



A Fact Sheet prepared by the National Telecommunications Safety Panel

Introduction

Floods are one of the most common and widespread of all natural disasters. In the United States alone, an average of almost 140 people per year lose their lives in floods with damage averaging more than \$2 billion per year. There are many types of flooding, each with their own unique hazards. They include coastal floods, flash floods, river floods, urban floods, and sheet floods.

Coastal Flooding

Hurricanes and tropical storms can produce heavy rains and, along with high winds, can drive ocean water onto coastal land. The high sea levels associated with the El Niño weather phenomenon are also responsible for record sea levels along coastal areas. Some of the most destructive coastal flooding is caused by tsunamis, which are giant tidal waves created by volcanoes or earthquakes in the ocean. A distinct problem with tsunamis is that the cause is often thousands of miles away, while the destruction occurs on what appears to be a perfectly calm day.

Flash Flooding

Flash flooding occurs when there is very heavy rain in a short period of time. Flash flooding can also occur when dams or levies give way or when ice jams break up allowing large quantities of water to move downstream. Relatively small or even dry creek beds can become raging rivers in a matter of minutes. In arid or desert regions there are water-carved gullies known as arroyos, which are normally dry but which can become fast moving rivers. At times, the concentrated rain is miles away but the flash flooding occurs in the arroyos and other waterways where there has been no rainfall.

River Flooding

River flooding is a natural event often occurring seasonally as winter snows melt and spring rains occur. River flooding often covers many square miles of low-lying areas within river basins. This type of flooding can usually be predicted and steps can be taken prior to the flooding to minimize damage and reduce injuries and deaths.

Urban Flooding

As undeveloped land is paved for parking lots and buildings, it obviously loses its ability to absorb water. Rainwater becomes runoff flooding roads, businesses, and parking lots. Water main breaks can also cause urban flooding, eroding roadways and causing damage to businesses and homes.

Sheet Flooding

Sheet flooding or sheet flow refers to water runoff that occurs over a broad, usually sloping, expansive area outside the boundaries of normal streams or riverbeds. The water varies from 1 to 3 feet in depth.

Watches and Warnings

- **Flood/Flash Flood Watch:** Current and developing weather conditions are such that there is a threat of flooding within 6 hours after the heavy rains end. During a Watch, flooding is neither certain nor imminent.
- **Flood/Flash Flood Warning:** Flooding is in progress, imminent, or highly likely.
- **Flash Flood Statement:** A statement issued about current flash flood conditions that may also contain river stage information.
- **Urban/Small Stream Flood Advisory:** Alerts the public to flooding which is generally only an inconvenience (not life threatening) to those living in the affected area. Issued when heavy rain will cause flooding of streets and low-lying places in urban areas. Also used if small rural or urban streams are expected to reach or exceed their banks.

General Safety Hazards

Some of the specific hazards associated with flood cleanup work include:

- Electrical hazards from downed power lines, water in electrical equipment, and backfeed from generators
- Carbon monoxide from pumps, generators, and pressure washers
- Musculoskeletal hazards to hands, backs, knees, and shoulders
- Thermal stresses – heat, cold/hypothermia
- Operating heavy equipment
- Structural instability
- Hazardous materials
- Fire
- Drowning

Floods, continued.

Precautions

Before the Flood

- If time permits, move equipment, furniture, vehicles, and other valuables to higher ground.
- Be sure propane and other fuel tanks are secured. Turn off gas and water supplies.
- Gather emergency supplies – drinking water, medicines, flashlights, etc.
- Listen to the radio, have vehicle fuel tanks filled and have an evacuation route planned.

During the Flood

- If you are in a low-lying area and warnings are issued for that area, get to higher ground immediately.
- Get out of places that are likely to flood like canyons, ditches, manholes, and dry streambeds.
- Avoid already flooded areas. As little as 6 inches of moving water can knock your feet out from under you and only 2 feet of moving water can lift cars and carry them away. There is also no way to ensure that the roadway is still intact.
- **Never drive through floodwaters.** If you do, and your car stalls in the water, call for help. If conditions are worsening and help does not arrive in a few minutes, abandon the vehicle immediately and climb to higher ground. Nearly half of all flash flood deaths are auto related. **Turn around, don't drown!**
- Stay away from downed power lines and electric wires as electric current passes easily through water. Electrocutation is another major cause of deaths in floods.
- Watch out for animals, especially snakes, spiders, and rodents that have also been forced out by rising waters and are seeking shelter.
- Floodwaters may contain fecal material from overflowing sewage systems and agricultural and industrial byproducts. Although skin contact with floodwater does not, by itself, pose a serious health risk, there is some risk of disease from eating or drinking anything contaminated with floodwater. If you have open cuts or sores that will be exposed to flood water, keep them as clean as possible by washing well with soap to control infection. If a wound develops redness, swelling, or drainage, seek immediate medical attention.
- Immunizations -Tetanus boosters should be up to date. Other vaccinations should be obtained based on a case-by-case basis or as determined by local and state health departments.
- Be on the alert for floating debris, dislodged propane cylinders, fuel, and other hazardous materials.
- Employees working over or near water, where the danger of drowning exists, shall be provided with U.S. Coast Guard-approved life jackets or buoyant

work vests. Ring buoys with at least 90 feet of line shall be provided. At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water. If using boats, ensure all operators have been properly trained.

After the Flood

- Wear rubber boots, gloves, and disposable dust mask as needed. Dust masks are a necessity when working in areas where workers are cleaning up the huge amount of dusty dried mud that is left after river waters recede.
- Before entering any building, inspect the foundation and walls for cracks or other damage.
- Upon entering a building, don't use matches or other open flames since gas may be trapped inside.
- Keep power off until an electrician has inspected the system.
- Be careful when walking as streets and floors may be slippery with mud and there is often debris including nails and broken glass.
- Never eat food that has been in contact with floodwaters. Discard refrigerated items if the power has been off for some time.
- Clean all walls, hard surfaces, counter tops, etc. with a solution of 1 cup of bleach to 5 gallons of water.
- Use fans, dehumidifiers, and air conditioners to help the drying process.
- Inspect for damaged asbestos and watch for mold growth. Remove and discard materials that cannot be properly dried.
- Be particularly cautious when working with or around portable generators. If you tie into an existing circuit, be sure the main breaker is off to prevent energizing power lines from backfeed. Run generators outdoors to prevent carbon monoxide poisoning.

Additional Information:

Centers for Disease Control and Prevention

<http://www.bt.cdc.gov/disasters/floods/readiness.asp>

<http://www.cdc.gov/niosh/flood.html>

Federal Emergency Management Agency

<http://www.fema.gov/hazards/floods/>

National Oceanic and Atmospheric Administration

<http://www.noaa.gov/floods.htm>

<http://www.srh.noaa.gov/srh/tadd/>

Occupational Safety & Health Administration

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10669

The information and material contained in this document has been developed from sources believed to be reliable. However, NTSP accepts no legal responsibility for the correctness or completeness of this material or its application to specific factual situations. By publication of this fact sheet, NTSP does not ensure that adherence to these recommendations will protect the safety or health of any persons or preserve property.