3. Environment

Clallam County is located on the Olympic Peninsula in the western most point in Washington State and the contiguous United States at a longitude of 124 degrees, 43 minutes, and 59 seconds West. Clallam County is located south from the Strait of Juan de Fuca, which forms the Canada–US border, with British Columbia's Vancouver Island across the strait.

The county has a total area of 2,671 square miles of which 1,738 square miles (65%) is land and 932 square miles (35%) is water. Clallam is derived from the Native American word Klallam "the strong people". The county was formed on April 26, 1854.

Forks, also previously known as the unincorporated town of Quillayute, is located in southwest Clallam County, Forks was named after the forks in the nearby Bogachiel, Calawah, and Sol Duc rivers which join to form the Quillayute River.

Topography

Forks is bound on the east by the Olympic Mountains which are spread out across Clallam, Grays Harbor, Jefferson, and Mason Counties, The mountains are a section of the larger Pacific Border province, which is in turn a part of the larger Pacific Mountain System. The densely forested western slopes are the wettest place in the 48 contiguous states. Most of the mountains are protected within the bounds of Olympic National Park and adjoining segments of the Olympic National Forest.
The mountains are not especially high as Mount Olympus, the highest summit, is 7,980 feet above sea level. The western slopes are separated from the Pacific Ocean by the low-lying 12 to 22 mile wide Pacific Ocean coastal plain.

The Forks Urban Growth Area (UGA) lies on the Forks Prairie which originated many thousands of years ago due to glacial action and is typical of the many western Washington prairies that exist in a sea of forest. The Prairie is underlain with a gravely substrate that has very high permeability. Because of the relatively flat nature and gravely substrate (glacial outwash) minimal foundation and settling problems ~~can be~~ is expected.

The Forks Urban Growth Area (UGA) lies on the Forks Prairie and is relatively flat sloping usually less than 1% with elevations ranging from 100 to 400 feet. Lower elevations and steep slopes primarily occur along the banks of the Calawah and Bogachiel Rivers and the higher elevations in some foothills portions of which were incorporated into the City of Forks to facilitate the development of the Olympic Natural Resources Center (ONRC). Foothills surround the city except to the west with elevations of up to 1,000 feet.

The Prairie's flatness has a detrimental feature - parts of the Prairie are low and some winter storms cause flooding including, for example, the practice field immediately east of Forks High School, and Russell Road just south of Bogachiel Way. Many other parts within the city suffer from periodic flooding during extreme rain conditions.

Earthquakes

Washington State ranks second in the nation, after California, among states susceptible to earthquake loss according to a Federal Emergency Management Agency (FEMA) study.

Washington State is located near the middle of an offshore tectonic plate convergent boundary called the Cascadia Subduction Zone (CSZ) that extends from the north end of Queen Charlotte Islands (renamed Haida Gwaii after historic resident native tribes) to Cape Mendocino, south of the northern border of California.

The CSZ may be 930 miles in length and if subduction occurred in a single event, the resulting earthquake could last 7 minutes and reach a magnitude 9.5 on the Richter scale.

The inland extent of related earthquake activity is the Cascade Mountain Range where the volcanoes mark the melting edge of the subducting (sinking) Juan de Fuca Plate.

Of the more than 1.000 earthquakes that occur in the region on an annual basis, only a few are large enough to cause ground shaking and property damage. The most recent damaging earthquake in Western Washington occurred on 28 February 2001 - the Nisqually Earthquake, a deep, 6.8 magnitude earthquake located approximately 12 miles northeast of Olympia.

In recent years, geologists have discovered evidence that very large earthquakes have occurred repeatedly in the past. The interval between these very large earthquakes is estimated to range from 100 to 1,000 years.

In 2024, Forks experienced 31 earthquakes with a magnitude of 0.1 or higher on the Richter scale, which is lower than the annual average of 181.00 earthquakes in the region. Based on historic earthquake data dating back to 1950, Forks is likely to be struck by an earthquake every 15.08 months.

The strongest earthquake recorded near Forks was a 6.80 magnitude earthquake with a depth of 32.1 miles that struck 95 miles east of the city in 2001.

Tsunami

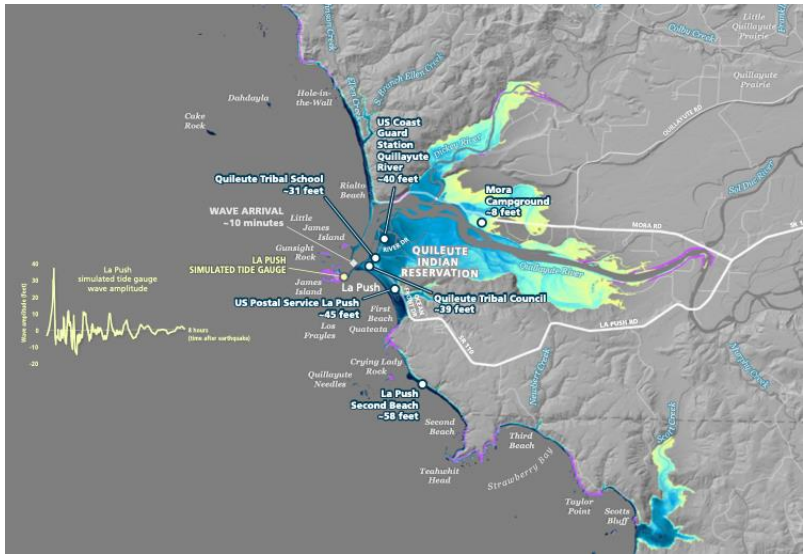
A tsunami is a series of waves commonly caused by an earthquake beneath the sea floor. As tsunamis enter shallow water near land, the waves increase in height and can cause great loss of life and property damage where the waves come ashore.

Recent research suggests tsunamis have struck the Washington coast on a regular basis and can occur at any time of the day or night, under any and all-weather conditions, and in all seasons. Beaches open to the ocean, bay entrances, tidal flats, and coastal rivers are especially vulnerable to tsunamis.

When a tsunami has been generated by a distant earthquake, the waves will not reach the Washington coast for several hours, and there is time to issue a warning. When a tsunami is generated by a strong offshore earthquake, the first waves would reach the outer coast within 15 minutes after the ground stops shaking. Feeling an earthquake could be the only warning.

A gigantic wave, between dozens of feet up to 150 feet, could reach the Quileute Reservation within minutes of the quake. The first wave is often not the largest; successive waves may be spaced many minutes apart and continue to arrive for several hours.

CSZ can generate a magnitude 9.5 or a little smaller or a little



bigger. A quake that powerful could cause shaking that lasts up to 7 minutes and generate tsunami waves up to 80 feet tall. The tsunami would destroy buildings along the shore and flood low-lying areas up to 1 mile inland.

Of particular concern are signals of massive earthquakes in the region's geologic history. The last "big one" is estimated to have been between 8.7-9.0-magnitude earthquake in 1700 based on centuries-old records of tsunamis, Native American oral histories, physical evidence in ghost forests drowned by saltwater, and limited maps of the CSZ fault[1]. Native oral histories estimate the tsunami waves were up to 130 feet tall. The recurrent interval for the CSZ subduction zone for big events is about every 500 years – meaning the region is overdue[2].

Scientists recently found that the subduction zone is much more complex than previously understood and is divided into 4 segments that could rupture independently of one another or together all at once. The segments have different types of rock and varying seismic characteristics - meaning some could be more dangerous than others.

The Federal Emergency Management Agency (FEMA), using historical extrapolations, estimates the tsunami hazard zone extends from La Push up the Quillayute River to the intersection of Mora and La Push Roads some distance from Forks proper.

Tsunami evacuation routes have been developed to guide coastal residents and visitors to safer locations when car evacuation is possible. The evacuation routes have been posted for the Quileute Reservation and Forks. The combination of earthquakes and tsunami, however, could isolate Forks and emergency help for a considerable period.

Rivers

Quillayute River (also spelled Quileute River) – comes from the Quileute name /kʷoʔlíːyot'/, which may be derived from /kʷolíː/ ("wolves"), and was the name of a village at La Push. The Quillayute River is the current, traditional, and ancestral center of the territory of the Quileute Native Tribe, which before European settlement occupied the entire Quillayute and Hoh River watersheds. The town of La Push is located on the small treaty reservation which adjoins the south shore of the Quillayute River at the mouth of the Pacific Ocean.

The Quillayute River is formed by the confluence of the Bogachiel River, Calawah River, and the Sol Duc River near Forks. The Dickey River joins the Quillayute from the north, just above the Quillayute's mouth at the Pacific Ocean. With the river's main tributaries of the Bogachiel, Sol Duc, Calawah, and Dickey Rivers, the Quillayute drains the largest watershed on the north Olympic Peninsula at 629 square miles.

Although the Quillayute is one of the main rivers on the Olympic Peninsula and has a large drainage area, it is only about 4 miles long. At the confluence of the Sol Duc and Bogachiel rivers the name Quillayute ends, although the source rivers continue far into the interior of the Olympic Mountains. In its lower reach the Quillayute River enters the coastal wilderness of Olympic National Park. The mouth of the Quillayute is contained within the Quileute Indian Reservation.

[1] USGS rated the 1700 quake as having a magnitude 9.0. See https://earquake.usgs/gov/earthquakes

[2] Milton Beck's analysis of the interval indicated that the average interval for a magnitude 9 earthquake since 2150 BC is 364 years with a range of 171 to 598 years. However, from 475 AD until 1700 AD, the average interval was 258 yeas and a range of 171 to 470 years.

Bogachiel River – "Bogachiel" is a corruption of the Quileute words bo qwa tcheel el, or /boqʷačʼíʔl/, from /bóːqʼʷa/, "muddy", and /číʔlowa/, "water", meaning "gets riley [turbid] after a rain", "muddy waters", or, less likely, "big river".

The Bogachiel River begins in several headwater streams near Bogachiel Peak deep in the Olympic Mountains, in the northwest part of the Olympic Peninsula flowing west through a densely forested valley just north of the Hoh River valley, the Bogachiel gathers various mountain streams, including its main tributary, the North Fork Bogachiel River.

Below the North Fork confluence, the Bogachiel River flows along the boundary between Clallam County and Jefferson County, crossing and recrossing the county line many times. After gathering many more tributaries, such as Tumwata Creek and Hades Creek, Bogachiel exits Olympic National Park.

Skirting the boundary of Olympic National Forest, the Bogachiel turns northwest, passing through Bogachiel State Park. US Route 101 crosses the river via a bridge in Forks and follows the Bogachiel valley for several miles. Just west of Forks the Calawah River joins the Bogachiel.

Below the Calawah confluence the Bogachiel River widens considerably and takes a meandering course westward through a broad valley. The Sol Duc River enters this valley from the north, and the 2 rivers meander alongside one another for several miles before joining.

The upper Bogachiel River valley contains temperate rain forests, similar to the Hoh Rain Forest of the Hoh River valley.

Calawah River – Calawah comes from the Quileute word qàlóʔwaː, meaning "in between", or "middle river". The Calawah is a 31 mile tributary of the Bogachiel River that drains an unpopulated portion of the low foothills of the Olympic Mountains from a watershed consisting of virgin forest. Its two major tributaries are the South and North Forks Calawah River.

The Calawah drains 129 square miles above US Route 101 which crosses the river about 6.6 miles upstream of the river's mouth within Forks city limits.

Sol Duc River (also spelled Soleduck) - comes from the Quileute name, /sóːliɬtʼaqʷ/, meaning "sparkling waters". In 1992 the spelling was officially changed to "Sol Duc" by the State of Washington Board on Geographic Names.

The Sol Duc is about 78 miles long, flowing west through the northwest part of the Olympic Peninsula, from the Olympic Mountains of Olympic National Park and Olympic National Forest, then through the broad Sol Duc Valley. Near the Pacific Ocean the Sol Duc River joins the Bogachiel River, forming the Quillayute River.

The Sol Duc's watershed is the largest of the Quillayute's tributaries, at 219 square miles. The Sol Duc River's main tributaries are the North Fork Sol Duc River and the South Fork Sol Duc River. Other notable tributaries include Bear Creek, Beaver Creek, and Lake Creek.

Much of the Sol Duc River's watershed is valuable timber land most of which have been logged at least once. The forests within Olympic National Park are protected.

Shorelines

The Calawah River along part of the north boundary of the Forks UGA and the Bogachiel River located at the southwest extreme of the Forks UGA are the only shorelines classified as shorelines of statewide significance within the Forks UGA.

Wetlands

Wetlands are fragile ecosystems that ~~assist in~~ reduce erosion, flooding, and ground and surface water pollution. Wetlands also provide an important habitat for wildlife, plants, and fisheries.

The Forks UGA has relatively few wetlands. In 1996 the city retained Sheldon & Associates to inventory wetlands found on the National Wetlands Inventory (NWI) map and Pesha Klein of Sheldon & Associates determined that the NWI wetlands denoted as "unconfirmed wetlands" were non-wetland areas.

In 1994, Clallam County commissioned a Comprehensive Flood Hazard Management Plan that included an Inventory of Western Clallam County Wetlands Two of Forks more valuable wetlands are located in the southern portion of the UGA and include a wetland immediately south of US Route 101, the current location of the Timber Museum/Logger Memorial Site, the ONRC, and a wetland located immediately west of Bunker Road located south of the airport off US-101.

Timber Museum/Logger Memorial Site/ORNC wetland - consists of approximately 130 acres classified as a palustrine forested area including western hemlock, Sitka spruce, skunk cabbage, and small fruit bulrush vegetation.

The buffer associated with this wetland is 50% forested. Although not inventoried, the animals associated with this area include Roosevelt elk, deer, and various waterfowl and other birds.

Bunker Road wetland - is located immediately west of Bunker Road and was determined to be an emergent wetland consisting of almost 3 acres. This wetland is classified as ~~being~~ palustrine scrub shrub including only willow vegetation. This area is also associated with Roosevelt elk, deer, and various waterfowl and other birds.

Campbell's Gravel Pit wetland - is in the southern portion of Section 8, Township 28 North, Range 13 West (South of Sherwood Forest Division III and west of Campbell's Gravel Pit). This wetland is a combination of palustrine shrub and palustrine forested with broad-leafed deciduous plants. Animals associated with this wetland include Roosevelt Elk, deer, and various songbirds.

Elk Creek wetland - is in the Southeast 1/4 of the Southeast 1/4 of Section 2, Township 28 North, Range 13 West. This wetland is associated with Elk Creek and consists of palustrine forested and palustrine shrub wetlands. While no animals were seen in the area, the area is prime deer and Roosevelt elk habitat and would favor both songbirds and raptors.

Flooding

The Bogachiel, Calawah, and Sol Duc Rivers can flood due to heavy rain, snowmelt, coastal storms, and other severe weather events. Flooding events can cause damage to homes, close roads (US Route 101), and municipal infrastructure like public drinking water and wastewater treatment. In 2021, significant flooding occurred along the drainage ditch of Calawah Way and Division Street including the land and housing areas between the roads.

The USGS Calawah River gage is located on the left bank 30 feet downstream from US Route 101 bridge, 0.8 mile northwest of Forks, and at river mile 6.6 with a drainage area of 129 square miles. The gage elevation is 201.58 feet above sea level and the flow is measured in cubic feet per second (cfs), the rate of flow past a given point where 1 cubic foot of water equals about 7 gallons. The Bogachiel River gage is located at the US Route 101 bridge south of Forks.

The National Weather Service (NWS) prepares forecasts and other services in collaboration with agencies like the US Geological Survey (USGS), US Bureau of Reclamation (BOR), US Army Corps of Engineers, Natural Resource Conservation Service (NRCS), National Park Service (NPS), ALERT Users Group, Bureau of Indian Affairs (BIA), and many state and local emergency managers using the following definitions:

100-year flood – an extreme flow rate that has a 1% chance of being exceeded in any given year. The 100-year flood is a flood that is equaled or exceeded once every 100 years on average or there is a 1% chance of the flood happening each year.

Flood watch - the first of 2 basic advisories issued by the National Weather Service (NWS) when conditions are favorable for flooding. A watch does not mean that flooding will occur, but it does give an early notice of potential flooding and allows a community to review flood safety steps.

Flood advisory - when flooding is expected to be severe enough to issue a warning. Flooding may occur and cause significant inconvenience. If caution is not exercised, flooding could lead to threats to life and/or property.

Flood warning - issued when flooding conditions are imminent or in progress so that residents can prepare and act. The local emergency alert system will advise if there is u need to evacuate.

Flood stage - a site-specific river level at which flood damage may start to occur; usually at or above the top of the riverbank. Flood heights are often measured relative to the flood stage elevation. At the Calawah River gauge, flood stage is 14.5 feet.

Flood insurance - coverage provided through the National Flood Insurance Program (NFIP) based on the Flood insurance Rate Map (FIRM), an official map on which the Federal Emergency Management Agency (FEMA) has delineated both the special hazard areas and the risk premium zoned applicable to the community. FIRMs typically identify the elevation of the 1% annual chance flood and the areas that would be inundated by that level of flooding; and are used to determine flood insurance rates and for floodplain management. FIRM maps are available at the Clallam County Planning and Permit Center.

Overall, Forks has a moderate risk from flooding along the banks of the Calawah and Bogachiel Rivers with some overflow of the Calawah River at the northern city and UGA boundary and of the Bogachiel River at the south end of the city and UGA boundary adjacent to US Route 101. As Forks feels the effects of a changing environment, however, events of all kinds will affect more properties within the community.

If a low-likelihood storm resulting in severe flooding (100-year flood event), occurred, flooding could affect 65 properties in Forks. This type of event has a 26% chance of occurring at least once over the life of a 30-year mortgage. 30 years from now, an event of this same likelihood could affect 67 properties due to a changing environment.

In 2024, 6.8% of properties in Forks have risk of flooding. In 30 years, 7% of properties in Forks will have risk of flooding. Climate change is producing stronger storms which is increasing flooding across the US.

Wildfire

In addition to damaging properties, wildfire can cut off access to utilities, emergency services, impact evacuation routes, and may impact the overall economic well-being of an area. Overall, Forks has a moderate risk of wildfire over the next 30 years based on the level of risk properties face rather than the proportion of properties with risk.

Rising average temperatures increase the rate of evaporation in

dense wilderness areas, causing soil and vegetation to dry more quickly and become flammable.

Large wildfires burned through the forests of the upper Sol Duc Valley in 1907 and in the 1951 Forks Fire. The Forks Fire started in the Olympic National Forest near Camp Creek, flaring up from the Sol Duc fire apparently caused by sparks from a logging train on the Port Angeles and Western Railroad. The fire covered an area of approximately 38,000 acres, a combination of privately owned, state land, and national forest land.

In Forks, several homes, businesses, and shops were destroyed. Some logging equipment and machinery was also lost to the fire, and logging railroad tracks were destroyed. In spite of the overall devastation of the area and the property damage, there was no loss of life. The fire had a long-term impact on the community, changing the logging industry in the area for many years to come.

Wildfires in this area tend to spread quickly east to west while remaining narrow north to south. This is due to the wind patterns near Lake Crescent, where east winds accelerate as the winds are funneled through a narrow valley corridor west of Lake Crescent and into the Sol Duc Valley.

The 1951 fire started on September 20 after 108 days without rain. Driven by high winds the fire spread west down the Sol Duc Valley at a rate of about 18 miles in 6 hours. Over 30,000 acres of timber was destroyed. Smoke in Forks was so dense that drivers evacuating in the middle of the day could barely see the road. The fire reached the edge of Forks, destroying 28 houses and several other buildings before a light rain began to fall, halting and eventually putting out the fire.

Fish

The Sol Duc and the other tributaries of the Quillayute River support some of the healthiest stocks of wild winter steelhead in the Pacific Northwest, with as many as 19,000 steelhead returning to spawn in some years. There are also large runs of chinook and coho salmon.

Unlike many other large rivers of the Olympic Peninsula, the headwaters of the Bogachiel, Sol Duc, Calawah, and the other Quillayute tributaries are not glacier-fed. Although the annual snowpack in these headwaters is considerable, they rivers do not experience the heavy summer-melt sediment loads of rivers to the south (Hoh, Queets, Quinault).

Of the Quillayute's tributaries, the Sol Duc River is one of the only rivers of the Olympic Peninsula that supports all 5 major species of salmon. The upper Sol Duc is a prime coho spawning stream that supports spring chinook salmon, sockeye salmon in June and July, and so-called summer coho salmon in August and September. Coastal cutthroat trout also spawn in the Sol Duc River.

The Bogachiel River hosts healthy stocks of wild winter steelhead (the anadromous form of coastal rainbow trout) with as many as 19,000 fish returning in some years and up to 50,000 hatchery raised steelhead. The river also supports large runs of Chinook and coho salmon and holds resident populations of coastal cutthroat trout and Dolly Varden.

Wildlife

Olympic National Park and surrounding areas are a rare refuge for species dependent on old growth forests, including some species protected under the Endangered Species Act. Olympic Peninsula provides one of the last remaining large tracts of intact primeval forest in the lower 48 states. The moist forests provide essential habitat for northern spotted owls, marbled murrelets, and a variety of amphibians.

The wildlife community of the isolated Olympic Peninsula is

also uniquely noteworthy not only for endemic animals (found only here), but also for species missing from the Olympics, yet found elsewhere in western mountains. Pika, ptarmigan, ground squirrels, lynx, red foxes, coyotes, wolverine, grizzly bears, bighorn sheep and historically, mountain goats, did not occur on the Olympic Peninsula.

Meanwhile, endemic species like the Olympic marmot, Olympic snow mole, and Olympic torrent salamander are found here and nowhere else in the world. The following animal species are endemic to the Olympic Peninsula:

Mammals

- Olympic marmot
- Olympic yellow-pine chipmunk
- Olympic coast mole
- Olympic Masama pocket gopher
- Olympic ermine
- Destruction Island Shrew

Amphibians

- Olympic torrent salamander

Fish

- Olympic mudminnow

Lepidoptera (butterflies and moths)

- Hulbirt's skipper
- Olympic arctic
- Makah Copper
- Taylor's Checkerspot (Endangered)

Orthoptera (grasshoppers)

- Olympic grasshopper

Coleoptera (beetles)

- Mann's gazzelle beetle
- Quileute gazelle beetle
- Tiger beetle

Mollusks

- Keeled jumping slug
- Opiliones (harvestmen)

- **Local species on the brink** - as of 2024, not including marine species that exist only in the waters outside the park:

Threatened

- Bull trout
- Eulachon
- Green Sturgeon
- Marbled murrelet
- Northern spotted owl
- Steelhead (Rainbow Trout)
- Salmon: sockeye
- Salmon, Chinook
- Salmon, Chum
- Whitebark Pine

Endangered

- Guadalupe fur seal
- Gray wolf (eliminated by the 1920s)
- Marsh sandwort
- Taylor's Checkerspot Butterfly

Soil classification

The US Department of Agriculture (USDA) inventoried soils throughout the United States in the 1980s including the types, locations, and suitability for various land use activities. The following information is from the original Soil Survey report of Clallam County Area, Washington issued 1987.

In the western part of Clallam County, the habitable lands are on the stream terraces and alluvial bottoms and along the shores near the few roads that penetrate the region. These alluvial bottom lands are widely scattered in small narrow strips, of limited extent, and are for the most part of old coarse-gravel out-wash, evidently derived from mountain glaciations.

The natural vegetation of the county includes nearly all the plants common to the northern Pacific coast. In the western part of Clallam County, a belt of Douglas-fir extends down the

droughty gravel terraces of the large rivers, but the dominant tree elsewhere is the Western hemlock, with large Sitka spruce and Western redcedar in swamps and bottom lands.

Dense forests originally covered all the area except the high mountaintops and several small prairies. More than 95% of the area remains uncleared, for clearing is both difficult and expensive.

The merchantable timber has been logged from a large part of the county outside the Olympic National Park, and there have been several large fires and blowdowns. The land, however, quickly gains a new second-growth cover of timber and brush denser than the virgin forest.

Judged by ordinary production standards of common farm crops, the county is not an important agricultural area. Extensive farm development is forestalled by the scarcity of naturally fertile soil, the dense forest cover, and a climate characterized by cool summers and a winter rainfall that leaches the soil but does not furnish adequate moisture for crops during the growing season.

The 11 soils in Forks are in an orderly pattern related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind or segment of the landscape. Individual soils on the landscape commonly merge gradually into one another as the characteristics gradually change.

Calawah silt loam, 0 to 15% slopes - very deep, well-drained soil on terraces over glacial outwash formed in loess and old alluvium. The native vegetation is mainly conifers and shrubs. Elevation is 100 to 1,200 feet. This soil is suited to the production of western hemlock.

Hoh silt loam, 0 to 2% slopes - very deep, well-drained soil on low terraces and flood plains formed in alluvium. The native vegetation is mainly conifers and shrubs. Elevation is near sea level to 500 feet. If this soil is used for homesite development, the main limitation is the hazard of flooding.

IIlwaco silt loam, 15 to 35% slopes - very deep, well-drained soil on foothills formed in highly weathered sandstone and loess. The native vegetation is mainly conifers and shrubs. Elevation is 50 to 1,600 feet. This soil 1s suited to the production of western hemlock.

Illwaco-Kline complex, 30 to 65% slopes - on foothills and terrace escarpments. The native vegetation is mainly conifers and shrubs. Elevation is 100 to 800 feet. The Ilwaco soil is well suited to the production of western hemlock.

Klone very gravelly loam, 0 to 15% slopes - very deep, well-drained soil on terraces formed in glacial outwash. The native vegetation is mainly conifers and shrubs. Elevation is 50 to 1,200 feet. This soil is suited to the production of western hemlock.

Ozette silt loam, 5 to 35% slopes - deep, moderately well drained soil on hills formed in loess and glacial till derived mainly from sandstone and siltstone and is underlain by compact glacial till. The native vegetation is mainly conifers and shrubs. Elevation is 100 to 1,800 feet. This soil is suited to the production of western hemlock.

Pits - open excavations from which soil material, material such as sand and gravel, and bedrock have been removed. Areas of this unit support little, if any, vegetation. This soil is used mainly as a source of road fill for surfacing roads and as a source of sand and gravel for Forks.

Queets silt loam, 0 to 5% slopes - very deep, well-drained soil on low river terraces and flood plains formed in silty alluvium. The native vegetation is mainly conifers and shrubs. Elevation is 50 to 600 feet. This soil is used mainly as woodland, hay land,

pastureland, and homesites. This unit is suited to the production of western hemlock and red alder. If this soil is used for homesite development, the main limitation is the hazard of flooding including the use of septic tank absorption fields.

Quillayute silt loam, 0 to 8% slopes - very deep, well-drained soil on terraces formed in loess and old estuary deposits is typical of the Quillayute and Forks Prairies. The treeless condition probably originated because of periodic burning by the Indians. The native vegetation is mainly conifers and shrubs. Elevation is 80 to 350 feet. This soil is used mainly as woodland, hay land, pastureland, and homesites. This unit is suited to the production of western hemlock. If this unit is used for hay and pasture, it has few limitations. If this unit is used for homesite development, the main limitation is the potential for shrinking and swelling. Use of the soil for septic tank absorption fields is limited by moderate permeability.

Riverwash - nearly level bars of recent sandy and gravelly alluvium with some cobbly places are located in areas adjacent to perennial and intermittent streams and commonly flooded by runoff from melting snow and heavy rains. River wash areas support sparse vegetation, consisting of brush and deciduous trees. This unit is used mainly as wildlife habitat. Some areas are also used as a source of gravel.

Snahopish very gravelly loam, 35 to 70% slopes - very deep, well-drained soil on mountainsides formed in loess, residuum, and colluvium derived from sandstone. The native vegetation is mainly conifers and shrubs. Elevation is 300 to 1,800 feet. This soil is suited to the production of western hemlock.

Solduc very gravelly sandy loam, 0 to 5% slopes - very deep, somewhat excessively drained soil on terraces formed in glacial outwash that has loess and volcanic ash in the upper part. The native vegetation is mainly conifers and shrubs. Elevation is 50 to 800 feet. This unit is used as woodland and homesites. This unit is suited to the production of western hemlock and Douglas-fir. This soil is suited to homesite development, the main limitation is the content of gravel. Use of the soil for septic tank absorption fields is limited by the rapid permeability of the substratum.

Mineral deposits - gravel is the only mineral currently extracted from within the UGA and there are several active rock pits in and near Forks. In the early to mid 1990s, there was a substantial interest in obtaining fossil fuels (oil and natural gas) from lands within the UGA. At that time, some individuals sold the mineral rights associated with their properties.

Climate

The climate of Forks and its surroundings is cool maritime. The air from the Pacific Ocean influences the climate throughout the year. In the late fall and winter, the low-pressure center in the Gulf of Alaska intensifies and is of major importance in controlling weather systems entering the Pacific Northwest.

In the summer months, the hottest month of the year in Forks is August, with an average high of 73°F and average low of 51°F though Forks reached record highs of 110°F in June 2021. In the winter months, the lowest temperatures are in the month of December with average high of 46°F and average low of 34°F.

Forks receives an annual precipitation of 113 inches. Precipitation includes rain and liquid equivalent of snow, hail, freezing rain, and sleet. The month with most precipitation in Forks is January, with an average monthly precipitation of 18 inches. Rainfall, however, has diminished in recent years causing drought conditions and resulting in water use restrictions during summer months.

Forks receives an annual snowfall of 7 inches from November to April. The month with most snowfall in Forks is January, with an average snowfall of 3 inches. Snowless period lasts from May to

October.

The humidity level in Forks remains comfortable throughout the summer. Generally, if the dew point temperature is below 50ºF, the air will feel dry. If the dew point temperature climbs to 70ºF or higher, the air will feel unpleasantly uncomfortable.

Wind speed remains relatively consistent throughout the year, with an average of 6 mph in the winter months (January, February, March, and December). In the summer months (June, July, and August), the average wind speed changes to 5 mph. Overall, the variation in wind speed ranges between 4 mph and 6 mph across the months.

The month with the clearest sky, characterized by predominantly clear, few, and scattered clouds, is September when the sky is either clear or with few and scattered clouds present 54% of the time. The cloudiest month of the year is December, when the sky is either overcast or covered with broken clouds, which occurs 68% of the time.

Every year, Forks has about 127 days or 4.2 months, with comfortable weather. The number of days per year with comfortable weather use the following criteria, which favor mild temperatures and low humidity:

- Daily high temperatures between 65ºF and 86ºF
- Daily maximum dew point temperatures less than or equal to 65ºF
- Average daily cloud cover less than or equal to 65%
- Average daily wind speed less than or equal to 18 mph

Critical areas

The Growth Management Act (GMA) requires all cities and counties adopt development regulations that protect critical areas to preserve the natural environment, maintain fish and wildlife habitat, and protect drinking water. Protecting critical areas reduces exposure to risks, such as landslides or flooding, and maintains the natural elements of landscape. It can be costly, or even impossible, to replace critical area functions and values once lost.

Critical areas typically include pieces of land that vitally impact the surrounding environment and can include wetlands, wildlife habitats, or environmentally hazardous areas. All critical areas must be designated, and the functions and values protected using Best Available Scientific (BAS) information.

Salmonids play an extremely important role in the ecosystem and are vital cultural and economic resources, therefore Critical Area Ordinances (CAOs) must also give special consideration to conservation and protection measures necessary to preserve or enhance anadromous fisheries.

Protecting critical areas has a nexus, or link, in several federal and state laws including the Federal Clean Water Act (FCWA), Safe Drinking Water Act (SDWA), Endangered Species Act (ESA), the National Environmental Policy Act (NEPA), and the National Floodplain Insurance Program (NFIP) administered by FEMA; and including the Washington State Environmental Policy Act (SEPA), Shoreline Management Act (SMA), Watershed Planning Act (WPA), Salmon Recovery Act (SRA), Municipal Water Law (MWL) and the GMA.

Additionally, federal and state governments have a responsibility to ensure that tribal treaty rights are upheld, which in part requires that fish habitat is protected and improved.

The location and size of critical areas is specified through performance standards in the Forks Critical Areas Ordinance (CAO). Since most of the Forks UGA is flat and drains well, the

amount of land in critical areas is relatively small.

The Forks UGA has 482.0 acres or 11.6% of the total land area in designated critical areas, While sizable, critical areas do not create any significant constraints on Forks land use planning.

Critical areas	City	Uninc	UGA
Average in critical areas	82.0	400.0	482.0
Average total in each area	1,271.2	2,882.1	4,153.3

Source: 2006 Forks Comprehensive Plan

Stormwater drainage is a problem throughout Forks but is mostly alleviated by city and county development standards mandating on-site water retention. Some undeveloped ITT property just south of the Campbell's Gravel pit is subject to flooding during intense rains, as is the practice field immediately east of the Forks High School. Development in these areas should be of low intensity. In 1997, Forks adopted a Comprehensive Flood Management Plan (CFMP) address site-specific problems associated with stormwater runoffs. In 2025, the City updated the associated Flood Hazard Management codes to comply with federal and state requirements.

Geologically hazardous areas - ~~foothills~~ to the east and south of Forks constitute steep slopes, as are some banks of the Calawah River and the banks at the mouth of Elk Creek.

Aquifer recharge areas - protection is important because the Forks water system and some residents depend on wells for drinking water. The only high aquifer recharge areas in Forks are along the Calawah River.

Frequently flooded areas - of Forks are within floodplains are along the Calawah and Bogachiel Rivers and along a ditching system on G Street and Russell Road.

Aquatic and wildlife habitat conservation areas - are identified through the performance standards of the Forks Critical Areas Ordinance (CAO). The only probable conservation area that is within Forks is the Calawah River, which as a shoreline of statewide significance under the Washington State Shoreline Management Act and qualifies as an aquatic habitat conservation area.

Goals and policies

ENV Goal 1 - Conserve and protect water resources.

ENV Policy 1.1 –Maintain existing surface water quality. Where applicable, work to rehabilitate less than desirable conditions in partnership with landowners, neighbors, and stakeholders.

ENV Policy 1.2 - Retain any existing publicly owned open surface water systems in a natural state and undertake programs to rehabilitate any degraded conditions.

ENV Policy 1.3 - Maintain and improve surface water quality as defined by state and federal standards.

ENV Policy 1.4 - Address surface water runoff with new development in such a manner as to conform to applicable state and federal law. Require ~~with~~ all new development retain all storm water on site in approved, and where applicable registered, manners.

ENV Policy 1.5 - Review and update as necessary stormwater drainage regulations to ensure the standards meet state standards for protection of fish and other aquatic species including those listed in the Endangered Species Act (ESA).

ENV Goal 2 - Conserve and enhance vegetation and earth characteristics.

ENV 2.1 – Promote development in a manner that protects existing topographic, geologic, vegetation, and hydrologic features.

ENV Policy 2.2 - Promote soil stability and use of natural drainage ways by encouraging the retention of existing native vegetation near streams, springs, and slopes.

ENV Policy 2.3 - Discourage the use of non-native vegetation, and where such non- native vegetation is found to be harmful, coordinate efforts to remove and replace it.

ENV Policy 2.4 - Preserve existing vegetation or provide and enhance vegetation that is compatible with the natural character of the existing ecosystems of the immediate area.

ENV Policy 2.5 - Minimize and control soil erosion during and after construction through use of best management practices and appropriate development regulations.

ENV Goal 3 - In partnership with Clallam County, identify and maintain a Hazard Mitigation Action Plan (HMAP) for dealing with earthquake, severe weather, and severe storm events in Forks.

ENV Policy 3.1 - Maintain a Hazard Mitigation Action Plan (HMAP) that identifies risk events and develops appropriate initiatives for reducing and resolving impacts.

ENV Policy 3.2 - Develop and improve a Communications Plan to keep residents informed of local conditions and matters of local importance including tools that can be used when the power is out.

ENV Policy 3.3 - Conduct a seismic risk assessment of city facilities to determine vulnerability and the need to retrofit city facilities to withstand earthquakes.

ENV Policy 3.4 - Encourage homeowners, particularly of older housing units, to install measures that reduce and mitigate potential hazard impacts such as installing reinforcement straps on water heaters, bracing plates on foundations and support columns, and seismic shut-off valves on propane storage tanks, among others.

ENV Policy 3.5 - Update Forks' Stormwater Management Comprehensive Plan (SMCP) to deal with severe winter rainstorm events and control stormwater collection.

ENV Policy 3.6 - Encourage homeowners and neighborhoods to develop readiness plans for dealing with hazardous events that promote 72-hour self-sufficiency.

ENV Policy 3.7 - Develop a Post Disaster Action Plan to includes a debris removal component and building code related activity that supports the Public Works Departments during reconstruction processes.

Goal ENV 4: Protect Forks from damage and loss caused by wildfire.

Policy ENV 4.1: Maintain the burn ban in city limits and the FUGA subject to the Fire Chief's review and approval of any recreation fires.

Policy ENV 4.2: Implement cleared safety zones around structures and neighborhoods to prevent the potential for wildland-urban interface (WUI) fires.

Policy ENV 4.3: Update building codes to require effective fire-retardant materials including non-combustible roofing and siding, and where appropriate fire sprinkler systems in larger structures.

Policy ENV 4.4: Collaborate on the development of a county-wide Community Wildfire Protection Plan (CWPP) to identify and prioritize hazardous fuel treatments and recommend ways to reduce structural ignitability in Forks and the FUGA.