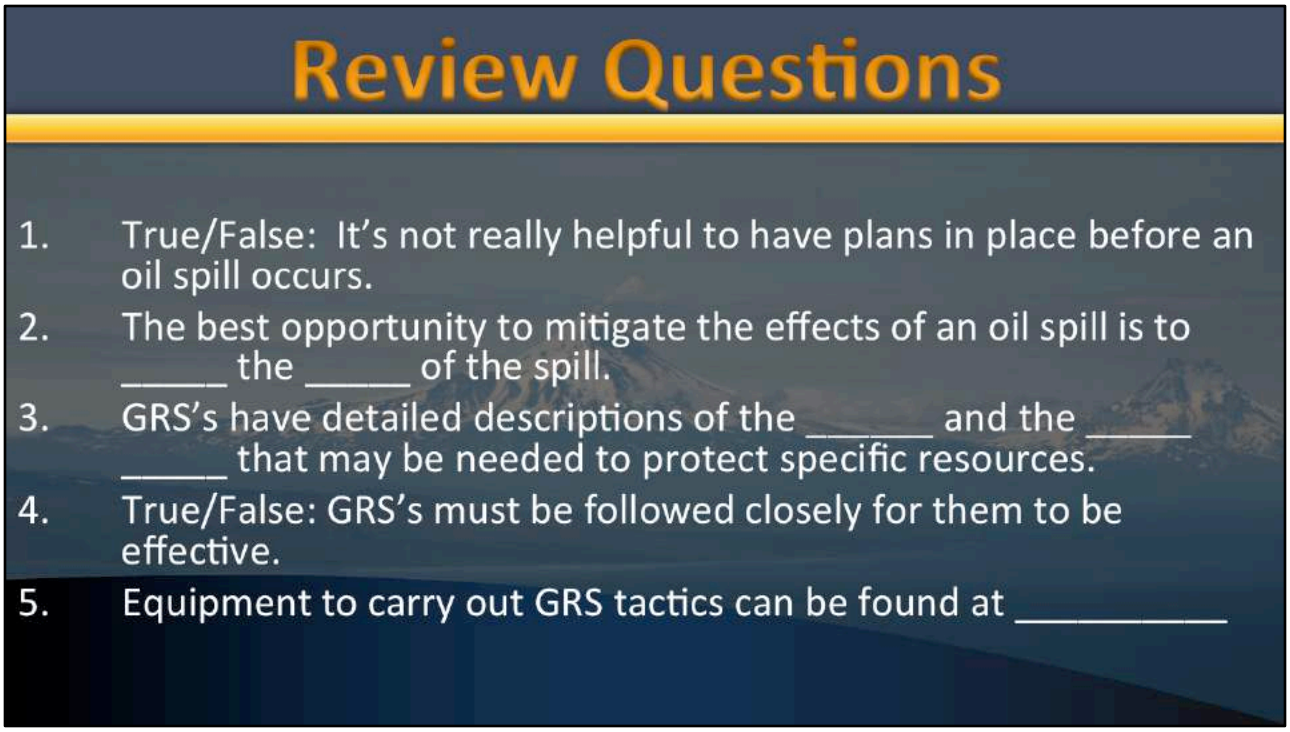
Alaska DEC Conex boxes are regional assets, so you can coordinate with neighboring communities if you don't have a container immediately available. If your region doesn't have a container nearby, equipment may also be available from other sources such as your local health clinic, fire department, Village Public Safety Officer, or State Troopers' office.

Alaska DEC Regional Offices

Area	Phone	FAX
Central (Anchorage)	(907) 269-3063	269-7648
Northern (Fairbanks)	(907) 451-2121	451-2362
Southeast (Juneau)	(907) 465-5340	465-2237

If GRS's have not been developed to protect areas important to your community, you can still take steps to identify and protect important sensitive resources in and near your community through other emergency planning efforts in your community.

For more information, contact your regional Alaska DEC office at the numbers listed on the screen.



1. False
2. Stop the source
3. Tactics and response equipment
4. False
5. facilities that buy, sell and store petroleum, at Oil Spill Response Organizations or OSRO equipment caches and in the Alaska DEC Conex boxes


Strategy/Tactics
Overview

Common oil spill response tactics are Exclusion, Deflection & Diversion booming in addition to Shoreside Recovery.

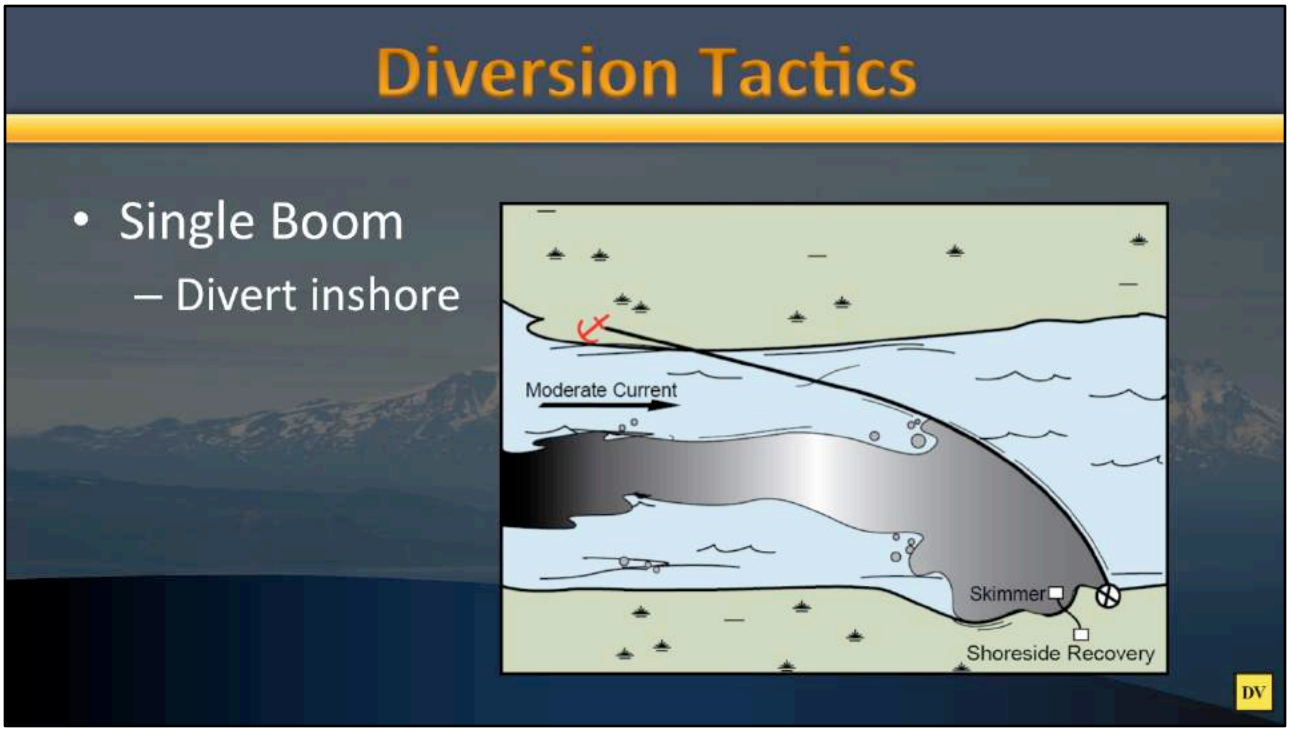
In all the Geographic Response Strategies in Alaska, the **Exclusion** booming tactic is the most common. It is a fixed-boom tactic with the objective of keeping oil slicks from entering a sensitive area. This technique is most efficient in low current areas, but can be deployed successfully in higher currents as well.

The **Deflection** tactic is effective in moving spilled oil away from sensitive areas where there is some current, usually between one half and 3 knots in speed. The boom is placed at an angle in front of the approaching oil and the current carries it oil along the boom surface and pushes it away from the area being protected. Deflection booming may be used to temporarily avoid impacts to a sensitive area, but there is no recovery of spilled oil associated with the tactic.

In this example, the spilled oil is being deflected toward another boom that will divert the oil to a shoreside recovery location.

Similar to the deflection tactic, the **Diversion** tactic uses the movement of the current to carry oil along the boom to a recovery location. Oil can be diverted to a shoreline as shown here or away from a shoreline to a vessel recovering oil in an open water

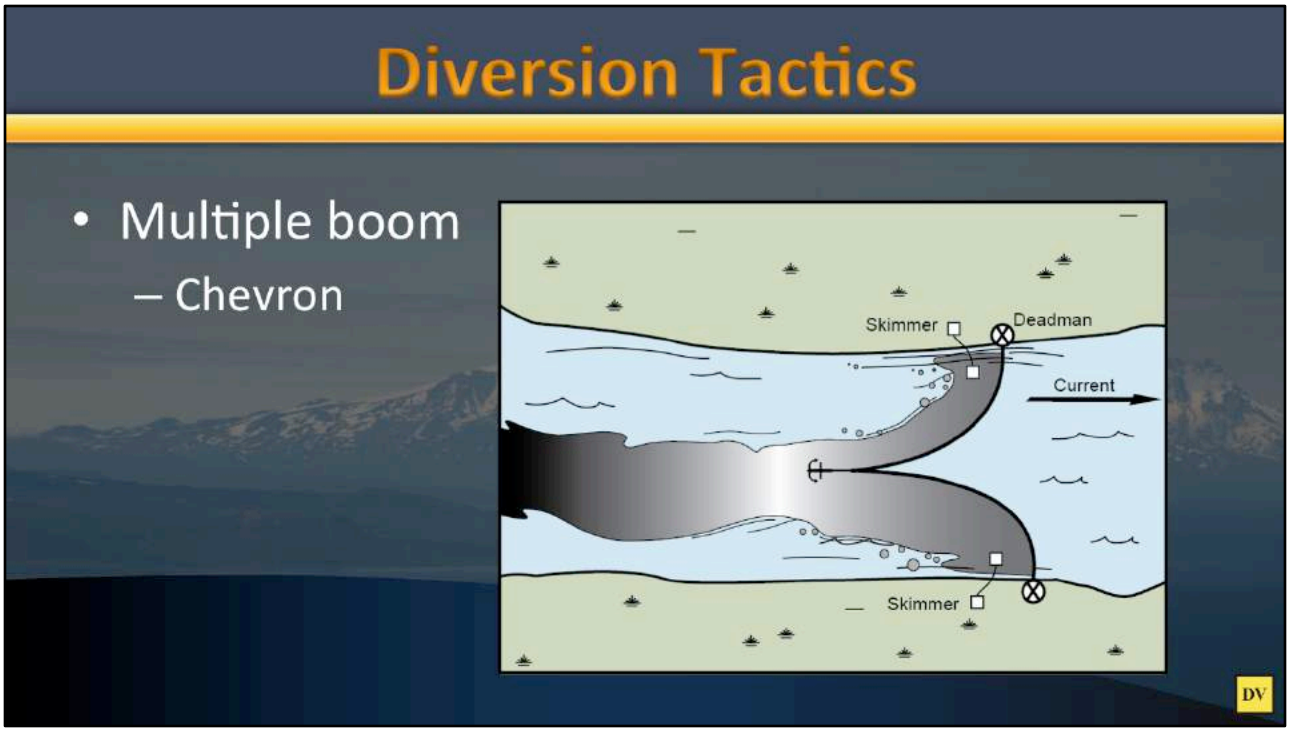

Diversion Tactics
DV



There are many deployment configurations for Diversion Boom so responders should consider prevailing conditions before selecting a specific recovery tactic.

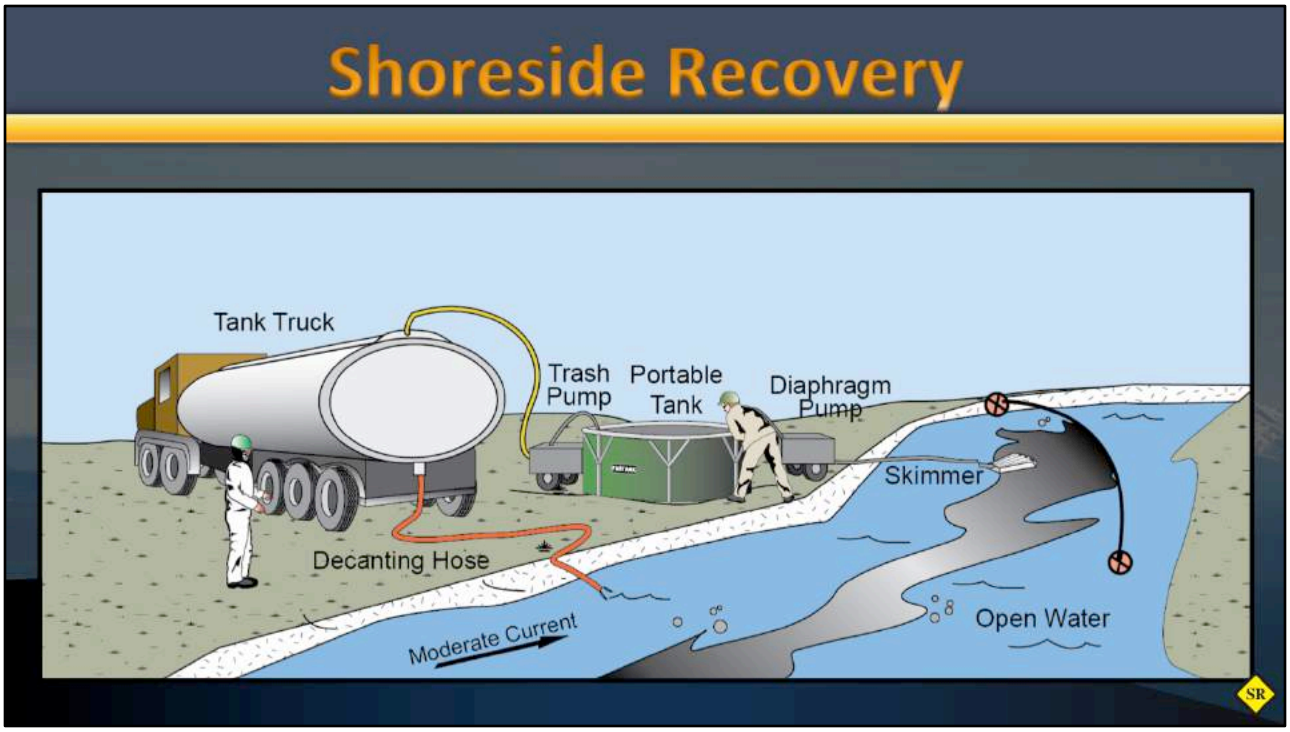
SINGLE BOOM – DIVERT INSHORE is a basic technique to divert oil from a current to a recovery site along a shoreline. The recovery site is chosen where there is minimal current (an eddy, quiet water, or collection beach) and a suitable recovery system can be deployed.

A single boom can also be set to divert oil away from the shore or shoal water, where it can be recovered by open water recovery systems.



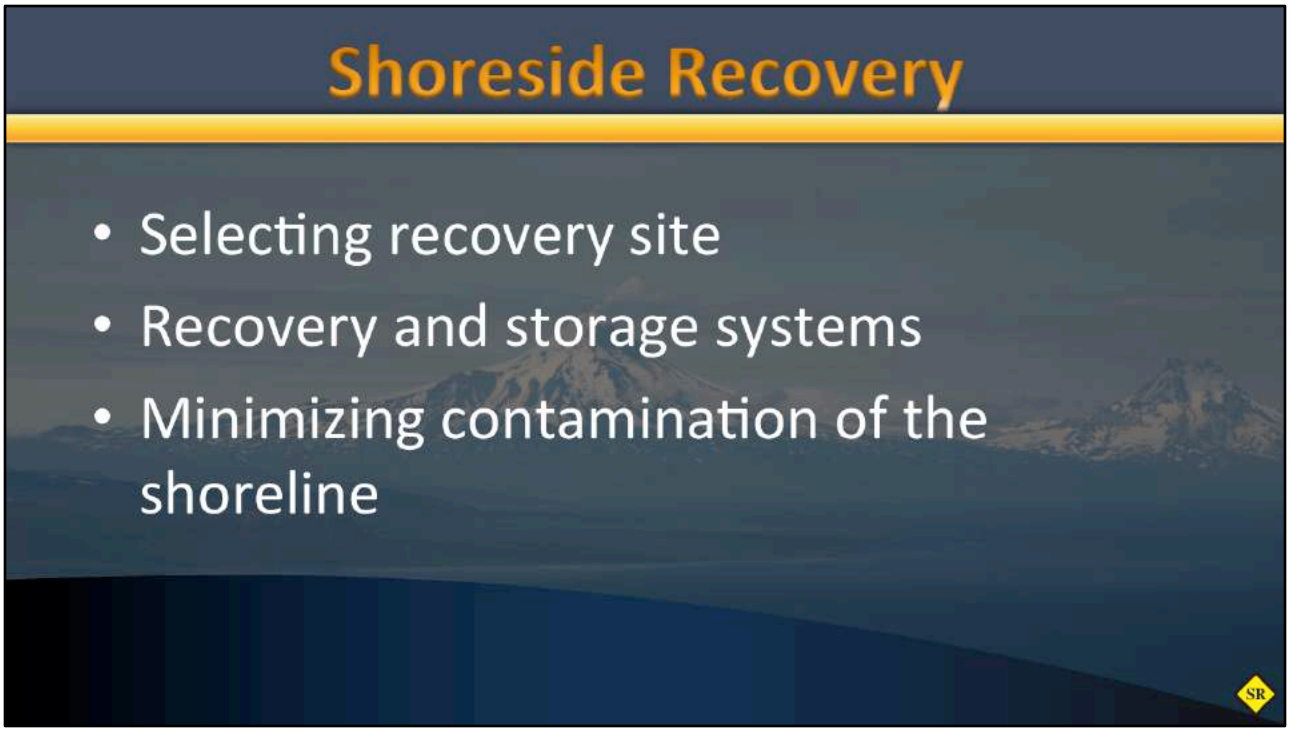
Chevron boom configurations may be used in fast water. Two booms are deployed from an anchor in the middle of the stream/river and then attached to each bank. A closed chevron configuration is used to divide a slick for diversion to two or more recovery areas.


Shoreside Recovery
Tactics
SR



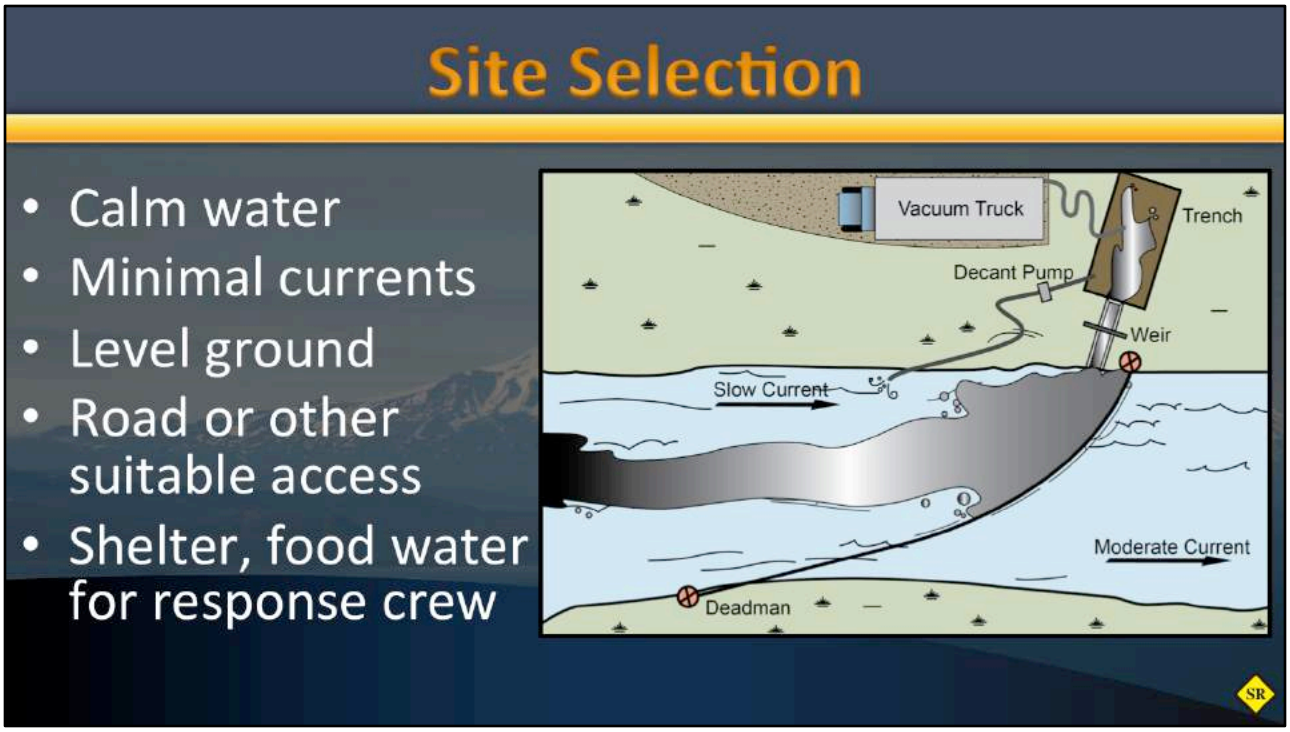
Shore side recovery tactics are usually deployed with a Diversion Boom strategy.

Shore side recovery systems are comprised of skimming and oil storage components. They can be deployed from land access routes (roads, beaches, all-terrain vehicles), water access (marine vessels), or air access (helicopter).



Important considerations in preparing a shoreside recovery site include:

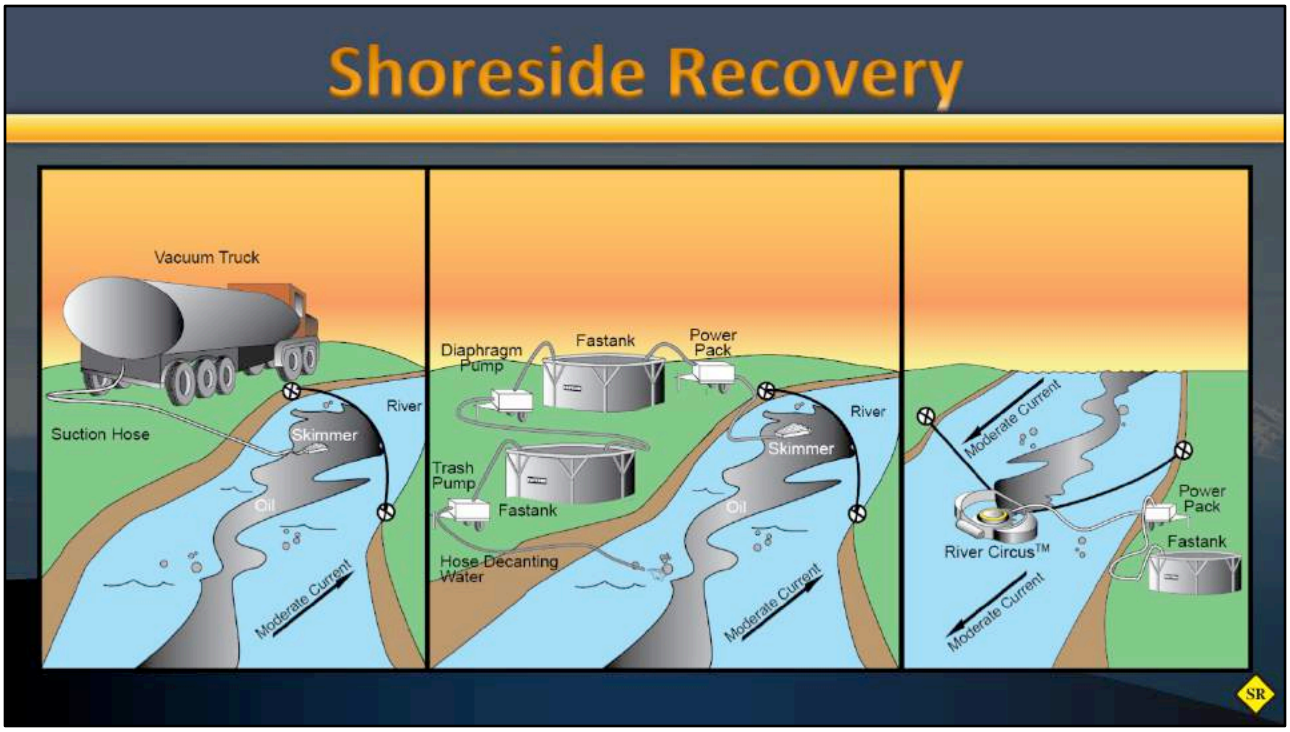
Selecting the recovery site location
Determining the recovery and storage systems based on oil type and access to the recovery site.
Minimizing contamination of the shoreline at the collection site.



The location of a shore side recovery site is critical to the success of this tactic. A recovery site should be in calm water with minimal currents. One option is to construct a quiet recovery spot by excavating a recovery lagoon or trench in the shoreline as seen in the figure on the screen. However, a permit would be required from the land managing agency to perform such an excavation. Alaska DEC can facilitate permitting requests.

The site must also have enough level ground above the high tide line to set up and operate a power source and portable tanks for storage. Sites with road access are preferred, but if not available, the site must have some other suitable access.

The ability to provide shelter, food and water for the response crew must also be considered in selecting a site.



Typical deployment configurations are shown in this diagram on the screen but responders should consider the actual conditions, and modify their deployment according to prevailing local conditions.

When preparing a shoreside site for recovery, It is important to minimize shoreline contamination at the recovery site. If possible, oil should not be allowed to contact the inter-tidal zone or shoreline if at all possible. This can be accomplished by integrating passive recovery tactics when planning for and setting up shoreside recovery tactics.

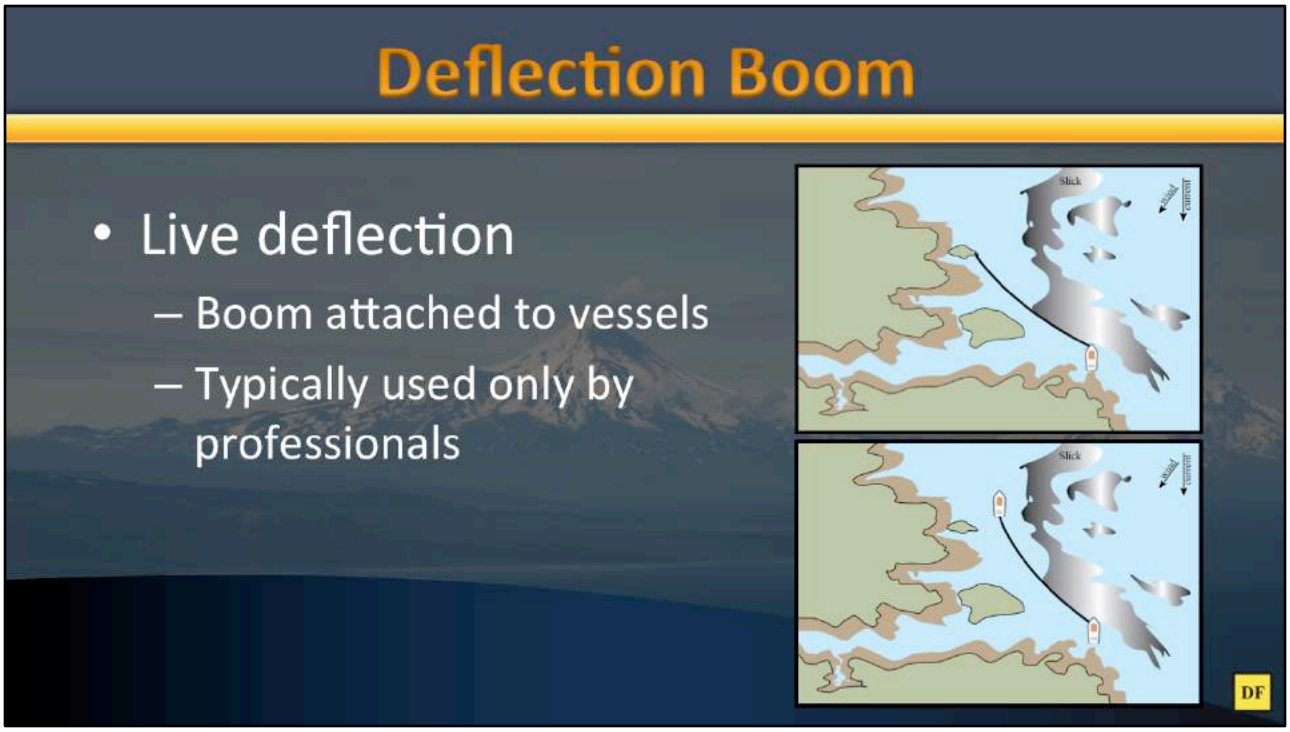
Oil contamination of the shoreline can be avoided by covering the shore with a sorbent material at the recovery location,

using passive materials to collect the oil prior to its reaching the shoreline

Review Questions

1. The Diversion tactic uses the movement of the current to carry oil along the boom to a _____ _____.
2. True/False: The location of a shoreside recovery site is not important to the success of the tactic.
3. The recovery site is chosen where there is _____ _____ and a suitable recovery system can be deployed.
4. When using the diversion tactic in fast water, a _____ boom configuration should be used.
5. When preparing a shoreside site for recovery, It is important to minimize _____ _____ at the recovery site.


Deflection Booming
DF

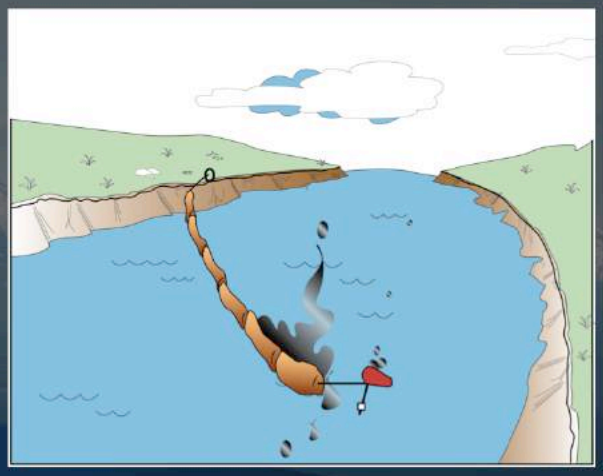


There are two alternatives for the Deflection Booming tactic. They are Fixed Deflection and Live Deflection.

In Live Deflection, the boom is attached to vessels and held in position by the power of those vessels. Live deflection is a very difficult tactic to execute and typically only done by professional response personnel. It should only be attempted where fixed deflection cannot be achieved, such as where the water is too deep or the bottom won't hold anchors.

Deflection Boom

- Fixed deflection
  - Most common
  - Boom anchored to shoreline and bottom



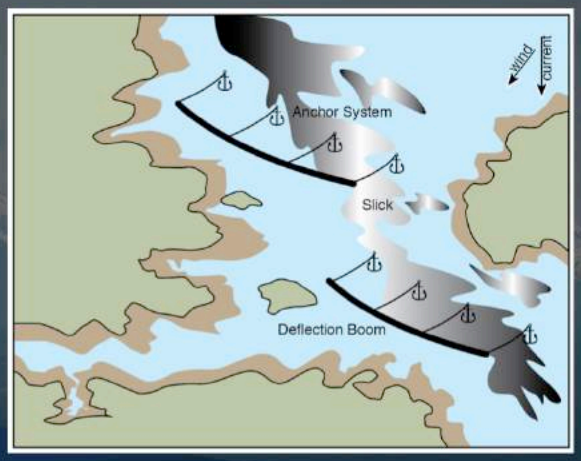
DF

Fixed Deflection is the most common form of this tactic and is where the boom is anchored to the shoreline and the bottom.

A Single Boom Configuration is deployed from a site at an angle to the current and anchored to deflect the oil away from a location as depicted on the screen.

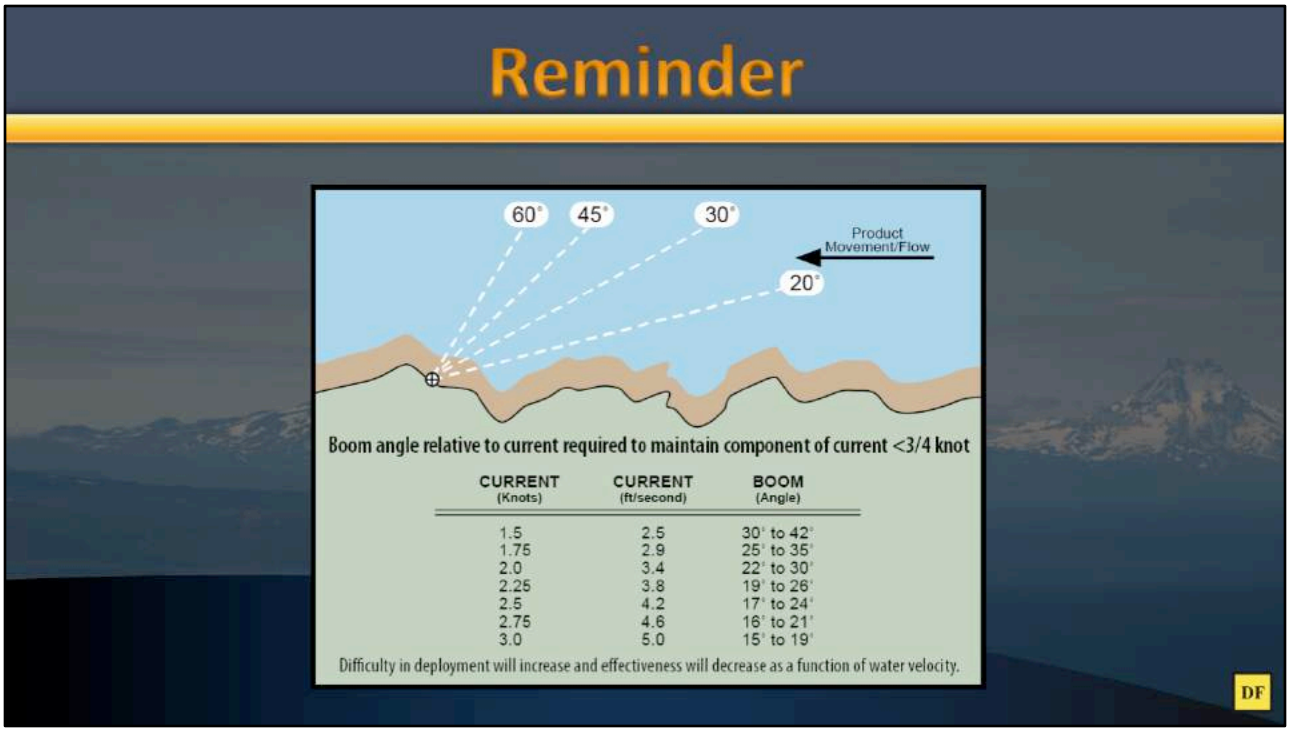
Deflection Boom

- Cascade Array
  - Typically used only by professionals



DF

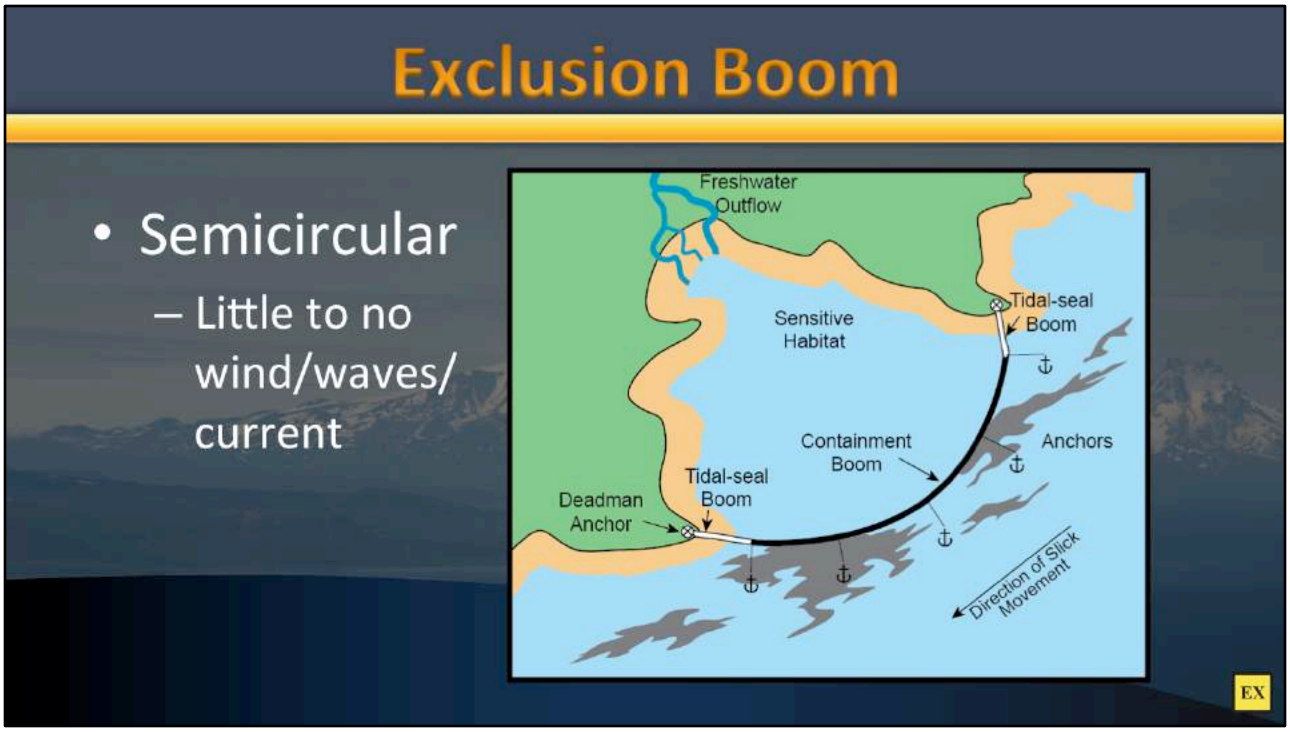
Two or more booms can be deployed together form a cascade configuration. This is done when a single boom cannot be used because of fast current or the need to leave openings in the boom for vessel traffic. This tactic is extremely challenging to deploy and typically used by professional responders



It's important to remember that the angle of the boom is dependent on the speed of the current to prevent entrainment and shoreline connection points should be identified based on the upcoming high tidal conditions in the area.

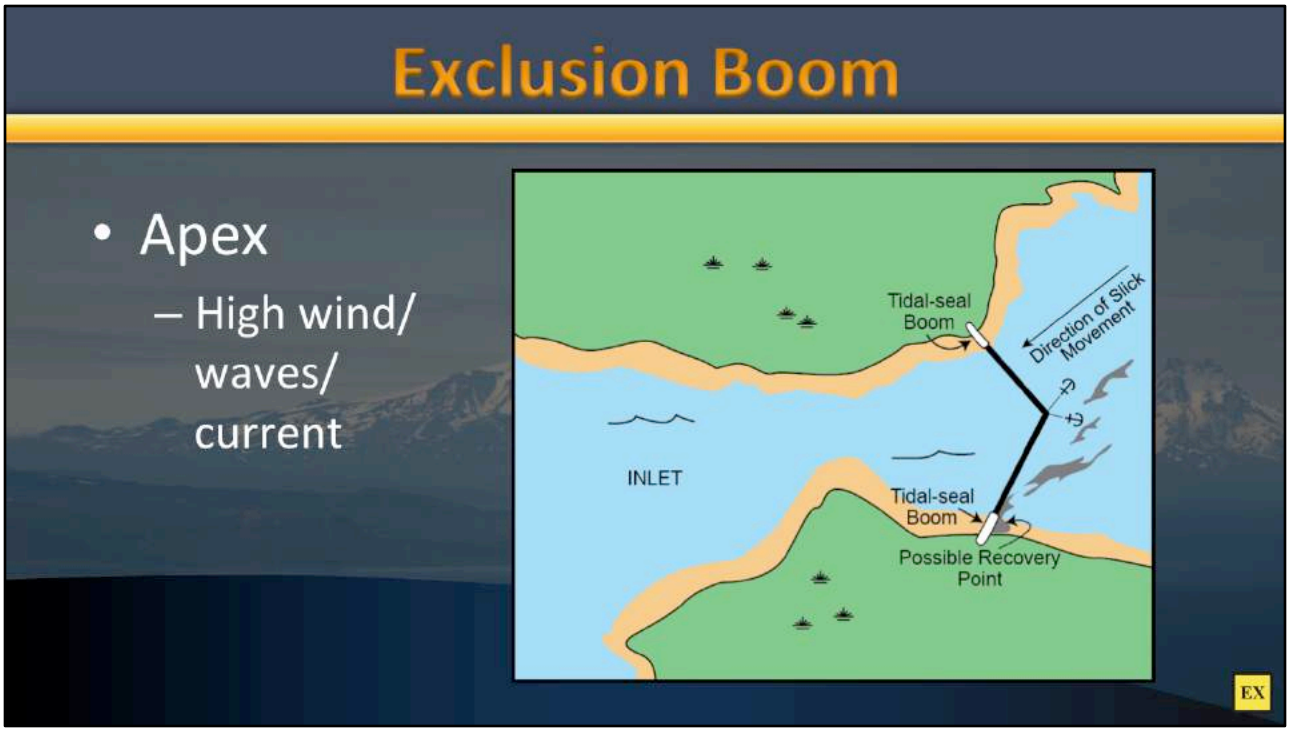
When deploying Deflection boom, constant monitoring and adjustment is required to be certain no oil is passing through the boom as the conditions at the site change,


Exclusion Booming Configurations
EX

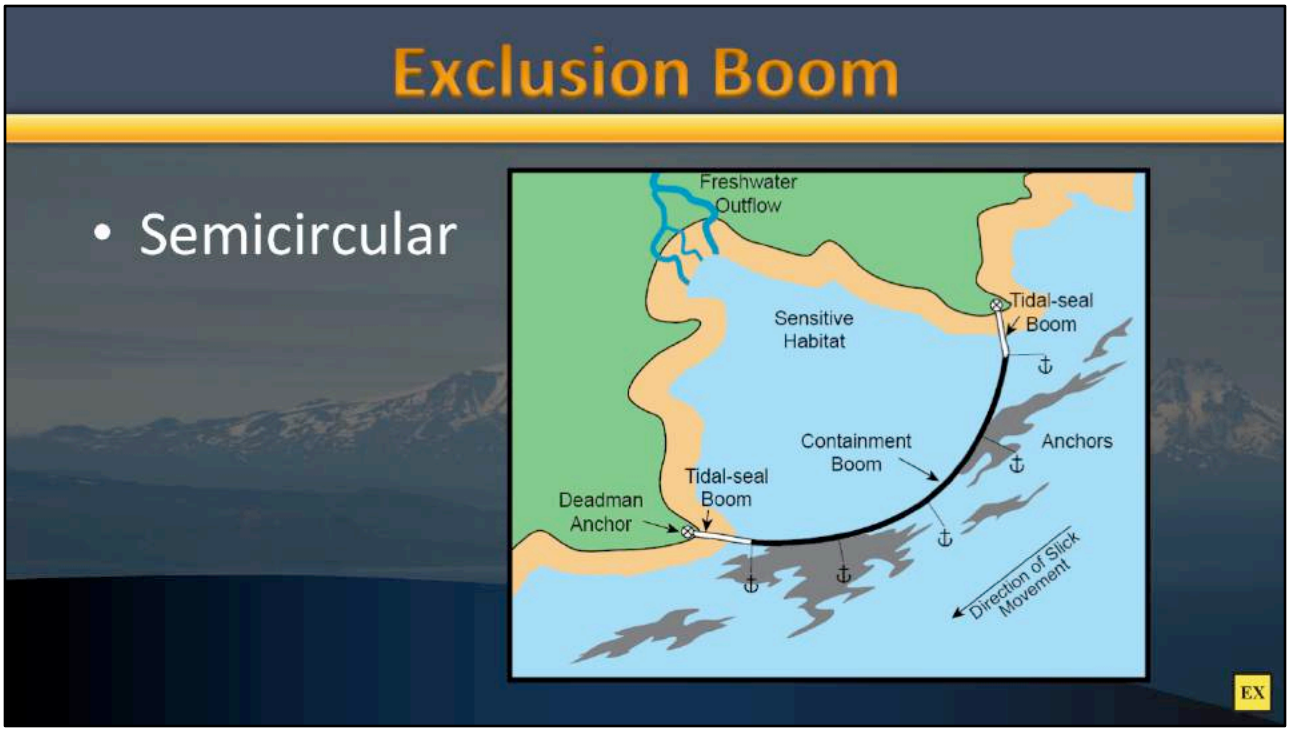


Exclusion Booming is a common tactic used for the protection of sensitive areas. This technique requires the area to be completely boomed off, forming a protective barrier with the objective of prohibiting, or excluding, oil slicks from entering an area.

There are two configuration options for exclusion boom. A semicircular configuration for areas where there is little to no current,



or an apex or chevron configuration for areas with high current or high wave or wind conditions.

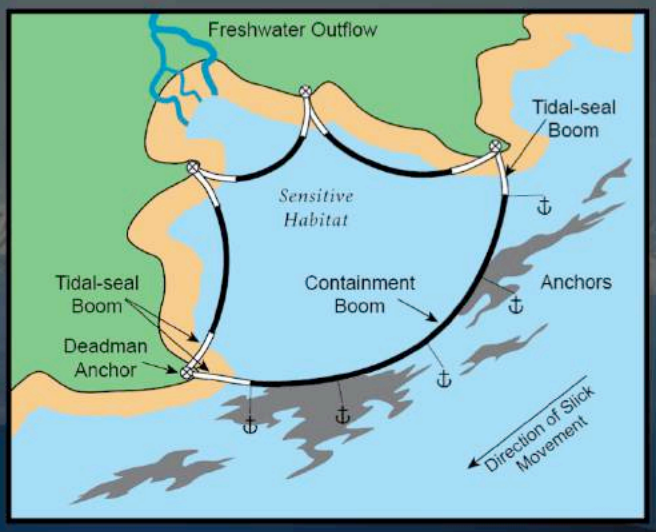


The semicircular configuration is deployed to protect larger areas where calm conditions are expected over the course of the operations. When available, tidal-seal boom is typically deployed at the shoreline/water interface on both shores and is secured into position. Conventional oil boom is then connected to the tidal-seal boom and is secured with additional anchor systems to form a barrier and to maintain its shape.

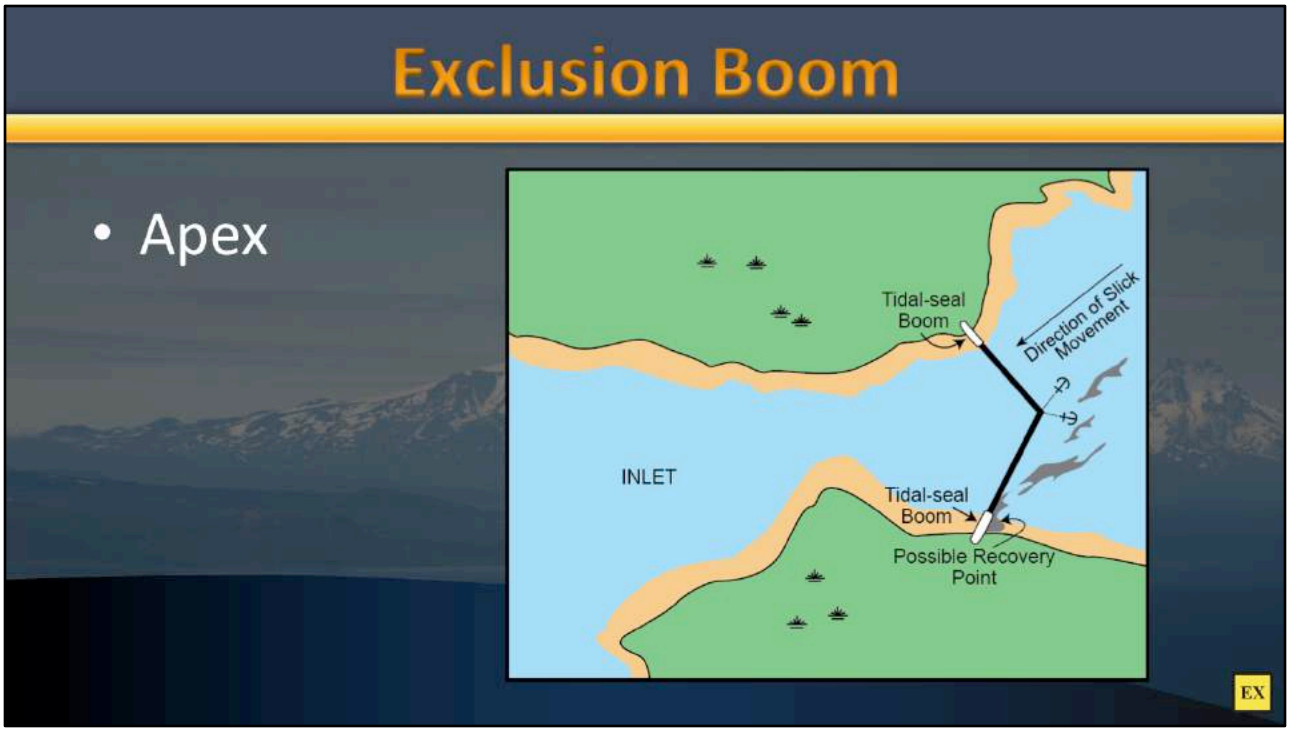
Freshwater outflow from a river or stream may also assist in maintaining boom configuration and pushing oil away from the area to be protected inside the boom.

Exclusion Boom

- Semicircular
  - Multiple boom Arrays



When deploying exclusion boom, don't attempt to exclude oil from too large of an area so that a single failure of boom will result in contamination of the entire area. It is usually better to deploy more small boom arrays covering the most sensitive areas than it is to use one long boom to try and protect large bays and inlets.

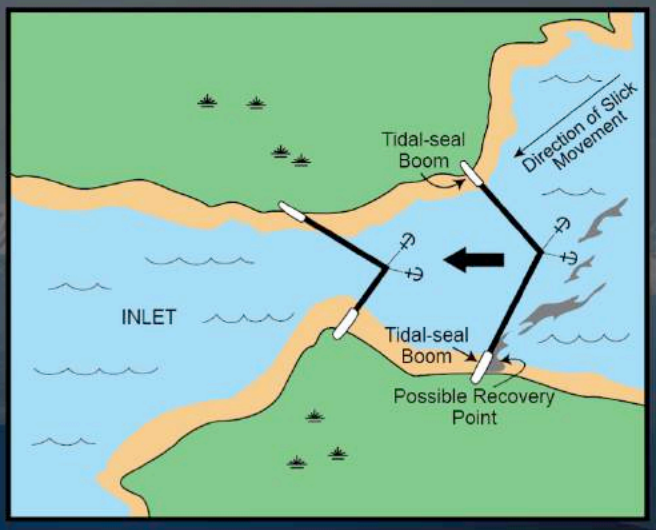


In areas that may be exposed to high wind and waves that would cause failure, such as where a river or stream enters the open ocean, the boom configuration may be moved further back into the stream where the wave action is reduced. This may expose some of the area to potential impacts but will provide protection from oil being pushed further upstream. The responders on site should evaluate the conditions and adjust the deployment to ensure its effectiveness.

As with deflection booming, responders must constantly monitor the effectiveness of the exclusion boom. You will need to readjust anchors and boom sections as necessary to meet changing conditions of the tide, current, and wind.

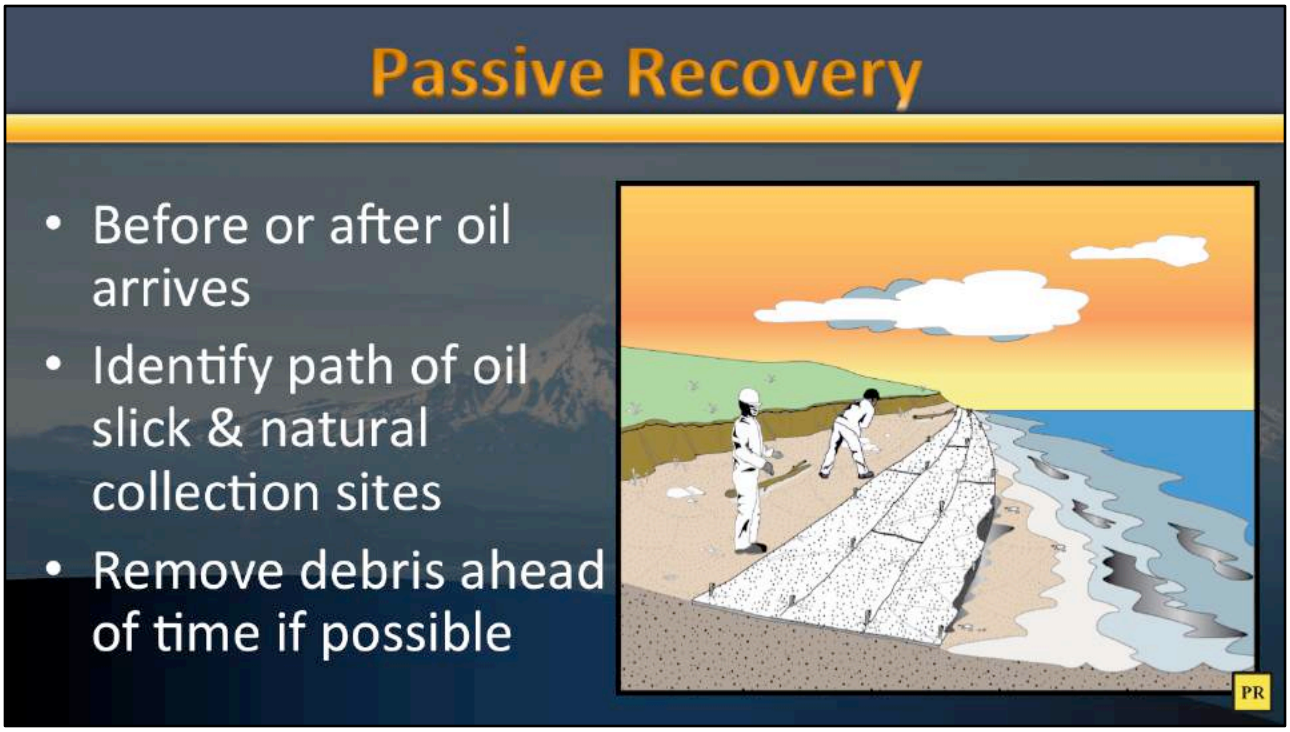
Exclusion Boom

- Apex
  - Extremely high wind/waves/ current



EX


Passive Recovery Techniques
PR



Passive recovery is another very common oil spill response tactic. It can be deployed along shorelines before oil arrives and reduce the amount of oil that might impact sensitive habitats. The tactic can also be applied to shorelines that have already been oiled to help keep the oil from re-mobilizing and migrating to other shorelines. As discussed earlier in this video, passive recovery techniques should also be considered wherever shore side recovery tactics are implemented.

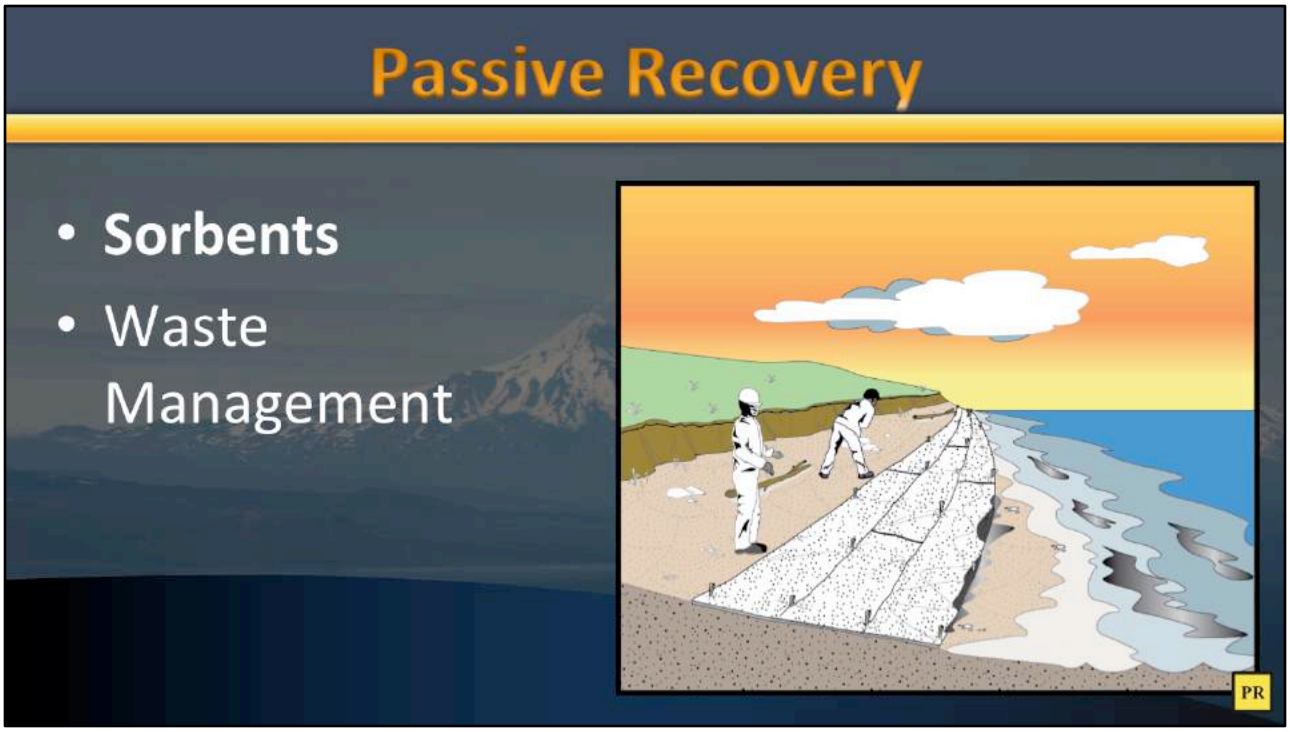
The general strategy for passive recovery is to pre-identify the path that the oil will follow and identify the natural collection sites in this path. These are areas where debris usually collect.

Passive Recovery

- Before or after oil arrives
- Identify path of oil slick & natural collection sites
- Remove debris ahead of time if possible

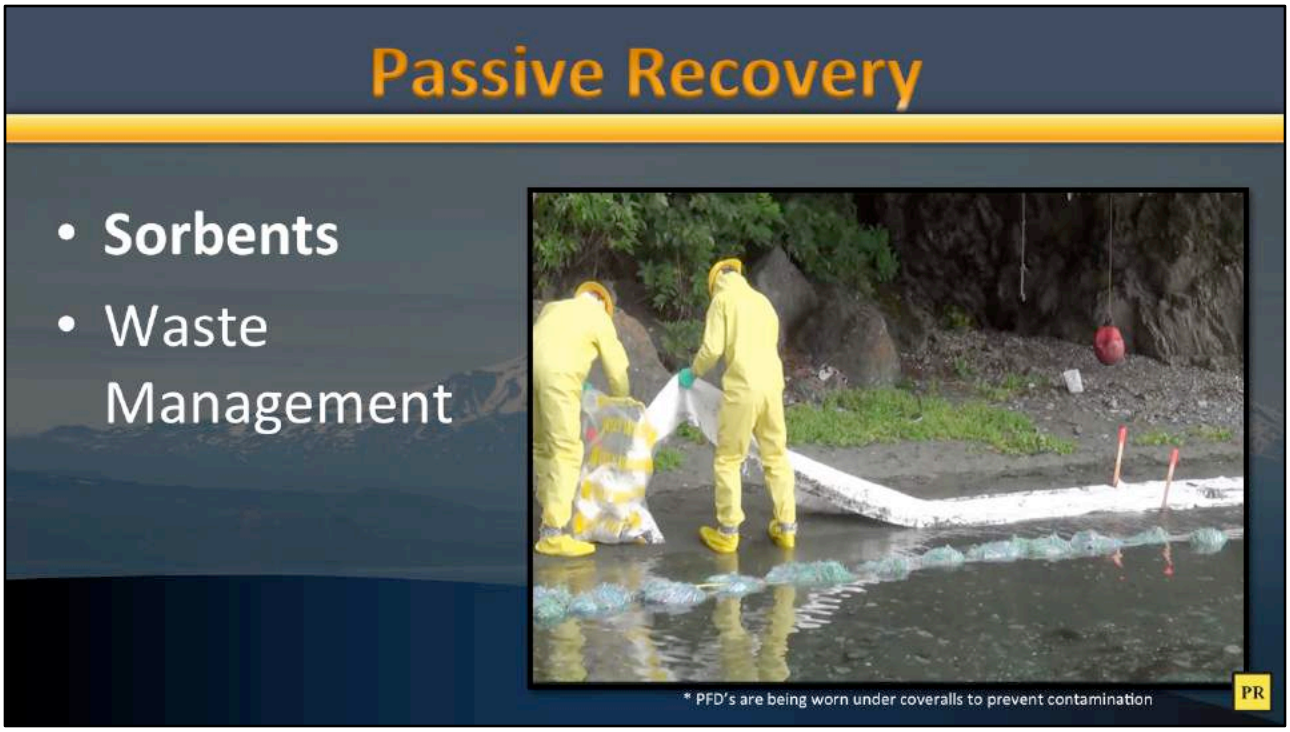
PR

Passive Recovery is often combined with debris removal, where concentrations of driftwood and other debris are relocated or removed from a likely impact area before oil arrives to minimize the volume of contaminated waste that will require disposal.



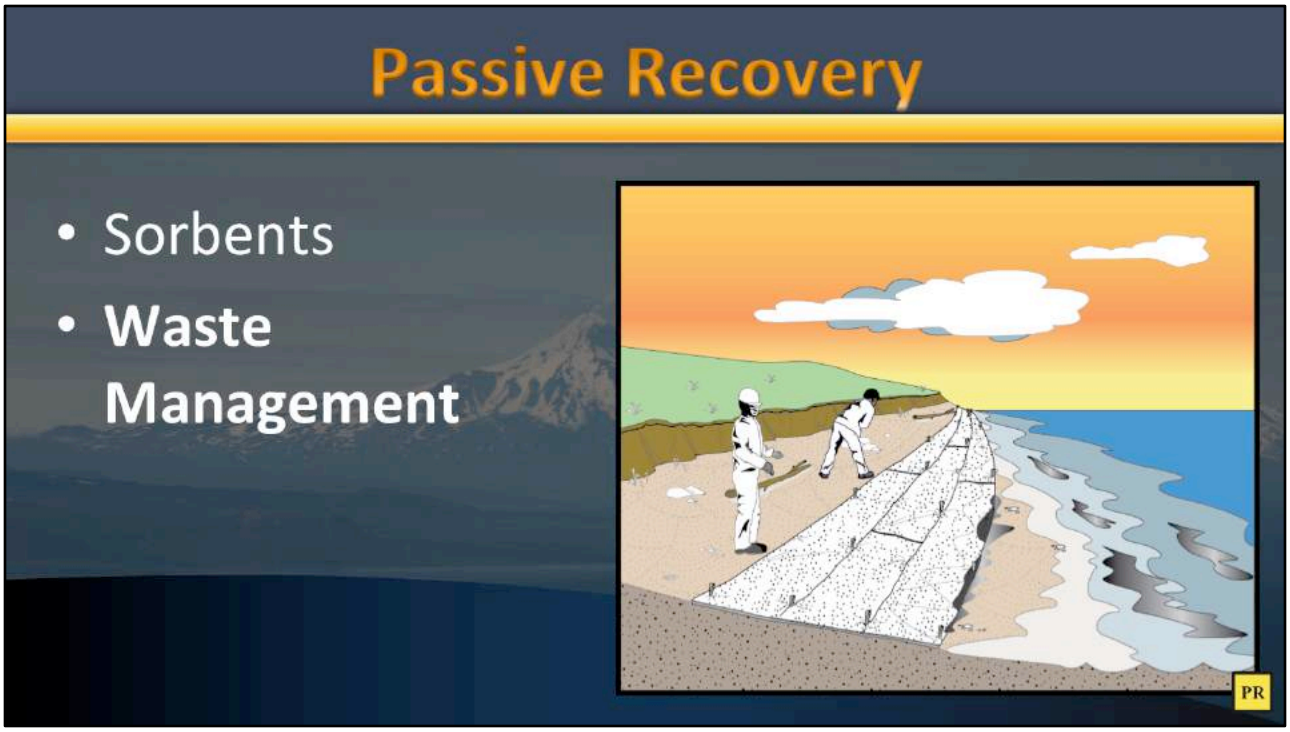
After deployment, the sorbents should be monitored on a regular basis for oil content, effectiveness, and security of the anchor systems as the tide changes. Oiled sorbents that have become loose pose an environmental problem that can be worse than spilled oil alone.

When conducting passive recovery, replace saturated sorbents as necessary. If you have sufficient supplies, don't wait until the sorbents are completely saturated to replace them.



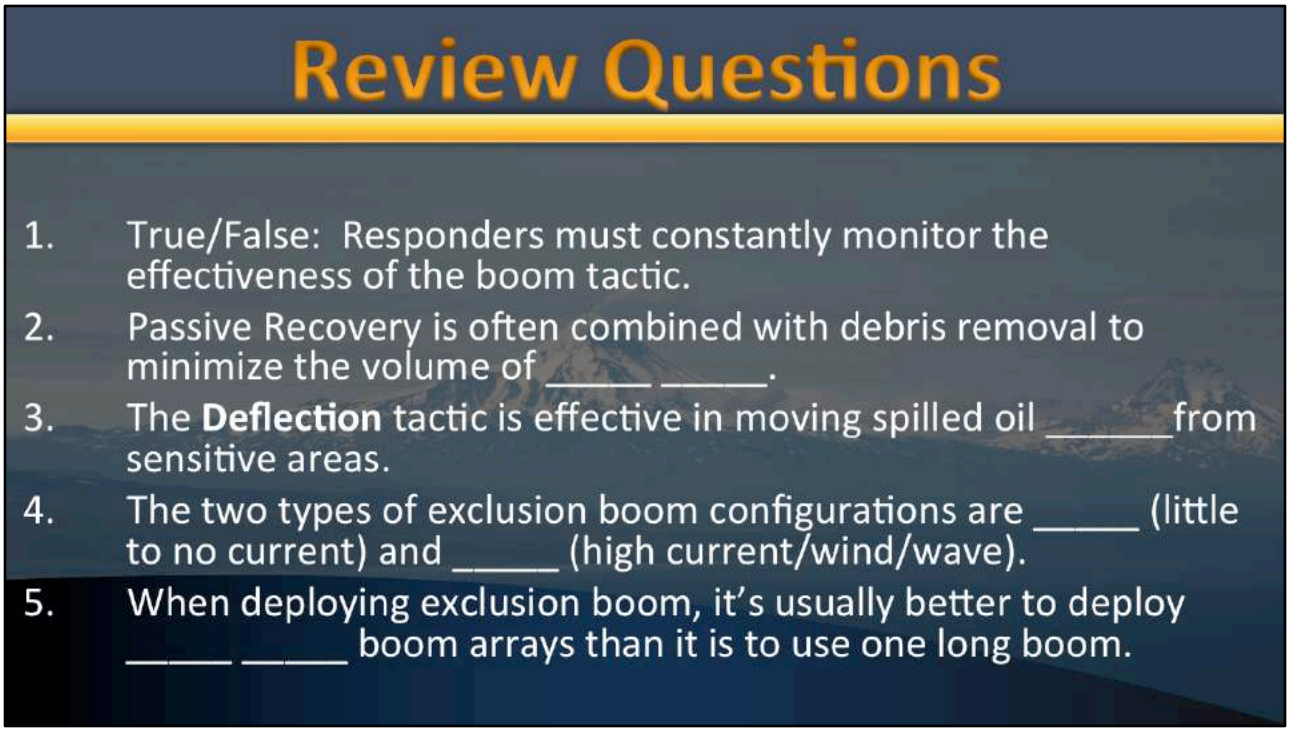
After deployment, the sorbents should be monitored on a regular basis for oil content, effectiveness, and security of the anchor systems as the tide changes. Oiled sorbents that have become loose pose an environmental problem that can be worse than spilled oil alone.

When conducting passive recovery, replace saturated sorbents as necessary. If you have sufficient supplies, don't wait until the sorbents are completely saturated to replace them.

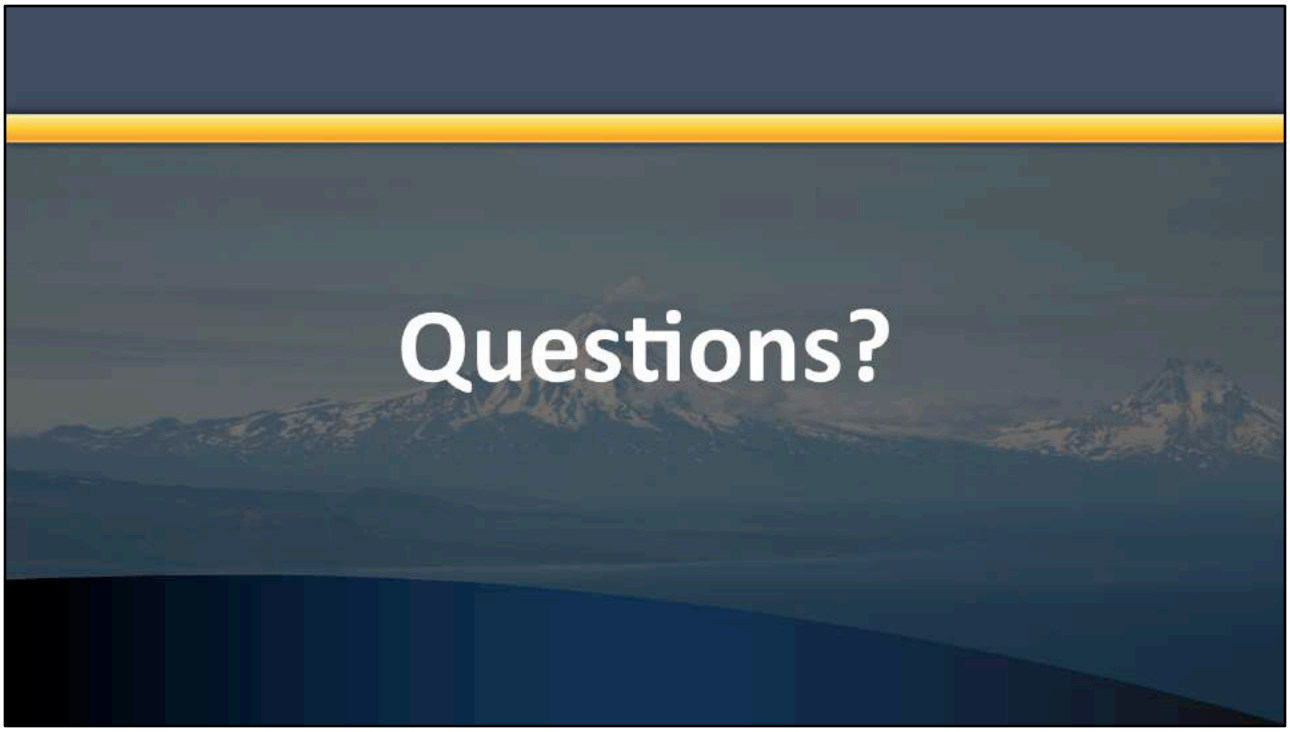


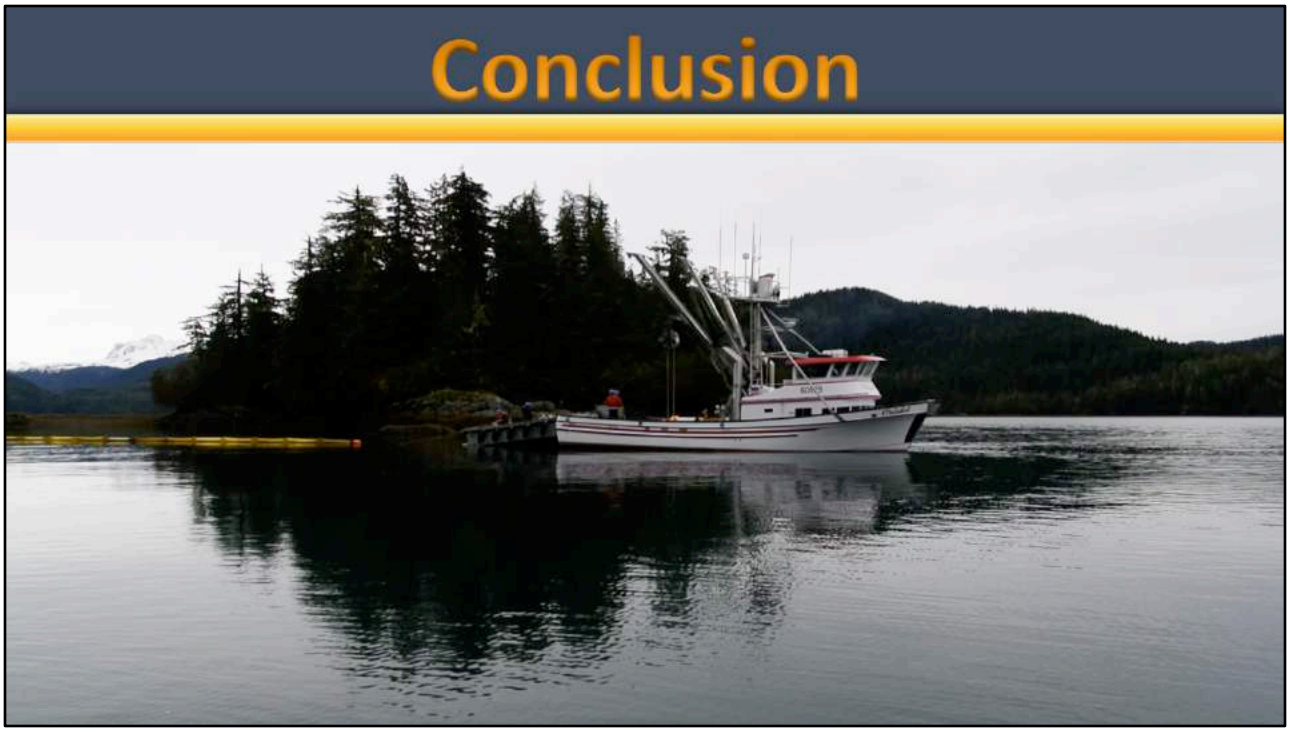
Store and dispose all recovered sorbents in accordance with the waste management plan. If there is no waste management plan, use drums, trashcans, or other appropriate containers double-lined with two plastic bags to dispose of sorbents until one is developed. Passive recovery operations can produce a significant amount of solid waste. Methods and considerations for the storage and disposal of this waste should be addressed early in the response.

To reduce solid oily wastes in an ongoing response the oiled sorbents may be wrung out into appropriate collection containers and reused. The Alaska DEC Conex boxes may contain sorbent pad wringers that can be used for this purpose. While this may reduce the amount of solid waste generated, adequate temporary storage must be available to accommodate the oily liquid waste.



1. True
2. Contaminated waste
3. Away
4. Semicircular and apex or chevron
5. More smaller


Questions?



There are many parts of Alaska where professional responders cannot arrive in time to deal with the immediate impacts of an oil spill. By using the procedures in this video along with the information in the STAR Manual, you will have the ability to play an important role in protecting your community in the first hours and days after an oil spill occurs.

Spill Tactics For Alaskan Responders (STAR) Manual Training

Participant Feedback Form 1

1	2	3	4	5
Strongly disagree	Mildly disagree	Neutral	Mildly agree	Strongly agree

Please use the above rating scale to rate how you feel about your ability before and after the training for each of the following topics.

I understood the learning objectives.	**1 2 3 4 5**
Comments:	
The material appropriately challenged me and the pace of instruction was correct.	**1 2 3 4 5**
Comments:	
The instructor did an excellent job.	**1 2 3 4 5**
Comments:	
I found the classroom to be a comfortable learning environment.	**1 2 3 4 5**
Comments:	
I will be able to use what I learned in this class.	**1 2 3 4 5**
Comments:	
The best thing about this training was_____.	
This training could have been better by improving _____.	

Spill Tactics For Alaskan Responders (STAR) Manual Training

Participant Feedback Form 2

1	2	3	4	5
Little or no understanding	Basic understanding, but cannot demonstrate it	Understands and can demonstrate it with assistance	Can demonstrate without assistance	Can demonstrate and teach others to do it

Please use the above rating scale to rate how you feel about your ability before and after the training for each of the following topics.

Before Training		After Training
	Safety	
1 2 3 4 5	Reporting an oil spill.	1 2 3 4 5
1 2 3 4 5	Accessing response equipment in an Alaska DEC Conex box.	1 2 3 4 5
1 2 3 4 5	Allowing and excluding access to an oil spill site.	1 2 3 4 5
1 2 3 4 5	Safely identifying the hazards associated with an oil spill.	1 2 3 4 5
1 2 3 4 5	Conducting a safety brief	1 2 3 4 5
1 2 3 4 5	Putting on and taking off personal protective equipment.	1 2 3 4 5
Comments:		
	Oil Spill Boom and Response Equipment	
1 2 3 4 5	Identify boom components	1 2 3 4 5
1 2 3 4 5	Towing boom	1 2 3 4 5
1 2 3 4 5	Anchoring boom in the water	1 2 3 4 5
1 2 3 4 5	Anchoring boom to shore	1 2 3 4 5
1 2 3 4 5	Adjusting boom to avoid common failures	1 2 3 4 5
1 2 3 4 5	Identify Oil Spill Response Equipment including: • Sorbent Materials • Oil Recovery Systems • Oil Storage Systems	1 2 3 4 5
Comments:		

Spill Tactics For Alaskan Responders (STAR) Manual Training

Oil Spill Tactics and Strategy		
1 2 3 4 5	Develop a strategy to respond to an oil spill or use a Geographic Response Strategy	**1 2 3 4 5**
1 2 3 4 5	Using the following tactics to recover spilled oil from water including: • Diversion booming tactics • Preparing a site for shore side recovery • Preparing a shoreline to minimize contamination	**1 2 3 4 5**
1 2 3 4 5	Using the following tactics to protect sensitive areas including: • Deflection Booming • Exclusion Booming Tactic • Passive Recovery Techniques	**1 2 3 4 5**
Comments:		

Please use this space to provide additional comments.