



COMMUNITY PLANNING & ECONOMIC DEVELOPMENT

3000 Pacific Ave SE, Olympia, WA 98501

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Website: ThurstonCPED.org

Creating Solutions for Our Future

Ashley Arai, Director

TO: Thurston County Planning Commission

FROM: Claire Swearingen, Associate Planner

DATE: July 15, 2026

SUBJECT: Frequently Flooded Areas Gap Analysis

BAS Overview

Introduction

Frequently flooded areas (FFAs) are parts of the landscape that are known to flood often. Specifically, they are defined in WAC 365-190-030(8) as:

"...lands in the flood plain subject to at least a one percent or greater chance of flooding in any given year, or within areas subject to flooding due to high groundwater. These areas include, but are not limited to, streams, rivers, lakes, coastal areas, wetlands, and areas where high groundwater forms ponds on the ground surface."

Thurston County's current definition of FFAs (TCC 24.03) expands on the WAC definition by including areas within the highest known level of flooding, usually called the "flood of record." The current County definition specifically references flood insurance rate maps (FIRMs) published by the Federal Emergency Management Agency (FEMA) for Thurston County. At minimum, the Washington State Dept. Of Commerce requires local jurisdictions to regulate areas designated as 100-year floodplains by FEMA and the National Flood Insurance Program (NFIP). Washington State Dept. of Ecology and Dept. of Commerce recommend that jurisdictions also consider other flood hazard areas like the flood of record and high groundwater hazard areas (Ecology, n.d., Newman et. al., n.d.).

Base Flood

As noted in the above definitions, FFAs include many types of flood hazards which occur in different parts of the landscape. The base flood is another term for the 100-year floodplain. These areas have a 1% chance of flooding each year, meaning they are expected to flood about every 100 years. Floodways are areas in stream or river channels that are necessary for discharging base floods. Development in floodways must be regulated to ensure it does not increase the base flood elevation (BFE), which is the height of the 100-year flood. The regulations are intended to ensure development does not expand the 100-year floodplain. FEMA flood maps include these, and other more granular designations of flood hazard areas. Major rivers in Thurston County associated with flood hazards include the Black, Chehalis, Deschutes, Nisqually, and Skookumchuck Rivers, as well as Scatter Creek. Thurston County also monitors the water levels for Long Lake and Lake St. Clair due to their potential to damage property in floods.



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Other Flood Types

High groundwater hazards areas exist where the water table is very close to the surface, or where subsurface geology creates surface pooling of groundwater on a regular basis (Newman et. al., n.d.). Flood of record maps indicate where flooding has been known to happen in the past. Flood of record maps may indicate flood areas with a wide range of annual probability. Channel migration zones are areas along streams and rivers which the main watercourse may occupy in the future, as the morphology of the river or stream changes. Channel migration is a naturally occurring process that can be impacted by human activity (Newman et. al., n.d., Thurston County, 2025). Coastal flooding can occur with strong tides and storm surges, causing flooding along the Puget Sound shoreline, and in delta areas (Mauger et. al., 2015). While this type of flooding does not currently pose a severe risk in Thurston County, climate change and sea level rise will increase risk over time, according to the Thurston County Flood Hazard Management Plan (FHMP).

Functions and values

Floodplains play an important role in dynamic hydrologic processes that support habitat for fish and wildlife, as well as human safety. The unique morphology of floodplains helps to protect aquatic species during high-flow events and helps to safely disperse floodwaters. Flood events also help mobilize and disperse streambed sediments and facilitate channel migration (Naiman and Décamps, 1997). Floodplains often overlap with other critical areas like Fish and Wildlife Habitat Conservation Areas, Wetlands, and Critical Aquifer Recharge Areas due to their capacity to support wildlife habitat and recharge aquifers. Floodplains also distribute woody debris (i.e. fallen trees and branches) into streams and rivers, which helps create high-quality fish habitat (Gurnell et. al., 2005, Kozłowski et. al., 2016). Disturbances in floodplains can negatively impact stream morphology, water quality, fish habitat, and the natural processes that help maintain healthy riverine ecosystems (Booth 1990, Booth 1991, Booth 2007).

Hazards, FEMA, and CRS

Floods are the most costly and damaging hazard in Washington State, according to the Department of Ecology (Ecology, n.d.), and cleaning up after a flood is much more expensive than avoiding flood impacts. Flood hazards have been complicated by a history of flood management that has focused on engineered changes to channel morphologies, like levees, dams, and channelization projects. Development in floodplains has disconnected rivers and streams from their hydrological and geological context, reducing the ability of floodplains to function naturally, and severely impacted riparian and aquatic habitat quality. The urbanization and development of watersheds has also impacted the functions of floodplains and increased the potential for floods to cause damage and harm (Booth 1990, Booth 1991, Booth 2007). Current best practices focus on leaving adequate undeveloped space for rivers and floodplains to perform their ecological functions naturally, and without undue impacts to human safety and property.



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Thurston County participates in FEMA's Community Rating System (CRS) program, which is part of the National Flood Insurance Program (NFIP). CRS credits certain community policies and activities that go above and beyond the minimum requirements for participating in the NFIP. According to the Thurston County FHMP, the County participates in credited activities in the following categories:

- Mapping and flood data
- Managing new development to minimize future flood damage
- Reducing flood losses to existing development
- Improving emergency preparedness and response
- Implementing public information activities

Thurston County has a Class 2 CRS rating, which is awarded based on robust flood planning and mitigation efforts. CRS ratings range from 1 through 10, with 1 being the highest level of credited activity. There are only nine jurisdictions in the country with a rating of Class 2 or higher. The County's Class 2 rating entitles flood insurance policy holders to major discounts on their policies, and the countywide annual savings on flood insurance total to \$372,397.

The CAO supports the County's high CRS rating by limiting development primarily in the floodway and the 100- and 500-year floodplain. Some credit is also given based on protections for high groundwater hazard areas and flood of record areas.

Climate Change

Flood events are highly susceptible to the changes in precipitation patterns associated with climate change. Climate change is likely to continue to cause more intense rainfall events in the wet season, and drier, hotter summers. Increased heavy precipitation events can also increase the severity, risk, and frequency of flood events (Thurston County, 2025). As the frequency and intensity of flood changes, it may become necessary to look beyond the 100-year floodplain, as events previously considered to be 100-year floods or 500-year floods become more common.

Climate change is also linked to sea level rise, which is an emerging threat in coastal areas. While Thurston County does not currently experience a high level of risk from coastal flooding, sea level rise combined with the potential increase in intensity and frequency of storm surges may pose a risk to coastal areas in the future (Mauger et. al., 2015).

The primary sources for flood hazard mapping are FEMA maps, but these maps do not consider climate change, sea level rise, or channel migration zones. Resources from other agencies like the Washington Silver Jackets, USGS, the WA Dept. Of Ecology, NOAA, the University of Washington Climate Impacts Group and more can help support areas not covered by FEMA maps and improve flood protections in Thurston County.



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Protection Strategies

Flood risk management is a systematic and complex effort. The role of the CAO in this effort is to identify and designate frequently flooded areas and regulate, condition, and limit new development in those areas. The FHMP highlights the CAO as one of the County's strongest tools to protect against flood hazards. Baseline requirements for the CAO are informed by the National Flood Insurance Program (NFIP), FEMA maps, the WA Dept. Of Commerce and Washington State law, and the federal agency Biological Opinion published by the National Marine Fisheries Service.

Generally, the CAO must ensure that no new development or expansion of development in floodplains or floodways creates a net rise in base flood elevation, a net loss of ecological function, and for rivers and streams that connect to the Puget Sound, impacts to salmonid species or resident Orca populations.

There are engineering solutions and building standards that allow some construction in FFAs, but these options are limited and must still meet the requirements to protect habitat and ecological function. Much of the County's CRS credits come from prohibiting development in certain FFAs. Any changes to allowed uses or administrative procedures should consider impacts to CRS.

Gap Analysis

The following gap analysis highlights potential changes to the existing CAO that came from initial Planning Commission feedback, public comment to date, recommendations from County staff who implement the existing CAO, and County, state or federal agency staff with relevant subject matter expertise. These changes have been made to the draft CAO update—this table and the descriptions that follow provide rationale for the proposed changes, and are intended to serve as a reference.

Code Section	Title	Recommendations	Reason
24.20.010	Frequently flooded areas designated	Include designation criteria in code section	Accessibility, usability, and transparency
24.20.010	Frequently flooded areas designated	Include additional flood areas, beyond the 100-year floodplain, in frequently flooded areas designation	Reflect BAS on climate change, and recommendations from the Dept. of Ecology and Dept. of Commerce.
24.20.013	The Puget Sound biological opinion	Describe permitting requirements set	Clarity and transparency



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		forth by the Biological Opinion.	
24.20.015	High groundwater areas – Base flood elevation	Remove outdated map references	Accuracy and clarity
24.20.020	High groundwater areas – No development zone	Remove provisions for the no development zone	Implementation and flexibility
24.20.025	High groundwater areas – Restricted development zone	Include the high groundwater base flood elevation in the provisions for the restricted development zone	Implementation and flexibility
24.20.025	High groundwater areas – Restricted development zone	Clarify the process for establishing that no hazard area is present	Implementation and flexibility
24.20.030	High groundwater areas – Delineation	Establish a review area for delineation requirements	Transparency and clarity
24.20.035	High groundwater areas – Map amendments	Remove and address standard critical areas map amendment procedures elsewhere	Transparency and clarity, ease of maintaining accurate maps
24.20.040	River, marine, lake, and coastal flood hazard areas – Map amendments	Remove and address standard critical areas map amendment procedures elsewhere	Transparency and clarity, ease of maintaining accurate maps
24.20.045	Channel migration hazard areas – Map	Remove	Outdated or inaccurate map reference
24.20.050	Channel migration hazard areas – Map amendments	Remove and address standard critical areas map amendment procedures elsewhere	Transparency and clarity, ease of maintaining accurate maps



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24.20.060	Building setbacks— Coastal flood hazard areas	Add additional provisions relating to seal level rise	Climate change BAS
24.20.063	Flood of Record — Notice on title	Require a notice on title for flood of record areas, and allow for additional flexibility in these areas	Transparency and protection of life and property, flexibility
Table 24.20-1	Allowable Uses and Activities in Flood and Channel Migration Hazard Areas	Ensure table column titles reflect designations in 24.20.010 - Frequently flooded areas designated, including adding a flood of record column	Clarity and usability
Table 24.20-1	Allowable Uses and Activities in Flood and Channel Migration Hazard Areas	Update provisions for infiltration of reclaimed water for aquifer recharge	New BAS and regulatory recommendations
24.20.132	Frequently flooded areas—Reclaimed water	Update provisions for infiltration of reclaimed water for aquifer recharge	New BAS and regulatory recommendations
24.20.135	Frequently flooded areas—Residential—Single-family homes	Clarify that new residential structures are completely prohibited in the floodway, per TCC 14.38.050	Clarity
Chapter 24.20	All sections	Address minor textual errors and language consistency where needed	Clarity

24.20.010 Frequently Flooded Areas Designated



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Designation criteria should be added to the chapter in clear language, with reference to publicly available maps, for the sake of clarity, accessibility, and transparency. This also makes the code easier to navigate. Reference to outdated tables, maps, and department names should be removed. Code language should support GeoData's ability to keep maps updated to use the best available science without causing a conflict in code. Based on recommendations from the WA Dept. of Ecology and the WA Dept. of Commerce additional sources and hazard types beyond FEMA maps should be considered, particularly with regard to climate change. Best available science also supports the designation of flood hazard areas outside of the 100-year floodplain.

24.20.013 The Puget Sound biological opinion

Some permits in Thurston County are subject to the Puget Sound Biological Opinion (BiOp), which requires habitat assessments for development in flood hazard areas associated with waterbodies which drain to the Puget Sound (NMFS 2008). The county has been meeting the obligation to implement the BiOp, but this was not previously referenced in Title 24.

24.20.015 High groundwater areas – Base flood elevation

Outdated map references should be removed, and maps should be referenced such that GeoData updates do not cause conflict with the code.

24.20.020 High groundwater areas – No development zone

Based on public and implementing staff feedback, the no development zone delineation for high groundwater hazard areas should be removed. Instead, structures must follow the building and engineering standards set forth in TCC 14.38.050, and ensure that development does not cause a net rise in base flood elevation.

24.20.025 High groundwater areas – Restricted development zone

To support the removal of the no development zone provisions, the base flood elevation areas for high groundwater hazards should be included in the restricted development zone. The code should also outline the requirements for establishing that no hazard is present, if this is the outcome of investigation by a qualified professional.

24.20.030 High groundwater areas – Delineation

In order to provide transparency and support the ability for applicants to plan development projects, a review distance for high groundwater hazard areas should be established, with input from staff subject matter experts.

24.20.035 High groundwater areas – Map amendments

The process for updating critical areas mapping should be addressed elsewhere, and should be consistent across all types of critical area. The procedure for map updates should be created in partnership with the GeoData team, and should allow for both public awareness and for maps to be updated in a timely manner as new data becomes available.



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24.20.040 River, marine, lake, and coastal flood hazard areas – Map amendments

The process for updating critical areas mapping should be addressed elsewhere, and should be consistent across all types of critical area. The procedure for map updates should be created in partnership with the GeoData team, and should allow for both public awareness and for maps to be updated in a timely matter as new data becomes available.

24.20.045 Channel migration hazard areas – Map

This section should be removed, as it identifies map resources that the county does not currently maintain.

24.20.050 Channel migration hazard areas – Map amendments

The process for updating critical areas mapping should be addressed elsewhere, and should be consistent across all types of critical area. The procedure for map updates should be created in partnership with the GeoData team, and should allow for both public awareness and for maps to be updated in a timely matter as new data becomes available.

24.20.060 Building setbacks—Coastal flood hazard areas

Language to allow or encourage elevated structures to accommodate future anticipated sea level rise should be added.

24.20.063 Flood of Record — Notice on title

Because the flood of record may represent flood events in a wide range of probability, flexibility for development in these areas is desirable. To account for the protection of life and property while offering more flexibility in development (see allowed uses table), a notice on title should be recorded when developing in these areas, for the awareness of future property owners.

Table 24.20-1 Allowable Uses and Activities in Flood and Channel Migration Hazard Areas

The column titles in this table should reflect the designations proposed to be set forth in TCC 24.20.010, including adding a column for the flood of record. Allowed uses in the flood of record should be added, and to reflect the variable nature of the flood risk posed within this designation, restrictions on uses may not need to be as strict as for other hazard designations. Based on proposed changes in the Critical Aquifer Recharge Areas regulations in this title, updates to language and allowances for the infiltration of reclaimed water should also be updated in this table.

24.20.132 Frequently flooded areas—Reclaimed water

Based on proposed changes in the Critical Aquifer Recharge Areas regulations in this title, updates to language and allowances for the infiltration of reclaimed water should also be updated in this table.

24.20.135 Frequently flooded areas—Residential—Single-family homes

Commented [AD1]: Accommodate sea level rise by placing structures above what current code would require, right? We might want to specify that. You could add 'future anticipated' before 'sea level rise' and I think that would do the trick.



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TCC 14.38.050 prohibits all new residential structures within the floodway, and these provisions are not subject to reasonable use exceptions. Structures in the floodway represent an extreme risk to life and property. This restriction should be clarified in this title as well.

BAS Resources

ASFP. (2003). *No Adverse Impact: A Toolkit for Common Sense Floodplain Management*. Association of State Floodplain Managers. <https://www.floods.org/resource-center/nai-no-adverse-impact-floodplain-management/>

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FEMA. (2025). *FEMA Flood Map Service Center*. <https://msc.fema.gov/portal/home>

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