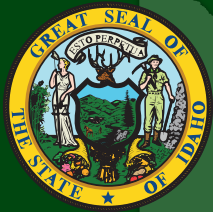




Photograph courtesy of Valley County Sheriff's Office

# Idaho Floods!

*A Flood Awareness Guide for the Gem State*





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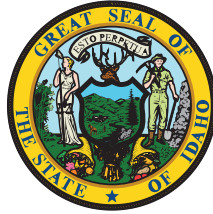
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## Letter from Governor Otter



*My Friends,*

*Each year in Idaho, our mountains and valleys undergo seasonal changes that can expose us to significant flood risk. The snow and rain that is so vital to Idaho's natural beauty and to our quality of life will sometimes exceed the capacity of our river systems, reservoirs, dams and levees. Idaho Floods! A Flood Awareness Guide for the Gem State is intended to increase awareness of the impact of flood hazards in Idaho and educate us on steps we can take to protect ourselves, our families, our homes, and our businesses.*

*This handbook recounts Idaho's history of flood events and provides an overview of the types of flood hazards we commonly experience. It explains the National Flood Insurance Program (NFIP) and the benefits of participation. You will find information on your area's potential for flooding, as well as suggestions on how to reduce a flood's impact and safely respond to and recover from a flood. For local governments and agencies, information is provided on the role that floodplain management, emergency planning and responsible development can play in protecting citizens.*

*Flooding is one of the most common hazards that we face in Idaho. Careful planning and preparation can mitigate its effects. Using this reference, you can educate yourself on the risks and dangers associated with flooding, reduce your vulnerability, and understand the best approaches for protecting yourself and your family before, during, and after a flood.*

*Thank you to our states' Bureau of Homeland Security and Department of Water Resources, as well as the National Weather Service, Federal Emergency Management Agency, Army Corps of Engineers, and U.S. Geological Survey who made the publication possible. It is my hope that this handbook is widely distributed throughout the homes, businesses, and public agencies of Idaho and that it will be incorporated into educational curricula, land use planning, and public forums.*



*As Always – Idaho, "Esto Perpetua"*

*C.L. "Butch" Otter  
Governor of Idaho*



## Why Should I Care: General Overview

**F**looding is one of the most serious, devastating, and costly natural hazards, occurring virtually anywhere water is present. Many Idaho residents live near rivers, streams and lakes that are subject to periodic flooding, and those floods frequently damage roads, farmlands, and structures, disrupting lives and businesses, and occasionally causing loss of life. Idaho's worst disasters have resulted from flooding, and the state has a recorded history of significant events dating back to its beginnings in the late 1800s. Floods occur regularly throughout Idaho, and many communities have experienced flood conditions at one point or another.

The more common types of flooding experienced in Idaho result from riverine flooding, flash floods, and ice or debris jam flooding. Understanding the different types of floods can be helpful when considering the range of flood risks and developing appropriate responses.



Figure 1 : Lake Fork Creek, Valley County, Idaho. June 2010

### Riverine Flooding

Riverine flooding in Idaho is the type of high water event most people imagine when they think of a flood. A riverine flood is a rise in water volume of a stream until it exceeds its normal channel capacity and overflows onto adjacent land, which is referred to as the floodplain. Such overflows are generally associated with spring runoff, winter rain, fast-melting snow, and ice jams. Riverine floods can affect large land areas and persist for periods of several days to several weeks.

Because spring runoff is an annual event, yearly spring high-flows have defined many of Idaho's stream channels over time. Small floods that exceed a stream's capacity, forcing water into the floodplain, are therefore fairly common events. On the other hand, unusually heavy snow packs followed by unseasonable warmth with heavy rain may result in runoff volumes significantly greater than can be contained by stream or river channels. Such floods can lead to widespread damage. Floods may also result from rainfall on frozen ground in the winter, or rainfall associated with warm, regional frontal systems. Occasionally a polar front develops on a line from Hawaii through Oregon, and warm, moist, unstable air moves into the region. This is often called an "atmospheric river," or "Pineapple Express." All of these situations quickly introduce large quantities of water into the stream channel system, easily overloading its capacity. Examples of this occurred along the Weiser River in 1997, the Big Wood River in 2006, the Coeur d'Alene River in 2008 and the Payette River in 2010.



### Flash Flooding

*Flash floods are frequent in Idaho and present significant risk to lives and property due to their sudden occurrence and the huge debris load carried by fast moving floodwaters.* Flash floods develop with little or no warning, providing limited time for people to escape. They typically result from a series of fast moving storms and may produce more than one flood crest. The sudden destruction of structures and washout of access routes may result in loss of life. There are a number of factors that can contribute to flash floods, some of which are natural, while others are man-made.

#### **Extreme Precipitation and Runoff Events**

Flash flooding, a type of riverine flooding, is caused by heavy rain and runoff and is dependent on the intensity and duration of the precipitation, soil types, vegetation, and topography of the area. When intense rainfall occurs immediately upstream of developed areas, flooding may begin within a matter of minutes.

Mountainous terrain is especially susceptible to damaging flash floods, as steep topography may stall thunderstorms within a limited area and may also funnel runoff into narrow canyons, intensifying flow. However, a flash flood can

occur on any terrain when extreme amounts of water accumulate too rapidly. Flash floods are most common in Idaho in the spring and summer months due to thunderstorm activity.

Sandy soils and sparse vegetation, especially in areas recently subject to forest or wild fires, are conducive to flash flooding. High heat from wild fires can harden soil, causing it to become water repellant, dramatically increasing runoff during heavy rainfall. Idaho's 2007 fire season resulted in approximately 2 million acres being burned, which led to numerous flash floods in and around those areas following the fires.

### ***Inadequate Urban Drainage Systems***

Flash flooding in urban environments is an increasingly serious problem. Urban areas are susceptible to flash floods due to a high concentration of streets, sidewalks and parking lots largely impervious to water, which results in rapid stormwater runoff. This can quickly overwhelm outdated stormwater drainage systems, forcing excess water into streets and open spaces. Surface runoff may be concentrated by the terrain, with streets and other paved areas between buildings functioning like canyons in mountainous areas, channeling the water, and moving it with great speed and force. Development in urban/wildland interface areas poses unique risks because flash floods originating in mountainous terrain grow in intensity and severity as they enter urban environments where vegetation has been removed, bridges and culverts constrict flow, and where buildings and paving have greatly expanded impermeable surfaces.



Figure 2 : Alluvial fan. Photo courtesy of USGS and Utah Division of Waterworks.

### **Alluvial fans**

Flash floods on alluvial fans are attracting greater attention as populations living in hazardous areas continue to rise. An alluvial fan is defined as “a sedimentary deposit located at a topographic break such as the base of a mountain front, escarpment, or valley side, that is composed of stream flow and/or debris flow

sediments and has the shape of a fan, either fully or partially extended.” Flooding on alluvial fans is characterized by rapid onset, fast flow, unpredictable path, and large amounts of sediment and debris. Thus, while flood depths are generally shallow, this kind of flooding can be highly destructive. Numerous developments throughout Idaho have been built on alluvial fans adjacent to mountains and foothills. Alluvial fans are a geological feature created by repeated flash floods over hundreds of years and indicate preferred locations for flash floods and debris flows in the future.

### Dam, Levee and Canal Failure

While dam failures are very rare events, they represent an extreme threat to life and property. The collapse of the Teton Dam in Eastern Idaho in 1976, which resulted in 11 deaths and over \$2 billion in damage, is an example of what can happen when a dam fails. More common is the occasional levee break or canal overflow. Like flash floods, floods resulting from dam failures or levee breaks are characterized by sudden onset, unpredictable nature, high flow velocities, and potentially large debris loads. Dam, levee and canal failures may result from

design or construction errors or omissions, overfilling/overtopping, and damage resulting from landslides, earthquakes, or other geological events. As unlikely as a catastrophic structural failure is, there are numerous aging dams, canals, and levees in Idaho which represent an extreme hazard should failure occur. The Idaho Department of Water Resources currently regulates about 600 water storage structures, of which 91 are rated "High Hazard" and 136 as "Significant Hazard." "



Figure 3 :Teton Dam Failure

### Ice Jam Floods

Ice jam floods can occur at any point throughout the winter season. Ice jams can form during fall freeze-up due to the formation of frazil ice (slushy, non-buoyant ice crystals that form when turbulent water is super cooled, causing the entire river to freeze rapidly). They may occur during midwinter periods when stream channels freeze solid forming anchor ice, and they can form during spring break-up, when rising water levels from snowmelt or rainfall break existing ice cover into large floating masses. The ice chunks flow downstream and accumulate at narrow channels, culverts, bridges, dams, and so forth. When jams form, water rises rapidly behind them. When they release, sudden, dangerous flooding occurs downstream. Ice jam flooding can be especially destructive because water levels are often higher than under normal flooding conditions, and additional damage is often caused by the force of ice impacting buildings and other structures.



Figure 4 : St. Joe River, Benewah County, Idaho. January 2009





## Sheet Flooding

All of these types of high water events can lead to a phenomenon referred to as sheet flooding. Sheet flooding is caused by shallow water either standing or flowing over wide, relatively flat areas which do not have the usual appearance of a defined watercourse. This type of flooding can occur for a number of reasons, such as a channel with insufficient flood depth overflowing its banks, or a river channel being constrained due to local topographic features. Sheet flooding is especially dangerous because it can be difficult to determine that an area is subject to this kind of event. Often, no features of the area reveal the danger. Sheet flooding has resulted in flooding of residences adjacent to inundated agricultural land and fields in a number of areas of Idaho.

## Idaho Flood Events

The following is a list of major flood events that have affected Idaho over the years. As can be seen from this list, every part of the state is susceptible to flooding, and while major flood events tend to affect sub regions of the state (i.e. Idaho Panhandle Region, Central Idaho, Southwestern Idaho, or Southeastern Idaho) at any one time, a large enough event can impact the entire state, especially in years with a large statewide snowpack.



Figure 5 : Medimont, Kootenai County, Idaho 2008 flood

YEAR	Area Affected
1894	Statewide
1927	Upper Snake River Basin
1933	Spokane River Basin
1943	Boise and Payette Basins
1948	Northern and Western Idaho
1955	Southwest Idaho
1956	Floods Statewide
1957	Flooding
1959	Boise River Basin
1962	Southern and Eastern Idaho
1963	Portneuf and Clearwater Basins
1964	Statewide at Low Elevations
1972	Severe Storms Extensive Flooding
1974	Northern and Central Idaho
1976	Teton Dam Failure
1984	Ice Jams and Flooding
1996	Storms and Flooding
1997	Severe Storms and Flooding
1997	Spring Flooding
2006	Severe Storms and Flooding Owyhee County
2008	Northern Idaho Flooding
2010	Central Idaho Severe Storms and Flooding

Source: State Hazard Mitigation Plan and Federal Emergency Management Agency

## Idaho's Flood History (Continued)

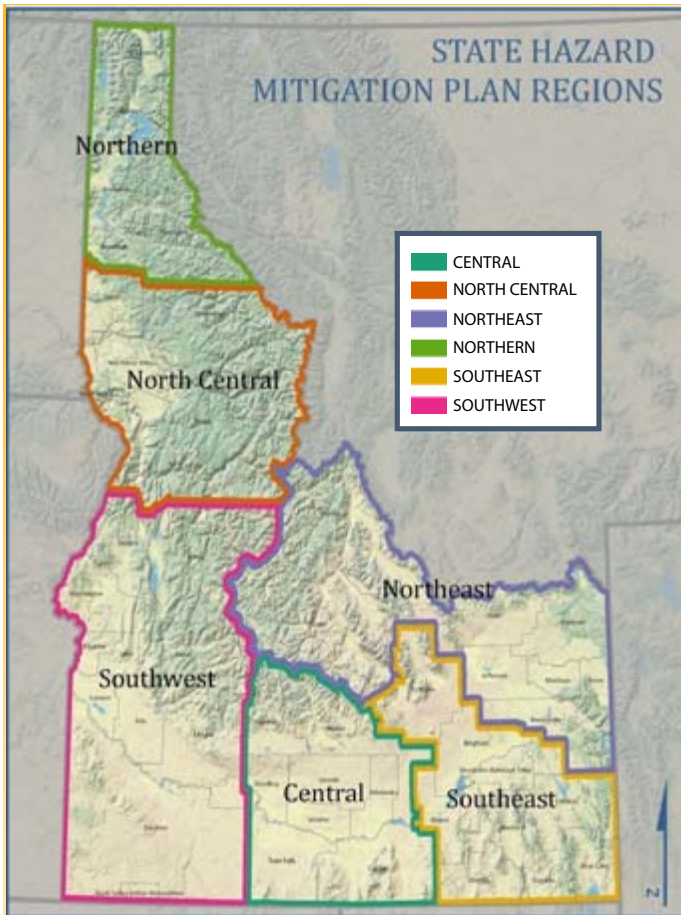


Figure 6 : Idaho State Hazard Mitigation Plan Regions

### Northern Idaho Flood Hazards

Communities in Northern Idaho are vulnerable to all of the different types of flooding discussed previously. At one time or another, every major river and lake in the area has been a source of flooding, causing damage to property and, in some cases, loss of life.

Annual precipitation in the region ranges from 12 inches to as high as 81 inches. Steep mountainous terrain combined with large amounts of timber allow for damaging flash floods, such as the 2006 event on Lightning Creek near Clark Fork. That flood obliterated long stretches of road, damaged infrastructure, and carried 50,000 tons of woody debris off the mountain, resulting in several million dollars in damage.

Because of the cold temperatures experienced during winter in Northern Idaho, ice jams occur frequently on the rivers and streams throughout the region. For instance, the St. Joe River has experienced several ice jams which create or compound flooding concerns. During the devastating 1996 floods, ice jams contributed to high water levels and the breaching of levees around St. Maries. Homes in several communities were destroyed, and damage was done to many of the region's roads and highways, completely washing them out in some areas. The flood ultimately resulted in over \$100 million in damages.

Northern Idaho has many miles of levees that protect surrounding communities from flooding. Major high water events, such as the 1996 floods at St. Maries seriously eroded and compromised some of the local levees, necessitating extensive repairs. Others have not been well maintained since their construction several decades ago, leaving them more vulnerable to failure. Every citizen that lives behind a levee should understand the level of protection they are provided by their local levee system.



Figure 7 : Pine Creek Levee, Pinehurst, Idaho. Photo courtesy of USACE Seattle District

## Idaho's Flood History (Continued)

Dams can also contribute to flooding when higher than expected spring runoff or heavy rainfall forces the quick release of large amounts of water to make room for incoming flows and protect the dam from failure. This was the case in the 2006 flood on the Kootenai River that threatened the town of Bonners Ferry, and the 2010 spring flood on the Snake River downstream of Hells Canyon Dam, both of which resulted from unusually heavy rains and high runoff in the basins.



Figure 8: Custer Mine, Shoshone County, Idaho

The Silver Valley in Shoshone and Kootenai Counties presents unique concerns to surrounding communities. The mining legacy of the valley has left sources of toxic heavy metals that can be carried by floodwaters. During a flood the metals are deposited along the banks and floodplains of local streams, as well as on the shores of Lake Coeur d'Alene. These heavy metals pose a risk to people who live or recreate in the contaminated areas.



According to the National Resources Conservation Service (NRCS), the mountains of Northern Idaho annually accumulate an average of 315 inches of snow across the Panhandle by April 1st. Major spring floods, usually occurring in April or May, are caused by unusually heavy snow packs, long spring warm spells, heavy rains on snow, or any combination of these factors. These floods tend to be slow rising, increasing from normal to extreme peaks in an average of five days, and can last for a period of several days to several weeks. Some of these major spring runoff floods were experienced in 1894, 1948, 1997, and 2008. The 1997 floods started when the snowpack was almost twice the average depth for several areas. When heavy rains and warm temperatures were added, lakes and rivers throughout Northern Idaho flooded, damaging homes and businesses, leaving residents stranded and in need of rescue, and depositing debris across acres of area lakeshores and riverbanks. A federal disaster was declared for Benewah, Bonner, Boundary, Kootenai, and Shoshone Counties.

Winter flooding has been the cause of the most severe events affecting Northern Idaho. Winter floods are caused by rainfall arriving with warm weather systems, which rapidly melt the snowpack and quickly introduce large volumes of water into the system. Because of the region's topography,

## Idaho's Flood History (Continued)

backwater flooding effects from the lakes during high water events such as these can pose a significant problem. This is most dramatic in the Lake Coeur D'Alene drainage, as high water levels prevent the St. Joe and Coeur d'Alene rivers from flowing into the lake. During the 1933 floods, the area was described as "a great inland sea stretching from Coeur d'Alene to St. Maries and to Wallace" (Spokesman Review, 1933).

### North Central Idaho Flood Hazards



Figure 10 : County road in Lemhi County flooding due to ice jam on the Salmon River in January 2010



Figure 11 : Ice jam located 7 miles north of Salmon, Idaho jam occurred January 2010



Figure 12: Pierce, ID in Clearwater County was impacted by this ice jam on Orofino Creek in January 2009



Figure 13: December 3, 1975. Flooding in the streets of Grangeville after rain and snowmelt filled the streets with water. Flood levels were worsened by frozen snow plugging street drains.



Figure 14 Home & driveway in Lemhi County, Idaho surrounded by water from the Salmon River January 2010.

## Idaho's Flood History (Continued)

Flooding can occur in North Central Idaho at any point throughout the year, but between the months of November through February, flooding from ice jams or rain combined with snowmelt poses the most serious risks. Ice jams have caused many floods over the years, especially in Lemhi, Clearwater and Idaho counties. Ice jams frequently occur on the Salmon and Lemhi Rivers in Lemhi County (see Figures 10, 11, 14), as well as on Orofino Creek in Clearwater County (see Figure 12). Many smaller creeks and rivers throughout the region have experienced ice jams and subsequent floods which are often associated with rainfall and melt runoff due to winter-time temperature increases associated with rain events (Figure 13).

Lemhi, Idaho and Clearwater counties are also susceptible to flash flooding from thunderstorms and heavy rain events that produce high intensity, short duration rainfall. These situations are worsened because of the many areas of steep, non-forested terrain throughout the region that create conditions causing large amounts of water and debris to flow swiftly downhill. In Lemhi County, flash flooding most commonly occurs along the Salmon River corridor (Figure 15).

Spring runoff on the Clearwater River can lead to flooding, particularly when it runs high and side channels (e.g. Orofino Creek) back up, overflowing the channels. The same flows also place stress on levees in the areas such as Kooskia and Sites, increasing the chance of failure.

Another risk created in this region comes from the frequent forest fires that occur. Heat from the fires causes an effect that makes the ground resistant to water absorption, leaving excess water and debris from rain and snowmelt with nowhere to go but to flow downhill, resulting in sudden and damaging flash floods (Figures 16 & 17). Prolonged rain events can also saturate soils leaving them susceptible to short duration, high intensity storms that produce overland flow and lead to flash floods (Figure 18).



Figure 15: Flash flood prone area along Salmon River corridor in Lemhi County.



## Idaho's Flood History (Continued)



Figure 16 : Debris flow produced from thunderstorm that occurred on May 19, 2006 in burn area near Grangeville, ID

Figure 17 : Debris flow produced from a thunderstorm that occurred on May 19, 2006 in a burn area near Grangeville.



Figure 18 : Overland flow due to saturated soils and quick bursts of high intensity short duration rainfall produce flash flooding in Idaho County.

### Southwestern Idaho

Southwestern Idaho sees most of its flooding from the rivers and streams that dominate the region. Such floods are most likely to occur in the winter and spring months due to snow melt or rain-on-snow events. Among the streams that frequently experience high water are the Boise, Payette, Weiser and Bruneau Rivers.

This region is also susceptible to frequent flash flooding which occurs most often between the months of May and September. The interplay between the arid desert and mountainous terrain contributes to atmospheric conditions that result in violent thunderstorms developing almost anywhere within the



## Idaho's Flood History (Continued)

region. Areas of steep terrain concentrate water and debris into swift and destructive floods that strike with little to no warning, sweeping down onto the communities and roadways below. This situation is exacerbated by the fact that many of these floods occur in normally dry streambeds, leading local residents into a false sense of security.

In Owyhee County in 2009, a sudden thunderstorm created flood conditions that sent four feet of water over the Highway 78 crossing at Scorpion Creek near Murphy. The flood occurred at night, and the unexpected high water resulted in a fatality as a passing driver was caught by surprise

Mud flows also occur within the region. An August 1959 foothills fire resulted in water repellent soil. A rainstorm soon afterwards caused flash flooding and mud flows in the city of Boise. History almost repeated itself in 1996 with another fire. However, mitigation and a little luck prevented a reoccurrence.



Figure 19: Flash flood and Debris flow washes out roads along Middle Fork of the Boise River after heavy rains fall on Burn Scar (August, 2003).



Figure 20: Flooding along Payette River in June 2010



Figure 21: Highway 78 crossing of Scorpion Creek near Murphy less than 24 hours after a flash flood crossed the road resulting in a fatality. The flood was about 4 feet above the road surface and occurred at night.



### Central, Northeast & Southeast Idaho Flooding

Counties in the Central, Northeastern and Southeastern regions of Idaho (commonly referred to as Eastern Idaho) are susceptible to various floods due to the numerous rivers and tributaries that crisscross the eastern half of the state. The Snake River basin, which stretches into Idaho from Northwest Wyoming, is the largest watershed in this region. All the rivers and smaller streams ultimately flow into the Snake River, which then empties into the Columbia River in Washington State. The topography of the three regions consists of numerous mountain ranges and valleys, while the broad Snake River Plain cuts through the lower eastern part of the state. Like other parts of Idaho, the types of flooding that affect this area are generally specific to the seasons.

During the winter of 1996, the snowpack in the Snake River Basin exceeded 250% of normal in some higher elevations. The following spring's runoff was high above normal and by June 11, the Snake River was seeing its highest flows since 1918. At its peak, the Snake River flooded as far as a mile from its banks, and many places were submerged under five feet of water. Several counties received disaster declarations because of extensive damage to property and agricultural land. Approximately 500 people were displaced from their homes in Jefferson and Bingham Counties, and officials estimated that more than 50,000 acres of agricultural land were flooded.

The steep mountain sides and narrow canyons of these regions are conducive to flash flooding, which threatens the numerous communities that have been built in drainage bottoms or sit adjacent to the many creeks and streams that run throughout the area. These flash floods will occur most frequently in the spring, as rapid run-off from snowmelt will send water coursing down the mountains.



Figure 22 : June, 1997 Snake River flooding of Interstate 15 between Blackfoot and Shelley.

These floods will often contain large amounts of mud and debris, especially when the soils have been affected by forest fires that frequently occur in the warm seasons, such as the Blackrock Fire near Inkom in 2003 or the Castlerock Fire above the town of Ketchum in 2007. Both these fires preceded flash flood events that resulted in major damage to surrounding communities. Large urban areas such as Pocatello, Idaho Falls and Rexburg are also at risk from significant flash flood damage due to the considerable percentage of surface area made impervious to water absorption from streets, sidewalks and parking areas.

# Idaho's Flood History (Continued)



Figure 23 : June 26, 2009 Pocatello flash flooding.

Ice jams are a relatively common occurrence in these regions, forming during especially cold, prolonged winter seasons. When river characteristics are ideal, such as changes to channel slope or at tight river confluences and bends, or because of external circumstances, such as bridge piers or fallen trees, ice jams can form and create dangerous flooding. The



Figure 24 : June 3, 2009 Burn area debris flow near Ketchum.

Teton, Falls, Portneuf and Henrys Fork Rivers all have a history of ice jam flooding during long, exceptionally cold periods of the winter.

Teton Dam Failure : On June 5, 1976, Teton Dam in Fremont County failed. An estimated 80 billion gallons of water were released into the Upper Snake River Valley from the reservoir. Devastating flooding occurred in the communities of Wilford, Sugar City, Rexburg, and Roberts; additional significant flooding occurred in Idaho Falls and Blackfoot. At the time of its failure, Teton Dam was brand new, stood 305 feet high, with a crest length of 3,100 feet and a base width of 1,700 feet. On June 6, President Gerald Ford declared Bingham, Bonneville, Fremont, Madison, and Jefferson Counties a Federal disaster area.



Figure 25 : January, 2008 Falls River ice jam.

On an annual basis, as much as 90 percent of damage from natural disasters can be attributed to floods and their associated mud and debris flows. To offset these risks and reduce damages, emphasis has been placed on improving flood warning systems and forecasting technologies. Accurately forecasting timely flood warnings can save lives and decrease flood related property damages.

Understanding conditions that cause floods is the best way to be proactive in monitoring, preventing and mitigating damage from a flood event. This is where the monitoring capabilities of the Natural Resources Conservation Service SNOTEL (SNOW Telemetry) Network are useful as an early warning tool.

The NRCS maintains a network of over 800 SNOTEL sites in the west with nearly 80 sites in Idaho. This network collects hourly climatic data that is available on the internet for users to access. Primary climatic parameters monitored include snow/water equivalent, precipitation, air temperature, snow depth (snowfall), soil moisture. Stations are typically installed in the primary snow accumulation zone in the 5,000 and 8,000 foot elevation range in Idaho. Knowing the key climatic indicators that lead to rapid runoff or melting of the snowpack, with or without significant amounts of precipitation, can help agencies predict, mitigate damage and assess if the potential for future streamflow increases has passed. More information and links about the Snow Survey program and data collection is available a [http://www.id.nrcs.usda.gov/snow/siteinfo/typical\\_snotel.html](http://www.id.nrcs.usda.gov/snow/siteinfo/typical_snotel.html).

The United States Geological Survey (USGS) currently controls more than 85% of all active stream gaging stations throughout the country. These stream gages provide the USGS, partner agencies, and the public with real-time data

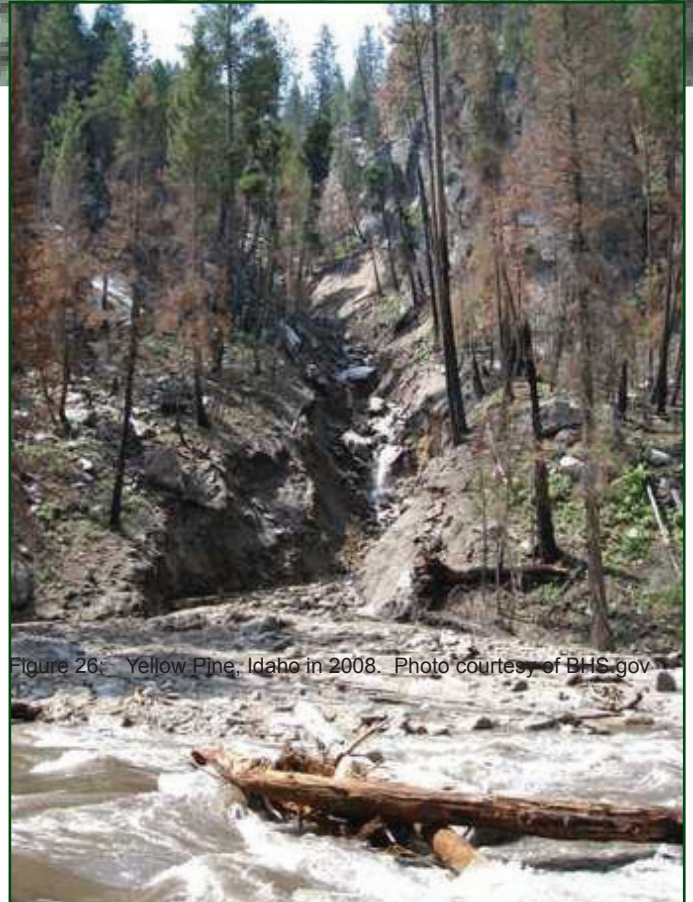


Figure 26: Yellow Pine, Idaho in 2008. Photo courtesy of BHS.gov

including flow speed, discharge rates and other information that is vital to accurately monitor and predict floods. In Idaho, the USGS currently operates approximately 220 stream gage stations, and data from these gages are available on a real-time basis on the USGS National Water Information System website at: <http://waterdata.usgs.gov/id/nwis/sw/>.



## Flood Monitoring in Idaho (Continued)

The USGS provides a number of websites that make extremely useful data available to users. Visit the following links to assist in monitoring local rivers and streams in your area:

USGS WaterAlert <http://water.usgs.gov/wateralert/>

The USGS WaterAlert site automatically notifies users via email or text when user specified stream-gage stations exceed pre-defined levels.

USGS StreaMail <http://water.usgs.gov/wateralert/streamail.html>

The USGS StreaMail system provides a system for users to contact stream-gage stations via email or cell phone to request specific information for that stream site.

USGS WaterWatch <http://waterwatch.usgs.gov/>

The USGS WaterWatch website displays current stream conditions in map and table formats.

USGS Flood Summary Reports <http://ks.water.usgs.gov/floodsummary/index.shtml>

Summaries of notable floods are periodically published as flood summary reports and posted on this website.

USGS National Streamflow Statistics Program <http://water.usgs.gov/osw/programs/nss/index.html>

Software and databases provided on this website allow users to estimate flood frequency statistics, as well as other streamflow statistics, at ungaged stream sites in both rural and urban areas.

USGS StreamStats <http://water.usgs.gov/osw/streamstats/>

This website allows users to obtain statistics (including flood frequency statistics) on specific stream sites

## Flood Monitoring in Idaho (Continued)

An additional resource is the National Weather Service (NWS). The NWS, a branch of the National Oceanic and Atmospheric Administration (NOAA), is the federal agency tasked with forecasting and monitoring weather conditions throughout the nation. This responsibility includes issuing flood forecasts and warnings for all rivers and streams that pose a risk to surrounding communities. The NWS maintains a website called the Advanced Hydrologic Prediction Service (AHPRS) that provides valuable information to the public. Using satellite imaging, river gages and computer modeling software, NWS scientists are able to forecast how a flooding river will behave. The AHPS system allows the NWS to predict flood height and timelines, display where and when floodwater will cover the ground at different river stages, and even determine how long floodwater will remain in any given area. The address for the AHPS website is <http://water.weather.gov/ahps/>.



River Height	Flow	Impact
13 feet	16000 cfs	MAJOR FLOODING WILL OCCUR NEAR THE RIVER IN BOISE... GARDEN CITY... EAGLE... STAR... AND CALDWELL. SOME RESIDENTIAL AREAS IN LOW LYING AREAS NEAR THE RIVER WILL BE FLOODED WITH WATER ENTERING SOME HOUSES. A FLOOD OF THIS MAGNITUDE HAS NOT OCCURRED ON THE BOISE RIVER SINCE 1942. MOST OF THE AREA WITHIN THE 100 YEAR FLOOD PLAIN... INCLUDING MANY CITY PARKS NEAR THE RIVER... WILL BE UNDERWATER. DEBRIS PILING UP ON BRIDGE CROSSINGS WILL CAUSE ADDITIONAL FLOOD DAMAGE.
12 feet	12000 cfs	FLOODING WILL OCCUR IN LOW AREAS AND PARK LAND ADJACENT TO THE RIVER IN BOISE... GARDEN CITY... EAGLE... STAR... AND CALDWELL. FLOODING OF LOW LYING RESEDINTIAL STREETS IN AREAS ADJACENT TO THE RIVER IS LIKELY... ESPECIALLY ON PORTIONS OF EAGLE ISLAND. DEBRIS DAMMING ON BRIDGES CROSSING THE RIVER WILL OCCUR AND MAY CAUSE WATER TO SPILL OVER THE ROAD SURFACES LEADING UP TO THE BRIDGE. PARK CENTER BOULEVARD IN SOUTHEAST BOISE WILL BE FLOODED BETWEEN THE PARK CENTER POND AND THE BRIDGE.
11 feet	8900 cfs	FLOODING OVER PARK CENTER BOULEVARD IN SOUTHEAST BOISE NEAR THE PARK CENTER POND WILL OCCUR. FLOODING NEAR THE RIVER WILL OCCUR IN LOW AREAS OF BOISE... GARDEN CITY... EAGLE... STAR AND CALDWELL. PORTIONS EAGLE ISLAND WILL BE SUBMERGED WITH FLOODING OF RESIDENTIAL PROPERTY IN LOW LYING AREAS NEAR THE RIVER LIKELY. THE WATER SHOULD REMAIN BELOW THE LEVEL OF MOST RESIDENTIAL STRUCTURES... BUT ACCESS IN AND OUT OF SOME NEIGHBORHOODS MAY BE LIMITED BY HIGH WATER.

### Flood Watch

*A flood watch is issued when conditions are favorable for flooding. It does not mean flooding will occur, but it is possible.*

### Flood Warning:

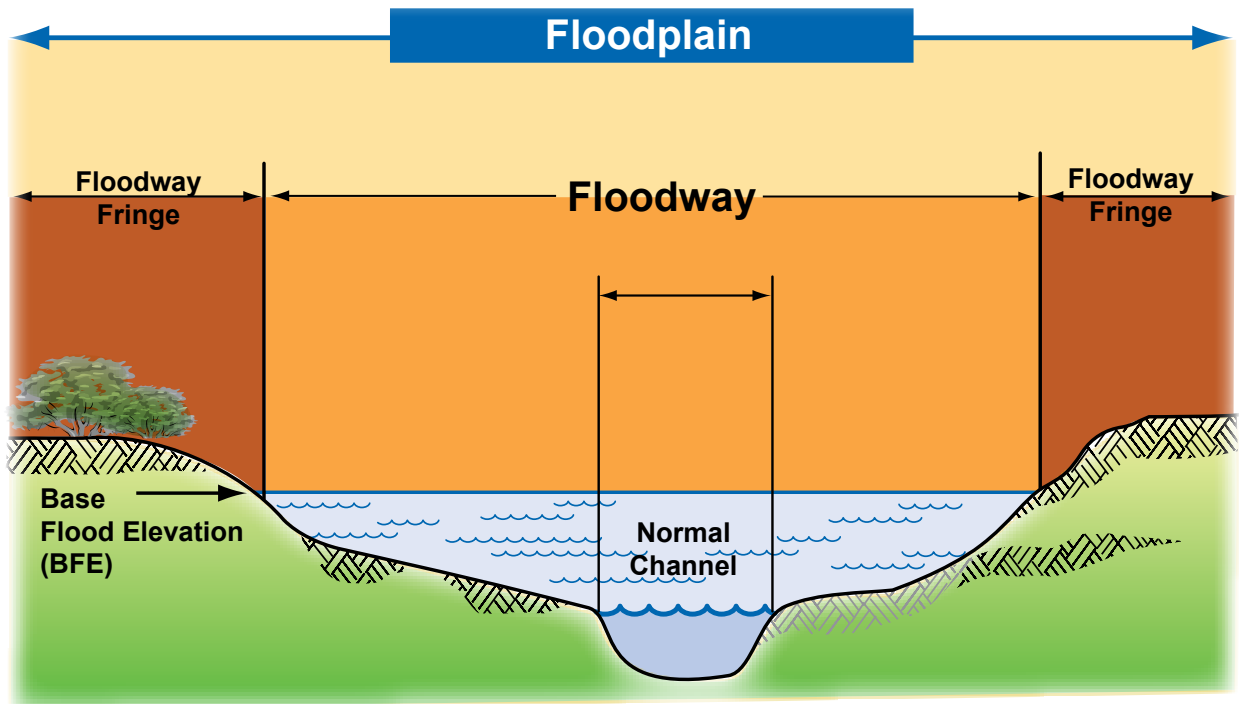
*A flood warning is issued when flooding is imminent or occurring.*

For many reasons throughout history, people have sought to live near water. Ease of travel, access to fresh water supplies, agricultural needs and abundance of wildlife and game are just some of the advantages of living near a river, lake, or ocean. As civilization has advanced, however, and these things have become more readily available, the desire to live near water has not diminished. People still like to have their house on the lake, or to be able to look out their window and see the river flowing by.

Problems arise with this kind of development when such construction is not managed carefully. When development is allowed to occur with no regulation or control, people will invariably build wherever they want without consideration of the risks, not only to them, but also to the environment around them. As our communities grow and expand, and the need for continued building increases, we begin to encroach more and more into the sensitive areas surrounding us. The ongoing need to build and live near water places us directly in its path.

## WHAT IS THE FLOODPLAIN?

Put simply, the floodplain is an area of land around inland and coastal waters that is susceptible to flooding. The floodplain is typically a low-lying, relatively flat area that has been built up with sedimentary deposits over time. Floodplains follow the natural tendency of a river or stream to manage overflows, and they have been created and shaped by years of flooding.



## The Floodplain (Continued)

Flooding is a natural function, and assists the environment in a number of ways. A properly working floodplain benefits the ecosystem by performing such functions as providing critical habitat for wildlife and endangered species, supporting a high rate of plant growth, and maintaining biodiversity. Flooding on floodplains recharges and purifies groundwater, processes organic waste, and can even assist agricultural resources by providing needed water and nutrients to assist crop growth. Unimpeded floodplains also have the ability to store and convey floodwaters, slowing water velocities and reducing damages resulting from flooding.

For floodplain management purposes, the floodplain is composed of two types of area. First, a high hazard zone referred to as the Special Flood Hazard Area (SFHA) which is regarded as the area having a 1-percent chance of flooding within any given year, also known as the “100 year floodplain.” Then, within the SFHA, is the area known as the floodway, which is the channel of a river, stream or drainageway, as well as the portion of the floodplain adjacent to the channel, that is required to carry floodwaters. It is in the floodway that floodwaters will reach their highest velocities, and is considered the most dangerous area of the floodplain.

The floodplain is a dynamic, ever-changing environment. As rivers and streams flow, over time they will often shift course, or move in new directions, a phenomenon referred to as channel migration. This can occur for any number of reasons, such as erosion, or a large enough flood event. These changes impact the floodplain, often moving it, or expanding it, and flooding that occurs from these changes is a natural occurrence, important for healthy floodplain growth and maintenance.

It is only when flooding impacts where we live that it becomes a significant problem.

Figure 27 : North Fork Payette River, Idaho Photo by John Wirt, USGS.gov



### FLOODPLAIN MANAGEMENT

From the early 1900s through today, flood damages have increased drastically, as more and more people choose to live near water. Approximately \$6 billion nationally in damages are caused by flooding every year. The Federal Emergency Management Agency (FEMA), and



Figure 28: Valley Creek, Stanley, Idaho 2010

the U.S. Army Corps of Engineers (USACE), as well as numerous other federal agencies and local governments, have developed policies and procedures to oversee and manage development within the floodplain in order to save lives, reduce property damage, and minimize environmental impacts.

It was originally thought that flood risks could be controlled by using structural facilities, such as dams and levees, to keep flood waters out of populated areas. Over time, it became clear that expensive flood control structures could not always prevent flooding, and in fact sometimes led to even greater risks and danger. Given a false sense of security from the presence of such structures, people developed in

hazardous areas they should have avoided. This situation becomes especially dangerous when such facilities fail, causing severe or even catastrophic damage to surrounding communities. As the cost to the taxpayer continued to rise, federal, state and local governments began examining broader, non-structural based forms of floodplain management. They began the process of learning to live with the rivers, instead of trying to change or control them.

Many different elements are involved in modern, effective floodplain management. It typically begins with the writing and enforcement of ordinances, usually specific to a community, that govern land use and building construction within the floodplain. Identification and correction of specific flood risks, zoning, lot size and coverage, open space and landscaping requirements, adoption of certain building codes, and development of sound engineering requirements for stormwater control are all examples of good floodplain management. Regulations implementing these measures are enforced by local officials, referred to as floodplain administrators, whose primary responsibility is to ensure that all construction and land use activities within the floodplain are carried out in compliance with local ordinances.

We have seen over time that the floodplain changes, not only due to natural occurrence, but also because we force our will upon it. By developing within the floodplain, we can, and often do, force it to adjust itself to meet the new demands placed upon it. These artificially induced changes can not only have serious impacts on the natural functions of the floodplain, but also on our neighbors.





## The Floodplain (Continued)

A relatively new philosophy in floodplain management that has begun to gather favor is the concept of “No Adverse Impact” (NAI). Land use decisions can often create controversy and contention, as everyone wants to determine what to do with their own land. NAI was conceived by the Association of State Floodplain Managers (ASFPM), an organization dedicated to the proper development of the floodplain, to promote the concept of managing development and land use in a way that does not harm one’s neighbors. The NAI viewpoint does not necessarily discourage all building within the floodplain, but it strongly encourages protecting the property rights of the entire community by providing a realistic yet conscientious foundation for safe and proper development.



Figure 29 : Valley Creek,  
Stanley, Idaho  
2010 Flood

Though the safest practice is to avoid building in the floodplain as much as possible, development will continue. The important thing is that when development within the floodplain is carried out, it must be done in such a way to minimize the overall impact, not only to the environment but to the homeowner and their neighbors. Actions that reduce or eliminate the threat of damage from disasters are called hazard mitigation, and they can take a number of forms, but the end goal is always the same: reducing flood risk.

For years, disaster recovery has followed the pattern of disaster-repair-disaster, meaning that after a disaster has occurred, the typical recovery process involved returning damaged structures and facilities as much as possible to their pre-disaster condition. In recent years, however, emphasis has been placed more on finding methods to remove those risks completely, with the intent of minimizing

or eliminating the need for repairs. Hazard mitigation involves the implementation of good floodplain management practices. Efforts such as acquisitions, or buy-outs, employ the purchase of flood-prone properties by local governments in order to return the land to open space use, forever removing it from the path of future disaster damage and the need for costly repairs. Another popular form of mitigation consists of structural elevations, which involves raising new and existing buildings above predicted future flood levels. Foundations can be designed to allow floodwater to flow freely through the lowest levels, minimizing water displacement. Critical utilities, such as water heaters and electrical panels can be elevated to higher levels to remove them from the reach of floodwaters. These techniques, and many more, are examples of effective hazard mitigation, which has been proven over time to reduce disaster recovery costs. In fact, for every dollar spent on hazard mitigation, we currently avoid about \$4 in subsequent damages.

Besides avoiding development in the floodplain in the first place, perhaps the most important means of protecting oneself from flood losses lies in the purchase of flood insurance. This valuable and reasonably priced coverage is made available through the National Flood Insurance Program.




Figure 28 Photo courtesy of [cdatribe.nsn.gov](http://cdatribe.nsn.gov)\_Lake Mgmt

The National Flood Insurance Program (NFIP) was created by the U.S. Congress in 1968, and is administered by the Federal Emergency Management Agency (FEMA). The NFIP was established to make flood insurance available to property owners in participating communities. Flood insurance through the NFIP was designed to reduce the cost of disaster assistance to the taxpayer by providing affordable flood insurance to businesses and homeowners. As of 2010, over 5.5 million residences and commercial buildings in more than 20,000 communities throughout the U.S. are insured against flood damage through the NFIP. Currently, Idaho has 168 participating communities.

Many people are unaware of the fact that standard homeowner's or property insurance offers no protection against losses from flood damage. It is commonly assumed that if someone pays for coverage on their property, then they are protected against all forms of disaster. In fact, to receive coverage against flood losses, a property owner must either purchase federal flood insurance from the NFIP, or a non-NFIP affiliated policy from a private insurance company, if available. While flood insurance is managed and paid through the NFIP, property owners can purchase coverage directly from most local insurance agents, who are authorized to write and provide such flood insurance policies.

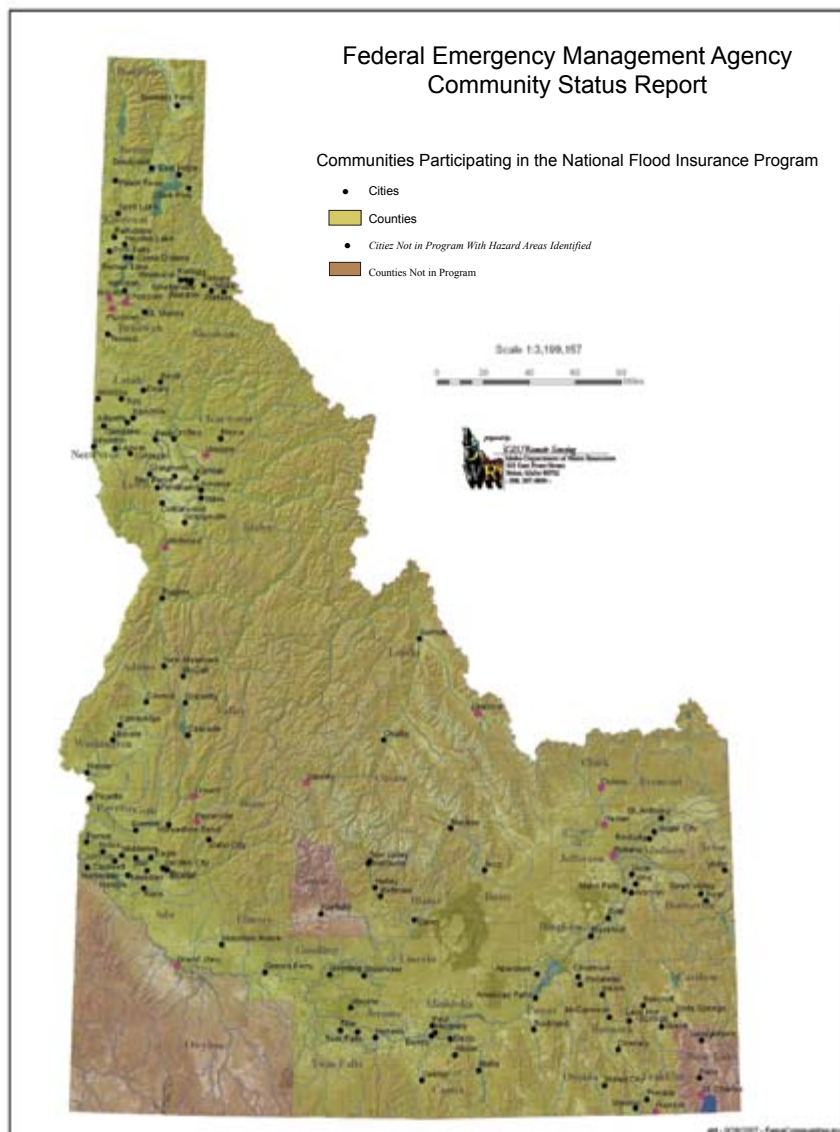


Figure 30 Idaho Communities Participating in the National Flood Insurance Program

the NFIP, or a non-NFIP affiliated policy from a private insurance company, if available. While flood insurance is managed and paid through the NFIP, property owners can purchase coverage directly from most local insurance agents, who are authorized to write and provide such flood insurance policies.

Following a disaster, such as a flood, FEMA provides disaster recovery assistance to those who qualify. While minimal grant assistance is available to some, the primary form of disaster aid comes in the form of low-interest loans from FEMA's partner in disaster response, the Small Business Administration (SBA). Loans from the SBA are only offered to those who qualify, and must be paid back eventually. On the other hand, flood insurance is readily available, and based on where the property is located, very often can be purchased for a low annual premium. An average flood insurance premium costs approximately \$400 for about \$100,000 in coverage.

To qualify for insurance through the NFIP, a property owner's community must be a participant in the program. To join the NFIP, a community must



## National Flood Insurance Program (Continued)

agree to adopt and enforce minimum floodplain management standards, such as requiring new or substantially improved structures to be elevated at or above the Base Flood Elevation (BFE).

The first step for a community in establishing NFIP participation involves identifying the flood risks and hazards within that community. Local officials must be committed to regulating development within the SFHA. All construction must be properly permitted and inspected. The use of materials and construction design that will minimize impacts on the floodplain must be documented. It is up to the community officials to ensure that NFIP requirements are met and maintained, and local regulations must be updated to meet NFIP standards.

When a community elects to opt out of participation in the NFIP, or is suspended for violations of regulations, residents of that community suffer several negative results. First, and perhaps most importantly, federal flood insurance becomes unavailable. Those with active policies cannot renew them. In addition, if a federally declared disaster occurs in that community, federal disaster assistance in the form of grants and loans from FEMA, the SBA and several other government agencies, is no longer provided for projects within the SFHA. While eligible applicants for aid are still able to receive disaster assistance that is not related to

permanent repair and reconstruction of damaged buildings, no long-term assistance is available. Finally, flood insurance is required for federally regulated loans to purchase or build structures in the SFHA, but is not available in non-NFIP participating communities.

While the minimum safety requirements established by the NFIP promote good baseline building standards and strong floodplain management policies, some communities feel that they have flood risks that require even greater levels of vigilance. To address any additional high water dangers facing their residents, some of these communities incorporate even higher regulatory safety ordinances than those required by the NFIP. The enforcement of freeboard, for example, is a popular form of additional safety margin many communities require in new and renovated buildings. Freeboard involves elevating a structure above the BFE for a given area by a certain number of extra feet. In other words, if a community has an established BFE of 8', and a requirement of 2' of freeboard, then every new or remodeled structure must elevate to a level of 10'. Freeboard is just one of the many extra steps that communities are taking to ensure that their inhabitants remain safe and secure from flood damage.



### Community Ratings System

To recognize and reward communities that go above NFIP minimum standards, the NFIP has instituted a voluntary program called the Community Ratings System (CRS). For participating communities, the CRS allows for the potential of even lower flood insurance rates. The CRS consists of a list of 18 creditable activities in four categories, for which communities receive points. Those points are added together, and for each increasing level of award, from Class 10 (which is the lowest level of a participating community, thus receiving no reduction), to a Class 1 community (the highest level of participation possible), a reduction of 5% per class is awarded. Therefore, a Class 1 community would benefit from a reduction of 45% off their flood insurance premium rates. Examples of activities that earn a community points are: making efforts at dispensing public information advising people about local flood hazards and flood insurance; mapping and regulations that address development, land use, and stormwater management; flood damage reduction techniques; and things to do in preparation for an impending flood. There are currently 21 communities in Idaho that participate in this program. Talk to your local floodplain administrator to learn more.

# National Flood Insurance Program (Continued)

## Idaho Flood Insurance Facts

Whether property owners know it or not, a large number of structures in Idaho are currently located within the floodplain. According to the latest figures, more than 23,000 structures throughout the state are known to be within the SFHA. However, floods are not restrained to the lines drawn on a map and a much greater number of homes and properties are located near a mapped floodplain that could also be at risk from flooding whenever nearby rivers, streams or canals overflow their banks. Of all of these potentially threatened structures, however, only slightly more than 6,000 are insured with policies through the NFIP, and only half of those policies are for structures in the SFHA.

## Idaho Flood Insurance Facts

### Myths & Facts about Flood Insurance

**MYTH:** The NFIP does not cover flooding resulting from hurricanes or the overflow of rivers or tidal waters.

**FACT:** The NFIP defines covered flooding as a general and temporary condition during which the surface of normally dry land is partially or completely inundated. Two properties in the area or two or more acres must be affected. Flooding can be caused by:

- Overflow of inland or tidal waters, or
- Unusual and rapid accumulation or runoff of surface waters from any source, such as heavy rainfall, or
- Mudflow, i.e., a river of liquid and flowing mud on the surfaces of normally dry land areas, or
- Collapse or subsidence of land along the shore of a lake or other body of water, resulting from erosion or the effect of waves, or water currents exceeding normal, cyclical levels

**MYTH:** You can't buy flood insurance if you are located in a high-flood risk area.

**FACT:** You can buy National Flood Insurance no matter where you live if your community participates in the NFIP, except in Coastal Barrier Resources System (CBRS) or other protected areas. The Program was created in 1968 to make federally backed flood insurance available to property owners who live in eligible communities. Flood insurance was then virtually unavailable from the private insurance industry. The Flood Disaster Protection Act of 1973, as amended, requires federally regulated lending institutions to make sure that mortgage loans secured by buildings in high flood risk areas are protected by flood insurance. Lenders should notify borrowers, prior to closing, that their property is located in a high-flood risk area and that National Flood Insurance is required.

**MYTH:** Only residents of high-flood risk areas need to insure their property.

**FACT:** All areas are susceptible to flooding, although to varying degrees. If you live in a low to moderate flood risk area, it is advisable to have flood insurance. Nearly 25 percent of the NFIP's claims come from outside high-flood risk areas. Residential and commercial property owners located in low-to-moderate risk areas should ask their agents if they are eligible for the Preferred Risk Policy, which provides inexpensive flood insurance protection.

For more information about the NFIP and flood insurance, call  
1-800-427-4661  
or contact your insurance company or agent.

For an agent referral, call 1-888-435-6637  
TDD 1-800-427-5593

<http://www.fema.gov/business/nfip>  
<http://www.floodsmart.gov>

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FEMA B-690 / Catalog No. 08094-3

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**Base Flood :** A flood that has a 1% chance of being equaled or exceeded each year.

**Base Flood Elevation (BFE):** The elevation in feet above mean sea level of the base flood or the 1% chance annual flood.

### Idaho's Flood Protection Elevation

Many people in Idaho are unaware that some state floodplain management regulations exceed the federal minimum requirements. Idaho has adopted the Flood Protection Elevation (FPE) as the elevation standard for new construction and substantial improvement of structures in the floodplain. According to Idaho Code, FPE is an elevation that corresponds to the elevation of the 1-percent chance annual flood (one hundred year flood), plus any increase in flood elevation due to floodway encroachment plus any amount of locally required or recommended freeboard.

## Understanding Flood Insurance Rate Maps

Flood Insurance Rate Maps, or FIRMs, are maps created by FEMA for the purposes of floodplain management and flood insurance rating. FIRMs are produced to display a community's base flood elevations, flood zones and SFHA boundaries. Property owners and community officials can use these maps to determine where a piece of property lies within the local floodplain, and to identify flood risks associated within the area.

FIRMs are important because they are the tool the NFIP uses to determine where flood insurance is required, and what the rates for that insurance will be. Federally regulated and insured lenders require all structures located in high-risk areas, as displayed on a FIRM, to carry a flood insurance policy.

To create a FIRM, FEMA engineers and cartographers first conduct one of two different types of flood studies for a specific area: an "approximate study" or a "detailed study." These studies examine such factors as hydrological, meteorological and hydraulic data, and local flood-control facilities and development. (The difference lies in the level of detail examined.) The information gathered is used to identify the SFHA for the areas intended for mapping. All the information is then compiled into a Flood Insurance Study (FIS), which is a narrative document that explains all the findings of the study. Based on that information, FEMA will then generate the FIRM. FIRMs will also typically note common physical features of the vicinity, flood insurance risk zones and floodways, among other aspects of the mapped area.

In the past, community FIRMs were produced on paper foldouts that could take up considerable space, depending on how much land area required flood mapping. FEMA is currently transitioning from the use of paper products to a digital format. While communities can still receive

one paper copy of each map and FIS within their area, the new digital FIRMs (DFIRMs) will be available at no cost as they are completed.

FIRMs for Idaho are available from several sources. As of the date of this publication, the Idaho Department of Water Resources (IDWR) Floodplain Management web page currently offers DFIRMs for eleven counties where flood studies have been revised by FEMA (Bonner, Kootenai, Benewah, Shoshone, Washington, Canyon, Ada, Blaine, Twin Falls, Jefferson and Bannock). There are eight counties in Idaho that have never been mapped for flood hazard areas (Bear Lake, Camas, Caribou, Clearwater, Lewis, Oneida, Owyhee and Power) although there are some cities within those counties where flood hazard information has been identified. For most other counties, flood hazard areas from the paper FIRMs have been digitized by mapping specialists at IDWR and overlaid on current aerial photography, making it possible to see the mapped flood hazard in a particular area. On the IDWR Flood Hazard map there is a search feature that enables a user to locate a specific address or tax parcel in most counties. On the internet, go to the following website <http://maps.idwr.idaho.gov/floodhazard/Map> and zoom into your area of interest. Current and historic FIRMs can also be viewed or obtained at FEMA's Map Information eXchange (FMIX) at <http://www.msc.fema.gov>.

FIRMs are usually available for review at the local government office responsible for floodplain management in your community. Your community's floodplain administrator may be a planner, a building official, an engineer, city or county clerk or even the mayor. Every community that participates in the NFIP is required to maintain local FIRMs, review development permits to determine whether a property is located in the SFHA, and assist property owners in developing properly in the floodplain. A list of floodplain administrators for Idaho NFIP participating communities is on the IDWR



## Flood Insurance Rate Maps (Continued)

floodplain website <http://www.idwr.idaho.gov/WaterManagement/FloodPlainMgmt/default.htm>.

FEMA's website for the NFIP provides a large amount of information on FIRMs and how to read them. Please take a look at this site for further assistance: [www.fema.gov/business/NFIP](http://www.fema.gov/business/NFIP).

The Floodsmart website at <http://www.floodsmart.gov/floodsmart/> is a user-friendly site that provides a great deal of information about flooding and flood damage, insurance, how to buy insurance, how to locate a property on a FIRM, and how to interpret the FIRM.

To learn more about FIRMS, dFIRMS and how to interpret their information, please visit this online tutorial available at <http://www.fema.gov/library/viewRecord.do?id=2324>.

Occasionally an engineering study may reveal an inaccuracy in a FIRM or FIS for a given area. Also, changes in the physical environment may warrant a change to the map. When these occasions arise, revisions may be made to the maps and studies by submitting technical data to FEMA under the Letter of Map Change (LOMC) process. This provides an official mechanism for amending or revising the effective Flood Insurance Rate Maps Flood Insurance Studies. Examples of the LOMC process are:

### Letter of Map Amendment (LOMA)

A letter based on technical data showing that a property was incorrectly identified as within the SFHA. A LOMA amends the current effective FIRM and establishes that a specific property is not located in a SFHA.

### Letter of Map Revision (LOMR)

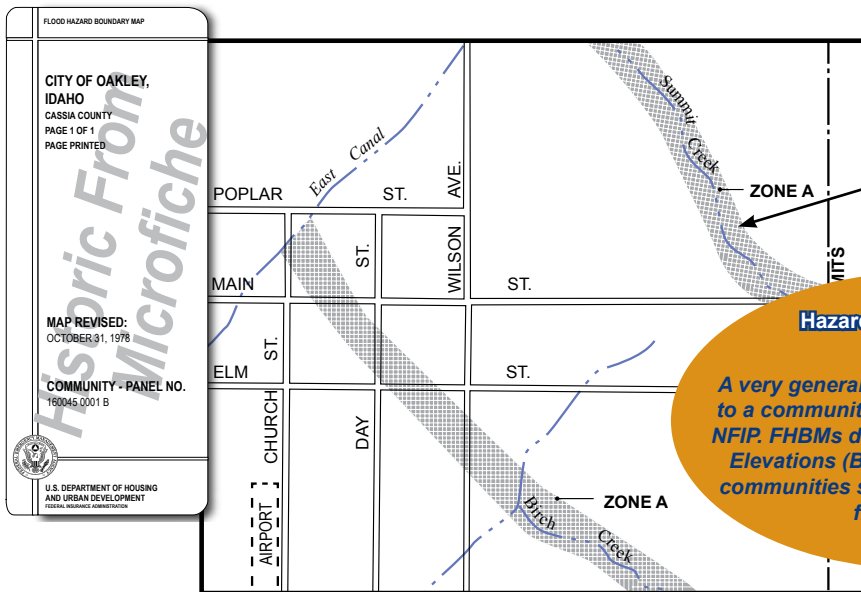
A letter of revision is based on technical data that displays changes (usually of a man-made nature) to flood zones, flood elevations, floodplain and floodway delineations, and planimetric features. One common type of LOMR, a LOMR-F, is a determination that a structure has been elevated by fill above the base flood elevation and is excluded from the SFHA.

### Conditional Letter of Map Revision(CLOMR)

A formal review and comment by FEMA as to whether a proposed project complies with the minimum NFIP floodplain management criteria. A CLOMR does NOT amend or revise effective FIRMs, Flood Boundary and Floodway Maps, or Flood Insurance Studies.



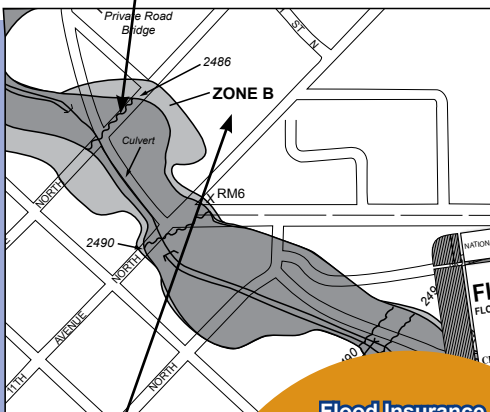
# Flood Insurance Rate Maps (Continued)



Zone A (unnumbered) is a special flood hazard area without BFE's.

**Flood Hazard Boundary Map (FHBM)**  
 A very generalized map usually issued to a community when they first join the NFIP. FHBM's do not include Base Flood Elevations (BFEs). Only a handful of communities still possess these basic flood maps.

Base Flood Elevation (BFE). Measured in feet above mean sea level, this is the elevation of the base flood or the 1% annual chance flood.



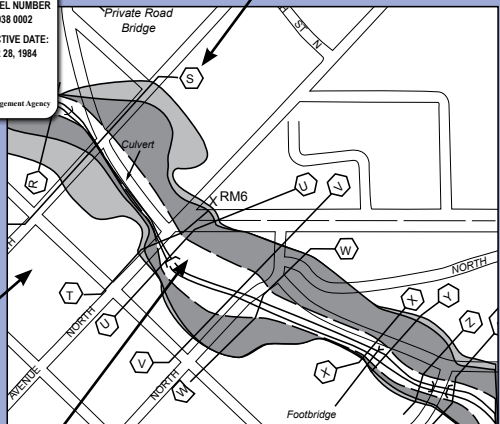
**Flood Boundary and Floodway Map**  
 Flood Boundary and Floodway maps delineate floodways but do not show flood zones or BFEs. A community must use its FIS to identify BFEs.

Cross-section location where ground surveys determined the shape of the land and how structures such as bridges and culverts affect the flow of water.

**Flood Insurance Rate Map (FIRM)**  
 Most communities have a FIRM. They generally include BFEs and show flood zones, Appendix A, and are based on a detailed study of flood potential in the community. With the FIRM, flood elevations at any specific development site within a community can usually be determined. More recently published FIRMs include both BFEs and regulatory floodways.

Zone B or Zone X (light shaded) shows areas of moderate flood risk subject to flooding by the 500-year flood 0.2% chance annual flood.

Zone C or Zone X (unshaded) is considered low risk



The Floodway is the channel of a river or other watercourse and the adjacent land areas reserved for discharging the base flood.

# Flood Insurance Rate Maps (Continued)

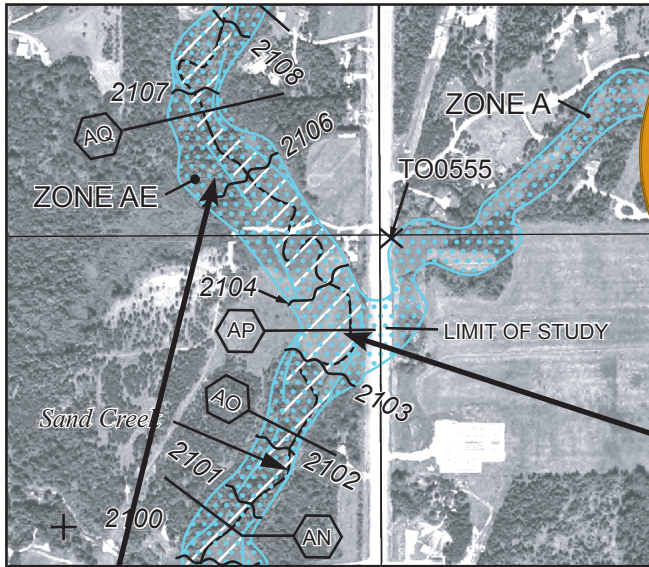


Figure 33 Sand Creek, Bonner County, Idaho 2009 DFIRM

Zone AE (dark shaded) is the 100-year (1% chance) floodplain with BFEs. Also called Zones a1-A30.

## Digital Flood Insurance Rate Map (DFIRM)

DFIRMs are FIRMs in an industry-standard Geographic Information System format that allows users to view information in a graphical format and add or remove layers of data according to their needs.

The Floodway is the channel of a river or other watercourse and the adjacent land areas reserved for discharging the base flood.

## Flood Insurance Study (FIS)

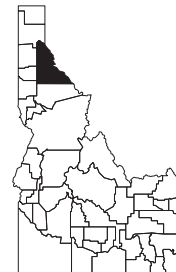
The official report by the Federal Insurance Administration evaluating flood hazards and containing flood profiles, floodway boundaries, and water surface elevations of the base flood. The FIS must be used to obtain a BFE at a specific location.

## FLOOD INSURANCE STUDY



### SHOSHONE COUNTY, IDAHO AND INCORPORATED AREAS

Community Name	Community Number
KELLOGG, CITY OF	160131
MULLAN, CITY OF	160115
OSBURN, CITY OF	160116
PINELURST, CITY OF	160200
SMELTERTVILLE, CITY OF	160117
WALLACE, CITY OF	160118
WARDNER, CITY OF	160130
SHOSHOEN COUNTY UNINCORPORATED AREAS	160114



EFFECTIVE:  
SEPTEMBER 26, 2008



Federal Emergency Management Agency  
FLOOD INSURANCE STUDY NUMBER  
16079CV000A



Figure 31: New York Canal Boise, Idaho

Over time, every river, stream, and lake will flood. We have come to depend on facilities like dams and levees to keep our homes and communities safe from inundation.

The federal government defines a levee as a man-made structure designed to contain, control, or divert the flow of water to protect from flooding. Originally, levees in Idaho were mostly utilized to keep floodwater from agricultural land, but as development spread, levees were increasingly relied on to reduce flooding in our communities.

Floods are measured by the percentage chance of their occurrence and estimated water levels, based on historical data for a particular area. In the past, their use primarily in agriculture did not require levees to be built to withstand high volume floods, such as the 1-percent (100 year flood) or .2-percent (500 year flood) chance annual events. Many were constructed to hold back the more common 10-percent floods, those having a 10-percent chance of occurring within a given year. With the growth of our population, many residential and commercial neighborhoods expanded into territory protected by agricultural levee systems that were never designed to protect homes and businesses.

There are numerous causes for levee failure - erosion, burrowing animals, invasive vegetation, waterborne debris, and earthquakes. Even frequent overtopping can wear a levee down until it no longer serves its original purpose. For these reasons, proper maintenance is critical to maintaining a reliable levee system. Addressing the problem of inadequate levees is difficult and expensive, but easier than dealing with the massive destruction often caused by unchecked floodwaters. It requires political will and leadership.

If you live anywhere near a river or large body of water, there is a strong possibility that you have a levee system near you as well. If you are unsure, there are ways of finding out. You can contact your local public works department, or flood control district, and they will be able to inform you of the presence of any levees in the area.



## Levees and Irrigation Canals (Continued)

When you learn your home is near a levee system, it is a good idea to be as informed as possible about what that means. Try to find out where the levees are and what areas of your community are protected by them. What size flood are they designed to protect against? Find out how the levees have performed in the past and what kind of condition they are in. There are several steps you can also take to make yourself, your family, and your property a little safer. First and foremost, speak with your homeowner's insurance agent about flood insurance. If you don't already have flood coverage, it is the simplest way of protecting yourself against flood losses. It is also a good idea to know how much time you would need to evacuate safely in the case of levee failure, and what would be the best route.

### Levee Certification vs. Accreditation

What does it mean for a levee system to be certified? How is accreditation different?

A levee system is certified if evidence, typically a statement by a licensed professional engineer or federal agency responsible for operation and maintenance, has been presented showing that the system meets current design, construction, maintenance, and operation standards to provide risk reduction from the 1-percent annual-chance flood. The levee owner is responsible for ensuring that the levee system is maintained and operated properly and for providing evidence of certification. If the levee satisfies the regulatory design, maintenance, and operation criteria FEMA will "accredit" the levee system as providing adequate risk reduction on the FIRM and the levee-impacted area will be shown as a moderate-risk area, labeled Zone X (shaded). FEMA will only accredit a levee system that meets NFIP criteria, which can be found by visiting <http://www.fema.gov/library/viewRecord.do?id=2741>.

It is important to note that neither certification nor accreditation guarantees protection from a given flood event.

### Additional Levee Information

Where can I go for more information about a levee system in my area?

You can find additional information about a levee system in your community from several locations:

Check the current FIRM for your community to see if a levee system or other flood risk reduction system is already shown as providing 1-percent annual-chance flood risk reduction. Community officials will have copies of the FIRM on file in the Community Map Repository. To learn the location of the Community Map Repository in your community, please call the FEMA Map Information eXchange (FMIX), toll free, at 1-877-FEMA MAP (1-877-336-2627). You can also view or order your own copy of the effective FIRM for your community from the FEMA Map Service Center website located at <http://msc.fema.gov>.

Call your local officials or flood control districts to request information about levee systems in your area. Because most levee ownership and maintenance responsibilities have been turned over to communities, local agencies should have information about the levee system, including its operations and maintenance schedule.

Check with your local USACE district office. To find your local USACE district office, please visit <http://www.nfrmp.us/guidance.cfm>. The USACE will have information about any federally owned levee systems in your area and possibly additional information about other levee systems.

### Irrigation Canals

An additional consideration of which Idaho residents should be aware is the risk posed by the network of irrigation canals that run throughout the state. Because agriculture is so vital to Idaho's economic stability, irrigation is a necessity in maintaining that industry. There are thousands of canals in Idaho, and a large number of them are located near, and even run through, communities. According to the Idaho Department of Health and Welfare, the canals are typically 7-10 feet deep, and canal water can flow at rates up to 520 cubic feet per second, which is the equivalent of 233,000 gallons per minute.



Figure 32 : Boise, ID Irrigation Canal. Photo courtesy of id.nrcs.USDA.gov.

Similar to the situation with Idaho's many levees, there is a significant potential for loss of life and property if some of these canals were to breach. In June 2006, the Mora Canal in Kuna ruptured due to animal intrusion. What started as an undetected burrow eventually became a 40-foot hole in the canal that resulted in over 30 homes flooding in a very short space of time. It was only through the concerted efforts of local citizens and officials that the situation was brought under control.

If you live near an irrigation canal system, the best thing to do for yourself is to be informed. As with the levees, contact your local public works department or irrigation district to learn what you need to know about any canals near your home, about their current condition, and what the threat of a canal rupture could mean to you.



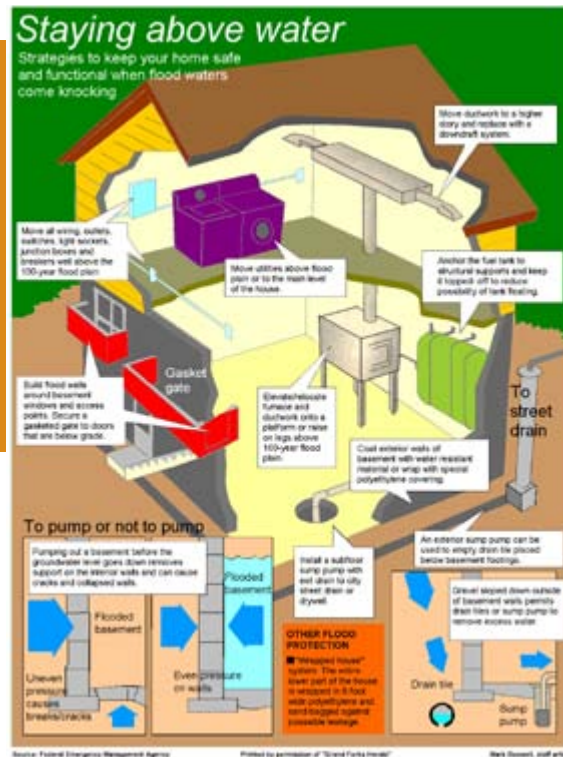
Figure 33: New York Canal, Boise, Idaho

We know that floods will keep happening. Whether you live in or near the floodplain and have experienced flooding in the past, or have never gone through it before, it is wise to prepare for the eventuality. There are a number of steps you can take long before the threat of a flood occurs. Having some or all of these precautions in place could make the difference between having three feet of water in your home and remaining dry and comfortable when it floods. It can even be a matter of life and death.

The first step to flood safety is to know your flood risks. There are several questions you need answered to ensure that you and your family are as safe as possible in light of the possibility of a flood. You need to determine if your property lies within or near a floodplain. It is beneficial to learn the flood history of the area. Find out how high future flood levels are predicted to reach. Also, look around your property and identify some of the obvious risks or challenges you might be facing in case of a flood.

The best source of information for your concerns will be your local floodplain administrator or the Idaho Department of Water Resources (IDWR). When talking with local officials, inquire about your community's building elevation regulations. Find out if there is an existing elevation certificate for your property that shows your structure's elevation in relation to the Base Flood Elevation (BFE). If one is not on file, consider hiring a licensed professional surveyor to produce one.

As previously discussed, the best means to protect yourself from flood losses is to have a flood insurance policy in place. Contact your local insurance agent about obtaining flood insurance. Remember that federal flood insurance is only available in communities that are participating in the NFIP. Another thing to keep in mind when purchasing federal flood coverage is that most policies have a 30-day waiting period before they



become active. If your local river is rising rapidly, and you haven't gotten covered yet, you've waited too long.

For insurance purposes, consider taking pictures of your valuables: things like televisions, stereo equipment, computers, etc. Keep these pictures in a safe location. If the time comes when you need to file an insurance claim, you will have a photographic record of the more important items that may have been damaged or lost during the event.

Besides purchasing flood insurance, there are a number of other precautions you can take to protect your home and property from flood damage. It is possible to make minor changes to a home or building that have long-term effects on the overall ability of a structure to withstand flood damage. Something as simple as elevating your air conditioning system, water heater, or furnace can go a long way toward reducing the costs of disaster recovery and repair. For those people

## Before a Flood (Continued)

that have a propane fuel system, make sure that the fuel tanks are anchored securely in place. An invaluable protective measure is installing backflow preventers on your sewer lines to keep overloaded sewers from backing up into your home. Relatively easy measures like this can save you lots of time, money, and heartache in the wake of a flood.

Many residents of Idaho get their water from a well. During a flood there will likely be chemicals, waste and foreign material in the water that could be hazardous. When a well is not constructed properly, it can become vulnerable to contamination. Fortunately, there are some things you can do to make your well a little more secure. By extending the well casing at least two feet above the highest predicted flood levels for your area, and topping it off with a water-tight seal or cover, you help prevent water intrusion into your well from floodwater above ground. Additionally, consider curbing the well casing at ground level by surrounding it with a watertight seal that is at

least four inches thick, to decrease the likelihood of seepage. Using grout to separate the walls of the well casing and the sides of the bore hole to a depth of at least ten feet will also help prevent contaminated floodwater from leaking into your well through the ground. In addition, protect your well's electrical controls from floodwater.

**PERMANENT IMPROVEMENTS FOR FLOOD PROTECTION FOR HOMES AND BUSINESSES**

IN ADDITION TO PHYSICAL MEASURES, EVERY HOME OR BUSINESS SHOULD BE PROTECTED BY FLOOD INSURANCE. TALK TO YOUR LOCAL INSURANCE AGENT FOR DETAILS.

**WHICH OF THESE OPTIONS IS BEST FOR PROTECTING YOUR PROPERTY?**

**RELOCATION**  
MOVE THE BUILDING TO HIGHER GROUND, OR MOVE THE OCCUPANTS TO A DIFFERENT BUILDING ON HIGHER GROUND.

**CONSIDERATIONS:** Relocation is the most effective preventive measure. The danger of flood damage can be eliminated completely. Flood insurance costs can be reduced to minimum. Land acquisition, moving, and foundation construction costs can be high. Disruption of business and home life can be extensive.

**ELEVATION**  
RAISE THE BUILDING ABOVE EXPECTED FLOOD LEVEL.

**CONSIDERATIONS:** Elevation is the second best preventive measure, and can greatly reduce danger of flood damage. Flood insurance costs can be reduced. Costs less than relocation, and disruption may be somewhat less.

**DRY FLOODPROOFING**  
PERMANENTLY WATERPROOF EXTERIOR WALLS AND PREPARE TO SEAL OPENINGS.

**CONSIDERATIONS:** Effective, but only to limited height. Requires "flood fight" action to seal openings before water rises. No reduction in flood insurance premiums.

**WET FLOODPROOFING**  
USE WATERPROOF, REMOVABLE, CLEANABLE MATERIALS FOR EASIER RECOVERY.

**CONSIDERATIONS:** "Last resort" method for use when other methods are impracticable or impossible, e.g. business buildings where location is crucial. Assumes that floodwater may enter the building. Requires action to move contents. No reduction in flood insurance premiums.

**LANDSCAPING**  
COMBINATIONS OF EARTHWORKS AND FLOOD WALLS DESIGNED TO EXCLUDE FLOOD FROM IMMEDIATE AREA AROUND BUILDING, WITHOUT CAUSING A NET RISE IN WATER LEVEL, CANNOT SIMPLY PUSH THE WATER OVER TO NEIGHBORING PROPERTY.

**CONSIDERATIONS:** Works best when there is sufficient land to balance cut and fill to insure no net rise. Requires "flood fight" action to seal openings before water rises. No reduction in flood insurance premiums.

**FLOOD FIGHT**  
KEEP MATERIALS AND PROCEDURES IN PLACE AND PEOPLE TRAINED TO IMMEDIATELY PLACE SANDBAGS, SEAL PROPERTY, ETC. UPON ISSUANCE OF FLOOD WARNING.

**CONSIDERATIONS:** Subject to unlucky timing, lapses in training, failure to maintain materials, unavailability of personnel. Should only be used to supplement other methods or when other methods are impossible.

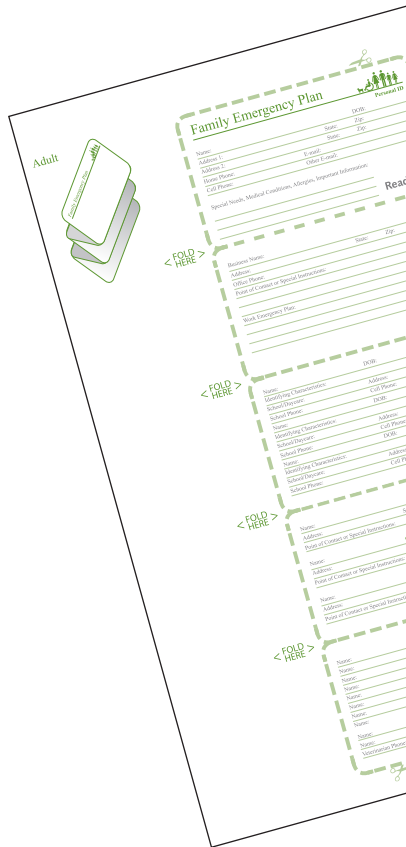
**TAKE PREVENTIVE ACTION AND BE READY WHEN THE NEXT FLOOD COMES!**

For Other Resources of Free Information: call the FEMA publications Warehouse at 1-800-498-2520

Suggested publications: FEMA L 235, Homeowners Guide to Retrofitting; FEMA 253, Engineering Principles; FEMA 346, Protecting Building Utilities; FEMA 499, Home Builder's Guide to Coastal Construction Technical Fact Sheets; FEMA P-89, Protecting Manufactured Homes From Floods and FEMA P-550, Recommended Residential Construction for Coastal Areas



## Before a Flood (Continued)



Adult

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**Ready** Family Emergency Plan

Prepare. Plan. Stay Informed.

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**ADDITIONAL FAMILY MEMBERS INFORMATION**

Name: _____	Social Security Number: _____
Date of Birth: _____	Important Medical Information: _____
Name: _____	Social Security Number: _____
Date of Birth: _____	Important Medical Information: _____
Name: _____	Social Security Number: _____
Date of Birth: _____	Important Medical Information: _____
Name: _____	Social Security Number: _____
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Name: _____	Social Security Number: _____
Date of Birth: _____	Important Medical Information: _____

Dial 911 for \_\_\_\_\_



**READY KIDS**

U.S. DEPARTMENT OF HOMELAND SECURITY

**COMMUNICATE!**

- C** Create a family communication plan so you can get in touch with family members. Give copies of contact information and meeting locations to everyone in your family.
- O** Options are available: telephones, cell phones, and e-mail are all great ways to get in touch with family members.
- M** Make sure you know the emergency plan at your child's school.
- M** Make a decision about where you will meet in case you can't get home during an emergency.
- U** Understand that it may take time to get through to everyone. Try to be patient.
- N** Needs of your pets should be kept in mind. Keep a pet carrier for easy transport, battery-operated radio for official guidance during an emergency, but also prepare in advance.
- C** Copies of your emergency plan should be in your emergency supply kit in case you need to leave in a hurry.
- A** Ask kids to discuss their concerns and feelings. Do they understand the family plan?
- T** Take the kids to visit the 'meeting spots' so that they are familiar and feel comfortable finding them on their own if necessary.
- E** Emergencies take many forms. Categorize different types of emergencies and discuss the level of concern related to each and how that is reflected in your family plan.

Finally, whether you live in an area of flood risk or not, it is always beneficial to have a plan. If a significant flood occurs, you may be required to evacuate your home. Would you know what to do and where to go? Do you have a preparedness plan or disaster kit? Ideas for assembling these items can be found by visiting <http://www.disaster.gov> or by contacting your local Red Cross.



When a flood does occur, a natural reaction is to panic. In our rush to get out of the path of the water, mistakes can be costly or even disastrous. Slow down and pay attention. There will be a lot of information coming your way through TV and radio broadcasts. The better informed you are ahead of time, the better you will be able to react during a flood.

If you attempt to secure your home against flood damage, be aware of time considerations. For example, if you choose to employ sandbags to protect your home, keep in mind that on average it takes one person one hour to fill and place 50 sandbags. However, it takes as many as 1000 sandbags to create a wall 3' high and 20' long, which would likely not even be enough to wall off a typical garage plus all the doorways into the average home. Local governments, flood control districts, and other government agencies are responsible for maintaining a supply of sandbags adequate to cover anticipated emergencies. The Army Corps of Engineers maintains a limited sandbag stockpile to augment local jurisdictions during actual flood emergencies, but is unable to issue bags to individuals. If you need help with sandbags, contact your local government. Keep in mind this may not be the most practical solution.

If an evacuation order is announced, follow instructions. Before you leave your property, look around your yard for any objects that can be brought inside or fastened down. A flood can turn anything loose into debris, which can then cause damage to your and other people's property while carried by flood water. Turn off your power and shut off your gas. If you use a propane fuel system, make sure it is switched off before you leave your property. By discovering and

fixing potential problems ahead of time, you give yourself one less thing to worry about later.

One of the biggest risks posed by floods is that people often fail to recognize the danger until water is upon them. Motorists may underestimate the depth and velocity of floodwaters, thinking they can safely maneuver, not realizing what a small amount of moving water it takes to cause a vehicle to lose traction with the road. A significant number of flood fatalities are vehicle related, usually arising when motorists attempt to drive through flood waters. The best advice for driving during any type of flood is when approaching a flooded road, **TURN AROUND AND GO ANOTHER WAY!**

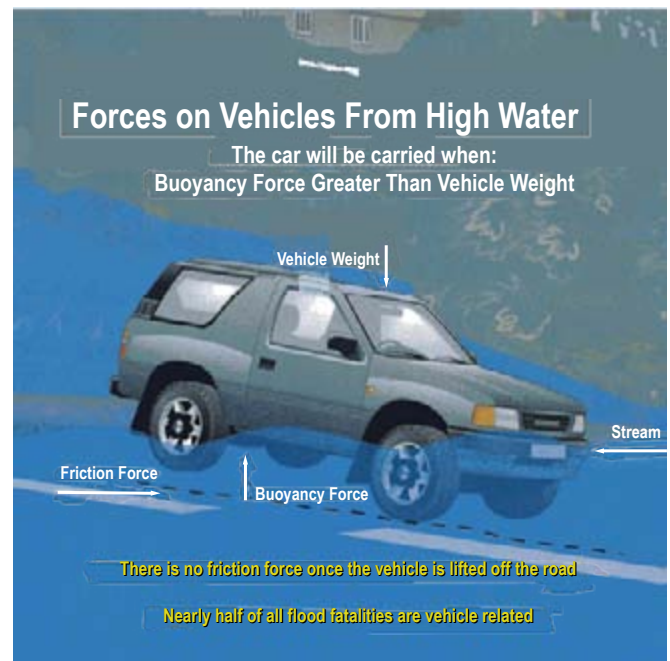




Figure 34 : Flood damaged home from 1997 flood.

When the time comes to begin the recovery process following a flood, there are many factors to consider. First and foremost is to ensure the personal safety of you and your family. While it is natural to be anxious to return to your home and assess any damage and begin repairs, don't be too hasty. Even after floodwaters begin to subside many dangers may still lurk, not only in the outside world, but possibly within your own home as well.

Continue to listen to warnings and stay as informed as possible. The flooding may appear to be over, but more could be on the way. If you return to a flooded area too quickly, you may only be putting yourself at risk again. Do not enter a flooded area until the authorities indicate it is safe to do so.

If there is still standing water, the best course of action is to simply stay out of it. Floodwater could be contaminated by any number of hazardous materials, such as fuel, fertilizers, chemicals, or raw sewage. Downed power lines may have electrified the water, and you risk electrocution if you walk

through the wrong area. Avoid flood debris as much as possible. Not only could it be hazardous in itself, but dangerous animals, such as poisonous snakes, could be hiding within it.

If you must walk in flooded areas, try to stay on firm ground. Remember that it only takes a few inches of moving water to sweep you off your feet. It can also be extremely slippery. If you enter any structures, remember that walls or foundations may have been weakened during the flood. Be aware of your surroundings.

Dealing with a flood and its aftermath can be physically as well as emotionally exhausting. With so much to do in terms of cleanup, repair, paperwork, and the loss of property and security, it can quickly become overwhelming. Prepare yourself for the challenges that lie ahead, and try to keep everything in perspective. It is impossible to do it all at once. Take things one step at a time.



## Repairing Your Flooded Home

FEMA P-234 / October 2010



FEMA

## After a Flood

Let your family know you are safe. If you have become separated from family members, contact the American Red Cross for assistance, as well as to register that you are safe and well.

Contact your insurance agent to begin the claims process. Have your paperwork and any pictures you've taken of your property ready to give to your agent once the claim is underway. A photo record of your property will go a long way to helping you on the path to financial recovery.



Figure 35: Flood damaged home.

When you return to your flooded property to begin the cleanup process, safety should be your primary concern. Before even entering your home, inspect the outside of the structure carefully. Check for loose power lines, gas leaks, and any structural damage. If you have any concerns, contact a qualified building inspector or structural engineer. They will be very busy, so be patient if they can't get to you right away. If you noticed something that made you hesitate, wait for a professional. Don't go charging in.

Once you enter your home, be careful. If you did not turn off your power before the flood, turn off the electricity at the main fuse-box upon your return, even if power to the neighborhood has not

been restored. This will allow you to determine when your home is dry enough to turn it back on. If you think water may have reached your electrical system, have an electrician inspect it before you turn the power on. Take pictures of the flood damage. You will need them when filing your flood insurance claim. Also, remember to talk to your local building official and floodplain administrator about any required permitting before you begin any reconstruction or significant repair.

Floodwater may have left behind hazardous materials and waste that could make you seriously ill. Wear the right clothing, such as hip waders, rubber gloves, goggles, and a safety rated face mask. Maintain good hygiene during cleanup. Wash your hands with boiled or disinfected water, especially when dealing with food. If clean water and disinfectant soap are not available, you can use an alcohol based sanitizer liquid. You can get a cleanup kit from the Red Cross that contains a mop, broom, bucket, and cleaning supplies. A good deal of useful information is available in their publication "Repairing Your Flooded Home," which you can find here: [http://www.redcross.org/www-files/Documents/pdf/Preparedness/file\\_cont333\\_lang0\\_150.pdf](http://www.redcross.org/www-files/Documents/pdf/Preparedness/file_cont333_lang0_150.pdf).

For those people that have wells, there are a number of steps you should take to make sure your water supply is safe and useable. First, determine if the well was exposed to floodwater. If you didn't actually see the water while it was on your property, mud and debris can indicate where the water reached. Check the ground near the well. Is it intact? Has it been disrupted or eroded by floodwaters? Can you see any visible damage to the well casing? Check to make sure the well cap remained fastened and secure during the event. If you have any doubts as to the condition of your well, do not turn on your pump, or drink from your water supply until you have verified its

## After a Flood

safe. Check with your local health department to request a test of the quality of your well water.

One of your biggest concerns after a flood will be the potential of mold and mildew growth. Some items will have to be discarded following inundation in floodwater, while others may be salvageable. Items like mattresses, carpeting and rugs, upholstered furniture, stuffed animals, baby toys, pillows, foam-rubber items, wall coverings, books, and most paper products should be thrown away. These types of items provide wonderful growth mediums for mold. Things like clothing and bedding can normally be retained but must be washed and disinfected thoroughly, perhaps

several times before use. Drywall and insulation that has gotten wet should be cut out, removed, and thrown away. It is typically advised to cut out such material at least 2-3' above the observable water line. All hard surfaces, such as wood, molding, metal furniture, concrete, appliances, linoleum etc., must be thoroughly cleaned and disinfected. You can find FEMA's publication "Dealing with Mold & Mildew in Your Flood Damaged Home" at this website: [http://www.fema.gov/pdf/rebuild/recover/fema\\_mold\\_brochure\\_english.pdf](http://www.fema.gov/pdf/rebuild/recover/fema_mold_brochure_english.pdf). It provides a lot of advice and information on cleaning up and preventing a problem with mold after a flood.



Figure 36: Flood damaged home..

Many local, state, federal, and private agencies can provide additional guidance and techniques to protect yourself and your property before, during, and after flood events. Beginning in July 2009, a formal team came together for Idaho called the “Idaho Silver Jackets team” to address the states’ flood risk management priorities. “The Idaho Silver Jackets team is a coalition of federal and state agencies that work together to develop comprehensive and sustainable solutions to Idaho’s flood hazard issues. In addition to the Army Corps of Engineers, the Idaho Team currently includes staff from the Idaho Department of Water Resources, Idaho Bureau of Homeland Security, Federal Emergency Management Agency, National Weather Service, and U.S. Geological Survey. The Idaho Silver Jackets team brings individuals from different agencies and expertise together to facilitate communication, share information, and provide ‘one-stop’ for local and state governments to obtain information and identify solutions to reduce flood hazards.

- **Idaho Bureau of Homeland Security (IBHS)**  
4040 Guard Street, Building 600  
Boise, ID 83705-5004  
Phone: (208) 422-3040  
Web: <http://www.bhs.idaho.gov>
- **Idaho Department of Water Resources (IDWR)**  
The Idaho Water Center  
322 East Front Street  
PO Box 83720  
Boise, ID 83720-0098  
Phone: (208) 287-4800  
Web: <http://www.idwr.idaho.gov/>
- **Idaho Department of Environmental Quality (IDEQ)**  
1410 N. Hilton  
Boise, ID 83706  
Phone: (208) 373-0502  
Web: <http://www.deq.idaho.gov/>
- **Federal Emergency Management Agency (FEMA)** Federal Regional Center, Region X  
130 228th Street SW  
Bothell, WA  
Phone: (425) 487-4600  
Web: <http://www.fema.gov>
- **U.S. Army Corps of Engineers (USACE)**  
Seattle District Headquarters  
P.O. Box 3755  
Seattle WA 98124-3755  
Phone: (206) 764-3742  
Web: <http://www.nws.usace.army.mil/>  
*Covers: Boundary, Bonner, Kootenai, Shoshone, and Bennewah Counties*
- **U.S. Army Corps of Engineers (USACE)**  
Walla Walla District Headquarters  
201 North Third Avenue  
Walla Walla WA. 99362-1876  
Phone: (509) 527-7020  
Web: <http://www.nww.usace.army.mil/>  
*Covers: Remaining Idaho Counties.*
- **U.S. Army Corps of Engineers (USACE)**  
Sacramento District Headquarters 1325 J Street  
Sacramento, CA 95814  
Phone: (916) 557-7490  
Web: <http://www.spk.usace.army.mil/>  
*Covers: Bear Lake, Caribou, Franklin, Oneida and parts of Bannock County.*
- **U.S. Bureau of Reclamation (USBOR)**  
Pacific Northwest Regional Office  
1150 North Curtis Road, Suite 100  
Boise, ID 83706-1234  
Phone: (208) 378-5012  
Web: <http://www.usbr.gov/pn/>



## Agencies That Can Provide Additional Assistance

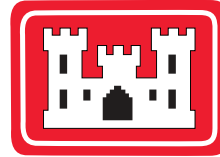
- **Environmental Protection Agency (EPA)**  
U.S. EPA, Region 10  
1200 Sixth Avenue, Suite 900  
Seattle, WA 98101  
Phone: (800) 424-4372 or (206) 553-1200  
Web: <http://www.epa.gov/region10>
- **NOAA, National Weather Service (NWS)**  
National Oceanic and Atmospheric Administration  
National Weather Service  
Boise Weather Forecast Office  
NIFC Building 3807  
Boise, ID 83705-5354  
Phone: (208) 334-9860  
Web: <http://www.wrh.noaa.gov/boi/>  
*Covers: Ada, Adams, Boise, Camas, Canyon, Elmore, Gem, Gooding, Jerome, Owyhee, Payette, Twin Falls, Valley and Washington Counties.*
- **National Oceanic and Atmospheric Administration**  
National Weather Service  
Missoula Weather Forecast Office  
6633 Aviation Way  
Missoula, MT 59808-9381  
Phone: (406) 329-4840  
Web: <http://www.wrh.noaa.gov/mso/>  
*Covers: Clearwater, Idaho and Lenhi Counties.*
- **National Oceanic and Atmospheric Administration**  
National Weather Service  
Pocatello Weather Forecast Office  
1945 Beechcraft Ave  
Pocatello, ID 83204  
Phone: (208) 232-9306  
Web: <http://www.wrh.noaa.gov/pih/>  
*Covers: Bannock, Bear Lake, Bingham, Blaine, Bonneville, Butte, Cassia, Caribou, Clark, Custer, Franklin, Fremont, Jefferson, Lincoln, Madison, Minidoka, Oneida, Power and Teton Counties.*
- **National Oceanic and Atmospheric Administration**  
National Weather Service  
Spokane Weather Forecast Office  
2601 N. Rambo Rd.  
Spokane, WA 99224  
Phone: (509) 244-0110  
Web: <http://www.wrh.noaa.gov/otx/>  
*Covers: Bennewah, Bonner, Boundary, Kootenai, Latah, Lewis, Nez Perce, and Shoshone Counties.*
- **U.S. Geological Survey (USGS)**  
Main Office (Idaho)  
F.H. Newell Federal Building  
230 Collins Road  
Boise, ID 83702  
Phone: (208) 387-1300  
Web: <http://id.water.usgs.gov/>
- **Red Cross**  
146 South Cole  
Boise, ID 83709  
Phone: (800) 853-2570 or (208) 947-HELP (4357)  
Web: <http://redcrossidaho.org>
- **Local or County Emergency Management Agency**  
Check your local listings.

While this manual is in no way a comprehensive text on Idaho's flood issues and history, we have tried to touch on many key points in the hopes of making you as aware as possible of the risks that flooding poses to you and your state. Flood disasters in Idaho may not attract the attention that similar events in other states have over the years, but they are no less a danger and no less worthy of concern. It is important that residents of Idaho take their flood risks seriously and take the necessary precautions to keep themselves, their families and their property safe from flood damage.

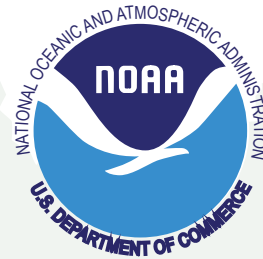
As we have discussed and demonstrated throughout this booklet, there is a wealth of knowledge available regarding flooding and how to prepare for it and deal with it after it happens. From the internet to your local government, there are numerous resources to assist you in learning what you need to know. The most important thing you can do is take an interest and learn your risks. Just because it hasn't happened to you up until now doesn't mean it won't happen in the future.



# ACKNOWLEDGEMENTS



**US Army Corps  
of Engineers**



**FEMA**

“This publication is the result of a collaborative effort by the members of the Idaho Silver Jackets Group.”