

FLOOD SAFETY

in Snohomish County October 2017



Prepare for flood season

If your property is in or near a “100-year floodplain,” there is more than a 25 percent chance that your home will be flooded sometime during your 30-year mortgage.

Most significant floods occur in fall and winter, so it’s important to have up-to-date information that will help you protect your home and family. To help you get ready, we’ve prepared this reference guide for residents living in or near flood hazard areas. Inside you will find information on:

- Natural benefits of floodplains
- Snohomish County’s history of flooding
- Property flood risks and channel migration
- Safeguarding your property
- Preparing for flooding
- Recovering from a flood
- Signing up for emergency warnings
- Emergency contacts

Find more information online at www.floods.surfacewater.info including our Real-Time Flood Warning System, road closures, flood emergency notification and this flood guide with hyperlinks.

Learn about floodplains



Snohomish River, between Snohomish and Everett

Floodplains provide natural benefits

Floodplains are the low-lying areas adjacent to rivers, lakes and coastlines prone to being inundated during times of heavy rains, snow-melt or high tides. They provide open space, scenic beauty and recreational opportunities. In their natural state, floodplains benefit our community in ways that include:

- **Natural flood and erosion control**—reducing flood velocities, peak flows and sedimentation; providing flood storage and conveyance
- **Water quality benefits**—filtering polluted runoff and moderating temperature fluctuations
- **Groundwater recharge**—promoting infiltration and aquifer recharge; reducing frequency and duration of low surface flows
- **Biological productivity**—providing fertile soils that promote vegetative growth, biodiversity and ecosystem stability
- **Fish and wildlife habitats**—providing habitat for many species, including water-fowl and rare and endangered species

Protect natural floodplain functions

Clear debris and trash. Help prevent flooding and maintain water quality by keeping the storm drains, culverts, ditches and swales near your property clear of debris and trash. This debris could reduce flood storage capacity and increase flooding on your property.

Report illegal dumping when you see it.

It is illegal to dump trash, hazardous chemicals or other materials into a river, stream or drainage system. If the situation is a severe threat to human health or the environment, please call 911; otherwise, please call the Snohomish County Public Works Surface Water Management (SWM) Water Quality Hotline at 425-388-6481 or use the county's online form (www.snoco.org, search "water quality complaint").



Snohomish County has a history of flooding

Snohomish County typically experiences flooding between November and February, following periods of heavy rain. The primary areas affected by flooding are the county's largest rivers—the Sauk, Stillaguamish, Snohomish, Skykomish and Pilchuck rivers. Historical flows for all of these rivers, with the exception of the Sauk, are available on the county's website (<https://snohomish.onerain.com>). Historical flows for the Sauk River are available on US Geological Survey's website (<http://waterdata.usgs.gov/WA/nwis/current/?type=flow>, under the Skagit River Basin).

Since 1962, there have been 18 floods of such record proportions that they met the qualifications for Presidentially Declared Disasters. Typically, the county experiences major flooding every three to five years. The last flood of impact was on November 17, 2015. Heavy rains on this date caused high flows countywide, but the most damage occurred in the Skykomish River floodplain south of Sultan.



Flooding on Mann Road near Sultan, fall 2015 *SR 530 mudslide/flooding, March 2014*

Flooding can occur outside rural floodplain areas as well, even in urbanized areas served by stormwater infrastructure. In these areas, heavy rainstorms sometimes overwhelm local drainage systems or storm drains can become blocked by debris.



An undersized culvert led to flooding in Marysville in 2005.

Drainage problems on your property or in your neighborhood?

Request a drainage investigation, which includes a site visit, by calling SWM at 425-388-3464.

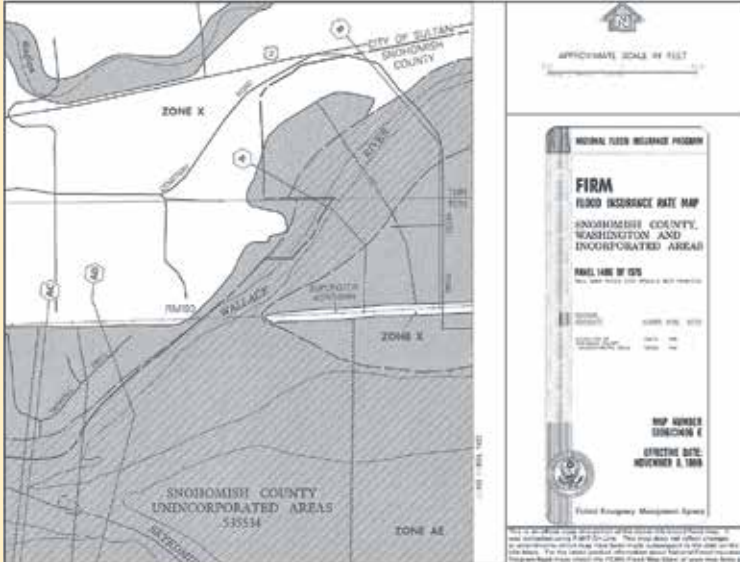
Know your property's flood risk

Learn about your property's flood risk and the flood risk of a property before you buy

Floodplains are mapped as Special Flood Hazard Areas (SFHAs) on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs). These maps identify the flood zone designations for a broad area. Within SFHAs, there is a one percent chance of flooding in a given year or a 26 percent chance within a 30-year period.

To evaluate the flood risk for your property:

- **Create your own FIRMette.** A FIRMette is a flood insurance rate map for an individual property that identifies the property's flood zone designation(s). Follow the instructions available at www.fema.gov/media-library/assets/documents/34930.



- **Consult your local planning department.**
 - Snohomish County Planning and Development Services (PDS) offers a Flood Hazard Determination service that provides information on a property's flood risk and regulatory base flood elevation. For more information, please contact PDS at 425-388-3311.
 - Snohomish County PDS has elevation certificates on file for structures on some properties within SFHAs, and will provide copies on request. For more information, contact PDS at 425-388-3311.
- **See FEMA's Map Service Center** (<http://msc.fema.gov/portal>) for flood zone designations and historic maps.

Find out if channel migration could affect your property

If your property is on a river, learn about the river's flood history and potential to migrate. For some general information about rivers and how they move through time, see the Washington State Department of Ecology publication, "Living with the River" (<https://fortress.wa.gov/ecy/publications/documents/0706016.pdf>). Check with SWM at 425-388-3464 to see if there is a flood study available for a section of river near your property.

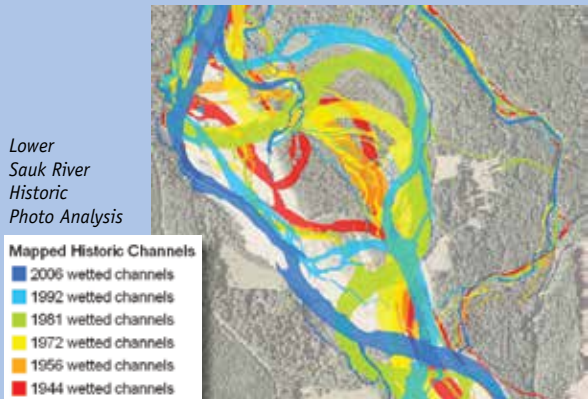


The migration in one section of the Pilchuck River resulted in the loss of more than 72 feet of bank within a three-year period. (photo: Feb. 2012)

What is channel migration?

Channel migration is the process by which a river or stream moves over time. It is a dynamic process that includes depositing and scouring of sediments that can shift the course of the channel. The Shoreline Master Program Guidelines define Channel Migration Zones (CMZs) as including areas within which a river can be expected to migrate over time due to the soil composition and hydrology in the area. Check with PDS to see if your property lies within a mapped channel migration zone (425-388-3311).

Example of Channel Movement



Other risks

For information on other risks that might affect the flood safety of your property, check the following publications:

- If your property is near a dam (www.fema.gov/library/viewRecord.do?id=6246)
- If your property is near a levee (<http://bit.ly/LivingwithLevees>)
- If your property is near a landslide, erosion or volcanic hazard area (www.snohomishcountywa.gov/DocumentCenter/View/14368)

Safeguard your property

Build responsibly

Snohomish County has participated in the National Flood Insurance Program (NFIP) since 1984. The program requires the county to adopt and enforce minimum floodplain development regulations to reduce future flood risks, and in return, the federal government makes flood insurance available to county homeowners for protection against flood losses.

All development activity in the floodplain—including filling, grading, excavation, new construction, substantial improvement or repairs—requires a flood hazard permit.

If you're making flood repairs, keep in mind that if the market value of repairs or improvements to an existing structure equals or exceeds 50 percent of the original market value of that structure, the property is considered to be substantially damaged. This means that the structure must be brought up to current county floodplain development standards in order to reduce future flood risks.

For more information, please contact Snohomish County's flood hazard specialist at 425-388-3311.



Consider property protection measures

- ✓ **Purchase sandbags** at your local hardware store, and check the US Army Corps of Engineer's publication at www.nws.usace.army.mil/Portals/27/docs/emergency/NWD_Sandbag_Pamphlet.pdf to learn how to use them.
- ✓ **Flood proof your home.** See the FEMA guide on retrofitting at www.fema.gov/media-library/assets/documents/480 for information on how to protect your utilities and electronics, foundation walls, sewer connections, basement and more. Please check with Snohomish County's flood hazard specialist regarding any required permits. (425-388-3311)
- ✓ **Consider elevating or relocating your home** to reduce future flood losses. Snohomish County administers two programs that compete for FEMA grants on behalf of willing property owners with qualifying projects. For more information, please contact David Wilson, P.E., of SWM, at 425-262-2585.

For advice on flood protection measures for your property, please visit www.snohomishcountywa.gov/972.



Insure your home

Flood insurance is the only sure way to be reimbursed for flood losses. Standard homeowner or commercial policies do not cover damage caused by flooding. Federal disaster assistance is only available if the president declares a disaster, and it is typically a loan that must be paid back with interest. For a \$50,000 loan at four percent interest, the monthly payment would be \$240 per month (\$2,880 per year) for 30 years.

Compare the potential cost of your losses to the cost of flood insurance. Snohomish County makes flood insurance more affordable through its participation in the Community Rating System (CRS), which earns residents a discount of 25 percent on annual NFIP premiums inside the special flood hazard area (SFHA) and 10 percent outside the SFHA. In Snohomish County, the average annual premium, including the CRS discount, is \$1,096 for a home in the SFHA and \$448 for a home outside the SFHA (FEMA, Dec. 2016).

You can purchase flood insurance through an insurance agent. Visit the website below or contact the NFIP at 888-379-9531. Please keep in mind that the actual cost of flood insurance for a specific property will vary based largely on the amount and type of coverage purchased, and that there is a mandatory 30-day waiting period on all new flood insurance policies.



Visit www.floodsmart.gov and view the video "What Could Flooding Cost Me?"

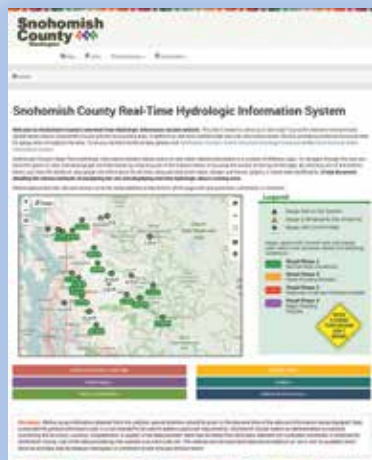
Stay calm during a flood

- Monitor local news and Snohomish County web and social media sites for emergency updates. Check the Road Closures Map, www.snoco.org/App4/SPW/pwapp/roads/emclosure/index.html, and call the 24-hour flood information lines listed below.
- If you have time before evacuating, turn off all utilities at the main power switch. Do not touch any electrical equipment unless it is in a dry area.
- Do not attempt to walk, wade or drive through flooded areas. Sixty-six percent of deaths during flooding occur when drivers make the mistake of driving through floodwaters.
- If your car has stalled in a flooded area, abandon it and walk to safety in the direction you came from.
- If you cannot safely leave your house, bring your family pets and supplies to the second floor or roof of your house and call 911 for help.



Stay current

- Listen to local news.
- Have a solar battery or crank radio to monitor local media.
- Call Snohomish County's 24-hour flood information hotlines:
 - Skykomish, Snoqualmie and Snohomish Rivers: 425-388-3653
 - Stillaguamish River: 425-388-3702
- Check out Snohomish County's online Flood Warning System, which is refreshed every five minutes, at <https://snohomish.onerain.com>.
- Visit www.snoco.org, @snocounty on Twitter, or SnohomishCountyWA on Facebook.



Sign up for alerts

AlertSense

Snohomish County has an emergency alert and notification system called AlertSense that allows information about local emergencies to be sent to those who may be affected. Landline telephones associated with a Snohomish County address (home or business) are automatically part of the secure database but you can sign up to receive alerts and notifications on your cell phone, too. Visit <http://public.alertsense.com/SignUp/?regionID=1129> and look for the “sign up” link.

The process will allow you to link a Snohomish County address to your cell phone number. You can also choose to receive weather-related alerts.



AlertSense is not a substitute for the National Emergency Alert System. The AlertSense notification system will call your cell phone number and deliver a text message when it's been identified by emergency officials that your address may be affected by a local emergency. Specific information will be provided in the message about the nature, extent and timing of the emergency, along with specific actions to take for safety's sake.

How am I notified?

Once emergency officials determine that the AlertSense notification system is going to be activated, the affected area is identified on a geocoded map within AlertSense and the system proceeds to call every phone number within that affected area in a matter of seconds to provide a specific message. This message may be a pre-recorded voice or a computer voice telling you about the emergency and what you should do to stay safe. The system will leave you a voicemail if you do not pick up and the caller ID will display as “Snohomish County DEM.”



Swift water rescue team (photo courtesy of Snohomish County Sheriff's Office)

Emergency officials also use other methods of alert and warning, such as local media (television, radio and social media). In time-sensitive situations, local law enforcement will also drive into areas affected by an emergency and use radios and PA systems to quickly alert people of emergencies.

To learn more about AlertSense, call the Snohomish County Department of Emergency Management at 425-388-5060.

Learn about flood phases

Summary of flood conditions at gage sites

Use the chart below in combination with the map on the next page to locate a gage site and see what typically happens in that area at each flood phase as river levels rise. Agencies respond depending on the severity of expected flooding, with Phase 4 being the most severe.

Flood Phase Number	River Level in Feet	Corresponding "On-the-Ground" Conditions
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A. Sauk River above Whitechuck R.

- | | | |
|---|-----|---|
| 2 | 8' | – Isolated bank erosion and tributary stream flooding possible. |
| 3 | 11' | – Flooding along Clear Creek Road, bank erosion and channel migration throughout river. |
| 4 | 13' | – Extensive inundation downstream of Darrington along with large scale channel migration.
– Water over SR 530 at the Suiattle River. |

B. Stillaguamish River, North Fork

- | | | |
|---|-----|--|
| 2 | 13' | – Oso Loop Road flooded, minor bank erosion occurring. |
| 3 | 14' | – Water over SR 530, county roads in Cicero and flooding in Swede Heaven area. |
| 4 | 15' | – Water over SR 530 at Oso, extensive inundation and bank erosion throughout valley. |

C. Stillaguamish River at Arlington

- | | | |
|---|-----|--|
| 2 | 14' | – Moderate overflow begins in the Florence and Norman areas.
– Water over Pioneer Highway east of Silvana. |
| 3 | 17' | – Norman Road and Marine Drive closed. |
| 4 | 19' | – Water crosses the road at Island Crossing.
– SR 530 northeast of Arlington under water.
– Silvana completely cut off.
– Moderate to severe flooding occurs near Stanwood. |
| 4 | 20' | – Major flooding throughout the floodplain.
– SR 530 east/north of Arlington impassable in places.
– Major overtopping of dikes and banks occurs. |

D. Stillaguamish River, South Fork

- | | | |
|---|-----|---|
| 2 | 14' | – Isolated bank erosion and tributary stream flooding. |
| 3 | 16' | – Flooding downstream of Granite Falls in Jordan Road/Blue Spruce area. |
| 4 | 18' | – Flooding in Rivershore Lane/Robe Valley.
– Water over Jordan Road near Jim Creek.
– Extensive bank erosion throughout river.
– Mountain Loop Highway closed. |

Flood Phase Number	River Level in Feet	Corresponding "On-the-Ground" Conditions
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E. Skykomish River near Gold Bar

- | | | |
|---|-----|---|
| 2 | 15' | – Flooding begins over low pastures near Monroe. |
| 3 | 16' | – Water over Ben Howard Road and Marvin Road.
– Sportsmen's Park flooding. |
| 3 | 17' | – River banks overflow, erosion occurs.
– Some flooding occurs in Sultan. |
| 4 | 19' | – Farms and homes near Monroe flood.
– Severe river flooding occurs in Sultan. |
| 4 | 21' | – Major flooding occurs in all low areas. |
| 4 | 22' | – Major overtopping of levees. |

F. Snohomish River at Snohomish

- | | | |
|---|-----|--|
| 2 | 25' | – River bank is full.
– Old Snohomish-Monroe Highway near Snohomish begins to flood. |
| 3 | 27' | – Dike monitoring and river predictions begin. |
| 3 | 28' | – Riverview Road begins to flood. |
| 4 | 30' | – River level nears top of all dikes.
– District 13 berm begins to overtop. |
| 4 | 31' | – Major flooding begins in District 13 and Ebey Slough.
– Lowell-Snohomish Road closed. |
| 4 | 32' | – Dike overtopping begins in French Slough and Upper Marshland areas. |
| 4 | 33' | – Major flooding in all areas. |

G. Snohomish River near Monroe

- | | | |
|---|-----|---|
| 2 | 15' | – Some overbank flows into low lying pasturelands along the river. |
| 2 | 19' | – Extensive flooding outside of leveed areas.
– Old Snohomish-Monroe Highway closed. |
| 3 | 20' | – River near crest of levees. |
| 4 | 21' | – Levee system begins overtopping |
| 4 | 22' | – Major flooding in all areas.
– Extensive levee overtopping throughout the valley.
– All valley roads and highways closed.
– High risk of levee breaches. |

Phase 1

Normal river conditions. County staff and Emergency Management Duty Officer monitor river levels.

Phase 2

Minor flooding is expected and some road closures may occur. Preparations are made to open the county's Emergency Coordination Center, if warranted. Flood information lines are periodically updated with current river gage/river level information.

Phase 3

Moderate to severe flooding, with numerous road closures and some levee overtopping expected. Investigational crews are sent out to monitor flood control facilities such as levees. County Emergency Coordination Center opens.

Phase 4

All agencies respond in anticipation of major flooding/widespread damage.

View river gages and flood history

B. North Fork Stillaguamish River

Nov. 1990 – 15.2' – 36,700 cfs
Oct. 2003 – 14.8' – 44,000 cfs
Jan. 2009 – 15.1' – 49,400 cfs
Dec. 2010 – 15.6' – 55,100 cfs
Nov. 2015 – 15.1' – 49,300 cfs

Stillaguamish River near Stanwood

Stillaguamish River at Pioneer Hwy

Stillaguamish River at I-5

D. South Fork Stillaguamish River near Granite Falls

Feb. 1932 – 19.7' – 32,400 cfs
Oct. 2003 – 21.2' – 39,300 cfs
Nov. 2006 – 22.8' – 44,100 cfs*
Dec. 2010 – 18.5' – no data
Nov. 2015 – 20.4' – no data

F. Snohomish River at Snohomish

Dec. 1975 – 33.2' – no data
Nov. 1990 – 33.5' – no data
Nov. 1995 – 33.1' – 132,000 cfs*
Nov. 2006 – 33.5' – no data
Jan. 2009 – 33.5' – no data

G. Snohomish River near Monroe

Dec. 1975 – 22.9' – 115,000 cfs
Nov. 1990 – 25.3' – 150,000 cfs
Nov. 1995 – 24.1' – 132,000 cfs
Nov. 2006 – 23.5' – 124,000 cfs
Jan. 2009 – 24.1' – 132,000 cfs

C. Stillaguamish River at Arlington

Oct. 2003 – 20.8' – 79,900*
Nov. 2006 – 21.1' – 81,800*
Jan. 2009 – 20.8' – 79,900*
Dec. 2010 – 21.2' – 82,400*
Nov. 2015 – 20.5' – 78,000*

Pilchuck River at Menzel Lake Road

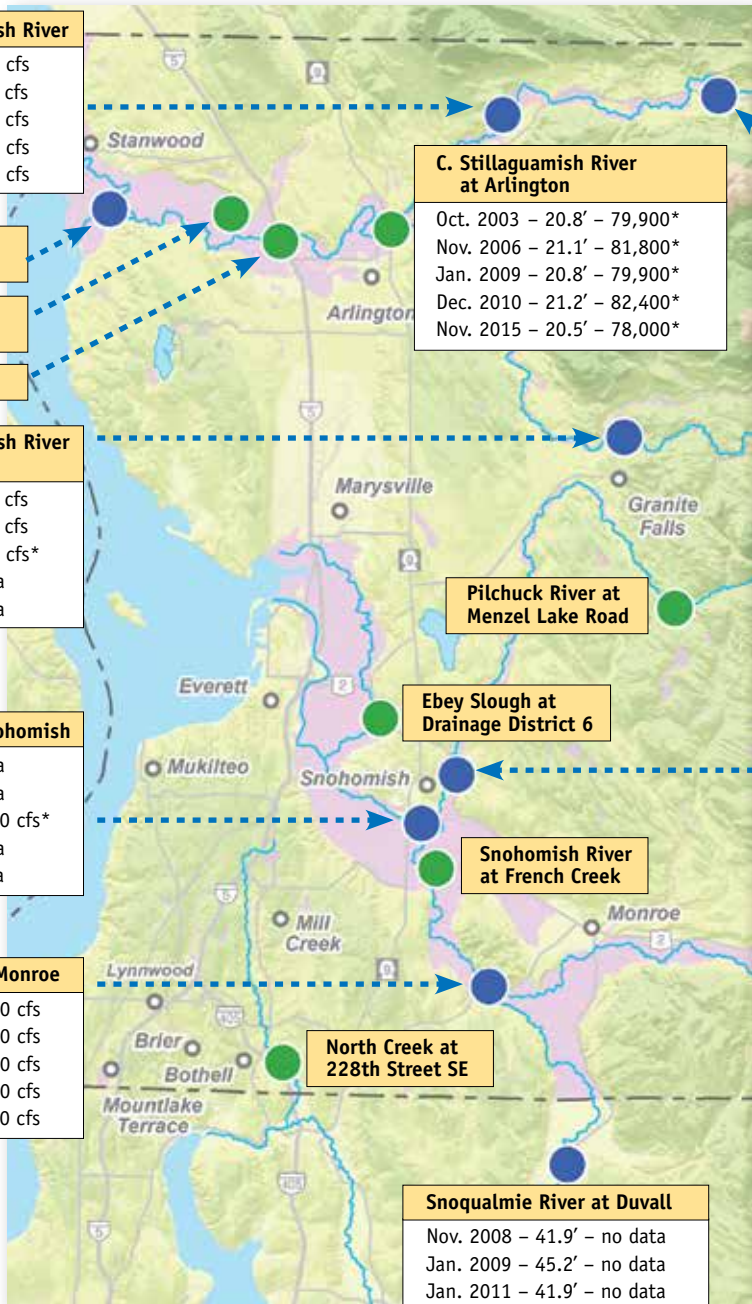
Ebey Slough at Drainage District 6

Snohomish River at French Creek

North Creek at 228th Street SE

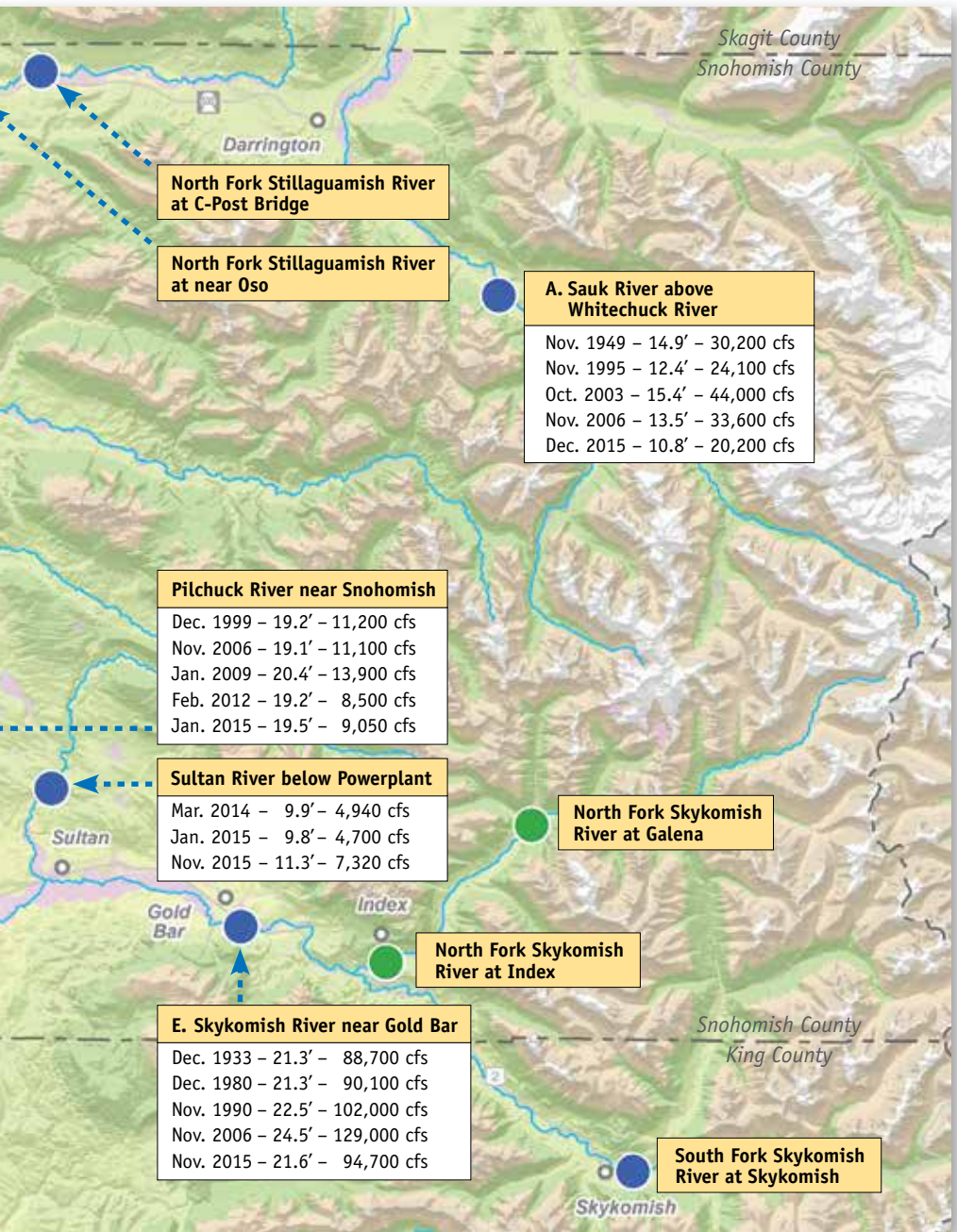
Snoqualmie River at Duvall

Nov. 2008 – 41.9' – no data
Jan. 2009 – 45.2' – no data
Jan. 2011 – 41.9' – no data
Jan. 2015 – 41.6' – no data
Nov. 2015 – 41.8' – no data



Online, real-time information

This map is a representation of the Real-Time Flood Warning Information map (<https://snohomish.onerain.com>). This online, interactive map shows river gage levels and provides flood history in different areas of the county. The gage information is updated every 15 minutes and the map refreshes every five minutes.



Legend

- Snohomish County Forecast Gage
- USGS Gage
- Cities
- 100 Yr. Floodplain
- Lakes, Bays
- Rivers
- Major Roads

cfs Cubic Feet per Second. A measure of volume of water (in cubic feet) that flows past a specific river location each second.

feet Water level in the river above an arbitrary base level. Also called the river "stage." Measurements (in feet) at one gage do not correspond to measurements at other gages.

* flows are approximate



Recover from flooding

Flood recovery tips

- Listen to the local news and return home only after authorities indicate that it is safe.
- Before re-entering your home, be aware of potential structural damage that could lead to collapse, as well as potential gas leaks, electrical shorts and live wires.
- If damage appears to be significant, contact PDS or your city's planning department to have a building official visit and determine if your home has been substantially damaged.
- Have a professional check your heating system, electrical panel, outlets and appliances before use. Call utility companies to have utilities turned back on. You cannot turn on your main gas supply yourself.
- Have your septic system checked if you suspect damage. For assistance, call Snohomish Health District at 425-339-5250.
- For the safety of your water supply and food, please visit www.snohd.org/water/flooding.
- Wear protective gear and clean your home as recommended to stop mold and mildew. See the FEMA publication on the subject at www.fema.gov/pdf/rebuild/recover/fema_mold_brochure_english.pdf.
- Make a permanent mark on your residence or property to show the height of the floodwaters.
- Document your losses and contact your insurance agent.
- Financial assistance may be available following a federal disaster declaration. Please call DEM at 425-388-5088 for details.



Mark the water height on your residence for future reference.



Dispose of your damaged, unwanted items in a legal manner. Special collection services and disposal rates may be available for flood victims. Call Snohomish County Public Works at 425-388-3425 to learn about the flood-related disposal options available.

Emergency Contacts

Snohomish County

- 24-hour hotlines with updated information during floods:
 - Skykomish, Snoqualmie and Snohomish Rivers, 425-388-3653
 - Stillaguamish River, 425-388-3702
- Disaster preparedness kit prep: DEM, www.snohomishcountywa.gov/DocumentCenter/View/45875, dem@snoco.org
- Disposal of flood debris: Solid Waste, 425-388-3425
- Flood preparedness: www.floods.surfacewater.info, dem@snoco.org
- Flood studies available for portions of the main rivers: SWM, 425-388-3464
- Inspection of flood-damaged structures: PDS, 425-388-3311
- Post-flood recovery assistance: DEM, 425-388-5060, dem@snoco.org
- Real-time Flood Warning System (updated every 15 minutes): <https://snohomish.onerain.com>
- Report dike/levee damage: DEM, 425-388-5060, dem@snoco.org
- Report illegal dumping: SWM Water Quality Hotline, 425-388-6481
- River conditions: DEM, 425-388-5060, dem@snoco.org
- Road conditions, road closures and report road or bridge damage: Road Maintenance, 425-388-7500, www.snohomishcountywa.gov/206
- Sandbagging information: DEM, 425-388-5060, dem@snoco.org
- Urban flooding and drainage assistance: SWM, 425-388-3464
- Water quality problems: SWM, 425-388-3464

Other agencies

- FEMA Assistance Center (flood assistance, flood insurance and flood protection): 1-800-621-3362, www.fema.gov
- Red Cross, Snohomish County Chapter (disaster preparedness): 425-252-4103, www.snohomishcounty.redcross.org
- Snohomish Health District (sanitation, septic tank or well problems): 425-339-5250, www.snohd.org/water/flooding

Cities

If you live in any of the following cities, please call or email the city directly for floodplain information:

- Arlington: 360-403-3400, www.arlingtonwa.gov
- Darrington: 360-436-1131, www.town.darrington.wa.us
- Gold Bar: 360-793-1101, www.cityofgoldbar.us
- Granite Falls: 360-691-6441, www.ci.granite-falls.wa.us
- Index: 360-793-2488
- Monroe: 360-863-4609, www.monroewa.gov/flood
- Snohomish: 360-568-3115, www.ci.snohomish.wa.us
- Stanwood: 360-629-2181, www.ci.stanwood.wa.us
- Sultan: 360-793-2231, www.ci.sultan.wa.us



Be prepared for the flood season ahead!

Title VI and Americans with Disabilities Act (ADA) Information: It is Snohomish County's policy to assure that no person shall on the grounds of race, color, national origin, or sex, as provided by Title VI of the Civil Rights Act of 1964, as amended, be excluded from participation in, be denied the benefits of, or otherwise be discriminated against under any County sponsored program or activity. For questions regarding Snohomish County Public Works Title VI Program, or for interpreter or translation services for non-English speakers, or otherwise making materials available in an alternate format, contact the Department Title VI Coordinator via email at spw-titlevi@snoco.org or phone 425-388-6660. Hearing/speech impaired may call 711.

Información sobre el Título VI y sobre la Ley de Americanos con Discapacidades (ADA por sus siglas en inglés): Es la política del Condado de Snohomish asegurar que ninguna persona sea excluida de participar, se le nieguen beneficios o se le discrimine de alguna otra manera en cualquier programa o actividad patrocinada por el Condado de Snohomish en razón de raza, color, país de origen o género, conforme al Título VI de la Enmienda a la Ley de Derechos Civiles de 1964. Comuníquese con el Department Title VI Coordinator (Coordinador del Título VI del Departamento) al correo electrónico spw-titlevi@snoco.org, o al teléfono 425-388-6660 si tiene preguntas referentes al Snohomish County Public Works Title VI Program (Programa del Título VI de Obras Públicas del Condado de Snohomish), o para servicios de interpretación o traducción para los no angloparlantes, o para pedir que los materiales se hagan disponibles en un formato alternativo. Los que tienen necesidades comunicativas especiales pueden llamar al 711.

SWM.7.1.BK.1017



Snohomish County
Public Works

Surface Water Management
3000 Rockefeller Ave., MS 607
Everett, WA 98201

PSRT STD
US Postage
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Permit No. 593