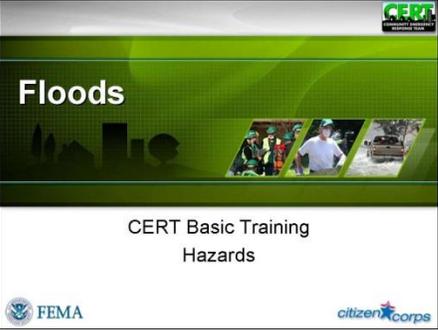
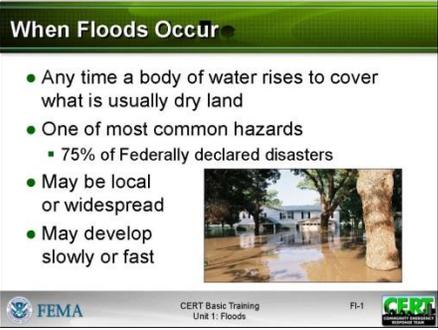
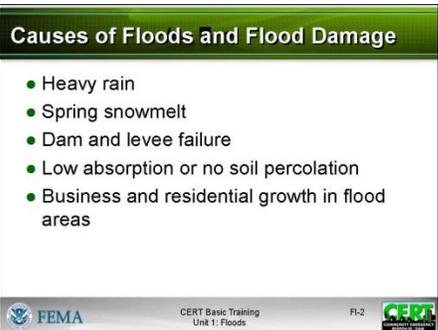
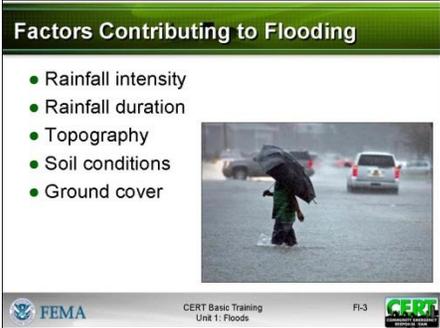


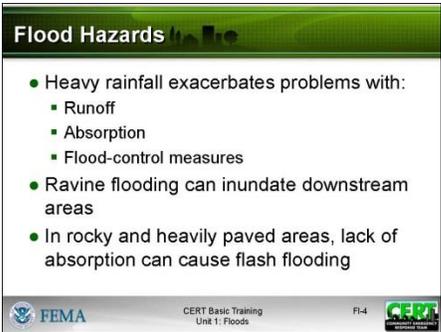
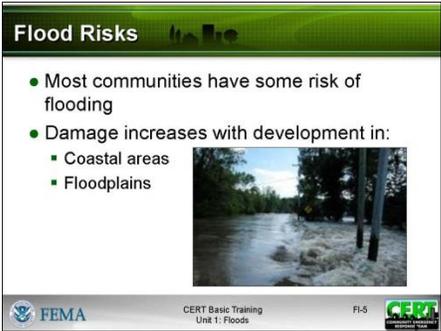
# Floods

INSTRUCTOR GUIDANCE	CONTENT
<p data-bbox="240 474 678 804"></p> <p data-bbox="240 842 505 877"><b>Display Slide FI-0</b></p> <p data-bbox="240 915 678 1245"></p> <p data-bbox="240 1283 505 1318"><b>Display Slide FI-1</b></p> <p data-bbox="240 1381 678 1711"></p> <p data-bbox="240 1749 505 1785"><b>Display Slide FI-2</b></p>	<p data-bbox="711 453 829 489"><b>Floods</b></p> <p data-bbox="711 541 1490 688">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 data-bbox="711 730 1511 1087">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 data-bbox="711 1356 824 1392"><b>Causes</b></p> <p data-bbox="711 1392 1349 1428">Floods and flood damage have many causes:</p> <ul data-bbox="711 1444 1507 1644" style="list-style-type: none"><li>▪ <u>Heavy rain</u>, which may occur over several days or as intense rainfall over a short period of time.</li><li>▪ <u>Spring snowmelt</u> or ice or debris jams that cause a river or stream to overflow its banks and flood the surrounding area.</li></ul>

**COMMUNITY EMERGENCY RESPONSE TEAM  
FLOODS**

INSTRUCTOR GUIDANCE	CONTENT
 <p><b>Display Slide FI-3</b></p> <p><a href="http://blog.nola.com/times-picayune/2007/10/large_rain2.jpg">http://blog.nola.com/times-picayune/2007/10/large_rain2.jpg</a></p>	<ul style="list-style-type: none"> <li>▪ <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>   <li>▪ <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>   <li>▪ <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.</li> </ul> <p>Each of these causes can be factored to several key elements.</p> <ul style="list-style-type: none"> <li>▪ <u>Rainfall intensity</u> is the rate of rainfall (in inches per hour).</li>   <li>▪ <u>Duration</u> is how long the rain lasts.</li>   <li>▪ <u>Topography</u> is the overall configuration of the Earth's surface, including natural and manmade features.</li>   <li>▪ <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>   <li>▪ <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.</li> </ul>

# COMMUNITY EMERGENCY RESPONSE TEAM FLOODS

INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="237 361 678 693"><p><b>Flood Hazards</b></p><ul style="list-style-type: none"><li>● Heavy rainfall exacerbates problems with:<ul style="list-style-type: none"><li>▪ Runoff</li><li>▪ Absorption</li><li>▪ Flood-control measures</li></ul></li><li>● Ravine flooding can inundate downstream areas</li><li>● In rocky and heavily paved areas, lack of absorption can cause flash flooding</li></ul><p>FEMA CERT Basic Training Unit 1: Floods FI-4</p></div> <p data-bbox="237 730 503 766"><b>Display Slide FI-4</b></p> <div data-bbox="237 1113 678 1444"><p><b>Flood Risks</b></p><ul style="list-style-type: none"><li>● Most communities have some risk of flooding</li><li>● Damage increases with development in:<ul style="list-style-type: none"><li>▪ Coastal areas</li><li>▪ Floodplains</li></ul></li></ul><p>FEMA CERT Basic Training Unit 1: Floods FI-5</p></div> <p data-bbox="237 1480 503 1516"><b>Display Slide FI-5</b></p> <p data-bbox="237 1549 467 1585"><a href="http://www.nssl.noaa.gov">www.nssl.noaa.gov</a></p> <p data-bbox="237 1617 625 1759">If you live in an area that is susceptible to flooding, add local experiences and prediction data.</p>	<h3 data-bbox="711 331 933 367">Flood Hazards</h3> <p data-bbox="711 388 1510 424">Explain that the reasons floods pose such a risk are that:</p> <ul data-bbox="711 441 1510 688" style="list-style-type: none"><li>▪ Heavy rainfall can exacerbate problems with runoff, absorption, and flood-control measures.</li><li>▪ Ravine flooding can potentially inundate downstream areas when protection fails.</li><li>▪ In rocky and heavily paved areas, lack of absorption can cause flash flooding.</li></ul> <p data-bbox="711 808 1502 913">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="711 934 1185 1018" style="list-style-type: none"><li>▪ Along the Mississippi River</li><li>▪ The central valley of California</li></ul> <p data-bbox="711 1081 1445 1155">Most areas of the United States are subject to some degree of flooding.</p> <p data-bbox="711 1186 1477 1302">Floodplain areas are widespread in the South Atlantic, the Gulf Coast, and the Missouri and Arkansas River basins.</p> <p data-bbox="711 1333 1510 1627">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**

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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><b>Flood Awareness</b></p> <p><b>What is “rule number one” where flooding is concerned?</b></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><b>How can you keep aware of the potential for flooding or flash flooding?</b></p>

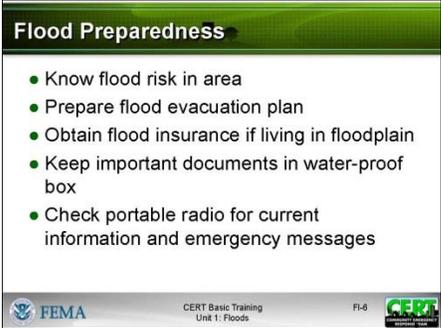
**COMMUNITY EMERGENCY RESPONSE TEAM  
FLOODS**

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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>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><b>What does a flood <u>watch</u> tell you?</b></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"><li>▪ Keep informed.</li><li>▪ Be ready to act if the watch is upgraded to a warning or if they see flooding.</li></ul>
 <p>Allow the participants time to respond.</p>	<p><b>What does a flood or flash flood <u>warning</u> tell you?</b></p> <p>Explain that there are two types of flood warnings:</p> <ul style="list-style-type: none"><li>▪ 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.</li><li>▪ 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.</li></ul>

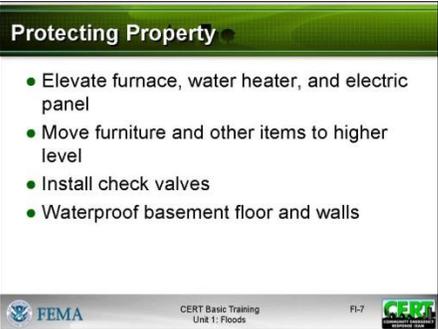
**COMMUNITY EMERGENCY RESPONSE TEAM  
FLOODS**

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INSTRUCTOR GUIDANCE	CONTENT
 <p>Allow the participants time to respond.</p>  <p><b>Display Slide FI-6</b></p>	<p>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><b>Flood Preparedness</b></p> <p><b>What can you do to prepare for a potential flood?</b></p> <p>Be sure to stress that it is important to:</p> <ul style="list-style-type: none"><li>▪ <u>Know the flood risk in the area</u>, including the elevation above flood stage and the history of flooding in the area.</li><li>▪ <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><li>▪ <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).</li> <li>▪ <u>Keep important documents in a water-proof box.</u></li></ul>

**COMMUNITY EMERGENCY RESPONSE TEAM  
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INSTRUCTOR GUIDANCE	CONTENT
 <p>Allow the group time to respond.</p>  <p><b>Display Slide FI-7</b></p>	<p>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.</p> <ul style="list-style-type: none"><li>▪ <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.</li></ul> <p><b>How can you protect your property from flood damage?</b></p> <p>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>Describe for the group the following steps:</p> <ul style="list-style-type: none"><li>▪ <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><li>▪ <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.</li><li>▪ <u>Install check valves</u> in plumbing to prevent flood</li></ul>

**COMMUNITY EMERGENCY RESPONSE TEAM  
FLOODS**

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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="240 766 678 1094"><p><b>If You Must Evacuate</b></p><ul style="list-style-type: none"><li>● Do not walk, swim, or drive through flood waters</li><li>● Stay off bridges over fast-moving water</li><li>● Keep away from waterways</li><li>● Pay attention to barricades</li><li>● Avoid storm drains and irrigation ditches</li><li>● Keep family together</li></ul><p>FEMA CERT Basic Training Unit 1: Floods FI-8</p></div> <p><b>Display Slide FI-8</b></p>	<p>water from backing up into the drains of the home.</p> <ul style="list-style-type: none"><li>▪ <u>Waterproof the basement floor and walls</u> to prevent seepage through cracks.</li></ul> <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"><li>▪ <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.</li><li>▪ <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.</li><li>▪ <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.</li><li>▪ <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.</li><li>▪ <u>Avoid storm drains and irrigation ditches.</u> During a flood, storm drains and irrigation ditches fill quickly</li></ul>

**COMMUNITY EMERGENCY RESPONSE TEAM  
FLOODS**

INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="237 640 316 714" data-label="Image"> </div> <p data-bbox="237 779 643 848">Allow the participants time to respond.</p> <div data-bbox="237 1104 677 1436" data-label="Complex-Block"> </div> <p data-bbox="237 1472 503 1507"><b>Display Slide FI-9</b></p>	<p data-bbox="756 331 1448 436">with fast-moving water. Walking in or near storm drains or irrigation ditches is nearly a sure way to drown.</p> <ul data-bbox="711 464 1495 562" style="list-style-type: none"> <li>▪ <u>Keep family together</u>. As always, family is most important in the event of a flood. Do not lose track of family members.</li> </ul> <p data-bbox="711 638 1224 674"><b>What should you do after a flood?</b></p> <p data-bbox="711 894 1490 1031">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 1077 1386 1108">Continue with precautions to follow after a flood.</p> <ul data-bbox="711 1129 1503 1850" style="list-style-type: none"> <li>▪ <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> <li>▪ <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> <li>▪ <u>Avoid driving</u>, except in emergencies. Reserve the roads for those who must evacuate and for emergency vehicles.</li> <li>▪ <u>Wait for authorities</u> to issue a clear message that it is safe to return to evacuated areas.</li> </ul>

**COMMUNITY EMERGENCY RESPONSE TEAM  
FLOODS**

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INSTRUCTOR GUIDANCE	CONTENT
	<ul style="list-style-type: none"><li>▪ <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.</li></ul> <p><b>Do you have additional questions, comments, or concerns about floods or flash floods?</b></p>