
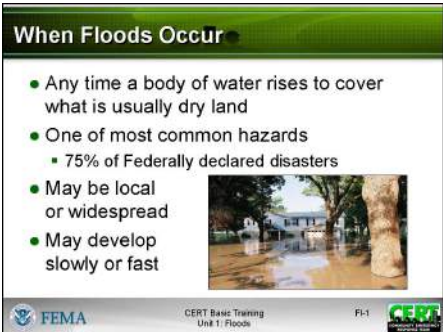
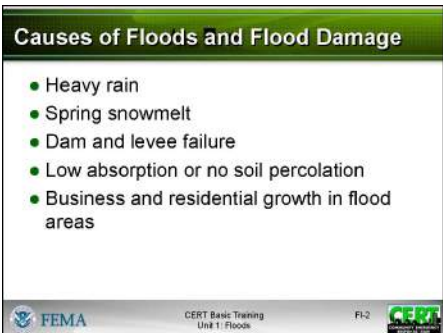


Floods

INSTRUCTOR GUIDANCE	CONTENT
 <p>Floods</p> <p>CERT Basic Training Hazards</p> <p>FEMA citizen corps</p>	<h2><i>Floods</i></h2> <p>Introduce this topic by explaining that floods are one of the most common hazards in the United States. A flood occurs any time a body of water rises to cover what is usually dry land.</p> <p>Point out that flood effects can be local, impacting a neighborhood or community, or very large, affecting entire river basins and multiple states. While some floods develop slowly, over a period of days; some may develop quickly, and cause flash floods. Floods are the most frequent and costly natural disasters in terms of human hardship and economic loss. According to a 2007 report by the U. S. Geological Survey (USGS), over 75 percent of declared Federal disasters are related to floods.</p>
 <p>When Floods Occur</p> <ul style="list-style-type: none">Any time a body of water rises to cover what is usually dry landOne of most common hazards<ul style="list-style-type: none">75% of Federally declared disastersMay be local or widespreadMay develop slowly or fast <p>FEMA CERT Basic Training Unit 1: Floods FI-1</p>	
 <p>Causes of Floods and Flood Damage</p> <ul style="list-style-type: none">Heavy rainSpring snowmeltDam and levee failureLow absorption or no soil percolationBusiness and residential growth in flood areas <p>FEMA CERT Basic Training Unit 1: Floods FI-2</p>	<h2>Causes</h2> <p>Floods and flood damage have many causes:</p> <ul style="list-style-type: none"><u>Heavy rain</u>, which may occur over several days or as intense rainfall over a short period of time.<u>Spring snowmelt</u> or ice or debris jams that cause a river or stream to overflow its banks and flood the surrounding area.
<p>Display Slide FI-0</p>	
<p>Display Slide FI-1</p>	
<p>Display Slide FI-2</p>	



COMMUNITY EMERGENCY RESPONSE TEAM FLOODS

INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="235 1163 675 1493" data-label="Image"> <p>The slide is titled 'Factors Contributing to Flooding' in a green header. Below the title is a bulleted list of five factors: Rainfall intensity, Rainfall duration, Topography, Soil conditions, and Ground cover. To the right of the list is a photograph of a person holding a black umbrella, standing in a street during a rainstorm. At the bottom of the slide, there is a FEMA logo on the left, the text 'CERT Basic Training Unit 1: Floods' in the center, and a 'FI-3' label with a CERT logo on the right.</p> </div> <p data-bbox="235 1528 503 1562">Display Slide FI-3</p> <p data-bbox="235 1598 552 1646">http://blog.nola.com/times-picayune/2007/10/large_rain2.jpg</p>	<ul style="list-style-type: none"> <li data-bbox="711 373 1485 514">▪ <u>Dam and levee failure.</u> While dam and levee failure occurs relatively infrequently, it can be a risk especially following prolonged heavy rain, such as occurred throughout the Midwest in 1993 and 2008. <li data-bbox="711 590 1469 877">▪ <u>Low absorption or no soil percolation.</u> As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization increases runoff 2-6 times over what would occur on natural terrain. In areas with rocky geology, rainfall or snowmelt cannot be absorbed. The result can be flash flooding with little or no warning. <li data-bbox="711 898 1507 1077">▪ <u>Business and residential growth in flood areas</u> destroys natural absorption of runoff due to impermeable surfaces. Homes and businesses located on flood plains are at significantly greater risk for serious flood damage. <p data-bbox="711 1136 1448 1203">Each of these causes can be factored to several key elements.</p> <ul style="list-style-type: none"> <li data-bbox="711 1224 1477 1291">▪ <u>Rainfall intensity</u> is the rate of rainfall (in inches per hour). <li data-bbox="711 1312 1242 1346">▪ <u>Duration</u> is how long the rain lasts. <li data-bbox="711 1367 1502 1434">▪ <u>Topography</u> is the overall configuration of the Earth's surface, including natural and manmade features. <li data-bbox="711 1455 1502 1560">▪ <u>Soil conditions</u> include the type of soil, the amount of moisture in the soil, and the amount of soil relative to the amount of rock. <li data-bbox="711 1581 1507 1759">▪ <u>Ground cover</u> includes vegetation as well as manmade covers. Ground that includes larger amounts of vegetation can absorb greater amounts of water. Ground that is paved or has structures on it will result in runoff.



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<div data-bbox="233 384 675 714" data-label="Image"> </div> <p data-bbox="233 747 503 785">Display Slide FI-4</p> <div data-bbox="233 1134 675 1463" data-label="Image"> </div> <p data-bbox="233 1497 503 1535">Display Slide FI-5</p> <p data-bbox="233 1568 466 1600">www.nssl.noaa.gov</p> <p data-bbox="233 1633 626 1780">If you live in an area that is susceptible to flooding, add local experiences and prediction data.</p>	<p data-bbox="704 352 930 386">Flood Hazards</p> <p data-bbox="704 407 1511 441">Explain that the reasons floods pose such a risk are that:</p> <ul data-bbox="704 457 1503 709" style="list-style-type: none"> ▪ Heavy rainfall can exacerbate problems with runoff, absorption, and flood-control measures. ▪ Ravine flooding can potentially inundate downstream areas when protection fails. ▪ In rocky and heavily paved areas, lack of absorption can cause flash flooding. <p data-bbox="704 823 1507 932">Explain that every major drainage basin in the United States has a floodplain surrounding it. Two areas where inundation is very likely are:</p> <ul data-bbox="704 949 1187 1037" style="list-style-type: none"> ▪ Along the Mississippi River ▪ The central valley of California <p data-bbox="704 1104 1445 1176">Most areas of the United States are subject to some degree of flooding.</p> <p data-bbox="704 1213 1474 1318">Floodplain areas are widespread in the South Atlantic, the Gulf Coast, and the Missouri and Arkansas River basins.</p> <p data-bbox="704 1356 1511 1650">Explain that the costs associated with flooding are increasing as more development occurs in coastal areas and floodplains. Each year, flood losses and damages reach into the billions of dollars. During the 10-year period from 1992 to 2001, floods cost, on average, \$4.1 billion annually. The long-term (30-year) annual average lives lost is 99 per year; most of these fatalities are a result of flash floods.</p>


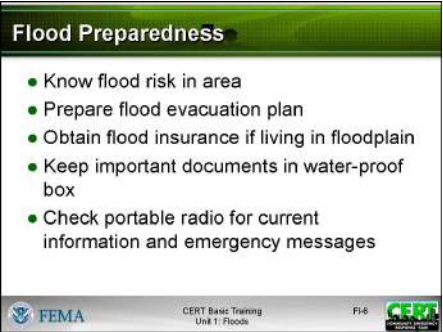
**COMMUNITY EMERGENCY RESPONSE TEAM
FLOODS**

INSTRUCTOR GUIDANCE	CONTENT
 <p>Allow the participants time to respond.</p>  <p>Allow the participants time to respond.</p>	<p>In 2005, Hurricane Katrina wreaked havoc on the Gulf states, causing an estimated \$150 billion dollars in damage, and resulting in nearly 2,000 fatalities. Much of this damage occurred after the hurricane during the resulting flood.</p> <p>Point out that floods are measured according to the height that the waters reach. Their magnitude is based on the chances that water levels will equal or exceed a certain point on a recurring basis. Intervals of probability are classified into <u>hazard zones</u>.</p> <p>Flood Awareness</p> <p>What is “rule number one” where flooding is concerned?</p> <p>Stress that “rule number one” is to <u>move quickly to higher ground</u>. Flood waters can carry debris, scour soil and asphalt, and trigger landslides. Even shallow-depth, fast-moving flood waters of 24 inches can produce enough force to carry away a vehicle, and six inches of swiftly moving water can knock someone off his or her feet. <u>Never try to walk, swim, or drive through flood waters!</u></p> <p>How can you keep aware of the potential for flooding or flash flooding?</p>

**COMMUNITY EMERGENCY RESPONSE TEAM
FLOODS**

INSTRUCTOR GUIDANCE	CONTENT
<p>Point out that watches and warnings for flash flooding are different from flood watches and warnings.</p>  <p>Allow the participants time to respond.</p>  <p>Allow the participants time to respond.</p>	<p>Remind participants that the risk of flood will be reported by radio and television, as well as NOAA Weather Radio using EAS (Emergency Alert System), as soon as the National Weather Service (NWS) issues a flood or flash flood <u>watch</u> or <u>warning</u>.</p> <p>What does a flood <u>watch</u> tell you?</p> <p>Explain that flood watches alert the public that <u>flooding is possible</u> within the watch area.</p> <p>Elaborate by telling the group that if they are in a watch area, they should:</p> <ul style="list-style-type: none">▪ Keep informed.▪ Be ready to act if the watch is upgraded to a warning or if they see flooding. <p>What does a flood or flash flood <u>warning</u> tell you?</p> <p>Explain that there are two types of flood warnings:</p> <ul style="list-style-type: none">▪ A <u>flood warning</u> is issued when flooding is expected to occur more than 6 hours after heavy precipitation, snowmelt, ice jams, or dam failures, or when a river is expected to exceed flood stage in the next 48 hours.▪ A <u>flash-flood warning</u> is issued when the potential exists for heavy precipitation to create flash flooding in the next 6 – 24 hours.

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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="237 730 315 804"></div> <p data-bbox="237 871 643 940">Allow the participants time to respond.</p> <div data-bbox="237 1029 677 1358"></div> <p data-bbox="237 1396 501 1430">Display Slide FI-6</p>	<p data-bbox="711 359 1511 573">Tell the group that whether the National Weather Service (NWS) issues a flood warning or a flash-flood warning, persons within the warning area should take precautions <u>immediately</u>! Continue by explaining that both watches and warnings will include protective measures that are recommended by NWS.</p> <p data-bbox="711 621 1015 655">Flood Preparedness</p> <p data-bbox="711 728 1455 762">What can you do to prepare for a potential flood?</p> <p data-bbox="711 999 1252 1033">Be sure to stress that it is important to:</p> <ul data-bbox="711 1052 1511 1591" style="list-style-type: none"><li data-bbox="711 1052 1511 1157">▪ <u>Know the flood risk in the area</u>, including the elevation above flood stage and the history of flooding in the area.<li data-bbox="711 1178 1511 1325">▪ <u>Prepare a flood evacuation plan</u> and practice the route. Be aware of which roads become flooded and which remain passable. The entire family should know where to go if they have to evacuate.<li data-bbox="711 1346 1511 1591">▪ <u>Obtain flood insurance</u> if living in a floodplain (Special Flood Hazard Area). <u>Homeowner's policies do not cover flooding</u>! Check with the city or county government to review the Flood Insurance Rate Maps (FIRMs). Then, check with an insurance agent to obtain coverage under the National Flood Insurance Program (NFIP).


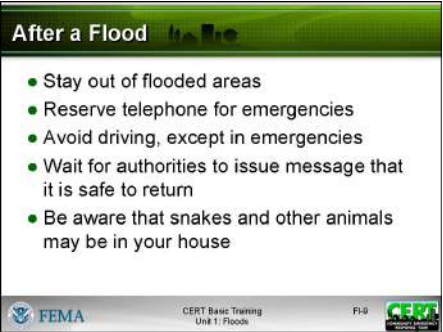
COMMUNITY EMERGENCY RESPONSE TEAM FLOODS

INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="235 787 313 861" data-label="Image"> </div> <p data-bbox="235 926 561 995">Allow the group time to respond.</p> <div data-bbox="235 1085 675 1415" data-label="Image"> </div> <p data-bbox="235 1451 501 1486">Display Slide FI-7</p>	<ul style="list-style-type: none"> <li data-bbox="711 373 1521 548">▪ <u>Keep important documents in a water-proof box.</u> Most documents can be replaced, but some are more difficult to replace than others. Protecting them in a water- (and fire-) proof container is the safest plan of action. <li data-bbox="711 573 1521 709">▪ <u>Check emergency messages</u> using a portable radio. NWS and local officials update watches and warnings as necessary. Listen often for up-to-date information. <p data-bbox="711 787 1404 856">How can you protect your property from flood damage?</p> <p data-bbox="711 1056 1521 1272">Remind the group that the best way to protect their property from flood damage is to avoid building in a flood plain unless the home is elevated and other flood protection measures are taken. If an existing home is in a floodplain, there are some steps that can help reduce potential damage.</p> <p data-bbox="711 1312 1304 1348">Describe for the group the following steps:</p> <ul style="list-style-type: none"> <li data-bbox="711 1367 1521 1583">▪ <u>Elevate the furnace, water heater, and electric panel</u> to at least one foot above the level of the floodplain (also called the <u>Base Flood Elevation</u>). In some areas, elevating these appliances and utilities may mean relocating them to a higher floor or even to the attic. <li data-bbox="711 1602 1521 1745">▪ <u>Move furniture and other items to a higher level.</u> Even if the main floor of the home is flood damaged, moving furniture and other items to a higher level will reduce flood losses.


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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="235 877 675 1205" data-label="Image"> </div> <p data-bbox="235 1241 503 1276">Display Slide FI-8</p>	<ul style="list-style-type: none"> ▪ <u>Install check valves</u> in plumbing to prevent flood water from backing up into the drains of the home. ▪ <u>Waterproof the basement floor and walls</u> to prevent seepage through cracks. <p>Remind the group that, in some cases, even these suggestions will not be enough to prevent serious damage from flooding. Urge those who live in floodplains to consult building professionals if they think they need more elaborate mitigation measures (such as elevation).</p> <p>Continue by telling the group that if they must evacuate, they should:</p> <ul style="list-style-type: none"> ▪ <u>Not walk, swim, or drive through flood waters.</u> Learn and practice driving the local flood evacuation routes. They have been selected because they are safe and provide the best means of escaping flood waters. Flood waters move swiftly and may carry debris that can cause injuries. Remember that 24 inches of water can wash a car away and 6 inches of fast moving water can knock a person off his or her feet. ▪ <u>Stay off bridges over fast-moving water.</u> Fast-moving water can wash bridges away without warning, especially if the water contains heavy debris. ▪ <u>Keep away from waterways.</u> If you are driving and come upon rapidly rising waters, turn around and find another route. Move to higher ground away from rivers, streams, and creeks. ▪ <u>Pay attention to barricades.</u> Local responders place barricades to warn of flooding ahead or to direct traffic safely out of the area. <u>Never</u> drive around barricades.

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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="237 751 315 827"></div> <p data-bbox="237 892 643 961">Allow the participants time to respond.</p> <div data-bbox="237 1220 677 1549"><p data-bbox="237 1583 501 1619">Display Slide FI-9</p></div>	<ul style="list-style-type: none"><li data-bbox="711 373 1471 548">▪ <u>Avoid storm drains and irrigation ditches.</u> During a flood, storm drains and irrigation ditches fill quickly with fast-moving water. Walking in or near storm drains or irrigation ditches is nearly a sure way to drown.<li data-bbox="711 573 1507 678">▪ <u>Keep family together.</u> As always, family is most important in the event of a flood. Do not lose track of family members. <p data-bbox="711 751 1224 787">What should you do after a flood?</p> <p data-bbox="711 1003 1490 1144">Stress that the best thing to do is listen to EAS information to determine whether it is safe to return and if there are special instructions to follow such as boiling water.</p> <p data-bbox="711 1188 1386 1224">Continue with precautions to follow after a flood.</p> <ul style="list-style-type: none"><li data-bbox="711 1245 1511 1350">▪ <u>Stay out of flooded areas.</u> Flooded areas remain unsafe. Entering a flooded area places you—and the individuals who may need to rescue you—at risk.<li data-bbox="711 1371 1503 1545">▪ <u>Reserve the telephone for emergencies only.</u> Telecommunication lines (both land line and cellular) will be busy following a flood. A nonemergency call may prevent an emergency call from getting through. It is best not to use the phone unless it is necessary.<li data-bbox="711 1566 1474 1671">▪ <u>Avoid driving,</u> except in emergencies. Reserve the roads for those who must evacuate and for emergency vehicles.

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INSTRUCTOR GUIDANCE	CONTENT
	<ul style="list-style-type: none">▪ <u>Wait for authorities</u> to issue a clear message that it is safe to return to evacuated areas.▪ <u>Be aware that snakes and other animals may be in your house in the aftermath of a flood.</u> Look for loose boards and dark spaces, and investigate with care. <p>Do you have additional questions, comments, or concerns about floods or flash floods?</p>