



FLOOD SAFETY: BEFORE, DURING, AND AFTER

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Flooding is the most common type of natural disaster worldwide. In the United States, flooding is the leading cause of weather-related deaths. Practically everyone who lives in the United States will experience a flood during his or her lifetime. Knowing how to prepare for and how to react during and after a flood event can save lives and property.

WHAT CAUSES FLOODS?

Flooding occurs in both rural and urban areas and can be caused by unusual weather events or structural failures. Most flooding occurs in floodplains (or low-lying areas prone to frequent flooding) after prolonged rainfall lasting over several days. However flooding can also occur in a short period of time with intense rainfall or when streams and rivers leave their banks due to significant upstream rainfall.

Coastal areas often flood because of tidal surges from tropical storms, tropical depressions, and hurricanes. In mountainous regions, rapid snowmelt combined with rainfall can cause flooding in early spring. A dam failure can unleash a tremendous, 10-to-20-foot wall of water that can roll boulders, tear out trees, sweep away cars, destroy buildings, and obliterate bridges.

Flash floods are particularly dangerous in urban areas. Flash floods are usually caused by intense storms that produce large amounts of rainfall in a short period of time. Storm water levels rise quickly, and normal drainage pipes and ditches do not permit water to be diverted away fast enough.

Because storm waters rise rapidly, and often unexpectedly, pedestrians and motorists are often caught off-guard and unprepared. Fast-moving flash flood waters also carry debris which intensify the flood water's destructive potential.

FLOOD ADVISORIES

The National Weather Service issues several statements that notify the general public of potential and imminent weather-related hazards. These advisories are typically posted and announced on television, radio, and internet and are specific to individual counties.

Urban and Small Stream Flood Advisory – Alerts the public to flooding which is generally only an inconvenience and does not pose a threat to life and/or property. Issued when heavy rain will cause flooding of streets and low-lying places in urban areas, or if small rural or urban streams are expected to reach or exceed banks.

Flash Flood Watch – Indicates that flash flooding is possible in and close to the watch area. Those in the affected area are urged to be ready to take quick action if a flash flood warning is issued or flooding is observed.

Flash Flood Warning – Signifies a dangerous situation where rapid flooding of small rivers, streams, creeks, or urban areas is imminent or already occurring. Very heavy rain that falls in a short time period can lead to flash flooding, depending on local terrain, ground cover, degree of urbanization, degree of man-made changes to river banks, and initial ground or river conditions.

FLOOD FATALITY DATA

According to the National Oceanic and Atmospheric Administration (NOAA), there were more than 300 flood-related deaths from 1998 to 2001 in the United States. Long-term data suggest an average of 100 people per year lose their life each year due to flooding.

Though flooding occurs in all 50 states, Texas led all states in flood-related fatalities from 1960 to

1995 with 612 deaths. This number is more than double that of California, the second highest state.

Overall, more than 50 percent of flood related deaths in the United States involve vehicles. In Texas, vehicles are involved in more than 75 percent of all flood fatalities. Circumstantial information surrounding flood-related deaths from 1998 to 2001 reveals several common causes of flood deaths. Deaths occurred to pedestrians, motorists, and to those in homes and buildings.

US Flood Fatalities from 1960 to 1995

Rank	State	Fatalities
1	Texas	612
2	California	255
3	South Dakota	248
4	Virginia	241
5	West Virginia	240

Source: National Climatic Data Center

Common Causes of Flood Drowning Deaths

- Driving around flood warning signs and barricades
- Driving over washed-out bridges and roadways
- Being entrapped in stalled vehicles in high water
- Attempting to flee from stalled vehicles in high, swift moving water
- Attempting to rescue flood victims from swift moving water
- Boating and kayaking in flooded rivers and streams
- Swimming, wading, and playing in swollen creeks
- Slipping into swollen, swift-moving streams and drainage ditches
- Attempting to clear debris from storm drains and ditches
- Disregarding evacuation orders to move out of homes
- Attempting to flee flooded homes

DID YOU KNOW?

- More than 2,200 lives were lost in 1889 as a result of a flood caused by an upstream dam failure in Johnstown, Pennsylvania.
- On July 31, 1976, the Big Thompson River near Denver, Colorado, overflowed after an extremely intense storm. A wall of water 19 feet high roared down the Big Thompson Canyon where many people were camping. One hundred forty people were killed and millions of dollars in property were lost.

SAFETY PRECAUTIONS

Many flood related deaths occur because people are unprepared for or careless in their actions in negotiating flood events. Knowing that you are at risk, and taking steps to prepare for floods will determine how you, your family, and your property are impacted.

Before the Flood

If you have lived for years on the coast or other flood-prone areas, preparing for floods may be second nature. However, because almost all locations in the United States are prone to at least flash flooding, everyone should know what to do in the case of a flood.

If you aren't sure whether your house is at risk from flooding, check with your local floodplain manager, building official, city engineer, or planning and zoning administrator. These officials can tell you whether you live in a flood hazard area. Knowing and understanding your home's potential for flooding helps you to determine the risk of financial loss and whether to purchase flood insurance.

A flood insurance policy is one of the most important things you can do to protect your home and family. Your homeowner policy does not typically cover flood damage, but you can obtain one through your insurance company or agent. Flood insurance is also available through the National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA).

Besides insuring your property, there are other things you can do before a flood to minimize property loss and ensure your family's safety.

- Take photos or videos of all your important possessions. If you have property damage, these items will help you to file insurance claims.
- Store important documents and irreplaceable personal objects in a safe storage facility.
- Post emergency telephone numbers by the telephone. Teach children to dial 911.
- Plan and execute a flood evacuation route with your family.
- Ask an out-of-state relative or friend to be the "family contact" in case your family is separated during a flood. Make sure everyone in your family knows the phone number and address of the family contact.

During the Flood

Now that you've prepared for a flood, there are several precautions to take while waiting for the water to subside.

- Get to higher ground. Stay away from flood-prone areas, including dips, low spots, valleys, ditches, etc.
- Don't allow children to play near high water, storm drains, or ditches.
- Fill bathtubs, sinks, and jugs with clean water in case water becomes contaminated.
- Listen to a battery-operated radio for the latest storm information.
- Turn off all utilities at the main power switch and the main gas valve if instructed to do so by authorities.
- If told to evacuate your home, do so immediately.
- If waters start to rise in your home before instructed to evacuate, move to the top floor, attic, or roof if necessary.
- If you come into contact with flood waters, wash hands immediately. Flood waters may carry raw sewage, chemical waste, and other disease-spreading substances.
- Avoid walking through flood waters. It only takes six inches of fast moving water to knock you to your feet.
- Never drive through a flooded area, even if you are familiar with the roads. Flood water can destroy underlying road surfaces, wash away bridges, and carry debris that can be displaced in your path. A car can be swept away by as little as two feet of flood water. Trucks and SUVs may only provide an additional 6 to 12 inches of clearance.
- Stay away from downed power lines. Electric current passes easily through water.
- Look out for animals including rats and snakes. Floods displace animals from their homes, too.

After the Flood

Now that the flood waters have subsided, you might suspect the danger is over. However, the hazards left by heavy floods sometimes go unnoticed. Thus, particular care should be taken when re-entering flood damaged homes, assessing property damage, and cleaning up debris.

- If your home has suffered damage, call your insurance agent. If you are unable to stay in

your home, make sure to leave a contact number with the agent.

- Take photos of any property damage and save damaged personal property before you start cleanup. An insurance agent will need to see the damage in order to file your claim.
- Check carefully for structural damage before re-entering the home. If you suspect damage, do not enter the home.
- Upon re-entering your home, do not use matches, cigarette lighters, or other open flame, because gas may be trapped inside. If you smell gas or hear hissing, open a window and leave the home immediately. Do not use the telephone. Call the gas company from a neighbor's telephone.
- Keep the power off until an electrician has inspected your system for safety.
- Check for sewage and water line damage. If you suspect damage, avoid using the tap and contact a plumber.
- Throw away any food that has been in contact with flood water, including all canned goods.
- Until local authorities declare your water supply to be safe, boil water for drinking and food preparation.

Property Protection

In some flood-prone areas, sewage can back up through sanitary sewer lines into houses through the drain pipes. Installing backflow valves and/or gate valves can help keep this from occurring. Major changes such as this must be performed by a licensed plumber to ensure that all local codes are met.

Raise electrical wires and circuit breaker boxes in homes and other buildings that may be damaged if under water. Electrical components often have to be replaced if under water for even a short period of time. Damaged electrical systems can also short-circuit and cause fires. Electrical system modifications must be done by licensed electricians.

REFERENCES

Federal Emergency Management Agency,
<http://www.fema.gov/hazards/floods>.

National Weather Service,
<http://www.noaa.gov/floods.htm>.

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