
FLOOD RESPONSE FOR CERTS

In this module, you will learn about:

- ***CERT Basic Training Concepts That Apply to Flood Response.*** How onscene management and the Incident Command System (ICS), personal safety, and medical skills apply to flood response.
- **Identifying a Flood.** How to know when a flood response will be needed and how the emergency management system responds to floods.
- **The Dangers of Floodwaters.** Recognizing the dangers of floodwaters and how to work safely around them.
- **Working with Sandbags.** How to fill and move sandbags during a flood response.
- **Constructing a Sandbag Barrier.** How to build a sandbag barrier safely and efficiently.

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**LEARNING
OBJECTIVES/
PERFORMANCE
OUTCOMES**

At the conclusion of this module, the participants will be able to:

- Identify the CERT role in responding to floods.
- Explain *CERT Basic Training* concepts that apply to flood response.
- Describe how to know when a flood response will be needed and how the emergency management system responds to floods.
- Explain the dangers of floodwaters and how to work safely around them.
- State how to work safely with sandbags: filling them, moving them, and using them to construct a sandbag barrier.
- Demonstrate how to fill and move a sandbag correctly and how to construct a sandbag barrier correctly.

SCOPE

The topics that will be discussed in this module are:

- Introduction and Overview
- *CERT Basic Training* Concepts That Apply to Flood Response
- Overview of Flood Response
- Personal Safety Around Floodwaters
- Working with Sandbags
- Building a Sandbag Barrier Activity
- Module Summary

**ESTIMATED
COMPLETION
TIME**

4 hours

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**TRAINING
METHODS**

The instructor will welcome participants to the module, facilitate introductions, and describe the module purpose, topics, and learning objectives.

Next, the instructor will begin a discussion about the history of flooding in the local community. During this discussion, the instructor will solicit stories from participants about their experience with floods.

The instructor will then review the Incident Command System (ICS) and where the local CERT fits into the structure. The instructor will emphasize the importance of communication during a flood response and review pertinent personal safety and medical topics from the *CERT Basic Training* course.

Next, the instructor will explain what constitutes a flood in the local community and introduce a scenario that provides context for an overview of the flood response. The localized scenario should put participants in the mindset that their community is in danger of imminent flooding. Throughout the ensuing presentation, participants will learn how to monitor the status of a flood and determine how to respond when activated.

The instructor will discuss the potential roles and responsibilities of CERT members during a flood response, emphasizing any CERT roles that are specified in the jurisdiction's Emergency Operations Plan (EOP) or Comprehensive Emergency Management Plan (CEMP). Then the instructor will describe the basic flood response process, including the types of barriers, equipment used, and other procedures.

Participants will be asked to share what surprised them most about any of their previous experiences with flood response. The instructor will use these stories to facilitate a guided discussion of the realities of flood response, including how best to avoid physical and mental fatigue. The instructor will describe the dangers that CERT members could encounter when working in and around floodwaters.

Participants will watch a 15-minute Sandbagging Demonstration video to become familiar with the sandbagging process. The instructor will review the key points from the video, including the proper technique for filling a sandbag, how to build a sandbag barrier, and related safety concerns.

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**TRAINING
METHODS
(CONTINUED)**

Participants will practice moving pre-filled sandbags down a line using the diagonal-pass method. The exercise will reinforce the benefits of the diagonal-pass method in preparation for the module's culminating activity.

The instructor will assign roles for the culminating activity, and participants will break into groups to practice filling and moving sandbags to construct a sandbag barrier. The instructor should develop a scenario, such as the one used earlier in the module, to provide context for the activity. Each participant should practice filling at least five bags before the participants begin practicing moving the sandbags along a diagonal-pass line. Participants at the end of the line will place the sandbags to start forming a barrier. Periodically, the instructor will ask the participants to rotate positions so that everyone has an opportunity to move and place sandbags.

After the activity, the instructor will provide feedback. The instructor will conclude the module by reviewing topics and summarizing important points learned in the module.

**RESOURCES
REQUIRED**

- Community Emergency Response Team Flood Response for CERTs Instructor Guide (for instructors)
- Community Emergency Response Team Flood Response for CERTs Participant Manual (for participants)
- PowerPoint slides 0 to 61
- Sandbagging demonstration video, Flood Fighting with Sandbags. This 15-minute video, produced by the Missouri State Emergency Management Agency, is intended to provide an overview of the sandbagging process. It can be viewed or downloaded at the national CERT Web site, <http://www.fema.gov/cert>.

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EQUIPMENT

The following equipment is required for this module:

- A computer with PowerPoint software and Windows Media Player
- A computer projector and screen
- Masking tape
- Easel pad and easel or whiteboard
- Markers
- One shovel for each team of two
- Ten bags for each team of two
- Sand

PREPARATION

1. Review this module and add local information wherever requested. Prepare information on:
 - State and local laws that affect the emergency management of a flood response
 - Details of the local jurisdiction's Emergency Operations Plan (EOP) or Comprehensive Emergency Management Plan (CEMP) that address flood response issues
 - The history of flooding and the types of floods that are likely to occur in your area
 - Local methods for staging flood response supplies (sandbags, polyethylene, lumber, shovels, etc.)
2. Prepare the shovels, bags, and sand for the activity.
3. Tell participants to wear sturdy shoes and to bring gloves and goggles to the training.

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NOTES	A suggested time plan for this module is as follows:
	Introduction and Overview 15 minutes
	<i>CERT Basic Training</i> Concepts That Apply to Flood Response 30 minutes
	Overview of Flood Response 40 minutes
	Personal Safety Around Water..... 40 minutes
	Break..... 10 minutes
	Working with Sandbags 40 minutes
	Building a Sandbag Barrier Activity 1 hour
	Module Summary 5 minutes
	Total Time: 4 hours

PARTICIPANT PREREQUISITES	Participants must have completed the <i>CERT Basic Training</i> course.
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INSTRUCTOR QUALIFICATIONS	Instructors for <i>Flood Response for CERTs</i> should have the following qualifications: <ul style="list-style-type: none">• Expertise in flood response with volunteers and using sandbags• Familiarity with the CERT model• Experience in teaching citizen volunteers• Knowledge of the local EOP or CEMP
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ACKNOWLEDGEMENTS	The National CERT Program would like to thank the following people who participated in a focus group and contributed material to develop this training module:
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Eric Evans
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**ACKNOWLEDGE-
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(CONTINUED)

Ken Fullagar
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Long Hill Township
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Les Miller
U.S. Army Corps of Engineers
Portland, OR


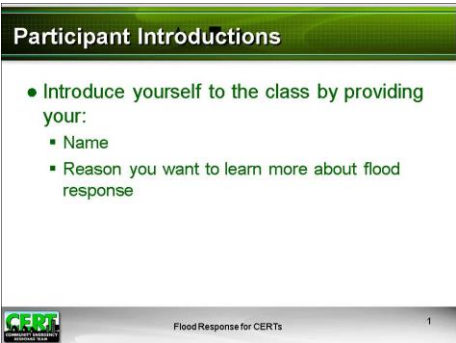
Dominic Marzano
Emergency Manager
City of Kent Emergency Management
Kent, WA

Paul Spangler
Disaster & Emergency Services Coordinator
Lewis & Clark County
Helena, MT




SOURCES

- Arizona Flood Response document
- Federal Emergency Management Agency's Expedient Flood Training Instructor Guide and Participant Materials
- Occupational Safety and Health Administration Flood Cleanup and Cleanup Hazards fact sheets
- U.S. Army Corps of Engineers Flood Fight Design and Planning Workshop Agenda and Overview
- U.S. Army Corps of Engineers Flood Fight Design Guidelines
- U.S. Army Corps of Engineers Flood-Fight Handbook: Preparing for a Flood (St. Paul)
- U.S. Army Corps of Engineers PowerPoint presentation (Seattle)
- U.S. Army Corps of Engineers sandbagging brochure (Seattle)
- University of Missouri Extension sandbagging demonstration video




Flood Response for CERTs

INSTRUCTOR GUIDANCE	CONTENT
 A presentation slide with a green header and footer. The title "Flood Response for CERTs" is in white text on a dark green background. Below the title are three small images: a group of people, a person in a hard hat, and a car. The CERT logo is in the top right corner.	<p><i>Introduction and Overview</i></p> <p>Welcome and Introductions</p> <p>Welcome the participants to the <i>Flood Response for CERTs</i> supplemental training.</p> <p>Introduce yourself and provide some background information about your experience with CERT or with emergency and flood response.</p> <p>Ask other instructors to introduce themselves in the same way.</p>
<p>Display Slide 0</p>  A presentation slide with a green header and footer. The title "Participant Introductions" is in white text on a dark green background. The main content is a bulleted list: "Introduce yourself to the class by providing your:" followed by "Name" and "Reason you want to learn more about flood response". The CERT logo is in the bottom left corner, and "Flood Response for CERTs" and the number "1" are in the bottom right corner.	<p>Participant Introductions</p> <p>Develop a class roster by passing around a sheet of paper and asking participants to write down their contact information or having them check in on a roster already developed from pre-registration information.</p> <p>If participants do not already know each other, have them introduce themselves by giving their names and, briefly, the reason they want to learn more about flood response.</p>

**COMMUNITY EMERGENCY RESPONSE TEAM
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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="190 430 643 768"><p>Administrative Announcements</p><ul style="list-style-type: none">• Breaks• Emergency exits• Restrooms, smoking policy, cell phones silent• Module completion<p style="text-align: right;">Flood Response for CERTs 2</p></div> <p>Display Slide 2</p> <div data-bbox="190 890 643 1228"><p>Module Purpose</p><p>To teach CERT members how to respond to a flood in a safe and efficient manner.</p><p style="text-align: right;">Flood Response for CERTs 3</p></div> <p>Display Slide 3</p>	<p>Administrative Announcements</p> <p>Make any necessary announcements, such as:</p> <ul style="list-style-type: none">• Schedule of breaks for this session• Emergency exits• Restroom locations, smoking policy, silencing cell phones, etc.• Module completion requirements <p>Module Purpose</p> <p>Review the module purpose.</p> <p>The purpose of the <i>Flood Response for CERTs</i> module is to teach CERT members how to respond to a flood safely and efficiently.</p> <p>Explain that the CERT supplemental training on flood response is meant to support the disaster response training that participants have already received in the <i>CERT Basic Training</i> course.</p> <p>Tell participants that this training will focus on flood response, not flood preparedness.</p>

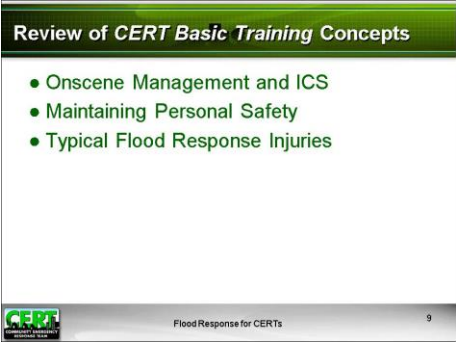
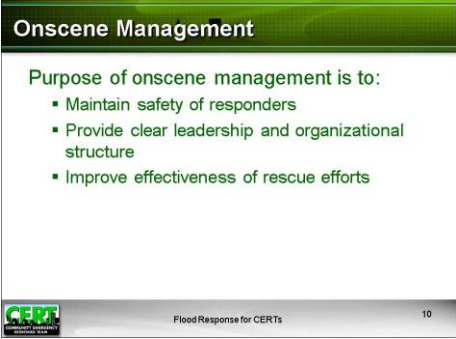
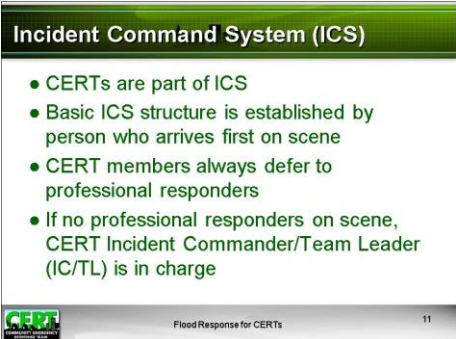
**COMMUNITY EMERGENCY RESPONSE TEAM
FLOOD RESPONSE FOR CERTS**

INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="188 422 643 762" data-label="Complex-Block"> <p>What You Will Learn</p> <ul style="list-style-type: none"> ● CERT Basic Training Concepts That Apply to Flood Response ● Overview of Flood Response ● Personal Safety Around Floodwaters ● Working With Sandbags ● Building a Sandbag Barrier Activity  <p style="text-align: right; font-size: small;">Flood Response for CERTs 4</p> </div> <p>Display Slide 4</p> <div data-bbox="188 892 643 1232" data-label="Complex-Block"> <p>Module Objectives</p> <ul style="list-style-type: none"> ● At the end of this module, participants will be able to: <ul style="list-style-type: none"> ▪ Identify the CERT role in responding to floods ▪ Explain <i>CERT Basic Training</i> concepts that apply to flood response ▪ Describe how to know when a flood response will be needed and how the emergency management system responds to floods  <p style="text-align: right; font-size: small;">Flood Response for CERTs 5</p> </div> <p>Display Slide 5</p> <div data-bbox="188 1299 643 1640" data-label="Complex-Block"> <p>Module Objectives (cont'd)</p> <ul style="list-style-type: none"> ● At the end of this module, participants will be able to: <ul style="list-style-type: none"> ▪ Explain the dangers of floodwaters and how to work safely around them ▪ State how to work safely with sandbags ▪ Demonstrate how to fill and move a sandbag correctly and construct a sandbag barrier correctly  <p style="text-align: right; font-size: small;">Flood Response for CERTs 6</p> </div> <p>Display Slide 6</p>	<p>What You Will Learn</p> <p>List the topics that will be taught in the module:</p> <ul style="list-style-type: none"> ● <i>CERT Basic Training</i> Concepts That Apply to Flood Response ● Overview of Flood Response ● Personal Safety Around Floodwaters ● Working with Sandbags ● Building a Sandbag Barrier Activity <p>Module Objectives</p> <p>Say that at the end of this module, participants will be able to:</p> <ul style="list-style-type: none"> ● Identify the CERT role in responding to floods. ● Explain the <i>CERT Basic Training</i> concepts that apply to flood response. ● Describe how to know when a flood response will be needed and how the emergency management system responds to floods. ● Explain the dangers of floodwaters and how to work safely around them. ● State how to work safely with sandbags, including: <ul style="list-style-type: none"> ○ How to fill them safely ○ How to move them safely ○ How to construct a sandbag barrier safely ● Demonstrate how to fill and move a sandbag correctly and how to construct a sandbag barrier correctly.

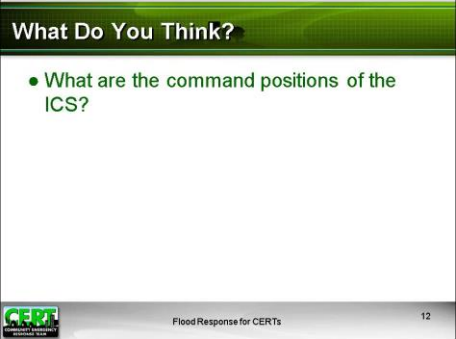
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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="188 430 643 768" data-label="Image"> <p>What Do You Think?</p> <ul style="list-style-type: none"> • What experience do you have with floods or flood response? <p><small>CERT Flood Response for CERTs 7</small></p> </div> <p>Display Slide 7</p> <p>Conduct a class discussion based on this question. Record participants' responses on an easel pad.</p> <div data-bbox="188 1058 643 1396" data-label="Image"> <p>Local Flooding History</p> <ul style="list-style-type: none"> • Event • Response • Lessons learned • Future threats <p><small>CERT Flood Response for CERTs 8</small></p> </div> <p>Display Slide 8</p> <p>This discussion should be localized to your community and may require some basic background research.</p>	<p>Introduction to Flood Response</p> <p>Ask the class:</p> <p>What safety concerns do you have about flood response?</p> <p>Encourage participants to describe any experience they may have had with floods or flood response. Use the participants' responses to facilitate a brief guided discussion of flooding in your community.</p> <p>Local Flooding History</p> <p>Review the history of flooding in your community, including past flood responses. During this discussion, be sure to focus on:</p> <ul style="list-style-type: none"> • The event • The response • Lessons learned • Future threats

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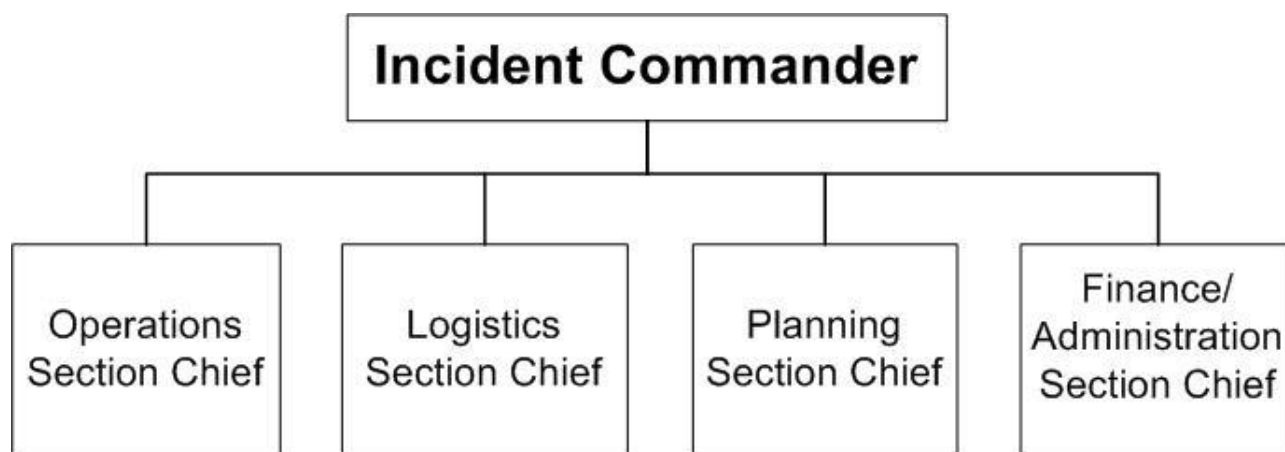
INSTRUCTOR GUIDANCE	CONTENT
 <p>Review of <i>CERT Basic Training Concepts</i></p> <ul style="list-style-type: none">● Onscene Management and ICS● Maintaining Personal Safety● Typical Flood Response Injuries <p><small>CERT Flood Response for CERTs 9</small></p>	<p><i>Review of CERT Basic Training Concepts</i></p> <p>Tell the class that in this topic they will review some of the skills and information from the <i>CERT Basic Training</i> course that are pertinent for a flood response.</p> <p>Say that the topics are:</p> <ul style="list-style-type: none">● Onscene Management and the Incident Command System (ICS)● Maintaining Personal Safety● Typical Flood Response Injuries
<p>Display Slide 9</p>	
 <p>Onscene Management</p> <p>Purpose of onscene management is to:</p> <ul style="list-style-type: none">▪ Maintain safety of responders▪ Provide clear leadership and organizational structure▪ Improve effectiveness of rescue efforts <p><small>CERT Flood Response for CERTs 10</small></p>	<p>Onscene Management</p> <p>Explain that, as with any CERT emergency response, onscene management is important during a flood response. Onscene management helps to:</p> <ul style="list-style-type: none">● Maintain the safety of responders● Provide clear leadership and organizational structure● Improve the effectiveness of rescue efforts
<p>Display Slide 10</p>	
 <p>Incident Command System (ICS)</p> <ul style="list-style-type: none">● CERTs are part of ICS● Basic ICS structure is established by person who arrives first on scene● CERT members always defer to professional responders● If no professional responders on scene, CERT Incident Commander/Team Leader (IC/TL) is in charge <p><small>CERT Flood Response for CERTs 11</small></p>	<p>Remind the group that ICS is the system used by emergency response agencies to manage emergency operations and establish onscene management. When CERTs activate for their neighborhood or workplace, they become part of that system.</p> <p>Explain that all CERTs must report to the first fire or law enforcement official at their location and take directions from that person until told that the command system has changed or until they are relieved.</p>
<p>Display Slide 11</p>	<ul style="list-style-type: none">● If no professional responders are on the scene, a CERT Incident Commander/Team Leader (IC/TL) should guide the response effort.

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INSTRUCTOR GUIDANCE	CONTENT
 <p>Display Slide 12</p> <p>Suggested responses:</p> <ul style="list-style-type: none">• Operations Section Chief• Planning Section Chief• Logistics Section Chief• Finance/Administration Section Chief (not typically necessary in CERT ICS) <p>PM, P. 3</p>	<ul style="list-style-type: none">• Initially, the IC/TL may handle all the command positions, but, as the incident evolves, he or she may assign personnel to fill these roles. <p>Ask:</p> <p>What are the command positions of the ICS?</p> <p>Refer the participants to the organization chart, <i>ICS Command Function Organization Chart</i>, and the responsibilities of the four command positions beneath the IC/TL. This organization chart is in the Participant Manual and on the following page in the Instructor Guide.</p>

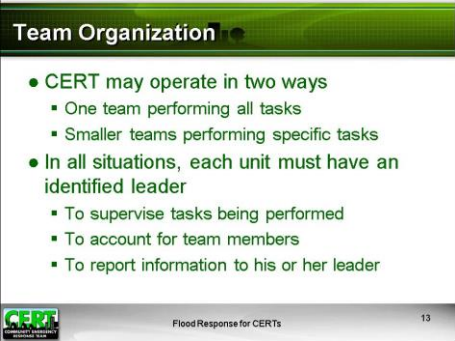


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PM, PAGE 3	ICS Command Function Organization Chart
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<p><u>Operations</u></p> <ul style="list-style-type: none"> • Directs and coordinates all incident tactical operations • Is typically one of the first functions to be assigned 	<p><u>Logistics</u></p> <ul style="list-style-type: none"> • Provides communications • Provides food and medical support to Team members • Manages supplies and facilities
<p><u>Planning</u></p> <ul style="list-style-type: none"> • Tracks resource status (e. g., number of CERT members who have “reported for duty”) • Tracks situation status • Prepares the Team’s action plan • Develops alternative strategies • Provides documentation services 	<p><u>Finance and Administration</u></p> <ul style="list-style-type: none"> • Provides contract negotiation and monitoring • Provides timekeeping • Manages cost analysis • Provides compensation for injury or damage to property

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INSTRUCTOR GUIDANCE	CONTENT
 <p>Team Organization</p> <ul style="list-style-type: none">● CERT may operate in two ways<ul style="list-style-type: none">▪ One team performing all tasks▪ Smaller teams performing specific tasks● In all situations, each unit must have an identified leader<ul style="list-style-type: none">▪ To supervise tasks being performed▪ To account for team members▪ To report information to his or her leader <p><small>CERT Flood Response for CERTs 13</small></p> <p>Display Slide 13</p>	<p><u>Team Organization</u></p> <p>Explain that a CERT may operate as a single team that performs all tasks or may be divided into smaller teams to achieve specific goals established by the team leader under the Operations function.</p> <p>Emphasize that in all situations, each unit assigned must have an identified leader to:</p> <ul style="list-style-type: none">● Supervise tasks being performed● Account for team members● Report information to his or her designated leader
 <p>Maintaining Personal Safety</p> <ul style="list-style-type: none">● Personal safety is CERT member's #1 priority● Know your limitations<ul style="list-style-type: none">▪ Don't engage in activities that are uncomfortable● Use buddy system  <p><small>CERT Flood Response for CERTs 14</small></p> <p>Display Slide 14</p>	<p>Maintaining Personal Safety</p> <p>Remind the group that rescuer safety is paramount during a flood response. Ultimately, CERT members are responsible for ensuring their own safety because people know their own bodies and limitations better than anyone.</p> <p>Say that participants will learn more about ensuring personal safety during a flood response activity later in the module. However, they should always:</p> <ul style="list-style-type: none">● Know personal limitations and never engage in any response activity that feels uncomfortable● Use the buddy system

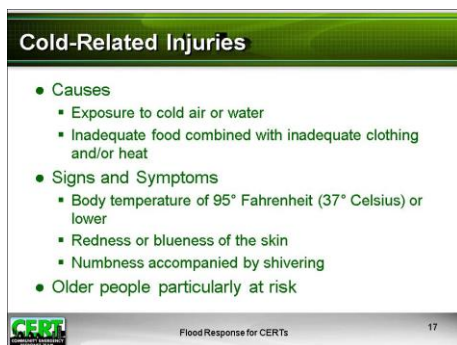
**COMMUNITY EMERGENCY RESPONSE TEAM
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INSTRUCTOR GUIDANCE	CONTENT
 <p>What Do You Think?</p> <ul style="list-style-type: none">• What safety concerns do you have about flood response? <p><small>CERT Flood Response for CERTs 15</small></p> <p>Display Slide 15</p> <p>Use the participants' responses to facilitate a general discussion of safety concerns and measures. If not mentioned by the participants, tell them that preventing injuries is one safety concern during a flood response.</p>	<p>Ask:</p> <p>What safety concerns do you have about flood response?</p>
 <p>Typical Flood Response Injuries</p> <ul style="list-style-type: none">• Working in and around floodwaters is dangerous• Reminder: Safety precautions limit injuries• Typical injuries<ul style="list-style-type: none">▪ Heat- and cold-related injuries▪ Sprains▪ Strains▪ Lacerations▪ Blisters <p><small>CERT Flood Response for CERTs 16</small></p> <p>Display Slide 16</p>	<p>Typical Flood Response Injuries</p> <p>Tell participants that, while taking certain safety precautions will limit the chance of injury, working in and around floodwaters is dangerous. It is important to know how to assess and treat typical flood response injuries using the skills learned in the <i>CERT Basic Training</i> course.</p> <p>Explain that you will review how to treat some of the most common injuries suffered during flood response.</p>

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Describe the typical flood response injuries.

- Heat- and cold-related injuries
- Sprains
- Strains
- Lacerations
- Blisters



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Cold-Related Injuries

Tell the group that hypothermia may be caused by exposure to cold air or water, or by inadequate food combined with inadequate clothing and/or heat. Older people are particularly at risk.

Point out that the primary signs and symptoms of hypothermia are:

- A body temperature of 95° F (37° C) or lower
- Redness or blueness of the skin
- Numbness accompanied by shivering



Display Slide 18

Explain that, because hypothermia can set in within only a few minutes, participants should immediately treat survivors who have been rescued from cold air or water environments.

- Remove wet clothing.
- Wrap the survivor in a blanket or sleeping bag and cover the head and neck.
- Protect the survivor against the weather.
- Provide warm, sweet drinks and food to conscious survivors. Do not offer alcohol.
- If possible, place the survivor in a warm bath if the survivor is conscious.
- Place an unconscious survivor in the recovery position.

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Heat-Related Injuries

- Heat cramps
 - Muscle spasms from over-exertion in extreme heat
- Heat exhaustion
 - Loss of body fluids through heavy sweating while working in extreme heat
 - Blood flow to skin increases, blood flow to vital organs decreases
 - Result: mild form of shock
- Heat stroke
 - Life-threatening
 - Victim's temperature control system shuts down; possible brain damage and death

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Treating Heat-Related Injuries

- Place victim in cool environment
- Cool body slowly with cool, wet towels or sheets
- Have victim drink water slowly: ½ glass every 15 minutes
- If vomiting, cramping, or loss of consciousness: NO food or drink; alert medical professional ASAP

CERT Flood Response for CERTs 20

Display Slide 20

- Do not attempt to use massage to warm affected body parts.

Tell the participants not to allow the survivor to walk around even when he or she appears to be fully recovered. If the survivor must be moved outdoors, cover the survivor's head and face.

Heat-Related Injuries

Tell the participants that there are several types of heat-related injuries, or hyperthermia, that they may encounter during a flood response. Review the following heat-related injuries:

- Heat cramps are muscle spasms brought on by over-exertion in extreme heat.
- Heat exhaustion occurs when an individual works in extreme heat resulting in loss of body fluids through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a mild form of shock.
- Heat stroke is life-threatening. The temperature control system shuts down. Body temperature can rise so high that brain damage and death may result.

Explain that treatment is similar for both heat exhaustion and heat stroke. Review the treatment of heat-related injuries.

- Take the survivor out of the heat and place in a cool environment.
- Cool the body slowly with cool, wet towels or sheets. If possible, put the survivor in a cool bath.
- Have the survivor drink water, SLOWLY, at the rate of approximately half a glass of water every 15 minutes. Consuming too much water too quickly will cause nausea and vomiting in a survivor of heat sickness.

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Display Slide 21

- If the survivor is experiencing vomiting or cramping or is losing consciousness, **DO NOT** administer food or drink. Alert a medical professional as soon as possible, and keep a close watch on the individual until professional help is available.

Treating Sprains and Strains

Tell the group that the most common signs of a sprain are:

- Tenderness at the site of the injury
- Swelling and/or bruising
- Restricted use, or loss of use

Remind the group that the signs of a sprain are similar to those of a nondisplaced fracture. Therefore, they should not try to treat the injury other than by immobilization and elevation.

Remind the group that immobilization must cover the joints above and below the site of the injury.

Tell the group that a strain involves a stretching and/or tearing of muscles or tendons. Strains during a flood response most often involve the muscles in the shoulder, knee, ankle, and back.

Point out that in some cases, strains may be difficult to distinguish from sprains or fractures. It is better to err on the side of caution and treat these injuries as if they were fractures.

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Display Slide 22

Conduct a class discussion based on this question.



Display Slide 23

Ask:

What guidelines did you learn in *CERT Basic Training* about immobilizing a sprain or strain?

Review the guidelines for splinting a sprain or strain:

1. Support the injured area above and below the site of the injury, including the joints.
2. Assess PMS (Pulse, Movement, Sensation) in the extremity before initiating the splint.
3. If possible, splint the injury in the position that you find it.
4. Don't try to realign bones or joints.
5. Fill the voids to further stabilize and immobilize the injury.
6. Immobilize above and below the injury.
7. After splinting, reassess PMS and evaluate against initial PMS assessment.



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Treating Lacerations and Blisters

Explain that debris in floodwaters may cause lacerations, while handling sandbags and equipment in a wet environment increases the likelihood of blisters. Blisters can be a common injury at sandbagging sites.

- To prevent a blister, use gloves, socks, a bandage, or similar protective covering over the area being rubbed.
- If a blister happens, try to keep it intact if it's not too painful. Unbroken skin over a blister provides a natural barrier to bacteria and decreases the risk of infection.
- Do not break blisters. Cover them loosely with dry, sterile dressings to keep air out, reduce pain, and prevent infection.
- For lacerations, control bleeding and dress and bandage the wound.

Remind the group that there are three main methods for controlling bleeding:

- Direct pressure
- Elevation
- Pressure points

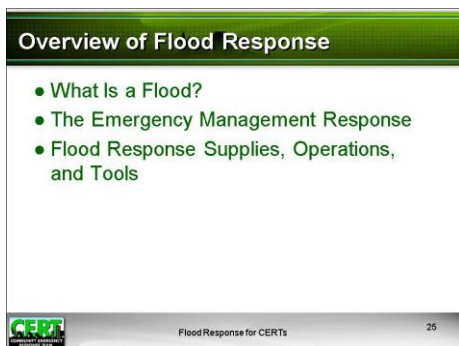
Remind participants that direct pressure and elevation will control bleeding in 95 percent of cases.

Explain that wounds should be cleaned by irrigating with clean, room temperature water. Once the wound is clean, apply a dressing and bandage to help keep it clean and control bleeding.

Does anyone have any questions about any of the injuries covered in this section?

Remind participants that safety precautions during flood response will be covered later in this module.





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Overview of Flood Response

Tell participants that in this topic they will be introduced to the basics of a flood response, including what constitutes a flood in their local community.

- What Is a Flood?
- The Emergency Management Response
- Flood Response Supplies, Operations, and Tools

What Is a Flood?

Explain that floods are one of the most common hazards in the United States. Flood effects may be confined to a community or neighborhood, or widespread.

Make these points about floods:

- All floods are not alike.
- Some floods develop slowly, sometimes over a period of days, while flash floods can develop quickly, sometimes in just a few minutes and without any visible signs of rain. Flash floods often have a dangerous wall of roaring water that carries rocks, mud, and other debris. Flash floods can sweep away most things in their path.
- Overland flooding occurs outside a defined river or stream – for instance, when a levee is breached – and can be very destructive.
- Flooding can also occur when a dam breaks, producing effects similar to flash floods.

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FLOOD RESPONSE FOR CERTS

Types of Floods

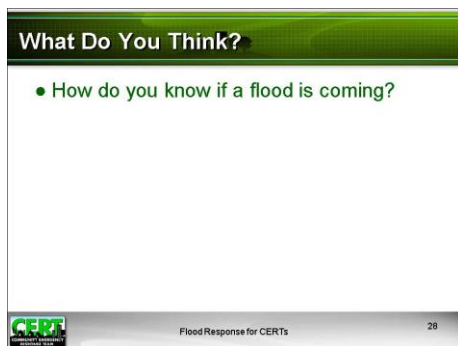
Explain the different types of floods.

- Coastal floods
 - May occur due to tidal surges and flash flooding
 - Are often produced by hurricanes and other large storms
- Overland floods
 - Occur when significant rainfall, sometimes combined with snow melt, causes a river to overflow waterway banks and levees
- Flash floods
 - Usually result from intense storms dropping large amounts of rain in a brief period
 - Occur with little or no warning
 - May occur even without rain in the immediate area, if rain causes flooding upstream
 - Effects are worsened by terrain
- Ice jams
 - Occur when ice sheets break apart, pile up, and form obstructions along rivers in colder climates
- Dam failures
 - Potentially the worst flood events
 - Usually the result of neglect, poor design, or structural damage
 - Giant quantity of water is suddenly let loose downstream

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Relate the question back to the scenario that you have just described. Record responses on an easel pad or whiteboard. Suggested responses:

- News reports
- TV crawl
- National Weather Service alerts (Web site, weather radio, e-mail, text message)
- Rising water levels

Scenario

To provide context for the information that will be presented in this topic, ask participants to imagine this scenario:

- Heavy rainfall in your community has caused water levels in a local waterway to rise
- The community has reason to believe that the waterway will eventually flood

Ask:

How do you know if a flood is coming?

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National Weather Service

- Storm Prediction Center issues watches and warnings
- CERT members should monitor these alerts during severe thunderstorms and coastal storms




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Flood Watch


- Indicates that flooding is possible and situation could worsen
- During a flood watch, you should:
 - Watch water levels
 - Stay tuned for further advisories
 - Alert neighbors

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Flood Warning

- Issued when flooding is expected
- Flash flood warning issued after few hours of locally heavy rainfall, a dam or levee failure, or water released from ice jam

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National Weather Service

Explain that the National Weather Service's Storm Prediction Center issues **watches** and **warnings** that can help communities prepare for floods, as well as tornadoes, severe thunderstorms, and hurricanes. It is important that you monitor these watches and warnings during inclement weather.

Say that the National Weather Service issues their watches and warnings using e-mail, text messages, and broadcasts on weather radios. It also posts this information on its Storm Prediction Center Web site at www.spc.noaa.gov.

Flood Watch

Explain that a flood watch is issued for situations related to widespread general flooding and indicates that flooding is possible and the situation could worsen. During a flood watch, participants should:

- Watch water levels
- Stay tuned for further advisories
- Alert neighbors

Flood Warning

Say that a flood warning is issued when flooding is expected.

Explain that a flash flood warning will be issued in response to a few hours of locally heavy rainfall, a dam or levee failure, or water released from an ice jam.

Remind participants that personal safety is the number one priority and that, in some instances, CERT members may have to evacuate instead of assisting professional responders.

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Flood Warning (cont'd)

- During a flood warning, you should take action
 - Alert neighbors
 - Listen to radio or television for further instruction
 - If any possibility of flash flooding, move to higher ground immediately
 - Prepare to evacuate
 - Evacuate

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Explain that, during a flood warning, participants should take action:

- Alert neighbors.
- Listen to radio or television for further instruction.
- If there is any possibility of flash flooding, move to higher ground immediately.
- Prepare to evacuate.
 - Move important items to an upper floor of your home.
 - Turn off utilities at main switches or valves if instructed to do so.
 - Disconnect electrical appliances.
 - Make sure your car is filled with gas.
 - Map a route to higher ground inland.
- Evacuate
 - Do not walk through moving water.
 - Do not drive into flooded areas.

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You should be familiar with the structure and protocols of the emergency management system in your community. You should also be well versed in your local Emergency Operations Plan (name changes by jurisdiction) as it relates to the procedures for responding to a flood.



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The Emergency Management Response

Explain that response protocols vary by community and that participants need to know the protocol in their community and where CERT fits into the protocol.

Continuing with the scenario, tell participants that the National Weather Service has issued a flood warning for your community.

Explain how the emergency management system in your community would respond to the scenario.

- Describe the Emergency Operations Plan in your community.
- Describe the roles and responsibilities of the public and private partners involved in a flood response in your community.

CERT Roles and Responsibilities

Explain how CERT fits into your community's Emergency Operations Plan.

- Discuss possible roles and responsibilities.
- Emphasize that roles may vary based on the type of flood, timing, and other variables, and that it is important for CERT members to adhere to the protocols for the incident to which they are responding.

Tell participants that, if their community needs them for a flood response, CERT members will be contacted. CERT members should not self-activate.

COMMUNITY EMERGENCY RESPONSE TEAM
FLOOD RESPONSE FOR CERTS

Tell participants that there are many jobs in a flood fight. CERTs will primarily be used to help fill sandbags and build a sandbag barrier(s).

Say that, if a CERT member is unable to handle heavy sandbags, there are other less demanding but equally important jobs to fill. For instance, a designated “stomper” may be appointed to flatten sandbags after they have been placed, which will be discussed later in this module.

Discuss the roles of the CERT Incident Commander/Team Leader (IC/TL) and Safety Officer in monitoring individual and team safety and well-being.

- There will need to be a process for rotating crews to keep responders fresh.
- CERT members will need to sign in and out so the IC/TL knows their whereabouts at all times.
- The CERT Safety Officer will oversee the operations scene to minimize or eliminate any hazards for CERT members.
- The IC/TL and Safety Officer will direct CERT members to take breaks, eat, and drink enough fluids.



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Be sure to specify which of these items will be provided to the CERT members (e.g., sand and sandbags) and which they will need to bring (e.g., work gloves).

Flood Response Supplies, Operations, and Equipment

Flood Response Supplies

Describe the basic supplies needed for building a sandbag barrier (in addition to people):

- Sandbags: Either cloth or plastic (both work well), and sand. Sandbags provide the mass to counter the force of the floodwaters.
- Polyethylene: commonly called "Poly." Poly provides a water barrier for sandbag barriers. The heaviest polyethylene sheeting available is used. Poly is generally available in 20- by 100-foot rolls from construction supply firms, lumberyards, and farm stores.
- Lumber and planking: Lumber may be needed for field construction projects, and planking is valuable to make paths over muddy ground.
- Shovels, wheelbarrows, etc.: These items are the mainstay of any flood fight.
- Other basic supplies: Drinking water, sanitation supplies, first aid kit, and work gloves.

Explain how sandbagging supplies will be staged during flood response, or how supplies have been staged in the past and are likely to be set up in future events.

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Flood Response Operations

Say that there are six basic operations that compose a flood response:

1. Supply and transportation
2. Filling sandbags
3. Moving sandbags
4. Building a sandbag barrier
5. Flood patrols
6. Support services

Say that this module focuses on Operations 2, 3, and 4 – working with sandbags.

Explain that you will now briefly cover Operations 1, 5, and 6, and that you will discuss Operations 2, 3, and 4 in detail in the Working with Sandbags topic.

Review Operations 1, 5, and 6:

- Operation 1, Supply and transportation: Those who work in this operation include: heavy equipment operators, truck drivers, people familiar with warehouse operations (including forklift drivers), school bus drivers to transport volunteers, and others. Without supplies and materials in the right place at the right time, the flood fight will grind to a halt.
- Operation 5, Flood patrols: These teams, usually groups of three, patrol the flood works and keep an eye out for developing problems. They look for and report leaks, sand boils (more on this later), and manholes or utility conduits that may have been missed and require sandbagging. Three-person teams are used for safety. If a problem develops or a person is hurt, one member can go for help while the other remains with the sick or injured worker.

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- Operation 6, Support services: Food service workers provide food and hot and cold beverages. Volunteers with medical experience deal with the minor cuts, scrapes, and blisters that can be expected.

Flood Response Equipment

Describe the equipment CERT members might see during a flood response:

- Pumps (to remove water that infiltrates past the barrier)
- Trucks
- Forklifts
- Front-end loaders
- Sandbag-filling machines

Explain that in addition to sandbags, a variety of barriers may be used during a flood response.

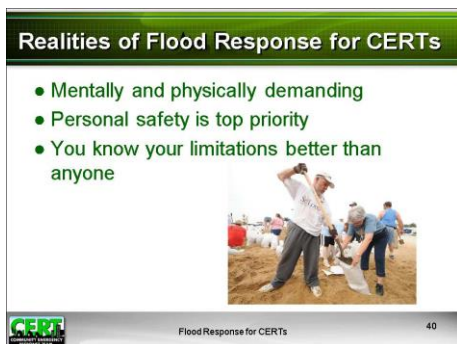
- Bags filled with dirt or gravel instead of sand
- Tubes and bladders filled with water
- Steel structures with a waterproof membrane
- Hay bales, plywood, or lumber covered with poly
- Concrete traffic dividers (Jersey walls)

Does anyone have any questions about the basics of a flood response?

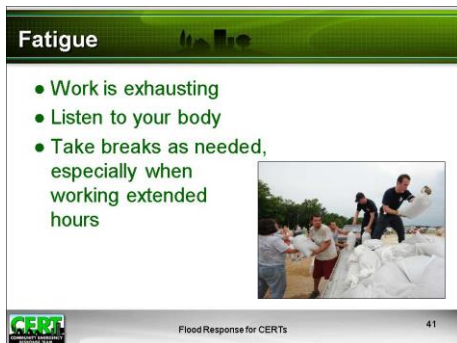
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Personal Safety Around Floodwaters

Tell participants that in this topic they will learn more about the dangers of floodwaters and how to work safely around them.

Begin this topic by inviting participants who have experienced a flood or flood response to briefly share what surprised them most. Use the participants' responses to facilitate a discussion about the realities of the flood response.

Realities of Flood Response for CERTs

Tell participants that flood response is a mentally and physically demanding process and that personal safety is always the top priority.

- CERT members should speak up if they are uncomfortable working in any situation.
- CERT members know their limitations better than anyone.

Fatigue

Reiterate that participating in a flood response is physically demanding. It is important for participants to listen to their bodies and take breaks as needed, especially when working extended hours under stressful circumstances.

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FLOOD RESPONSE FOR CERTS

Weather

- Weather conditions can affect a flood response by making tasks more difficult
- Dress appropriately for weather
- Dress in layers



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Mental Preparation

- Flood response is long process
 - Work is repetitive
 - Signs of progress are limited
 - Experience can be frustrating
- Take breaks to keep yourself alert



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What Do You Think?

- What are some of the most common dangers during a flood response?

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Write the participants' responses on an easel.

Weather

Say that weather conditions, such as rain and wind, can affect the flood response by making the tasks associated with constructing a sandbag barrier more difficult and increasing the likelihood of injury.

Emphasize that it is important to dress appropriately for the weather and in layers.

Mental Preparation

Say that responding to a flood is a long, arduous process. The work involved, including filling sandbags, is often repetitive, and there are few immediate signs that progress is being made. This can result in a frustrating experience for responders who aren't mentally prepared.

Explain that the mental stress, as well as the physical stress, is another reason that taking breaks is important during flood response to stay alert.


Ask:

What are some of the most common dangers during a flood response?

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FLOOD RESPONSE FOR CERTS

Dangers of Flood Response

- Icy/muddy conditions
- Electrical equipment and machinery
- Swift water movement
- Contaminants
- Temperature (hot and cold)
- Debris
- Sand boils

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Sand Boils

- Occur when pressure of floodwater causes water to bubble up on dry side of sandbag barrier
- Generally harmless if contain clean, clear water
- Extremely dangerous if contain sand ("dirty")
 - May lead to eventual barrier failure
- Treat all sand boils as "dirty"
 - Do not ignore
 - Surround with ring of sandbags



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Dangers of Flood Response

Review some of the dangers of working in and around floodwaters.

- Icy/muddy conditions
- Working around electrical equipment and machinery
- Swift water movement
- Contaminants
- Temperature (hot and cold)
- Debris
- Sand boils

Explain that sand boils occur when the pressure of floodwater causes water to bubble up on the dry side of a sandbag barrier or levee. Although sand boils containing clean, clear water are generally harmless, sand boils containing sand (called "dirty") are extremely dangerous and may lead to eventual levee failure.

Explain that, since it is very difficult to tell if water in a sand boil is dirty or clean, sand boils should never be ignored. The best way to deal with a sand boil is to fight it by building a ring of sandbags around it.

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Common Ailments and Injuries

Reemphasize some of the common ailments and injuries that may occur during a flood response.

- Hyperthermia
- Hypothermia
- Sprains and strains (ankle, knee, back, and shoulder are the most common)
- Raw hands
- Blisters
- Lacerations

Work Smart

Tell participants that there are a number of safety tips that CERT members should follow to limit the demands and dangers of responding to a flood.

Review with participants the Work Smart: Flood Response Safety Tips sheet in the Participant Manual and on the following page in the Instructor Guide.

Remind participants that safety is ultimately each individual's responsibility.

Does anyone have any questions about personal safety around floodwaters?

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Work Smart: Flood Response Safety Tips

Work Smart: Flood Response Safety Tips

Take Care of Yourself

- Drink plenty of fluids and eat regularly.
- Pace yourself.
- Dress appropriately.

Stay Healthy

- Wash your hands before eating, and follow basic sanitary procedures.
- Always lift with your legs, not your back.
- Properly care for all wounds and injuries, no matter how minor.
- Stop immediately if you feel dizzy, have chest pain, shortness of breath, or pain down your left arm. Women are somewhat more likely than men to experience symptoms such as shortness of breath, nausea/vomiting, and back or jaw pain. Seek immediate medical attention if you experience any of these symptoms!



Practice Safety

- Use gloves, goggles, and a personal flotation device.
- Use the buddy system.
- Travel only when necessary and in groups of three.
- Plan an emergency escape route.

Watch Out!

- Use extreme caution around electrical equipment and machinery.
- Don't walk behind construction equipment.
- Use extreme care when walking in flooded areas.
- Be particularly cautious when working around levees or barriers that may fail.
- Be careful around foundations and watch out for cave-ins.
- Report broken gas lines immediately!
- Treat all sand boils as if the water is "dirty." Ring all of them with sandbags.

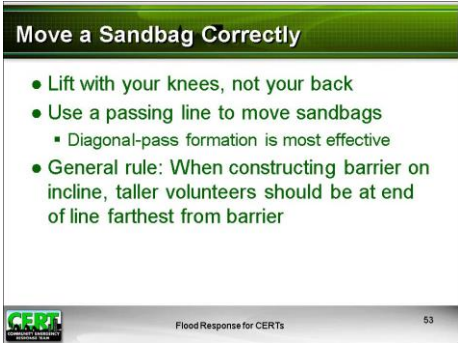
**COMMUNITY EMERGENCY RESPONSE TEAM
FLOOD RESPONSE FOR CERTS**

INSTRUCTOR GUIDANCE	CONTENT
<p data-bbox="196 430 643 768"></p> <p data-bbox="191 787 435 821">Display Slide 49</p> <p data-bbox="191 905 602 976">Show the <i>Flood Fighting with Sandbags</i> video.</p>	<p data-bbox="678 430 1097 472"><i>Working with Sandbags</i></p> <p data-bbox="678 489 1463 674">Remind the class that Operation 1 in flood response, supply and transportation, was summarized earlier. Explain that sandbags are the primary tool for fighting floods. Tell the class that they will now learn about flood response Operations focused on sandbagging:</p> <ul data-bbox="678 693 1279 835" style="list-style-type: none">• Operation 2: Filling sandbags• Operation 3: Moving sandbags• Operation 4: Building a sandbag barrier <p data-bbox="678 905 1438 1014">Tell participants that they will watch a 15-minute video that provides an overview of the full sandbagging process.</p> <p data-bbox="678 1033 1422 1142">After showing the video, tell participants that they will have an opportunity to practice sandbagging skills during the culminating activity of this module.</p> <p data-bbox="678 1161 1458 1270">As discussed earlier in the module, your jurisdiction may have a procedure or plan for staging or distributing sandbagging supplies. If so, remind participants.</p>
<p data-bbox="196 1327 643 1656"></p> <p data-bbox="191 1675 435 1709">Display Slide 50</p>	<p data-bbox="678 1327 1003 1369">How to Fill a Sandbag</p> <p data-bbox="678 1377 1442 1520">Remind participants that hundreds or thousands of sandbags may be needed for a flood response, so it is important to follow the best practices outlined in this module to conserve energy.</p> <p data-bbox="678 1539 1414 1572">Several essential items are used to make sandbags.</p> <ul data-bbox="678 1591 1029 1734" style="list-style-type: none">• Sand (or dirt)• Bags (cloth or plastic)• Shovel <p data-bbox="678 1753 1344 1824">You may use bulk food bags from restaurants if traditional sandbags are not available.</p>

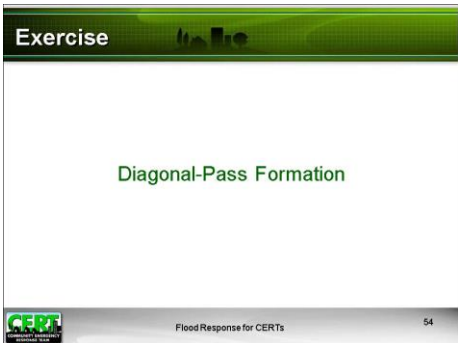
**COMMUNITY EMERGENCY RESPONSE TEAM
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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="188 422 643 762" data-label="Image"> </div> <p data-bbox="188 779 431 814">Display Slide 51</p>	<p data-bbox="672 426 1459 495">Describe the correct way to fill a sandbag with a shovel, citing the key points from the video.</p> <ul data-bbox="672 520 1422 898" style="list-style-type: none"> • Filling a sandbag is a two- or three-person operation. • One volunteer holds the empty sandbag on the ground, slightly in front of his or her spread feet, folding out the throat. • Second volunteer empties a shovelful of material into the open end until the bag is 1/2 to 2/3 full. • Third volunteer, if available, stacks and stockpiles the filled sandbags. <p data-bbox="672 919 1459 1058">Explain that, for larger operations, bag-holding racks, funnels on the backs of trucks, and other power-loading equipment, if available, may be used to expedite the process.</p>
<div data-bbox="188 1134 643 1474" data-label="Image"> </div> <p data-bbox="188 1488 431 1524">Display Slide 52</p> <p data-bbox="188 1541 639 1829">Note: Tied sandbags should be used only for special situations when pre-filling and stockpiling may be required, or for specific purposes such as filling holes, holding objects in position, or to form barriers backed by supportive planks.</p>	<p data-bbox="672 1134 1053 1169"><u>General Sandbagging Tips</u></p> <p data-bbox="672 1186 1026 1222">Emphasize the following:</p> <ul data-bbox="672 1241 1463 1528" style="list-style-type: none"> • Keep your elbows close to your sides when filling sandbags. • Rotate the various duties involved in filling sandbags so that you aren't working the same muscle group for extended periods of time. • Gloves are extremely important so your hands don't become raw. <p data-bbox="672 1547 1459 1656">Sandbags do not need to be tied, although they may be tied loosely at the top. Untied bags form a tighter seal when stacked than tied sandbags.</p>

**COMMUNITY EMERGENCY RESPONSE TEAM
FLOOD RESPONSE FOR CERTS**

INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="188 428 643 768"></div> <p data-bbox="188 785 435 821">Display Slide 53</p>	<p data-bbox="673 428 1052 464"><u>Move a Sandbag Correctly</u></p> <p data-bbox="673 480 1432 590">Explain that using the improper technique to lift and move a sandbag increases the likelihood of injury and the rate at which you become fatigued.</p> <ul data-bbox="673 611 1409 680" style="list-style-type: none">• When lifting sandbags, it is important to use your knees, not your back. <p data-bbox="673 699 1438 768">Tell participants that sandbags are typically moved via a passing line.</p> <ul data-bbox="673 789 1456 1220" style="list-style-type: none">• Standing in a staggered line with volunteers facing each other reduces the physical exertion required to move sandbags down the line.• The following technique can be used to set up the diagonal-pass formation:<ul data-bbox="771 1010 1419 1220" style="list-style-type: none">○ Volunteers who are part of the pass line stand side by side and count off “1, 2, 1, 2” etc.○ All the ‘1s’ take a baby step back.○ All the ‘2s’ turn around. <p data-bbox="673 1241 1435 1350">Explain that, as a general rule, when constructing a barrier on an incline, the taller volunteers should be at the end of the line farthest from the barrier.</p>

**COMMUNITY EMERGENCY RESPONSE TEAM
FLOOD RESPONSE FOR CERTS**

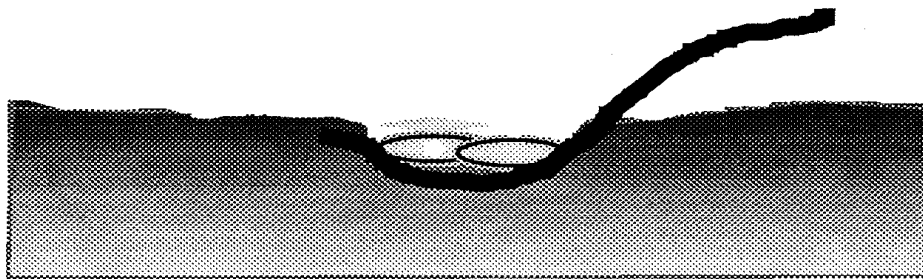
INSTRUCTOR GUIDANCE	CONTENT
 <p>Display Slide 54</p> <p>The purpose of the exercise is to demonstrate the effectiveness of the diagonal-pass formation, not to practice moving sandbags and then placing them to build a sandbag barrier. Those two skills will be reinforced in the culminating exercise of this module.</p>	<h3>How to Move a Sandbag</h3> <p><u>Diagonal-Pass Demonstration</u></p> <p><u>Purpose:</u> To demonstrate the recommended method for moving sandbags down a line, perform the following exercise.</p> <p><u>Instructions:</u> Follow the steps below to conduct the exercise.</p> <ol style="list-style-type: none">1. Divide the class into two groups.2. Tell one group to line up side by side.3. Tell the other group to form a staggered line facing each other (as they would to use the diagonal-pass method).4. Hand the participants at the end of each group's line a filled sandbag, and tell them to pass the sandbag down the line.5. After the participants have passed the sandbag up and down the line at least two times, ask the groups to switch formations.6. Repeat Step 4. <p><u>Debrief:</u></p> <p>Ask which method was easier and more efficient.</p> <p>Explain that, instead of requiring the passer to turn his or her body 180 degrees after receiving a sandbag, the diagonal-pass formation creates a virtual conveyor belt that reduces stress on your body and increases efficiency.</p>

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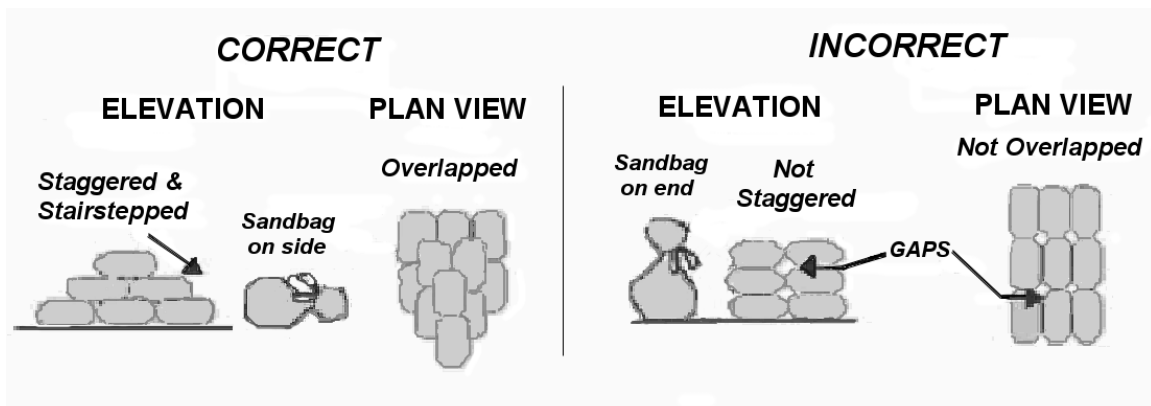
How to Build a Sandbag Barrier

1. Remove any debris from the areas where bags are to be placed.
2. Dig a trench 4-6 inches deep and two sandbags wide.
3. Place poly flat on the ground, extending across the trench and away from the bottom row of sandbags and toward the water.



Water is on this side

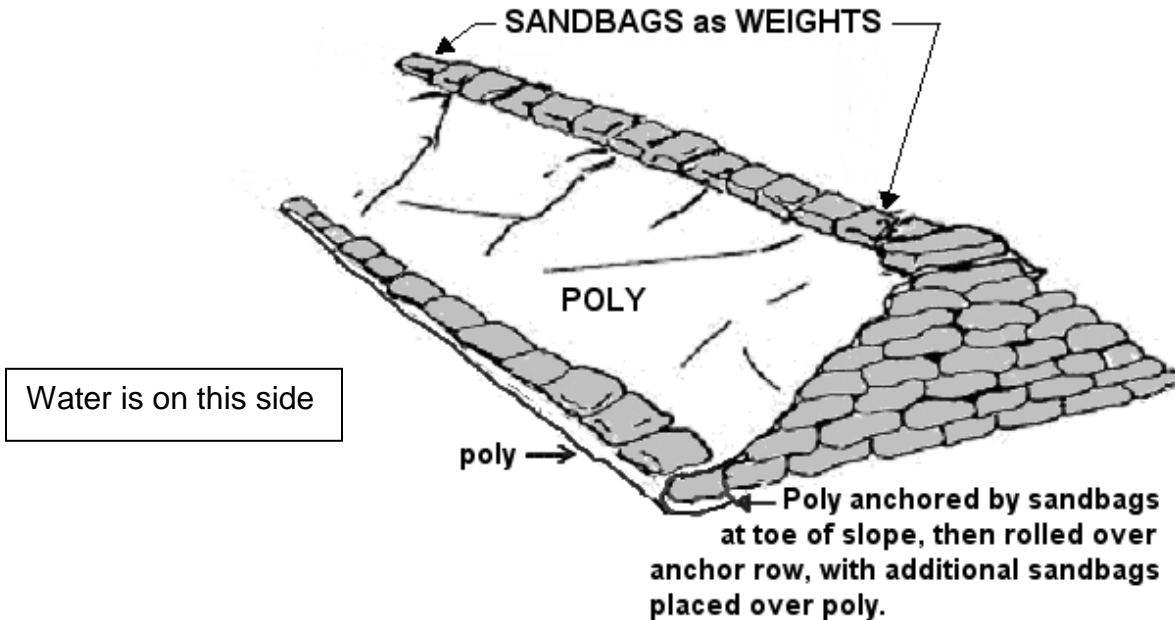
4. Place a row of sandbags over the poly edge to anchor it.
 - a. Place the bags lengthwise and parallel to the direction of flow.
 - b. Overlap the sandbags parallel to the direction of the water flow.
 - c. The filled portion of one bag should lie on the unfilled portion of the previous bag.



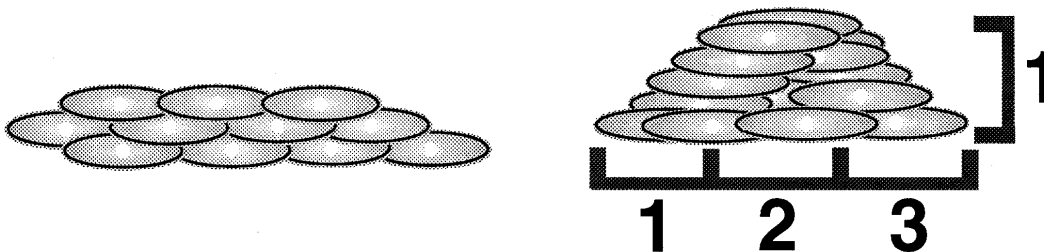
5. Place the second layer of bags parallel to the first layer.
 - a. Be sure to place sandbags over the seams of the previous layer.

**COMMUNITY EMERGENCY RESPONSE TEAM
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6. Roll the poly over the anchoring row of sandbags and anchor again.
7. Flip the poly over the second row of sandbags to move it out of the way while you are building the barrier. The end result will look like this:



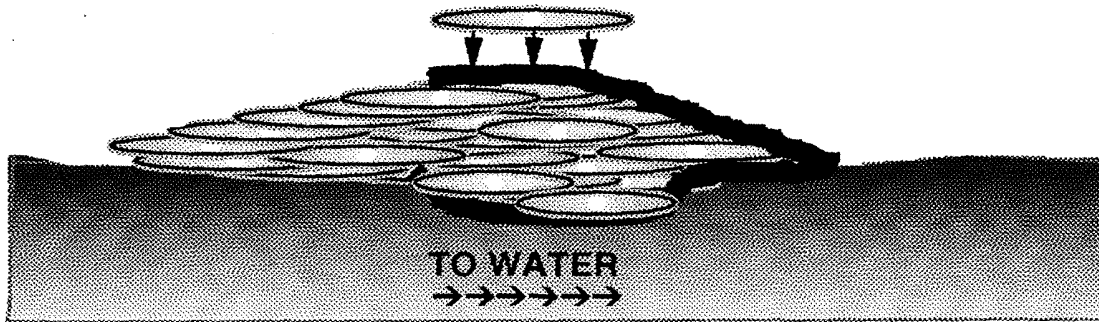
8. Place sandbags in additional layers parallel to previous layers (and parallel to the flow).
 - a. Offset rows of sandbags by one-half bag length to cover seams in layer below.
9. Stack sandbags in a pyramidal structure using a 3-to-1 ratio. That is, for every foot in height, there should be 3 feet in width. This ratio provides the best structural integrity.



10. After placement, tamp each sandbag in place to eliminate gaps and form a tight seal. Walk on the sandbag and butt the ends of the sacks together, maintaining a staggered joint placement and folding under all loose ends.

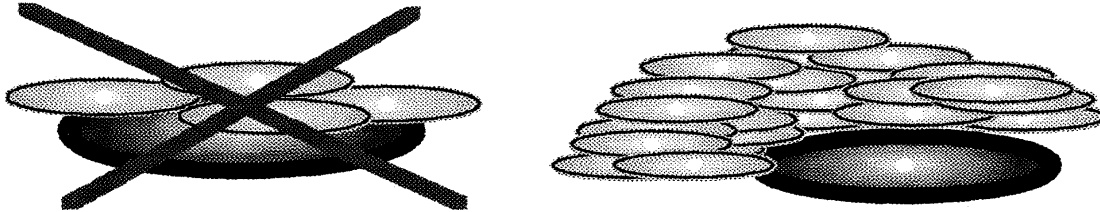
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11. Once the barrier is at the appropriate level, fold the poly over the top of the barrier and anchor it with additional sandbags.

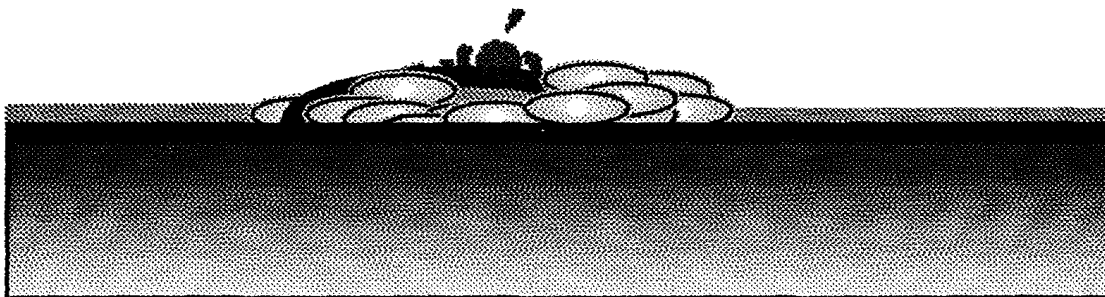


Sandbagging Manholes and Sand Boils

Do not place sandbags on manhole covers! Ring manholes with sandbags and allow the water to seek its own level.




Ring sand boils with sandbags to reduce water flow and stop sand and soil movement. Do not attempt to completely stop the water flow.



Illustrations from Federal Emergency Management Agency's *Expedient Flood Training* and U.S. Army Corps of Engineers *Flood-Fight Handbook: Preparing for a Flood* (St. Paul)

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INSTRUCTOR GUIDANCE	CONTENT
<p data-bbox="191 430 643 768"> Pyramid or Vertical? <ul style="list-style-type: none">• General rule: Do not stack sandbags vertically• May be placed one on top of another if floodwater:<ul style="list-style-type: none">▪ Is not fast moving▪ Is up to a foot high with no debris Flood Response for CERTs 57</p> <p data-bbox="191 787 435 823">Display Slide 57</p> <p data-bbox="191 890 643 1228"> Building a Barrier Safety Concerns <ul style="list-style-type: none">• Maintain situational awareness• Treat all sand boils as dirty• Be cautious when working on levees; barriers may break Flood Response for CERTs 58</p> <p data-bbox="191 1247 435 1283">Display Slide 58</p> <p data-bbox="191 1360 269 1430"></p>	<p data-bbox="673 430 966 466"><u>Pyramid or Vertical?</u></p> <p data-bbox="673 485 1463 625">Sandbags should generally not be stacked vertically. However, they may be placed one on top of another if the floodwater is not fast moving and is up to a foot high with no debris.</p> <p data-bbox="673 646 1422 753">Emphasize that for any form of sandbag barrier other than the pyramidal structure, the design should be cleared first by an engineer.</p> <p data-bbox="673 894 1029 930"><u>Related Safety Concerns</u></p> <p data-bbox="673 949 1105 984">Explain these safety concerns:</p> <ul data-bbox="673 1003 1463 1161" style="list-style-type: none">• It is impossible to tell if water in a sand boil is dirty or clean, so boils should always be treated as dirty.• Be cautious when working on levees; barriers may break. <p data-bbox="673 1356 1406 1425">Does anyone have any questions about working with sandbags?</p>



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INSTRUCTOR GUIDANCE	CONTENT
<p>See Preparation. You will need the following supplies for this activity:</p> <ul style="list-style-type: none">• Shovels• Sand• Bags <p>Participants will need gloves and goggles.</p>	<p><i>Sandbagging Activity</i></p> <p><u>Purpose:</u> This exercise allows participants to practice filling and moving sandbags and constructing a sandbag barrier. Everyone has an opportunity to practice each skill involved in the sandbagging process.</p> <p><u>Instructions:</u> Follow the steps below to conduct the activity.</p> <ol style="list-style-type: none">1. Divide the class into teams of two.2. Tell each team to fill 10 sandbags – five per team member – with one team member holding the empty sandbag on the ground and the other team member using a shovel to fill the sandbag.3. After each team has filled 10 bags, tell the participants to bring their filled sandbags to a communal stockpile. Remind participants to lift sandbags with their knees, not with their backs.4. Tell participants to form a diagonal-pass line to practice moving sandbags.5. Tell participants at the end of the line to place the sandbags to form a barrier that is 9 feet wide and 3 feet high. (You may alter the dimensions of the barrier depending on the number of participants.)6. Periodically, ask participants to rotate their positions along the line so that everyone has an opportunity to practice placing the sandbags.7. Provide corrective feedback as necessary during the sandbagging process. For example, coach the participants if they forget to overlap seams or to stomp each sandbag as it is placed.

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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="190 632 643 968"> <p>Summary</p> <ul style="list-style-type: none"> • Types of floods common in the local area • Review of relevant concepts from <i>CERT Basic Training</i> <ul style="list-style-type: none"> ▪ Remember onscene management and ICS structure ▪ Personal safety is paramount ▪ Conduct medical assessment and treatment • Types of floods and flood watches and warnings • Emergency management system response to floods <p><small>CERT Flood Response for CERTs 59</small></p> </div> <p>Display Slide 59</p> <div data-bbox="190 1136 643 1472"> <p>Summary (cont'd)</p> <ul style="list-style-type: none"> • Flood response supplies, operations, equipment • Flood realities and dangers • How to fill and move sandbags safely and correctly • How to build a sandbag barrier safely and correctly <p><small>CERT Flood Response for CERTs 60</small></p> </div> <p>Display Slide 60</p>	<p>Module Summary</p> <p>Review any lessons learned from the sandbagging activity.</p> <p>Review the key points discussed in this module.</p> <ul style="list-style-type: none"> • Types of floods common in the local area • Relevant concepts from <i>CERT Basic Training</i> <ul style="list-style-type: none"> ○ Remember onscene management and the ICS structure ○ Personal safety is paramount ○ Conduct medical assessment and treatment • Types of floods and flood watches and warnings • Emergency management system response to floods <ul style="list-style-type: none"> • Flood response supplies, operations, equipment • Flood realities and dangers • How to fill and move sandbags safely and correctly • How to build a sandbag barrier safely and correctly

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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="190 426 643 764"><p>Additional Resources</p><ul style="list-style-type: none">• www.ag.ndsu.edu/disaster/flood.html• www.redcross.org/en/prepare/events• OSHA Fact Sheets: Flood Hazards and Flood Cleanup<p style="text-align: center; font-size: small;">Flood Response for CERTs</p><p style="text-align: right; font-size: small;">61</p></div> <p>Display Slide 61</p> 	<p>Additional Resources</p> <p>Tell participants that they can access the following Web sites for additional information on flood response procedures:</p> <ul style="list-style-type: none">• www.ag.ndsu.edu/disaster/flood.html• www.ready.gov/floodawareness• www.redcross.org/en/prepare/events <p>Refer participants to the glossary and the two OSHA fact sheets: Cleanup Hazards and Flood Cleanup. They are at the conclusion of the Participant Manual and on the following pages of the Instructor Guide.</p> <p>Explain that the fact sheets contain important safety information about cleaning up after floods. Advise participants to review the fact sheets before participating in flood cleanup activities.</p> <p>Do you have any questions about anything covered in this module?</p> <p>Closing</p> <p>Provide information on any upcoming training or other local CERT activities.</p> <p>Present certificates to participants.</p> <p>Thank participants for attending the session.</p>

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Glossary of Terms for Flood Response for CERTs

Flood categories:

Coastal: Occur from tidal surges and flash flooding; are often produced by hurricanes and other large storms.

Overland floods: Occur when significant rainfall, sometimes combined with snow melt, causes a river to overflow waterway banks and levees.

Flash floods: Usually result from intense storms dropping large amounts of rain in a brief period; may occur even without rain in the immediate area, if rain causes flooding upstream.

Ice jams: Occur when ice sheets break apart, pile up, and form obstructions along rivers in colder climates.

Flood crest: Maximum height of floodwaters.

Flood patrols: Teams, usually groups of three, which patrol the flood works and keep an eye out for developing problems.

Floodplain: Any land area susceptible to being inundated by floodwaters from any source.

Floodwaters: The waters of a flood.

Jersey barrier: A concrete barrier originally developed as a highway median. Also called Jersey wall, Pennsylvania separator, traffic divider, and K-rail.

Levee: A natural or artificial slope or wall to regulate water levels. It is usually earthen and often parallel to the course of a river or the coast.

National Weather Service watches and warnings:

Flood Watch: National Weather Service notice that flooding is possible. Listen to NOAA Weather Radio, commercial radio, or television for information.

Flash Flood Watch: National Weather Service notice that flash flooding is possible. Be prepared to move to higher ground; listen to NOAA Weather Radio, commercial radio, or television for information.

Flood Warning: National Weather Service notice that flooding is occurring or will occur soon; if advised to evacuate, do so immediately.

Flash Flood Warning: National Weather Service notice that a flash flood is occurring; seek higher ground on foot immediately.

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Poly: Polyethylene that provides a water barrier for sandbag levees.

PPE: Personal Protective Equipment. For flood response it includes appropriate dress for the weather, work gloves, goggles, and personal flotation devices if working near water.

Sand boil: Along a river levee, a "sand boil" can be formed by a difference in hydraulic pressure between the water the levee is holding back and saturated ground on the other side of the levee. Under pressure, water bubbles up on the dry side of the levee.

Sandbag: A sack made of burlap, polypropylene, or other materials that is filled with sand or dirt and used for flood control.

Sandbag barrier: An artificial levee made of sandbags.



OSHA FACT Sheet

Cleanup Hazards

Cleanup work of any kind is hazardous, but flood conditions make it even more so. Following the procedures listed below will help to keep you safe and healthy while cleaning up after natural disasters that involve flooding.

Health Tips

- Take frequent rest breaks when lifting heavy, water-laden objects. Avoid overexertion and practice good lifting techniques. To help prevent injury, use teams of two or more to move bulky objects; avoid lifting any materials that weigh more than 50 pounds per person, and use proper automated lifting assistance devices if practical.
- When working in hot environments, have plenty of drinking water available, use sunscreen, and take frequent rest breaks. Wear light-colored, loose-fitting clothing.
- Be sure a first-aid kit is available to disinfect any cuts or abrasions. Protect open cuts and abrasions with waterproof gloves or dressings.
- Wash your hands often during the day, especially before eating, drinking, or applying cosmetics.

General Precautions

- Use a wooden stick or pole to check flooded areas for pits, holes, and protruding objects before entering.
- Ensure that all ladders and scaffolds are properly secured prior to use.
- Conduct a preliminary worksite inspection to verify stability before entering a flooded or formerly flooded building or before operating vehicles over roadways or surfaces. Don't work in or around any flood-damaged building until it has been examined and certified as safe for work by a registered professional engineer or architect.
- Washouts, trenches, excavations, and gullies must be supported or their stability verified

prior to worker entry. All trenches should be supported (e.g., with a trench box); if no support is available, the trench must be sloped at no less than a 1:1 (45°) angle for cohesive soil and 1:1½ (34°) angle for granular soils including gravel, sand, and loamy sand or submerged soil or soil from which water is freely seeping.

- Establish a plan for contacting medical personnel in the event of an emergency.
- Report any obvious hazards (downed power lines, frayed electric wires, gas leaks or snakes) to appropriate authorities.
- Use fuel-powered generators outdoors. Do not bring them indoors.
- Use life-vests when engaged in activities that could result in deep water exposure.
- Use extreme caution when handling containers holding unknown substances or known toxic substances (for example floating containers of household or industrial chemicals). Contact the Environmental Protection Agency for information on disposal at the National Response Center (1-800-424-8802).
- Do NOT use improvised surfaces (e.g., refrigerator racks) for cooking food or for boiling water to avoid exposure to heavy metals.

Clothing and Personal Protective Equipment

- Always wear water tight boots with steel toe and insole, gloves, long pants, and safety glasses during cleanup operations; sneakers should NOT be worn because they will not prevent punctures, bites or crush injuries. Wear a hard hat if there is any danger of falling debris.
- Wear a NIOSH-approved dust respirator if working with moldy building materials or vegetable matter (hay, stored grain, or compost).

- When handling bleach or other chemicals, follow the directions on the package; wear eye, hand, and face protection as appropriate; and have plenty of clean water available for eye wash and other first-aid treatments.

Electrical Hazards

- Do NOT touch downed power lines or any object or water that is in contact with such lines.
- Treat all power lines as energized until you are certain that the lines have been de-energized.
- Beware of overhead and underground lines when clearing debris. Extreme caution is necessary when moving ladders and other equipment near overhead power lines to avoid inadvertent contact.
- If damage to an electrical system is suspected (for example, if the wiring has been under water, you can smell burning insulation, wires are visibly frayed, or you see sparks), turn off the electrical system in the building and follow lockout/tagout procedures before beginning work. Do not turn the power back on until electrical equipment has been inspected by a qualified electrician.
- When using a generator, be sure that the main circuit breaker is OFF and locked out prior to starting the generator. This will prevent

inadvertent energization of power lines from backfeed electrical energy from generators and help protect utility line workers from possible electrocution.

- Be aware that de-energized power lines may become energized by a secondary power source such as a portable backup generator.
- Any electrical equipment, including extension cords, used in wet environments must be marked, as appropriate, for use in wet locations and must be undamaged. Be sure that all connections are out of water.
- All cord-connected, electrically operated tools and equipment must be grounded or be double insulated.
- Ground-fault circuit interrupters (GFCIs) must be used in all wet locations. Portable GFCIs can be purchased at hardware stores.

Fire Protection

- Immediately evacuate any building that has a gas leak until the leak is controlled and the area ventilated.
- Be sure an adequate number of fire extinguishers are available and re-evaluate the fire evacuation plan.
- Be sure all fire exits are clear of debris and sand bags.

This is one in a series of informational fact sheets highlighting OSHA programs, policies, or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to *Title 29 of the Code of Federal Regulations*. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999. See also OSHA's website at www.osha.gov.





OSHA FACT Sheet

Flood Cleanup

Flooding can cause the disruption of water purification and sewage disposal systems, overflowing of toxic waste sites, and dislodgement of chemicals previously stored above ground. Although most floods do not cause serious outbreaks of infectious disease or chemical poisonings, they can cause sickness in workers and others who come in contact with contaminated floodwater. In addition, flooded areas may contain electrical or fire hazards connected with downed power lines.

Floodwater

Floodwater often contains infectious organisms, including intestinal bacteria such as *E. coli*, *Salmonella*, and *Shigella*; Hepatitis A Virus; and agents of typhoid, paratyphoid and tetanus. The signs and symptoms experienced by the victims of waterborne microorganisms are similar, even though they are caused by different pathogens. These symptoms include nausea, vomiting, diarrhea, abdominal cramps, muscle aches, and fever. Most cases of sickness associated with flood conditions are brought about by ingesting contaminated food or water. Tetanus, however, can be acquired from contaminated soil or water entering broken areas of the skin, such as cuts, abrasions, or puncture wounds. Tetanus is an infectious disease that affects the nervous system and causes severe muscle spasms, known as lockjaw. The symptoms may appear weeks after exposure and may begin as a headache, but later develop into difficulty swallowing or opening the jaw.

Floodwaters also may be contaminated by agricultural or industrial chemicals or by hazardous agents present at flooded hazardous waste sites. Flood cleanup crew members who must work near flooded industrial sites also may be exposed to chemically contaminated floodwater. Although different chemicals cause different health effects, the signs and symptoms most frequently associated with chemical poisoning are headaches, skin rashes, dizziness, nausea, excitability, weakness, and fatigue.

Pools of standing or stagnant water become breeding grounds for mosquitoes, increasing the risk of encephalitis, West Nile Virus or other mosquito-borne diseases. The presence of wild animals in populated areas increases the risk of diseases caused by animal bites (e.g., rabies) as well as diseases carried by fleas and ticks.

Protect Yourself

After a major flood, it is often difficult to maintain good hygiene during cleanup operations. To avoid waterborne disease, it is important to wash your hands with soap and clean, running water, especially before work breaks, meal breaks, and at the end of the work shift. Workers should assume that any water in flooded or surrounding areas is not safe unless the local or state authorities have specifically declared it to be safe. If no safe water supply is available for washing, use bottled water, water that has been boiled for at least 10 minutes or chemically disinfected water. (To disinfect water, use 5 drops of liquid household bleach to each gallon of water and let sit for at least 30 minutes for disinfection to be completed.) Water storage containers should be rinsed periodically with a household bleach solution.

If water is suspected of being contaminated with hazardous chemicals, cleanup workers may need to wear special chemical protective outer clothing and goggles. Before entering a contaminated area that has been flooded, you should don plastic or rubber gloves, boots, and other protective clothing needed to avoid contact with floodwater.

Decrease the risk of mosquito and other insect bites by wearing long-sleeved shirts, long pants, and by using insect repellents. Wash your hands with soap and water that has been boiled or disinfected before preparing or eating foods, after using the bathroom, after participating in flood cleanup activities, and after handling articles contaminated by floodwaters. In addition, children should not be allowed to play

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FLOOD RESPONSE FOR CERTS

Flood Cleanup

in flood waters or with toys that have been in contact with flood waters. Toys should be disinfected.

What to do if Symptoms Develop

If a cleanup worker experiences any of the signs or symptoms listed above, appropriate first-aid treatment and medical advice should be sought. If the skin is broken, particularly with a puncture wound or a wound in contact with potentially contaminated material, a tetanus vaccination may be needed if it has been five years or more since the individual's last tetanus shot.

Tips to Remember

- Before working in flooded areas, be sure your tetanus shot is current (given within the last 10 years). Wounds that are associated with a flood should be evaluated for risk; a physician may recommend a tetanus immunization.
- Consider all water unsafe until local authorities announce that the public water supply is safe.

- Do not use contaminated water to wash and prepare food, brush your teeth, wash dishes, or make ice.
- Keep an adequate supply of safe water available for washing and potable water for drinking.
- Be alert for chemically contaminated floodwater at industrial sites.
- Use extreme caution with potential chemical and electric hazards, which have great potential for fires and explosions. Floods have the strength to move and/or bury hazardous waste and chemical containers far from their normal storage places, creating a risk for those who come into contact with them. Any chemical hazards, such as a propane tank, should be handled by the fire department or police.
- If the safety of a food or beverage is questionable, throw it out.
- Seek immediate medical care for all animal bites.

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