

Flooding Fast Facts

What is a flood?

Flooding is the unusual presence of water on land to a depth which affects normal activities. Flooding can arise from:

- Overflowing rivers (*river flooding*),
- Heavy rainfall over a short duration (*flash floods*), or
- An unusual inflow of sea water onto land (*ocean flooding*). Ocean flooding can be caused by storms such as hurricanes (*storm surge*), high tides (*tidal flooding*), seismic events (*tsunami*) or large landslides (sometime also called *tsunami*).

Important facts to know about floods

River and flash flooding usually result from abnormally high rainfall over a relatively short period: Hours for flash floods; Days for river floods. Rapid snow melt can bring more water into the hydrological system than can be adequately drained, leading to what is generally called *spring floods*. Heavy rainfall during the a tropical rainy season can lead to *monsoon floods*, which can affect rivers and may also occur as flash flooding.

Sedimentation of river beds and deforestation of water catchment areas can exacerbate conditions leading to river valley floods. Deforestation and paving over land can significantly increase the risk of flash floods. Building in flood plains or in environmentally degraded areas, or changing the natural drainage systems, can significantly increase the risk of flood damage.

Not all floods are bad. Seasonal flooding can be an important source of nutrients for agricultural lands, and recharge water supplies in dams and underground aquifers. In some parts of the world, a lack of seasonal flooding is a disaster.

A disaster usually occurs when people are not prepared for a flood due to the lack of *early warning systems*, *preparedness* and *mitigation* measures. Flooding which occurs at night, which happens rapidly, or both, is the most dangerous type of flooding.

What are the elements most at risk during floods?

- any structure situated within a flood plain
- earth buildings or masonry with water-soluble mortar

- buildings with shallow foundations or weak resistance to lateral loads or impact
- roads and bridges
- basements or underground buildings
- utilities
- machinery and electronics, including industry and communications equipment
- food stocks
- cultural artifacts
- fields and orchards
- confined livestock
- fishing boats and other maritime industries

How can communities be more protected against floods?

Here are some things that can be done to protect homes and communities from the damage caused by flooding.

Before the floods

Raise community awareness about flooding and flood protection measures.

- Include flood awareness and preparedness in school programs.
- Publicize flood risk areas, warning signs and evacuation plans.
- Collect the local history of flooding, mark areas affected (flood height markers) and commemorate the dates of significant floods.

Conduct risks assessments

- Identify locations which might be affected by flooding, determine how often the flooding may occur and identify what might be damaged in a flood.
- Distribute flood hazard maps so that people know where there is a risk of flooding. Flood maps identify risks to individuals, enable preparation of emergency response plans, and determine where flood protection measures must be taken. They are also a great tool for community education and awareness
- Install sign posts marking possible flooding levels in the community to remind people of flood risks.
- Prepare community plans of action that explain what to do in case of flooding.

Undertake non-structural measures

- Identify ways in which the use of possible flood areas can be changed to avoid or reduce the impact of flooding.

- Have a good early warning system in place. Local and regional weather information can be used to let the public know when flooding is a risk. With advance warning, steps can be taken to increase protection, such as placing emergency response teams on high alert and preparing emergency shelters.
- Educate people about the causes, risks and warning signs of floods.
- Develop evacuation plans, not forgetting the very young, elderly and disabled who may not be able to evacuate easily.

Undertake structural measures

- Build dams and reservoirs, dikes and levees, retaining ponds, flood channels, and flood walls may help to reduce flooding. However, these measures can be very expensive!
- Protect well water from contamination, as flood waters often carry toxic materials, including raw sewage, animal waste, oil, and chemicals.

Land planning

- Where possible, prevent building and development on flood-prone lands. Use land along rivers for parks or ecological reserves.
- If industry is based on the flood-prone areas, ensure there is flood-proofing and plans to evacuate machinery and materials which might be damaged by a flood.
- Protect wetlands and flood plains.
- Maintain natural vegetation and forest cover in wetlands and flood plains. Trees help the soil hold water!
- Restore and protect degraded wetlands and flood plains. These areas can store large amounts of flood water.
- Make room for rivers to flow naturally. Creating more space for rivers, flood plains, and wetlands is a major contribution to flood prevention and protection

Increase building resilience

- Elevate the homes, schools and public buildings above flood level.
- Use water-resistant building materials, such as concrete or ceramic, in areas where frequent flooding is a risk.
- Ensure that important appliances, such as heating and electrical systems, are raised high above flood level.
- Install water-tight flood shields or barriers for basement windows, doors, and other openings.
- Flooding can cause sewage to back up into houses through drain pipes, creating a health hazard. Install sewer backflow valves to prevent this risk

- Buy flood insurance.

During the floods

- Evacuate: An evacuation should be based on a pre-flooding plan, include provision for elderly, young and disabled, and provide for evacuation shelters which have adequate food, water, sanitation and lodging facilities.
- Provide information to the evacuated on flood levels, possible damage and when people can expect to return. Most people do not want to say away from their homes more than necessary and want to return to rebuild as quickly as possible.
- Ensure that utilities are cut-off in flooded areas to avoid unnecessary damage or risk of injury.
- Plan for post-flooding damage assessments.
- Work with schools, government and business to ensure that normal activities can continue as much as possible during the flooding.
- Finding work, even temporary, may be very important for some of the evacuees.
- Continuing schooling and social and commercial activities such as markets, are important for evacuees to provide a sense of normal to their lived disrupted by the flooding.
- Work with professional services to providing counseling to those who are most affected by the flooding.

http://www.fema.gov/hazard/flood/fl_during.shtm

After the floods

- Conduct and publicize impact assessments.
- Develop recovery plans which ensure people can quickly rebuild their homes and that social and commercial services will re-open as quickly as possible.
- Assist people in returning to their home and communities as quickly as possible, but not so soon that it is dangerous.
- Warn returnees of the risks of injuries and health problems in rebuilding from flood damage.
- Ensure flood victims have fair and easy access to information on relief and recovery services and assistance which may be available.
- Provide advice and training to flood victims on ways to quickly rebuild in ways which will reduce future damage from floods.
- Provide appropriate assistance to the elderly and other disadvantaged groups (the ill, orphans, disabled) who need additional assistance to recovery from the flooding.
- Draw lessons from the impact of the floods and enhance measure to prevent or mitigate these impacts in the future.

- Invest in mitigation measures.

See more practical measures on: http://www.fema.gov/hazard/flood/fl_after.shtm

Statistics

http://www.em-dat.net/disasters/Visualisation/profiles/natural-table-emdat_disasters.php?dis_type=Flood&Submit=Display+Disaster+Profile

Good case studies

Bangladesh

Vietnam

Canada

http://www.rms.com/Publications/Central%20Europe%20Floods%20Whitepaper_final.pdf, pg. 9.

For Further Information:

<http://www.fema.gov/hazard/flood/index.shtm>

http://www.redcross.org/services/disaster/0,1082,0_585_00.html

<http://www.unep.org/depi/PDF/EEsnewsletterissue3.pdf>

<http://assets.panda.org/downloads/livingwithfloodswwfpolicybriefingfinal.pdf>

ISDR Guidelines for Reducing Flood Losses,

<http://www.unisdr.org/eng/library/isdr-publication/flood-guidelines/Guidelines-for-reducing-floods-losses.pdf>;

European Union, Best Practices on Flood Prevention, Protection, and Mitigation,

http://www.floods.org/PDF/Intl_BestPractices_EU_2004.pdf

World Wildlife Fund, *Living with floods: Achieving ecologically sustainable flood management in Europe*,

<http://assets.panda.org/downloads/livingwithfloodswwfpolicybriefingfinal.pdf>

Organization of American States, Hazard Mitigation Planning: Tools and Techniques,

<http://www.oas.org/CDMP/document/mitiplan/mittools.doc>