

Floods

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General Information

A flood is the inundation of normally dry land resulting from the rising and overflowing of a body of water. It is a natural geologic process that shapes the landscape, provides habitat and creates rich agricultural lands. Human activities and settlements tend to use floodplains, frequently interfering with the natural processes and suffering inconvenience or catastrophe as a result. Human activities encroach upon floodplains, affecting the distribution and timing of drainage, and thereby increasing flood problems. The built up environment creates localized flooding problems outside natural floodplains by altering or confining drainage channels. This increases flood potential in two ways: it reduces the stream's capacity to contain flows and increases flow rates downstream. There are basically three types of floods:

- 1) a rising flood which occurs because of heavy prolonged rain or melting snow or both.
- 2) flash floods which are characterized by quick rise and fall of flood levels.
- 3) wind-driven flood tides that combine wind and tides to flood coastal areas.

The most recent Presidentially declared flood disasters were the November 1995 and February 1996 floods when storm fronts and melting snowpack caused massive flooding throughout Washington and Oregon. During these floods twenty-two counties were declared emergencies. All rivers monitored by King County Surface Water Management (SWM) reached Phase 4 flood alerts.

The November 1990- March 1991 floods were also a Presidentially declared flood disaster. Flooding in early November had swelled major rivers throughout Western Washington. "Then on November 23, a heavy downpour of warm rain -- referred to by local weather forecasters as the 'Pineapple Express' because of its origins in the southern Pacific Ocean -- began to fall on a recent snowfall in the Cascades. The resulting runoff from melting snow and rain hit the already saturated floodplains on the next day, leading to the highest flows ever recorded on most of the rivers and streams draining the western slopes of the mountains". In some cases the flows were so high that stream gages reached their maximum height, unable to record any additional flow. More than \$15 million in damage was done in King County alone. Nearly 900 homes were damaged or destroyed and two men drowned. Agricultural areas experienced heavy losses, as hundreds of cattle and other livestock drowned; equipment, feed and buildings were inundated. Dozens of roads were impassable during the flood, and numerous streets, bridges, levees and other public property were heavily damaged.

Vulnerability

Flood hazard areas in Washington state are located on the floodplains of all rivers, streams, lakes, wetlands, and closed depressions. The state normally experiences some degree of type 1 (rising) flooding on its river and stream systems every year. Types 2 (flash) and 3 (wind driven) floods have not historically been a threat. High water and flooding most commonly occur between October and June, during periods of heavy rainfall or rapid snowmelt. Historically, the

Snoqualmie river has been a primary indicator of flooding in King County in that when it floods, other river systems also flood.

Effects

Floods can cause loss of life and great damage to structures, crops, land resources, flood control structures, roads, and utilities. Flood damages in King County and the State of Washington exceed damages by all other natural hazards. These impacts result primarily from two types of hazards created by floods: inundation and bank erosion.

Inundation is defined as floodwater and debris flowing through an area. It can cause minor to severe damage, depending on the velocity of flows, the quantity of logs and other debris they carry, and the amount and type of development in the floodwater's path.

Bank erosion can threaten areas that are not inundated by floods. For example, a home on a high bank, above flood levels, can be undermined by the flood's erosive flows. The amount of erosion at a site depends on its location on the channel, flow velocities, the pattern of debris and sediment accumulation in the channel, and the erodibility of the bank. Some rivers, such as the Tolt, experience sudden and dramatic patterns of bank erosion that can create major course changes during a single flood event.

It is important to remember that dangers associated with flooding do not end when the rain stops. Electrocutation, structural collapse, hazardous materials leaks, and fire are secondary hazards associated with flooding and flood cleanup.

Conclusions

Citizens in Washington state should understand the flood potential of areas in which they elect to live. Normally, flood plain information is available through city and County building permit offices and emergency management offices. By law, citizens purchasing property that is located in a flood plain must be notified of that fact. Flood insurance information is available from insurance agents throughout the state, however, only about 14 percent of homes in mapped floodplains are insured against flood losses.

[More on Flooding \(website reference\)](#)

[Move on to the "Landslides" page](#)