CHELAN COUNTY

HAZARD IDENTIFICATION AND VULNERABILITY ASSESSMENT (HIVA)

Foreword

The Chelan County Hazard Identification and Vulnerability Assessment assesses natural and technological (man-made) hazards within Chelan County. Assessment is the initial step in the emergency management process that leads to mitigation against, preparedness for, response to, and recovery from hazards. Hazards have the potential of becoming disasters or emergencies that can adversely affect the people, environment, economy, and property of the County.

Hazard assessment helps emergency managers rate the risk, determine vulnerability, and predict the adverse impact of disasters and emergencies. Emergency managers with good hazard assessments can effectively organize resources and develop comprehensive emergency management plans to minimize the impact of disasters and emergencies.

The HIVA contains information from federal, state, and local government as well as from public sources.

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Purpose

The purpose of this analysis is to provide general information on potential hazards which may threaten or cause loss of life or injury, along with property and environmental damages in Chelan County. The information discussed in this analysis serves as the basis for county level preparedness planning. Additionally, this information serves as a foundation for initiating effective mitigation, emergency response, and recovery activities.

The following thirteen (13) hazards may not be inclusive of all that could affect Chelan County, but are the focus of this analysis.

Natural	Technological
Floods	Dam Failures
Earthquakes	Terrorism/sabotage
Droughts	Hazardous Materials
Slides	Utility outages
Volcano	Urban fires
Severe Storms	Civil disturbances
Wildland fire	

Background

Chelan County experiences significant impacts from natural hazards including floods, droughts, slides, severe storms and wildland fires. Beyond natural hazards, there are technological hazards, including dam failures, hazardous material incidents, utility outages and the potential for terrorism. All of these require assessment and determination by the county officials to organize resources so that losses can be prevented or minimized.

Chelan County usually has several declared emergencies each year, most often pertaining to wildland fires and flooding. Often the declared emergencies are for specific areas of the county, and not declared for the entire county.

Scope

Per the Washington State HIVA, “A HIVA is applicable to all cities and counties in the state. State law requires all political subdivisions to be part of an emergency management organization and to have an emergency management plan. Chapter 118-30 Washington Administrative Code requires that emergency management plans be based on a written assessment and listing of the hazards to which the political subdivision is vulnerable.” This

document will fulfill the requirement for a HIVA and is the basis for the current Chelan County Comprehensive Emergency Management Plan (CEMP).

Area Characteristics

AREA LOCATION AND MAKEUP: Chelan County is located in North Central Washington and encompasses an area of 2,921 square miles making it the third largest county (by area) in the state. Approximately 67 percent of Chelan County is forest land, 6 percent agricultural land, 2 percent urban and 25 percent uninhabitable or undeveloped.

WATER: Major bodies of water in Chelan County include the Columbia, Entiat, and Wenatchee Rivers as well as Lake Chelan and Lake Wenatchee.

GEOLOGY: Bedrock geology in the county is varied. The bedrock underlying the Wenatchee River watershed is the non-marine sedimentary swauk formation formed during the Tertiary period of geologic time. This formation is composed of conglomerate sandstone and shale interbeds and extends as far north as Lake Wenatchee and south to the Cle Elum River drainage. As these interbeds were later subjected to the mountain building forces during the emergence of the Cascade Mountain Range, a complex range of land forms was produced. This occurrence created a history of geologic instability present to this day. Other major bedrock formations located in the County include metamorphic rock formations, granite intrusions and thick sequences of volcanic and marine sedimentary rock of the Chumstick formations (Ciolek, 1975; Shank, 1983).

PHYSIOGRAPHY: For emergency planning purposes, important physiographical features in Chelan County are elevations and slopes. Chelan County has an extremely rugged topography which is marked by steep slopes and exposed rock faces. Within the County the elevation ranges roughly from 9,000 feet above sea level near the Cascade Mountain crest on the west side of the county, to 700 feet above sea level near the city of Wenatchee.

CLIMATE: The climate of Chelan County is characterized by hot, dry summers and cold winters. Hot, sunny summer days are common with average temperatures in July of 87.3 in the lower elevations; 65.7 in the higher (Western Regional Climate Center). The months of July and August also bring thunderstorms to the area. These storms often produce dry lightning which has been a major cause of wildland fires in the area. On occasion where there is precipitation with the storm, flash flooding has been a problem. Winters bring cold temperatures and snow with the average January temperature in lower elevations (Wenatchee) at 33.9 and higher elevations at 28.6.

PRECIPITATION: The average annual precipitation in the lower elevations of Chelan County is 8.20 inches, and higher elevations ranging from 25.55 at Leavenworth to 81.54 at Stevens Pass (Western Regional Climate Center). The bulk of precipitation falls as snow which has reached 100 inches or more

in the upper watersheds (U.S. Forest Service, 1996). Several of the severe floods have occurred in the months of October, November, December, June and July, and were caused by rain or early snow packs or late winter snow.

LAND OWNERSHIP: Land use practices in Chelan County are closely related to land ownership. Within the County, land ownership can be grouped into four major categories which include the Federal Government (U.S. Forest Service & Bureau of Land Management), State Government (Department of Natural Resources and Department of Fish and Wildlife), Corporate Private, and Private. Eighty seven percent of the land within Chelan County is under public ownership with the remaining thirteen percent in some form of private ownership.

Demographics

The 2015 census estimate figures estimate Chelan County with a population of 73,644, a 4.4% increase over the 2010 numbers.

Additionally there are various local events which can temporarily increase the County's population. Festivals including the Apple Blossom festival in Wenatchee and Leavenworth's Maifest, Autumn Leaf and Christmas lighting ceremonies have increased local populations by 30,000 to 100,000 people. Seasonally, during harvest months of August through October up to 10,000 migrant workers will temporarily locate in the County. Weekend recreationists can also account for an average increase in population of approximately 4,000 to 8,000 on given weekends scattered throughout the year.

FLOODS

Definition: Flooding is defined as a significant rise in water level due to increased surface water run-off or groundwater saturation that results in an increase in surface water levels beyond what is typically expected and that can cause damage to man-made structures.

The two types of flooding common in Chelan County are stage and flash flooding. Stage flooding occurs during periods of heavy rains, especially upon existing snow packs ("rain-on-snow" events) occurring early winter and late spring. Stage flooding can last several days after the storm. Flash floods are more likely to occur during the summer months during thunderstorm season and are usually associated with cloudburst-type rainstorms and/or ice or debris dams.

HISTORY

Stage flooding events have been more common in the past fifteen years in Chelan County, with the last two episodes occurring in 1990 and 1995. Both events well exceeded 100-year flood events. These floods have caused extensive damage along the Wenatchee and Icicle river drainages; however, no fatalities have occurred as a result of stage flooding in Chelan County. In October, 2003, substantial flooding occurred in the Stehekin River, destroying public and private property and infrastructure.

Stage Flood Events

May/June 1948 Snowmelt flooding broke lake and river records countywide.

May/June 1972 Snowmelt flooding combined with heavy rains affected rivers countywide, particularly the Entiat River

November 1990 Severe storms and flooding occurred during the Veteran's Day and Thanksgiving weekends countywide, particularly the Wenatchee River

November/December 1995 Extensive rains caused flood stage records countywide, particularly in the Wenatchee River

December 1996/January 1997 Saturated ground combined with snow, freezing rain, rain, rapid warming and high winds within a five-day period caused flooding

November, 2006 Significant rainfall, causing significant runoff. Flooding occurred throughout the county

August, 2014 Numerous locations on SR 150 between Chelan and Manson experienced flooding from heavy rainfall. Water got into some homes. Rainfall amounts ranged from one inch to one and a half inches.

Flooding occurred in the Entiat area due to debris flow in the Entiat River.

Flash flooding has caused deaths in the area and is a threat to local populated areas due to the topographical makeup of the County. For example, the City of Wenatchee, with a population nearing 30,000 is located on an alluvial fan below the mouths of three canyons (Number 1, Number 2 and Dry Gulch). Severe thunderstorm or rapid snowmelt poses a constant threat of extensive damage and death.
The following flash flood events have resulted in fatalities:

YEAR	LOCATION	FATALITIES
1925	Squilchuck Creek	14
1942	Tenas Gorge	8
1948	Pine Canyon (Douglas County)	1
1972	Preston Creek/Entiat River	4

Hazard Identification and Vulnerability Assessment Flooding is one of the most common natural hazards in Chelan County. Steep drainage areas and populated low-lying areas typical of the County present a geography that will continually be subject to flooding problems. Historically, Chelan County has had regular occurrences of flash flooding. Due to the County's topography and climate, stage and flash flooding will continue to be a threat in most parts of the county.

The Columbia River, Wenatchee River, Entiat River and other perennial streams in Chelan County follow an annual cycle with peak stream flow in April and May and low stream flow in August and September. Normally stream flow in many of the smaller drainages are intermittent seasonally, while drainages in lower elevations are often dry. Hazardous areas found along stream courses for most types of residential or recreational development include those areas within the floodplain (100-year flood event) and floodway (10-year flood event) boundaries. Present problem areas for flash flooding include Slide Ridge in the Chelan area and #1 and #2 Canyons in the Wenatchee area. Stage flooding problem areas are in the area where the Icicle and Wenatchee Rivers meet in Leavenworth, the headwaters of the Wenatchee River and the confluence area of the Wenatchee River.

The primary cause of flash flooding which can occur in any drainage area in the county is high intensity rainfall. Although infrequent, and usually of short duration, high intensity rainfall has been seen in all seasons in the past and particularly in July and August.

The threat of flash flooding is increased in an area that has suffered from a major wildland fire. Not only is there a greater amount of loose debris, most of the ground cover has been burnt away. Without ground cover more soil and debris will be allowed to flow, increasing the chance of debris dams. Major wildland fires have occurred recently in Chelan County, and flash floods and mud flows have occurred following these events.

Depending upon the characteristics of a particular watershed, peak flows may be reached from less than one hour to several hours after rain begins. The debris dams and mudslides accompanying rapid runoff conditions make narrow canyons and alluvial fans at the mouth of the canyons extremely hazardous areas.

Conclusion Floods have caused loss of life, personal injuries and damage to property, along with damage to roads, bridges, utility systems, etc. in Chelan County. Secondary events from major flooding by polluted water include the spread of disease and contamination. This increases the health risk for those people returning to homes in areas that have been flooded. Due to the geography of Chelan County, many residents must locate their homes, businesses and other infrastructure near or within the 100-year and 500-year floodplain. While there are few repetitive loss properties within the County, particularly with respect to critical infrastructure, continued development in flood-prone areas may result in significant losses due to flooding.

EARTHQUAKE

Definition An earthquake is the sudden release of stored geologic energy along the fault line of tectonic plates or weak areas where plates contact each other.

As a result of the location of Washington at the conversion location of two tectonic plates, many areas within the State are subject to a variety of earthquake types: intraplate, colliding, and overriding plate. Chelan County is typically subject to shallow crustal earthquakes typical of overriding plate types.

History Earthquakes in Eastern Washington have generally been small in magnitude, and shallow in depth. These shallow, moderate magnitude earthquakes often cause considerable damage in the immediate vicinity of the earthquake (Noson, 1985).

From the early 1900's to the present, over 130 earthquakes have been recorded in North Central Washington. A majority of the seismic activity in Chelan County has been recorded at earthquake epicenters near Lake Chelan, Chelan Falls, Entiat and Wenatchee. Magnitudes of these earthquakes have ranged in intensity from 3 to 6 on the Richter Scale. Damage by earthquakes has been low in the County.

What may have been the largest earthquake in the history of the Pacific Northwest occurred on December 14, 1872 in Chelan County. Due to poor record keeping in a predominately frontier area, scientists have been unable to determine an exact intensity for that incident. However, general consensus indicates a range of 7 - 8 on the Richter Scale was not unlikely. Most scientists agree that the epicenter of this earthquake was located in the Northern Cascades, Okanogan area within a zone extending from Lake Chelan in the south to Southern British Columbia in the north (Coombs, 1979). This earthquake was felt from British Columbia to Oregon and from the Pacific Ocean to Montana. It occurred in a wilderness area, which in 1872 had only a few inhabitants – local Indian tribes, trappers, traders, and military men. Because there were few man-made structures in the epicenter area near Lake Chelan, most of the information available is about ground effects, including huge landslides, massive fissures in the ground, and a 27 foot high geyser.

Extensive landslides occurred in the slide-prone shorelines of the Columbia River. One massive slide, at Ribbon Cliff between Entiat and Winesap, blocked the Columbia River for several hours. A field reconnaissance to the Ribbon Cliff landslide area in August 1976 showed remnants of a large landslide mass along the west edge of Lake Entiat (Columbia River reservoir), below Ribbon Cliff and about three kilometers north of Entiat. Although the most spectacular landslides occurred in the Chelan-Wenatchee area, slides occurred throughout the Cascade Mountains.

Most of the ground fissures occurred in the following areas: at the east end of Lake Chelan in the area of the Indian camp; in the Chelan Landing-Chelan Falls area; on a mountain about twelve miles west of the Indian camp area; on the east side of the Columbia River (where three springs formed); and near the top of a ridge on a hogback on the east side of the Columbia River. Slope failure, settlements, or slumping in water-saturated soils may have produced fissures in areas on steep slopes or near bodies of water. Sulfurous water was emitted from the large fissures that formed in the Indian camp area. At Chelan Falls, “a great hole opened in the earth” from which water spouted as much as 27 feet in the air. The geyser activity continued for several days, and after diminishing, left permanent springs.

In the area of the epicenter, the quake damaged one log building near the mouth of the Wenatchee River. Ground shaking threw people to the floor, waves were observed in the ground, and loud detonations heard. About two miles above the Ribbon Cliff slide area, the logs on another cabin caved in.

In October of 1979, WPPSS completed an earthquake study prior to construction of Washington nuclear power plants one and four. Parts of this study focused on identifying geologic faults found in that portion of the Cascades within Chelan County. Although presumed inactive, major faults were located at Leavenworth and in the Entiat Valley area. Somewhat more active and shorter fault zones of approximately 30 km. long merge into these larger faults. They are the Chumstick fault and Eagle Creek fault. An additional major fault is located in the upper Naneum Creek. However, the study concludes recent seismic activity in Chelan County has not been associated with these major faults.

Another type of stress zone which is highly correlated to earthquake epicenters is located in the Lake Chelan area. Seismic activity in this area is related to the compression of the land mass by the weight of the water in the lake. The 1979 WPPSS study found this type of stress has a greater risk for earthquake potential than the inactive fault zones found in other areas of the County.

Hazard Identification and Vulnerability Assessment Although earthquakes are unpredictable and can occur anywhere at any time, historical and scientific data suggest there are some areas within Chelan County with a higher risk potential for future seismic activity. These higher risk areas include Lake Chelan and vicinity and the Entiat area. Historically, the Lake Chelan area is the most active earthquake area in Chelan County with over 23 earthquakes since 1900. From 1901, numerous earthquakes have occurred in the Entiat area ranging in magnitude from 1.4 to 3.6. Earthquakes have occurred sporadically throughout the rest of Chelan County.

It should be noted that Chelan County is in the "Back-Arc" region (McCrumb, et al) and that earthquakes in this region have a more shallow epicenter than on the west side of the Cascades. Seismic activity in Eastern Washington

occurs at depths less than 8 km. The shallow depths produce more aftershocks deeper depths (McCrumb, et al).

Earthquakes can range in intensity from slight tremors to great shocks and may last from a few seconds to as long as five minutes. After the initial shock, additional shocks (aftershocks) may occur over a period of several days. Depending upon the magnitude of a given earthquake, the primary effect of actual ground movement may include fatalities and/or injuries from collapsed buildings, bridges, dams or other structures, landslides or avalanches severing transportation routes, disruption or failure of electric, telephone, gas, water, sewer and other essential utilities.

Secondary effects in an earthquake damaged area can include fires from ruptured gas mains or downed power lines, contamination or lack of water from ruptured water and sewer lines, hampered rescue efforts due to damaged equipment or roads, and the risk of aftershocks creating more damage.

Conclusion Earthquakes can occur anywhere, at anytime and without warning. Because a majority of earthquakes are not associated with known faults, they are also very unpredictable. Past geological studies indicate areas prone to earthquakes may experience long periods of inactivity. These areas may be building tension which can lead to a major earthquake.

Due to the unpredictability of earthquakes, forecasting when or where they next one will occur in Chelan County is impossible. Although past earthquakes have been in the form of mild tremors, the potential for a major earthquake cannot be ruled out. For the North Central Washington area, stress profiles obtained for a Washington Public Power Supply System (WPPSS) earthquake study in 1979 based on regional gravity data identified the Chelan area as a high potential earthquake epicenter zone. The probability that an earthquake will occur in Chelan County is high. The question of when, where and of what magnitude remains to be seen.

In addition to the geologic vulnerability, socioeconomic factors in Chelan County indicate a vulnerable population in the event of a major earthquake incident. Chelan and Yakima Counties rank highly Statewide in the socioeconomic factors that would challenge emergency responders during an event.

DROUGHT

Definition A drought is a prolonged period of dryness severe enough to reduce soil moisture, water and snow levels below the minimum necessary for sustaining plant, animal, and economic systems. Washington State has a statutory definition of drought. According to state law, an area is in a drought condition when (1) the water supply for the area is below seventy-five percent of normal and (2) water uses and users in the area will likely incur undue hardships because of the water shortage. (RCW 43.83B.400)

Drought condition types in Chelan County can be described by their potential impacts and by using the National Drought Mitigation Center at the University of Nebraska-Lincoln categories.

- Agricultural – Drought threatens crops that rely on natural precipitation
- Water Supply – Drought threatens supplies of water for irrigated crops and for communities
- Fire hazard – Drought increases the threat of wildfires from dry conditions in forest and range lands.

History In the State of Washington there have been nineteen drought occurrences since 1901. These dry spells have typically lasted for a period of one to two months to a period of two years.

According to the National Drought Mitigation Center at the University of Nebraska-Lincoln, the Pacific Northwest region (Columbia, Willamette, and Snake River basins of Idaho, Oregon, and Washington, and portions of Montana and Wyoming) experiences drought more frequently than most other regions of the nation. During 1895-1955, much of the state was in severe or extreme drought at least five percent of the time. The east slopes of the Cascades and much of Western Washington was in severe or extreme drought from five to ten percent of the time. Chelan County has experienced drought conditions ten to fifteen percent from 1895 to 1995, more than thirty percent from 1985 to 1995, and thirty to forty percent from 1976 to 1977. The 2001 drought was the second worst drought on record.

Hazard Identification and Vulnerability Assessment All areas of Chelan County are vulnerable to drought conditions. Although not subject to severe annual precipitation deficiencies, periodically Chelan County experiences seasonal dry spells lasting two to three months. However, since the early 1920's there have been approximately thirteen droughts statewide which have particularly impacted Chelan County. During these low water years, agriculture, forestry and hydroelectric interests have been impacted, particularly non-irrigated farm, range and forest land uses.

Additionally, drought conditions can affect hydropower production capacity, and significant hydropower facilities exist in Chelan County, notably Rocky Reach and Rock Island Dams owned by the Chelan County Public Utility District #1.

Conclusion Locally, droughts have left a major impact on individuals and the agriculture, timber and hydroelectric industries. Lack of snowpack has forced ski resorts and other recreation based companies into bankruptcy. The primary effects of drought in Chelan County include loss of fruit and dryland crops, loss of range and domestic animals, wildlife and wildlife habitat, and extreme increase in the danger for wildland fires. Secondary effects involve social and economic hardships due to crop losses, energy curtailment, temporary unemployment, domestic and municipal water shortages and an increased number of major wildfires.

Socioeconomic factors in Chelan County contribute to drought vulnerability as shown below (state rank in parentheses).

Time in serious or extreme drought (1895-1995)	10-15%
Irrigated agricultural lands (acres)	30.562, 3
Market value (state rank)	$146,403,000, 10
Median household income (<75% state average of $45,776)	$37,316
Distressed County (unemployment >20% state average)	Yes

Because of the increased fire danger, forested and grassland areas of Chelan County can become extremely hazardous areas during prolonged drought situations. Populated areas in the county, including cities can be directly affected by low stream flows. Hazardous conditions, including domestic and municipal water shortages affect the ability of local government to effectively fight fires or provide sufficient water and sewage services.

Note: from the WSU news file -- WA Drought 2016 Outlook

Washington's statewide drought declaration expired on December 31st, 2015. Water supplies must be below 75 percent of normal for the consideration of a drought emergency. Currently, snowpack accumulations statewide are at higher levels than 2015. Another declaration will be considered later in 2016 if water supply conditions change.

SLIDES

Definition A landslide is the movement of material down steep slopes, including snow, rocks, mud and other earthen materials.

Landslides of rock, mud and other earthen materials can range in size from thin masses of soil a few yards wide, to deep-seated bedrock slides greater than six miles across. Travel rates may range in velocity from a few inches per month to many feet per second. Old slide areas and slumps can be reactivated by earthquakes or unusually wet winters. These areas are also more susceptible to construction triggered sliding than adjacent undisturbed material (Satterlund, 1972).

While gravity is the primary reason for a landslide, there can be other contributing factors:

- The local topography, or the shape, size and degree of a slope and its drainage
- Erosion by rivers, glaciers, or ocean waves that create over-steepened slopes
- Saturation, by snowmelt or heavy rains, that weaken rock or soils on slopes
- Earthquakes create stress that cause weak slopes to fail. Earthquakes of magnitude 4.0 and greater can trigger landslides.
- Volcanic eruptions that produce loose ash deposits and debris flows
- Excess weight, from accumulation of rain or snow, from stockpiling of rock or ore, from waste piles, or from man-made structures, may stress weak slopes to failure
- Human action, such as construction, logging or road building that disturbs soils and slopes

History Some damaging slides have occurred in and near to Chelan County. On December 14, 1872, a slide triggered by an earthquake caused a massive rock slide, which cut off the flow of the Columbia River. This slide occurred a few miles north of the present location of the town of Entiat. This event is detailed more thoroughly in the Earthquake History Section.

A handful of small-scale landslides have occurred in Chelan County over the years, usually the result of significant precipitation. A mud slide up the Entiat River Road caused damage to many houses, and knocked one off of its foundation. In 2008 a snow slide destroyed a home valued at one million dollars in the Kahler Glen area. Both slides occurred in areas where a wildfire had destroyed vegetation one to three years earlier. Some landslide events have resulted in fatalities as noted below. In March, 2016, Whispering Ridge at Wenatchee Heights became an area to be watched. Cracks in the ground due to water soaked soil became a major concern. Evacuation of the area was ordered, and the area closed off. The area is continually monitored,

although most of the residents have moved back into their homes. One house was condemned, and a senior citizen home was closed.

Landslide deaths in Chelan County

Year	Location	Type	Fatalities
1942	Tenas George	Mud	8
1965	Leavenworth	Mud	1
1973	Preston Creek	Mud	4
1995	US 97A	Rock	2

Hazard Identification and Vulnerability Assessment Landslides are relatively uncommon in Chelan County despite the fact that over eighty five percent of the County is within steeply-sloped areas of the Cascade Range Landslide Province as identified in the Washington State Hazard Assessment (draft). Much of the underlying earthen material is bedrock and therefore less susceptible to landslides. Snow slides or avalanches are more common.

Areas vulnerable to landslides are identified largely by steep slope classifications, soil types, conditions of bedrock materials and water content or unstable soils. Recognition of hazardous conditions and identification of historically prone landslide areas are especially important for future land use development planning. Often man-made structures, both public and private, are constructed on top of or below bluffs and slopes which are subject to land sliding. Additional development is occurring on alluvial plains and at the mouths of narrow, restricted canyons. Other areas subject to landslides are the mountain pass highway routes and areas located below watersheds which have been de-vegetated in wildfires or heavily logged.

Conclusion Landslides occur in Chelan County though are not one of the County's top natural hazard threats. Landslides are the cumulative result of a series of events. Slides often occur on steep slopes after severe storms, wildfires, earthquakes or construction activity in the slide-prone areas. Because of the steep topography and narrow valleys of Chelan County, the potential for slides is high all year round. Under the right conditions any steep sloped area of Chelan County may be classified as a potential hazard area.

The ever-increasing pressure for development in or near the mountains and narrow valleys bring added exposure to people and their structures. Increasingly, more and more people are recreating, working and building in potentially hazardous areas with little caution or preparation. Development pressure in rural areas and at recreation sites in the mountains brings added exposure to people and their structures. Slide effects on the individual or public organizations include partial damages or destruction of significant portions of highways and railroads, utility lines, private and public property. Other major effects involve the loss of natural resources and the cost of debris removal.

VOLCANO

Definition A volcano is a vent in the earth's crust through which magma, rock fragments, gases, and ash are ejected from the earth's interior. Over time, accumulation of these erupted products on the earth's surface creates a volcanic mountain.

History All of the active and dormant volcanoes in the State indicate the presence of heat and on occasion emit steam and hydrogen sulfide gas. Mt. St. Helens is the most active of the volcanoes in the State. Studies indicate that it may have been active every few hundred years for centuries with the most recent series of eruptions occurring in the early 1980's to present.

Past studies of Mt. Rainier and Mt. Baker outlined in the Washington State Hazard Analysis indicate their latest eruption activity may have occurred in the early and mid 1800's. Glacier Peak, which is located closest to Chelan County, may have erupted as recently as the 17th century. Many geologists feel there is a possibility that these volcanoes will erupt again

Hazard Identification and Vulnerability Assessment There are no active or dormant major volcanoes located in or near Chelan County that present a direct threat to its citizens, although the Cascade Mountain range contains hundreds of extinct volcanoes. Volcanoes are considered active if they have erupted within recent historical time, or are showing present signs of activity. Accordingly, Mt. Baker, Mt. St. Helens, Mt. Rainier, and Glacier Peak are all considered active. Dormant volcanoes are those that have not shown signs of erupting within the last 10,000 years. Mt. Adams is considered dormant, but it is capable of renewed activity. Both the active and dormant volcanoes of Washington are of the composite category.

Conclusion Volcanic hazards to Chelan County are low to non-existent, and in the event of volcanic activity from the likely volcanoes, the impacts to Chelan County would most likely be minimal. As demonstrated by the 1980 eruption of Mt. St. Helens, the primary effects in Chelan County were the results of ash fallout. Thus, the effect of volcanic activity upon Chelan County depends on the location of the volcano and the prevailing wind direction. Depending upon the severity of the eruption and the areas of the downwind plume, these effects may include immobilization of transportation; telephone communication short circuits; power failures; and respiratory or other health problems. Secondary problems include economic cost for clean up, ash disposal problems and structural failures due to the density of ash, where one inch of ash weighs ten pounds to the square foot.

Glacier Peak is located a few miles northwest of the County. This volcano was formerly thought to be inactive, but recent studies have shown steam issues from its flanks. This mountain is also the site of three hot springs which indicates there is heat somewhere within it. Scientists have only recently indicated that this volcano has potential for eruption.

SEVERE STORMS

Definition A severe storm is an atmospheric disturbance that results in one or more of the following phenomena: strong winds and large hail, thunderstorms, tornados, rain, snow, or other mixed precipitation. Typically, major impacts from a severe storm are to transportation and loss of utilities.

For the purposes of the Chelan County Severe Storms profile, the following sever storm elements are considered:

- High winds – Storms with sustained winds of forty miles per hour (mph) or gusts of fifty eight mph or greater, not caused by thunderstorms, expected to last for an hour or more. The National Weather Service classifies wind from thirty eight to fifty five mph as **gale force winds**; fifty six to seventy four mph as **storm force winds** and any winds over seventy five mph as **hurricane force winds**.
- Severe Thunderstorm – Storms that produce winds of fifty eight mph or greater or three-quarter inch or larger hail.
- Winter storm – A storm with significant snowfall, ice, and/or freezing rain; the quantity of precipitation varies by elevation. Heavy snowfall is four inches or more in a twelve hour period, or six or more inches in a twenty four hour period in non-mountainous areas; and twelve inches or more in a twelve hour period or eighteen inches or more in a twenty four hour period in mountainous areas.

History Historically, Chelan County has had a number of severe storms over the years. While not all of these have caused major long-term problems, they all have disrupted people's day-to-day activities and posed a burden, especially on the poor and elderly.

Notable Recent Severe Storms in Chelan County

DATE	TYPE OF STORM	DESCRIPTION
January 1950	Snow	Eastern Washington received up to 50 inches of snow
October 1950	Wind	Entire State, Max. velocity 57-60 mph
March 1956	Wind	Entire State, Max. velocity 48-60 mph
December 1968	Snow	Chelan County, extensive snowfall
March 1972	Rain	Wenatchee area record rainfall for 24 hour period, Flash flood on 1970 burn
June 1972	Hail	Wenatchee area, extensive soft fruit damage
August 1979	Thunder	Entiat and Chelan area, ignited largest wildfires in the nation for 1970s
January 1983	Wind	Wenatchee area, peak gusts 52+ mph

March 1988	Wind	Entire county, unofficial gust 100+ in the Manson and Wenatchee areas
January 1996	Snow	Several structures damaged due to snow loads
January 1997	Snow	Passes closed two days due to heavy snow and avalanche danger
December 2006	Snow	Heavy snowfall caused major power outages in the Entiat Valley and in the Lake Wenatchee area
January 2007	Wind	Gale and hurricane force winds damaged residences and knocked out power throughout the Wenatchee valley
December 2012	Snow	Lake Wenatchee area – heavy snowfall, caused damage from trees falling onto homes and highways, and extensive time without power. Falling trees onto highways caused several accidents including a double fatality.

Hazard Identification and Vulnerability Assessment Chelan County is subject to a number of severe storm conditions such as thunder, lightning, wind, snow, ice and hail. Since severe weather disturbances often represent the extremes in wind, cold, precipitation or other weather phenomena, direct damage to the natural and built environment have occurred countywide.

Depending upon the time of year, additional hazards resulting from a severe storm can include wildfires, flashfloods, avalanches or landslides. Severe thunder, hail, wind and winter storms are common in all parts of Chelan County. The climate possesses both continental and marine characteristics, with the Cascades serving as a topographic and climatic barrier. Air warms and dries as it descends along the eastern slopes of the Cascades, resulting in shrub-steppe conditions in the lower elevations of Chelan County. In the driest areas, rainfall occurs about seventy days each year in the lowland and about one hundred twenty days in the higher elevations near the eastern border and along the eastern slopes of the Cascades.

During July and August, four to eight weeks can pass with only a few scattered showers. Thunderstorms, most as isolated cells, occur on one to three days each month from April through September. A few damaging hailstorms are reported each summer. Summers are warmer, winters are colder, and precipitation is less than in Western Washington. Extremes in both summer and winter temperatures generally occur when air from the continent influences the inland basin. During the coldest months, freezing drizzle occasionally occurs, as does a Chinook wind that produces a rapid rise in temperature.

During most of the year, the prevailing wind is from the southwest or west. The frequency of northeasterly winds I greatest in the fall and winter. Wind velocities ranging from four to twelve mph can be expected sixty to seventy percent of the time; thirteen to twenty four mph fifteen to twenty four percent

of the time; and twenty five mph or higher one to two percent of the time. The highest wind velocities are from the southwest or west and are frequently associated with rapidly moving weather systems. Extreme wind velocities can be expected to reach fifty mph at least once in two years; sixty to seventy mph once in fifty years; and eight mph once in one hundred years.

Severe local storms occur when the interior of British Columbia is under the influence of high barometric pressure, and a deep low pressure center from over the Pacific approaches the Washington coast. At this latitude, severe storms normally approach Chelan County from the south or southeast. Although the intensity of major storms has often been reduced by the Cascades, winds over exposed peaks can reach one hundred mph or greater, with peak gust of one hundred twenty five to one hundred fifty mph as the storm moves inland.

Primary flood season in Chelan County occurs during the spring snowmelt (March to June) and again October to February when rain-on-snow events have produced historic floods. Windstorm season is typically October through March, and snow season runs October through March, although higher elevations may see snow ten months of the year.

Chelan County Severe Storm Hazards
(as identified in WA Hazard Assessment)

	Vulnerable due to meteorological conditions	Recurrence Criteria	Meets Recurrence Criteria
High Wind	Yes	100%	No
Winter Storm	Yes	>50%	
Blizzard	No	>2.5%	No
Dust Storm	No	>2.5%	No
Severe Thunderstorm	Yes	>20%	Yes (30%)
Tornado	No	>5%	No
Coastal	No	>2.5%	No

Conclusion Historically, Chelan County has been subject to many types of storms. These have varied in intensity from mild to severe. Common types of storms in this area include thunder, hail, wind, and winter related blizzards, etc. Normally the mountainous terrain and the north/south orientation of the Cascades tend to isolate severe storms into localized areas of the County, although individual storms can generate the force to impact the entire County at one time. Primary effects vary with the intensity of the storm. In some cases transportation accidents can occur from accumulation of snow, ice, hail, or dust from accompanying winds. Other primary effects may include loss of life and injury from accompanying flash floods, fires or avalanches. Physical damage to facilities can occur from accumulation of snow, ice, hail, or dust and from accompanying winds. Secondary effects can include severe wind erosion of dry soil, overtaxing of electric utilities during severe weather conditions, crop damages or loss from hail, agricultural damages created from

inflated prices and finally temporary shortages of necessities in the storm-impacted area.

WILDLAND FIRE

Definition Wildland fire is burning fuel or other material caused by nature or humans that result in the uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas.

Wildland fires are of on type, although wildland fire intensity revolves around three elements: fuel, weather and terrain.

> *Fuel* Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite. Snags and hazard trees are prolific in the forests of Chelan County.
>
> *Weather* East of the Cascades, summer drying typically starts in mid June and runs through early September, with drought conditions extending this season. Passage of a dry, cold front through this region can result in a sudden increase in wind speeds and a change in wind direction affecting fire spread. Thunderstorm activity with dry lightning occurs in Chelan County.

History Data from the Wenatchee National Forest shows that during the period from 1981 to 1990 there were a total of 639 fires in the forest, within Chelan County. 404 (63%) were lightning caused and 235 (37%) were human caused.

The Tyee, Round Mountain and Hatchery Creek fires of 1994 and Dinklemen fire of 1988 were from lightning strikes. The Rat Creek fire (1994 fires) was human caused. The 1994 fires consumed over 292 square miles (10% of the County) of wildland, forest and private property over a one month period. Total cost of suppression, damages and rehabilitation exceeded 100 million dollars.

Recent fires have shown that Chelan County is extremely vulnerable to wildland fires and that their effects are devastating. Fires that occurred in September, 2012 severely tested the resources of Chelan County and the state ---- a dry lightning storm ignited numerous fires in Chelan County, including one that threatened a housing area close into Wenatchee. In addition, a fire in Kittitas County, the Table Mountain fire, came over the top and extended into Chelan County. In addition to all the fires, Chelan County air quality was severely compromised, necessitating the need to distribute face masks and to establish a clean air shelter in Waterville.

Significant Wildland Fires Since 1990

Year	Fire	Area	Acres Burned	Impact
1970	Lightning Bust	Chelan & Okanogan Counties	188,000	
1988	Dinkelman	Chelan County	50,000	1 death
1992	Castlerock	Wenatchee		24 homes destroyed
1994	Tyee Creek, Hatchery Creek, Rat Creek, Round Mountain	Chelan County	180,000	2700 homes threatened and evacuated, 37 home destroyed
2001	Rex Creek Complex		55,913	
2001	Union Valley		4,700	100 structures threatened, 3 destroyed
2001	Icicle Fire Complex	Leavenworth area	7,697	
2001	Tommy Creek Fire		646	
2002	Deer Mt.	Lake Chelan	2,281	
2002	Deer Point	Lake Chelan	43,373.5	
2003	Maple 2		2,409	
2003	Square Lake		1,097	
2003	Crystal		1,300	
2003	Chelan Butte		548	
2004	Icicle	Leavenworth	778	
2004	Pot Peak	Lake Chelan	17,226	
2004	Sisi Ridge	Lake Chelan	280	
2004	Deep Harbor	Lake Chelan	29,700	
2004	Fischer Fire	Dryden/Cashmere area	16,513	1 home destroyed
2004	Dirtyface	Lake Wenatchee area	270	
2005	Dirtyface	Lake Wenatchee area	1,150	
2006	Tinpan	Entiat Valley	9,247	
2006	Flick Creek	Stehekin/Lake Chelan	7,883	
2007	Domke Lake	Lake Chelan	11,900	
2007	Easy Street	Wenatchee	5,209	Outbuildings lost
2009	Union	Chelan	768	

	Valley			
2010	Swakane	Wenatchee	19,291	
2010	Wenatchee River Complex	Cashmere	2,065	
2010	Rainbow Bridge	Stehekin	3,710	
2011	Tumwater Canyon	Leavenworth	458	
2012	Antoine Creek	Chelan	6,837	
2012	Canyons Fire	Wenatchee	7,557	
2012	Byrd Canyon	Chelan	14,160	
2012	Peavine	Wenatchee	18,880	
2012	Poison Canyon	Cashmere	5,909	
2012	Twin Peaks	Joined with Canyons Fire		
2012	First Creek	Chelan	1,360	
2012	Pyramid	North of Entiat	1,068	
2012	Klone		1,335	
2012	Basalt	Lake Wenatchee	793	
2012	Sears Creek	Lake Wenatchee	368	
2012	Cashmere Mountain		1,451	
2012	Maverick		22	
2013	Lake Wenatchee	Leavenworth		3 cabins lost
2013	Colockum Tarps	Malaga	80,184	3 residences, outbuildings lost
2013	Milepost 10	Malaga	5,445	
2014	Chiwaukum Complex	Chelan County	50,540	3 cabins lost
2015	Sleepy Hollow Fire	Wenatchee	2,950	30 homes, 5 businesses destroyed
2015	Wolverine	Lucerne	62,167	
2015	Blankenship	Stehekin	180	
2015	Goode	Stehekin	2	
2015	Chelan Complex (includes Antoine Creek, Cagle	Chelan	90,210	

	Gulch, Reach Fire, and in Okanogan County Black Canyon and McFarland Creek			
2015	First Creek	Chelan	1,242	At least 10 homes lost
2016	Suncrest	Peshastin	390	

Hazard Identification and Vulnerability Assessment The geographical location and climate of Chelan County makes the entire county vulnerable to wildland fires. Although many wildland fires have been human caused, the most devastating wildland fires have been naturally-occurring. The thunderstorm season of late July and early August brings dry lightning. During this period each year, hundreds of ground strikes by lightning are recorded.

The effects of wildland fire on Chelan County varies with the intensity of the fire which is affected by fuel types, topography and time of year. Significant effects of wildland fire include loss of life, personal injury, damage to private and public property and economic impact. Fires in the past, especially the 1994 fires, caused economic impact on local business, as well as loss of tax revenue to government entities.

Wildland fires also cause negative impacts on watersheds which, among other things, increases the soil erosion and stream degradation that contributes to potential flooding in the County.

For most years wildfire season in the State of Washington runs from mid May through October. In Eastern Washington, any prolonged period of low precipitation presents a potentially dangerous problem. In Chelan County the probability of a wildland fire starting at a particular location depends upon fuel conditions and topography, time of year, weather conditions and the level of human activities occurring that day; however, wildland fires have occurred in almost every month of the year. Drought, snow pack and local weather conditions can expand the length of the fire season. The early and late shoulders of the fire season usually are associated with human-caused fires, with the peak period of July, August and early September related to thunderstorms and lightning strikes.

Short-term loss caused by a wildland fire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds; vulnerability to flooding increases due to the destruction of watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure.

Conclusion Wildland fires, particularly in the urban interface, are one of Chelan County's greatest natural hazards. Chelan County's dry summer climate, topography, large forested area, and open grasslands, combined with heavy recreational use makes the entire county susceptible to wildland fire. Wildfires in the summer months are difficult to suppress. This has resulted in long-term resource loss, increased flood potential and loss to private and public property.

As Chelan County grows and citizens continue to build in the wildland urban interface, wildland fire potential grows and the probability of fire starts increases. Combined with a lack of public understanding and the lack of preventative measures on the part of the public, the potential for devastating losses continues to increase.

Chelan County contains several urban interface communities that are considered to be at high risk to wildland fire as designated by the State Forester, including the cities of Cashmere, Entiat, Leavenworth, and Wenatchee and the rural villages of Stehekin, Peshastin, and Manson.

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DAM FAILURE

Definition A dam is a barrier of earth, rock or other material that obstructs the flow of water. In the past, dam failures have been caused by flooding, mis-operation, poor construction, lack of maintenance or repair, vandalism, terrorism, earthquakes, etc.

History A dam failure has never been recorded in Chelan County to date. Because of an increasing rate of dam failures nationwide, Congress passed the National Dam Inspection Act of 1978 (PL 92-367) which resulted in the inventorying of all dams in the U.S. and the inspection of 8,639 non-federal dams nationally.

Hazard Identification and Vulnerability Assessment There are approximately 36 dams located in Chelan County as of 1995, most of which are over 50 years old. Most dams in Chelan County are for irrigation use and are earthen constructed dams. Some were constructed in the late 1800's.

Many of these dams do not have spillways or mechanisms to control flow. In the event of a severe storm, debris could accumulate creating a potential hazard. The Dam Safety Division of the Washington State Department of Ecology reports that dam failures, historically, have been equally divided into three categories:

1. overtopping with erosion resulting in failure
2. slope instability within the dam structure
3. water intrusion via percolation and subsequent failure

HAZARD AREAS

The following shows the flood plains downstream from the identified dams in Chelan County.

Dam	Nearest Downstream Community	Construction Date/Owner	Stream
Antilon Lake	Manson	1928 Lake Chelan Rec. Dist.	Johnson Creek
AZ Wells	Chelan Falls	1969 Douglas County PUD	Columbia River
Beehive	Wenatchee	1953 Beehive Irrigation Dist.	Squilchuck
Chelan Dam	Chelan Falls	1928 Chelan Co PUD	Chelan River
Clear Lake	Malaga	1888 Stemilt Irrigation Dist	Stemilt Creek

Colchuck Lake	Leavenworth	1930 Icicle Irrigation Dist.	Colchuck Creek
Colchuck Lake Saddle	Leavenworth	1930 Icicle Irrigation Dist.	Colchuck Creek
Eight Mile Outlet	Leavenworth	1933 Icicle Irrigation Dist.	Eight Mile Creek
Eight Mile Spillway	Leavenworth	1933 Icicle Irrigation Dist.	Eight Mile Creek
Greenwood Resvr. #1	Malaga	1945 H. Greenwood	Stemilt Creek
GreenwoodResvr. #2	Malaga	1945 H. Greenwood	Stemilt Creek
H & H Resvr.	Wenatchee	1926 Halverson Hampton	Mission Creek
H & H Resvr. #1H.	Wenatchee	1926 Halverson Hampton	Mission Creek
H & H Resvr. #2	Wenatchee Squilchuck	1931 Halverson	Hampton Creek
Klonaqua Lake	Leavenworth	1933 Icicle Irrigation Dist.	French Creek
Lily Lake	Malaga	1892 Lake Irrigation Co. Stemilt	Stemilt Creek
Mathison Resvr.	Malaga	1946 C. Mathison	Stemilt Creek
Meadow Lake	Malaga	1920 Galler Ditch Co.	Columbia River
Parkens/Stegman	Leavenworth	1925 USIFS	Eagle Crk
Rock Island	Vantage	1933 Chelan Co. PUD	Columbia River
Rocky Reach	Wenatchee	1962 Chelan Co. PUD	Columbia River
Rose Lake	Malaga	1892 Lake Irrigation Co.	Stemilt Creek
Spring Hill	Malaga	1918 Spring Hill Irrigation Co.	Stemilt Creek
Square Lake	Leavenworth	1938 Peshastin Irrigation Co.	Prospect Creek
Steffen Bros.	Malaga	1947 Steffen Brothers	Stemilt Creek
Stemilt Project	Malaga	1962 Stemilt Project Inc	Orr Creek
Three Lakes Resvr.	Malaga	1908 Three Lakes Water Assn.	Columbia River

Tumwater Canyon	Leavenworth	C1907 Chelan Co. PUD	Wenatchee River
Upper Wheeler Resvr.	Malaga	1922 Wenatchee Hgts. Rec. Dist.	Orr Creek
Wapato Lake	Manson	1920 Lake Chelan Irrigation Project	Lake Chelan
Wenatchee Hgts #1	Malaga	1909 Wenatchee Hgts. Rec. Dist	Stemilt Creek
Wenatchee Hgts #2	Malaga	1909 Wenatchee	Stemilt Creek
Wood Resvr.	Malaga	1964 M.A. Wood	Stemilt Creek
Zimmerman Pond	Wenatchee	1906 G. Zimmerman	Squilchuck Creek
No Name 115	Malaga	1900 G. Cammack	Stemilt Creek
No Name 118	Malaga	1947 M. Wood	Stemilt Creek

Conclusion There are many older dams located on streams in Chelan County. Most of the older earth dams which are fifty years old and older can be considered potentially hazardous during certain climatological situations or during/after an earthquake. Presently, the State Department of Ecology, Dam Safety Division is responsible for inspecting private and other non-federal dams for safety conditions.

Currently the Federal Energy Regulatory Commission requires non-federal hydroelectric dam owners to develop emergency response procedures as a licensing requirement

TERRORISM/SABOTAGE

Definition The U.S. Department of Justice defines terrorism as a "A violent act or an act dangerous to human life, in violation of the criminal laws of the United States or any segment to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives". The FBI defines terrorism as "the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population or any segment thereof in furtherance of political or social objectives".

History Although there have been few acts of terrorism committed by terrorist groups in Chelan County, the potential for this type of incident is present.

Hazard Identification and Vulnerability Assessment Chelan County is vulnerable to many terrorist acts from global or local groups or even individuals. These acts may include bombings, arson, radio nuclide or toxin dispersal, or dispersal of biological agents. Various events within the county can assemble in excess of 100,000 people for a weekend event and other gatherings may assemble as many as 25,000 people in a three block area. These assemblies could be potential terrorist targets.

Depending upon the individual or group cause, almost any facility, organization or activity in Chelan County could be a potential target for terrorist activity. Likely targets in Chelan County would be political figures, infrastructure, events, children, animals, local, state and federal facilities, hydroelectric facilities and the associated distribution infrastructure, major industry and warehouses, and communications facilities.

Conclusion Little terrorist activity has occurred in Chelan County, however, as we participate in a global society this issue must be addressed. Terrorist acts are difficult to prevent, however, mitigation may limit the effect of the terrorist activity. Mitigative precautions should involve: the training of response personnel and elected officials and the development of policies and procedures relating to the response to suspected terrorist acts.

HAZARDOUS MATERIALS

Definition Hazardous materials are materials, which, because of their chemical, physical, or biological natures, pose a potential risk to life, health, or property when released. A release may occur by spilling, leaking, emitting toxic vapors, or any other process that enables the material to escape its container, enter the environment, and create a potential hazard. The hazard can be explosive, flammable, combustible, corrosive, reactive, poisonous, toxic, biological, and/or radioactive.

History Because of major transportation routes and a large agricultural based economy, incidents involving hazardous materials can occur at anytime or place in Chelan County. Statistically, the majority of statewide incidents involving hazardous substances have been transportation related spills of petroleum products. This is true for Chelan County also.

Chelan County has had several hazardous material incidents. The following are examples of some of the larger HazMat incidents occurring in Chelan County:

Date	Incident	Location	Injuries
August, 1967	**Fire at Ag-Chem. Warehouse**	**Wenatchee**	**0**

(Northwest Wholesale's warehouse burned in large fire)

August 6, 1974	**Explosion of RR tank car**	**Appleyard**	**2 deaths**

(Tank car in Appleyard, south of Wenatchee exploded, killing 2 and starting a wildland fire. Explosion threw metal up to 3 miles from site)

May, 1992	**Gasoline Tanker fire**	**Monitor**	**2**

(Gasoline tank truck is involved in a traffic accident. Accident caused the gasoline being hauled to ignite.)

November 18, 1993	**Ammonia release**	**Wenatchee**	**0**

(Anhydrous Ammonia from the refrigeration system of Tree Top on the Chelan hwy, north of Wenatchee is released.)

January 27, 1994	**Chlorine release**	**Wenatchee**	**3**

(A 150 LB Chlorine cylinder is accidentally opened, causing the Chlorine to be released. 3 employees are taken to the hospital. Incident occurred at Tapplett Fruit.)

Date	Incident	Location	Injuries
July, 1996	**Chlorine release**	**Wenatchee**	**3**

(A 150 LB cylinder of Chlorine at the Wenatchee City swimming pool releases around 8 lb. of Chlorine before it is shut off. 3 hospitalized.)

August, 1999	**Fire at Ag-chemical Warehouse** Wilbur Ellis arson fire	**Chelan**	**0**
February, 2000	**Overturned gasoline tanker** Multi truck incident	**Leavenworth**	**0**

Hazard Identification and Vulnerability Assessment All areas of the County are vulnerable to the effects of a hazardous materials incident. There is greater vulnerability in areas adjacent to:

Cold storage warehouses. In these areas you will find Anhydrous Ammonia, and possibly Chlorine and Methyl Bromide.

Ag-Chemical warehouses. Toxic materials are warehoused, most are in Wettable Powder form, however there are also liquids and compressed gases.

Water treatment facilities. Most of the potable water and waste water treatment sites use Chlorine in their treatment. In addition to these sites, places like public swimming pools also treat their water.

Major transportation routes. Chelan County has two major highways, US 2 and US 97. US 2 at Stevens Pass has a traffic count of 5,000 vehicles per day near the summit, but outside of Wenatchee, the count is closer to 20,000. On US 97, 4,900 vehicles crest the summit, but at the base of the pass, near the junction of US 2 6,800 vehicles per day cross the traffic counter. On US 97A the DOT counts 13,000 vehicles at Ohme Gardens, while at Lakeshore Drive near Chelan, the count is 3,700. (DOT 1998) In addition to these highways, the Burlington Northern Santa Fe Railroads (BNSF RR), Chicago to Seattle main line, runs through Chelan County. In a 1994 Commodity study, it was found that, on average, there are 27 train movements over this main line in a 24 hour period. Two of these are Amtrak, about six are "auto rack' trains and the rest are freight cars that carry hazardous materials. Some of the more hazardous materials that are carried in bulk are: Anhydrous Ammonia, Chlorine, Liquefied Petroleum Gas (LPG), Hydrogen Peroxide (greater than 52%), and molten sulfur.

Another area of hazard is the lack of resources and advanced trained personnel. Most area fire fighters have been trained to the First Responder - Operational level. This means they can only respond in a defensive manner to a chemical release. In the event of a large scale hazardous materials incident, outside resources will have to be called in

through the Department of Ecology. This response takes time, so if there is no responsible party to mitigate the release, local responders will have to allow the release to continue until properly trained personnel can arrive.

Conclusion As the population increases, so does the demand for products that require hazardous chemicals. This increase in the amount being shipped as well as the BNSF RR main line coming through Chelan County, lends itself to a potential hazard. Although safety is constantly stressed in the transportation industry, equipment malfunctions and human error can occur, making the potential for a hazardous materials incident quite high. Any local incident has the potential of becoming a large scale disaster. Today the quantity of materials being transported, plus the complex nature of these hazardous materials, presents a problem so large that no single agency or industry is capable of handling all of the possible problems that may arise.

UTILITY OUTAGES

History Petroleum shortages can occur at any time, depending on events in the politically volatile Middle East. Although imports have decreased substantially, the United States remains dependent upon imports for approximately thirty five percent of its petroleum needs. Hydroelectric dams produce roughly eight percent of the electricity in the Pacific Northwest. Low water years in the 1970s and the resulting overbuilding of regional thermal (coal fired and nuclear plants) power facilities at a time coinciding with low power demands, resulted in a default of the bonds financing Washington nuclear plants 4 and 5. Questions concerning the region's electric utilities liability for repayment are currently being resolved. Perhaps this may result in significant electricity rate increases in the region for an extended period of time.

With the exception of World War II's rationing, specific energy shortages in Chelan County were uncommon until the 1970's Then petroleum shortages occurred as a result of the 1973-74 OPEC oil embargo and the Iran cut-off of 1979. Electrical shortages also occurred in 1973-74 and 1977-78 due to drought conditions and insufficient water to operate hydroelectric dams at a needed capacity. At the same time, the Chelan County Public Utility District #1 was forced to purchase emergency power from the BPA grid to meet local demands.

Hazard Identification and Vulnerability Assessment Short term power outages can occur in Chelan County at any time. Normally this is the result of a storm, auto accident or human error. This type of temporary energy loss generally affects service in isolated portions of the County and is of relatively short duration. Long term shortages of imported petroleum products, however will impact the entire County and affect the United States at large. Judging from past events, future petroleum shortages would likely be caused from political incidents in the Middle East resulting in trade embargoes of long duration.

Conclusion Future energy emergencies are likely to occur due to numerous factors. Locally, energy emergencies can occur as a result of a drought affecting generating capacity at hydroelectric facilities, tremendous increases in local power rates, or as the result of a worldwide energy embargo. Because of this, most facilities or entities that require non-interruptible power must plan an alternate power supply system that could take over in emergencies. Additional local government provisions should be made for the effective conservation of available energy resources in the area. In a large scale energy emergency, local government would also be involved with public education programs on energy conservation and establishing priorities for restoration of energy resources at vital facilities.

URBAN FIRE

Definition Urban fires occur primarily in cities or towns with the potential to rapidly spread to adjoining structures. These fires damage and destroy homes, schools, commercial buildings, and vehicles.

History Major urban fires can occur throughout the year in every Chelan County community. Most urban fires, however, have been limited to single structures. Most of the small communities in Chelan County cannot afford to maintain the standing fire department required to meet a major fire situation so they rely on volunteer fire fighters and mutual aid for handling major incidents.

Chelan County has not seen many major urban fires, but there have been some. In September of 1991, 16 homes and 5 triplexes were destroyed in Wenatchee by a wildland fire that started on Castle Rock. In 1985 two fruit warehouses, one in Wenatchee, the other in Peshastin, were destroyed by fire. Again in 1967 a warehouse was totally destroyed by fire.

Hazard Identification and Vulnerability Assessment Every incorporated and unincorporated community in Chelan County has a potential for a major urban fire. Areas where older structures were built extremely close together and primarily constructed of wood have the greatest risk for a major structural fire. These structures, residential, commercial and industrial, exist in every community and populated area of the County.

Fire hazards in the older buildings are high due to the construction materials which were used at the time (sawdust insulation, etc.), the original electrical wiring, and minimum spaces between buildings.

Fire hazards to the homes built in or near to grass/forested lands are somewhat high due to their location, combustible roofing material and a lack of defensible space.

Conclusion Prevention is a simple solution to reduce destructive fires. It is incumbent upon each citizen to take the responsibility for his or her family and individual safety and to practice fire and burn prevention. Citizens should insure that the following critical areas of preparedness and prevention are followed to reduce fire deaths and property losses:

- Matches and lighters out of the reach of children
- Heaters 36 inches from anything that can burn
- Cooking always attended
- Homes have a defensible space from wildfire
- Fire safety is practiced at home and work

Fire sprinklers are the most effective fire protection feature a home can have. Installation of home sprinklers must be aggressively pursued, especially for the vulnerable populations of the elderly and disabled. Good public education

programs, conducted by fire departments and districts, on fire safety, fire alarms, and fire response are important and aid prevention.

CIVIL DISTURBANCE

Definition Any incident that disrupts a community where intervention is required to maintain public safety is a civil disturbance. Examples are demonstrations, riots, strikes, public nuisances, and criminal activities.

History Past civil disturbances in Chelan County have been relatively minor in scope and have resulted in less than significant damages. Unruly and violent group incidents have occurred at picket lines and in local outlying areas during the annual Wenatchee Apple Blossom Festival and Memorial Weekend in Chelan.

Hazard Identification and Vulnerability Assessment In the United States, protesters and anarchists tend to practice civil disturbance at large, schedules peaceful gatherings such as union marches or world or global meetings. They believe all types of governments and global organizations are oppressive and undesirable and should be abolished. Their activities involve disruption of activities, resistance, and rejection of all forms of control and authority. Modern anarchists are well-organized, using command centers, tactical communications, and the Internet for planning and operations. Control of anarchists requires police forces trained and experienced in the Incident Command System and riot control. Effects of anarchism include injury to participants and spectators and property damage.

The hazards of civil disturbances cannot be limited to geographical boundaries. However, the potential for damages seems greater in the populated areas of the County.

Conclusion A civil disturbance can occur due to a variety of reasons. They often start as a public gathering and can erupt into protest demonstrations or riots with little warning. There are various events occurring throughout Chelan County annually. Although these events are peaceful in nature, there remains the potential for violence and/or general unruliness. The occurrence of a violent demonstration seems remote, however the potential needs to be acknowledged. Preparation for festivals and high use weekends must include local level planning of traffic control, additional security, fire precautions and increased law enforcement activities.

DEFINITIONS AND ACRONYMS

WORD	DEFINITION
Aftershock	A quake of lesser magnitude, usually one of a series, following a large earthquake in the same area
Alluvial fan	A fan-shaped deposit where a fast flowing stream flattens out
Avalanche	A fall or slide of a large mass, as of snow or rock, down a mountainside
Back-Arc	A depression landward of a volcanic arc (a change of volcanoes fueled by magma that rises from and underlying subducting plate) in a subduction zone (Elongate region along which lithospheric block descends relative to another lithospheric block) which is lined with trapped sediment from the volcanic arc and the plate interior.
Bedrock	The solid rock that underlies loose material, such a soil, sand, clay, or gravel
Biological Agent	Any bacterium or virus or toxin that could be used in biological warfare
BNSF RR	Burlington Northern Santa Fe Railroad
Canyon	A narrow chasm with steep cliff walls, cut into the earth by running water; a gorge
CEMP	Comprehensive Emergency Management Plan
Chemical	Chemical substances that can be delivered using munitions and dispersal devices to cause death or sever harm to people, animals and plants
Civil disturbance	Any incident that disrupts a community where intervention is required to maintain public safety is a civil disturbance. Examples are demonstrations, riots, strikes, public nuisances, and criminal activities.
Colliding plate	Collision of two plates of the Earth's lithosphere (the solid outer portion of the planet)
Combustible	Capable of igniting and burning
Compression	The process or result of becoming smaller or pressed together
Conglomerate	Made up of loosely cemented heterogeneous (*Chemistry*. (of a mixture) composed of different substances or the same substance in different phases, as solid ice and liquid water) material
Contamination	The presence of extraneous, especially infectious, material that renders a substance or preparation impure or harmful
Corrosive	Causing or tending to cause the gradual destruction of a substance by chemical action
Drought	A long period of abnormally low rainfall, especially one that adversely affects growing or living conditions
Earthquake	A shaking, trembling, or concussion of the earth,

WORD	DEFINITION
	due to subterranean causes, often accompanied by a rumbling noise.
Elevation	The height of a thing above a reference level; altitude.
Epicenter	The point of the earth's surface directly above the focus of an earthquake.
Explosive	A substance, especially a prepared chemical, that explodes or causes explosion.
Fault	A fracture in the continuity of a rock formation caused by a shifting or dislodging of the earth's crust, in which adjacent surfaces are displaced relative to one another and parallel to the plane of fracture.
Fissure	A long narrow opening; a crack or cleft.
Flammable	Easily ignited and capable of burning rapidly; inflammable.
Flash flood	A sudden flood of great volume, usually caused by a heavy rain.
Flood	An overflowing of water onto land that is normally dry.
Floodplain	A low plain adjacent to a river that is formed chiefly of river sediment and is subject to flooding
Geologic	Of or pertaining to geology, or the science of the earth.
Geology	1. The scientific study of the origin, history, and structure of the earth. 2. The structure of a specific region of the earth's crust.
Geyser	A natural hot spring that intermittently ejects a column of water and steam into the air.
Hazardous materials	Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment (this definition is applicable to Department of Energy orders and is not to be confused with the term "hazardous material substance" defined in Section 101(14) of Comprehensive Environmental Response, Compensation and Liability Act of 1980 and in [4OCFR300.6]). Also defined by 49 Code of Federal Regulations 171.8 as a substance or material designated by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce

WORD	DEFINITION
	and which has been so designated.
HIVA	Hazard Identification and Vulnerability Assessment
Hogback	A sharp ridge with steeply sloping sides, produced by erosion of the broken edges of highly tilted strata.
Intensity	Exceptionally great concentration, power, or force.
Interbed	A typically thin bed of rock material alternating with contrasting thicker beds.
Intraplate	Processes within the earth's crustal plates.
Intrusions	1. The forcing of molten rock into an earlier formation. 2. The rock mass produced by an intrusive process.
Lithosphere	The outer solid part of the earth, including the crust and uppermost mantle. The lithosphere is about 100 km thick, although its thickness is age dependent (older lithosphere is thicker).The lithosphere below the crust is brittle enough at some locations to produce earthquakes by faulting, such as within a subducted oceanic plate.
Mitigation	To moderate (a quality or condition) in force or intensity; alleviate.
Overtopping	To extend or rise over or beyond the top of; tower above.
Physiography	The study of the natural features of the earth's surface, especially in its current aspects, including land formation, climate, currents, and distribution of flora and fauna.
Poisonous	Having the qualities or effects of poison; venomous; baneful; corrupting; noxious.
Potable	Fit to drink.
Reactive	Tending to be responsive or to react to a stimulus.
Richter scale	A logarithmic scale used to express the total amount of energy released by an earthquake. Although the scale has no upper limit, values are typically between 1 and 9, and each increase of 1 represents a 32-fold increase in released energy.
Sabotage	A deliberate act of destruction or disruption in which equipment is damaged
Saturation	To soak, fill, or load to capacity.
Sedimentary	Rocks formed by erosion, transport and deposition.
Seismic	Of or having to do with earthquakes.
Severe storm	Of or relating to rocks formed by the deposition of sediment.
Shale	A fissile rock composed of layers of claylike, fine-grained sediments.

WORD	DEFINITION
Shock	An instance of agitation of the earth's crust
Steppe	A vast semiarid grass-covered plain, as found in southeast Europe, Siberia, and central North America.
Slope	A stretch of ground forming a natural or artificial incline
Slump	To slide or slip on a declivity, so that the motion is perceptible; said of masses of earth or rock.
Snag	A rough, sharp, or jagged protuberance, as: A tree or a part of a tree that protrudes above the surface in a body of water
Socioeconomic	Of or involving both social and economic factors.
Spillway	A channel for an overflow of water, as from a reservoir.
Stage flood	The height of the surface of a river or other fluctuating body of water above a set point.
Statutory	Enacted, regulated, or authorized by statute.
Sulfurous	Characteristic of or emanating from burning sulfur. (Sulfur - A pale yellow nonmetallic element occurring widely in nature in several free and combined allotropic forms. It is used in black gunpowder, rubber vulcanization, the manufacture of insecticides and pharmaceuticals, and in the preparation of sulfur compounds such as hydrogen sulfide and sulfuric acid.)
Tectonic plate	The two sub-layers of the earth's crust (lithosphere) that move, float, and sometimes fracture and whose interaction causes continental drift, earthquakes, volcanoes, mountains, and oceanic trenches
Terrorism	The unlawful use or threatened use of force or violence by a person or an organized group against people or property with the intention of intimidating or coercing societies or governments, often for ideological or political reasons.
Tertiary	Of or belonging to the geologic time, system of rocks, or sedimentary deposits of the first period of the Cenozoic Era, characterized by the appearance of modern flora and of apes and other large mammals.
Topography	The description of a particular place, town, manor, parish, or tract of land; especially, the exact and scientific delineation and description in minute detail of any place or region.
Toxic	Capable of causing injury or death, especially by chemical means; poisonous.

WORD	DEFINITION
Tremor	A shaking or vibrating movement, as of the earth.
Urban	Of, relating to, or located in a city.
Urban interface	The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.
Velocity	Rapidity or speed of motion; swiftness.
Volcano	An opening in the earth's crust through which molten lava, ash, and gases are ejected.
Watershed	The region draining into a river, river system, or other body of water.
Wettable	Able to be made wet
Wildland fire	There are three different classes of wildland fires. A SURFACE FIRE is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A GROUND FIRE is usually started by lightning and burns on or below the forest floor. CROWN FIRES spread rapidly by wind and move quickly by jumping along the tops of trees.
WPPSS	Washington Public Power Supply System

Storm Events Database

Search Results for CHELAN (County), (WASHINGTON)

73 event(s) were reported between 01/01/2000 and 8/31/2016 (6088 days)

Summary Info:

Number of County/Zone areas affected:	5
Number of Days with Event:	258
Number of Days with Event and Death:	4
Number of Days with Event and Death or Injury:	9
Number of Days with Event and Property Damage:	58
Number of Days with Event and Crop Damage:	10
Number of Event Types reported:	22

Column Definitions:

'Mag': Magnitude, 'Dth': Deaths, 'Inj': Injuries, 'PrD': Property Damage, 'CrD': Crop Damage

Location/County/Zone	BEGIN_DATE	BEGIN_TIME	EVENT_TYPE	MAG	DTH	INJ	PrD	CrD
WENATCHEE AREA (ZONE)	1/4/00	200	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/9/00	800	High Wind	60	0	0	0	0
E CHELAN/EXTREME W DOUGLAS (ZONE)	2/1/00	400	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	2/1/00	400	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	11/26/00	2000	Heavy Snow		0	0	0	0
E CHELAN/EXTREME W DOUGLAS (ZONE)	11/29/00	0	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/14/00	1400	Winter Storm		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	1/29/01	1530	Avalanche		1	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	2/4/01	200	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	2/15/01	2300	Heavy Snow		0	0	0	0
E CHELAN/EXTREME W DOUGLAS (ZONE)	2/15/01	2300	Heavy Snow		0	0	0	0
CHELAN CO.	6/26/01	1800	Heavy Rain		0	0	0	10000000
CHELAN CO.	8/12/01	1400	Wildfire		0	0	200000	0
W OKANOGAN/C&W CHELAN (ZONE)	11/28/01	100	Heavy Snow		0	0	0	0
E CHELAN/EXTREME W DOUGLAS (ZONE)	11/28/01	500	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	12/6/01	0	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	12/15/01	600	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	1/19/02	400	Winter Storm		0	0	0	0
E CHELAN/EXTREME W DOUGLAS (ZONE)	1/20/02	1200	High Wind	46	0	0	40000	0
W OKANOGAN/C&W CHELAN (ZONE)	1/24/02	0	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/21/02	2000	High Wind	82	0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	3/10/02	2200	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	3/11/02	700	High Wind	85	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/19/02	200	High Wind	92	0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	3/19/02	600	Heavy Snow		0	0	0	0

W OKANOGAN/C&W CHELAN (ZONE)	3/26/02	2000	High Wind	79	0	0	5000	0
W OKANOGAN/C&W CHELAN (ZONE)	4/14/02	300	High Wind	87	0	0	10000	0
E CHELAN/EXTREME W DOUGLAS (ZONE)	12/12/02	1400	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/27/02	1600	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/1/03	1	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/1/03	1	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/21/03	1200	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	1/26/03	1000	Flood		0	0	10000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/4/03	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/5/03	600	High Wind	94	0	0	0	0
WENATCHEE AREA (ZONE)	3/5/03	800	High Wind	50	0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	3/8/03	2200	Heavy Snow		0	0	0	0
CHELAN CO.	6/9/03	1600	Heavy Rain		0	0	0	0
CHELAN CO.	8/5/03	1800	Thunderstorm Wind	38	0	0	2000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/20/03	2000	Flood		0	0	1600000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/20/03	2000	Debris Flow		0	0	150000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/28/03	1600	High Wind	62	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/16/03	900	Heavy Snow		0	0	0	0
E CHELAN/EXTREME W DOUGLAS (ZONE)	11/16/03	1500	High Wind	60	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/23/03	1600	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/28/03	600	Heavy Snow		0	0	0	0
E CHELAN/EXTREME W DOUGLAS (ZONE)	12/23/03	2200	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/1/04	1800	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/4/04	100	Cold/Wind Chill		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/4/04	100	Cold/Wind Chill		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/30/04	400	High Wind	50	0	1	1000	0

WENATCHEE AREA (ZONE)	1/30/04	400	High Wind	50	0	0	1000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	4/27/04	1500	High Wind	60	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/7/04	1200	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/7/04	1200	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/9/04	2000	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	12/19/04	1100	High Wind	60	1	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/6/05	1500	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/6/05	1500	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/15/05	800	Ice Storm		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/15/05	800	Ice Storm		0	0	0	0
E CHELAN/EXTREME W DOUGLAS (ZONE)	3/16/05	600	High Wind	60	0	0	0	0
CHELAN CO.	4/23/05	1930	Thunderstorm Wind	70	0	0	0	0
CHELAN CO.	5/9/05	1600	Flash Flood		0	0	0	0
WENATCHEE AREA (ZONE)	11/30/05	1430	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/1/05	1	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	12/29/05	1400	Heavy Snow		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	1/5/06	2000	Debris Flow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/28/06	1500	Winter Storm		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	1/31/06	400	Winter Storm		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	2/1/06	0	Winter Storm		0	0	0	0
WENATCHEE AREA (ZONE)	2/1/06	630	Winter Weather		0	3	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/19/06	1330	Avalanche		1	1	0	0
CHELAN CO.	5/17/06	1900	Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	5/18/06	1800	Debris Flow		0	0	0	0
CHELAN CO.	5/23/06	1840	Lightning		0	0	2000	0
W OKANOGAN/C&W CHELAN (ZONE)	6/12/06	1845	Debris Flow		0	2	0	0

CHELAN CO.	6/12/06	1845	Thunderstorm Wind	50	0	0	0	0
CHELAN CO.	6/12/06	1845	Flash Flood		0	0	0	0
CHELAN CO.	6/12/06	1850	Flash Flood		0	0	0	0
CHELAN CO.	6/12/06	1850	Flash Flood		0	0	0	0
CHELAN CO.	6/12/06	1900	Lightning		0	0	5000	0
CHELAN CO.	6/12/06	1915	Flash Flood		0	0	0	0
CHELAN CO.	6/12/06	1933	Flash Flood		0	0	0	0
CHELAN CO.	6/12/06	2025	Flash Flood		0	0	0	0
CHELAN CO.	7/4/06	1415	Thunderstorm Wind	50	0	0	0	0
CHELAN CO.	7/4/06	1415	Hail	1.25	0	0	0	4160000
CHELAN CO.	7/5/06	1525	Hail	1.25	0	0	0	4160000
CHELAN CO.	7/5/06	1615	Hail	1	0	0	0	4160000
CHELAN CO.	7/5/06	1646	Hail	1	0	0	0	4160000
CHELAN CO.	7/5/06	1650	Hail	0.75	0	0	0	4160000
CHELAN CO.	7/5/06	1655	Flash Flood		0	0	0	0
CHELAN CO.	7/6/06	1123	Lightning		0	1	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/6/06	1419	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/24/06	1300	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/26/06	900	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/1/06	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/1/06	0	Wildfire		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	8/1/06	0	Wildfire		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	8/22/06	1200	Wildfire		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	8/22/06	1200	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	9/1/06	0	Wildfire		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	9/1/06	0	Wildfire		0	0	0	0

W OKANOGAN/C&W CHELAN (ZONE)	9/1/06	0	Wildfire		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	9/1/06	0	Wildfire		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	9/1/06	0	Wildfire		0	0	0	0
W OKANOGAN/C&W CHELAN (ZONE)	9/4/06	1200	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/1/06	0	Wildfire		0	0	0	0
CHELAN CO.	11/6/06	1200	Flood		0	0	569000	0
CHELAN CO.	11/7/06	500	Flood		0	0	0	0
CHELAN CO.	11/7/06	500	Flood		0	0	0	0
CHELAN CO.	11/7/06	500	Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/10/06	1000	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/12/06	1800	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	11/26/06	500	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/12/06	2100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/14/06	800	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/14/06	1100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/14/06	1800	Strong Wind	48	0	0	60000	0
WENATCHEE AREA (ZONE)	12/14/06	2300	High Wind	56	0	0	196000	0
WENATCHEE AREA (ZONE)	12/23/06	200	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/24/06	1415	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/26/06	800	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/26/06	800	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/1/07	2200	Winter Storm		0	0	0	0
WENATCHEE AREA (ZONE)	1/1/07	2200	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/5/07	1300	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/7/07	1000	High Wind	64	0	0	10000000	18000
WENATCHEE AREA (ZONE)	2/24/07	700	Heavy Snow		0	0	0	0

WENATCHEE AREA (ZONE)	2/27/07	1900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	5/20/07	2000	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	7/7/07	0	Wildfire		0	0	500	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/13/07	1200	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/5/07	1700	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	9/1/07	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/18/07	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/1/07	1800	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/1/07	1900	Winter Storm		0	0	0	0
WENATCHEE AREA (ZONE)	12/18/07	300	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/23/07	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/4/08	600	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/9/08	2200	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/7/08	1615	Avalanche		0	0	1100000	0
WENATCHEE AREA (ZONE)	4/19/08	300	Frost/Freeze		0	0	0	105000000
CHELAN CO.	5/17/08	1622	Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	5/18/08	1610	Landslide		0	0	1040000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/10/08	1515	Strong Wind	43	0	0	2000	0
CHELAN CO.	8/8/08	1532	Flash Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/10/08	0	Wildfire		0	0	0	0
CHELAN CO.	11/12/08	1030	Flood		0	0	0	0
CHELAN CO.	11/12/08	1030	Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/12/08	1000	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/12/08	1200	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/17/08	800	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/20/08	1800	Heavy Snow		0	0	0	0

EAST SLOPES NORTHERN CASCADES (ZONE)	12/26/08	1500	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/26/08	2000	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/1/09	400	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/1/09	500	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/4/09	1600	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/4/09	1700	Heavy Snow		0	0	0	0
CHELAN CO.	1/6/09	1200	Flood		0	0	10000	0
WENATCHEE AREA (ZONE)	1/6/09	1900	High Wind	68	0	0	64000	0
CHELAN CO.	1/7/09	0	Heavy Rain		0	0	0	0
CHELAN CO.	1/7/09	0	Flood		0	0	1100000	0
CHELAN CO.	6/12/09	1915	Flash Flood		0	0	1000	0
CHELAN CO.	6/12/09	1915	Flash Flood		0	0	1000	0
CHELAN CO.	6/24/09	1400	Dust Devil		0	0	0	0
WENATCHEE AREA (ZONE)	7/28/09	1900	Wildfire		0	0	0	0
WENATCHEE AREA (ZONE)	8/1/09	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/21/09	1800	Wildfire		0	0	0	0
WENATCHEE AREA (ZONE)	10/3/09	2200	High Wind	50	0	0	5000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/18/09	1900	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/14/09	1900	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/4/10	500	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/15/10	1630	Landslide		0	0	0	0
WENATCHEE AREA (ZONE)	5/3/10	900	Strong Wind	47	0	0	1000	0
WENATCHEE AREA (ZONE)	7/4/10	1700	Wildfire		0	0	0	0
WENATCHEE AREA (ZONE)	7/10/10	1100	Wildfire		0	0	0	0
CHELAN CO.	7/28/10	1635	Flash Flood		0	0	500000	0
WENATCHEE AREA (ZONE)	7/28/10	1700	Wildfire		0	0	0	0

CHELAN CO.	7/28/10	1800	Flash Flood		0	0	20000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/29/10	1400	Wildfire		0	0	0	0
CHELAN CO.	7/31/10	1300	Heavy Rain		0	0	1000	0
CHELAN CO.	7/31/10	1430	Hail	0.75	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/1/10	0	Wildfire		0	0	0	0
CHELAN CO.	8/4/10	400	Flash Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/26/10	1030	Strong Wind	35	0	0	1000	0
WENATCHEE AREA (ZONE)	9/10/10	1400	Wildfire		0	0	0	0
WENATCHEE AREA (ZONE)	11/15/10	2230	High Wind	55	0	0	3000	0
WENATCHEE AREA (ZONE)	11/19/10	1900	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	11/22/10	1200	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	11/22/10	2000	Strong Wind	43	0	0	1000	0
WENATCHEE AREA (ZONE)	12/11/10	1100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/11/10	1100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/11/11	2100	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/11/11	2200	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	2/23/11	1800	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/27/11	900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/5/11	1530	Avalanche		1	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/27/11	1600	Landslide		0	0	500000	0
CHELAN CO.	3/30/11	500	Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/31/11	1420	Landslide		0	0	0	0
CHELAN CO.	3/31/11	1530	Flood		0	0	10000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/31/11	2300	Landslide		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/31/11	2300	Landslide		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	5/14/11	1200	Landslide		0	0	0	0

CHELAN CO.	5/15/11	945	Flood		0	0	20000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	5/25/11	1800	Landslide		0	0	0	0
CHELAN CO.	5/28/11	1700	Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	5/31/11	700	Landslide		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	5/31/11	1535	Landslide		0	0	14000	17000
EAST SLOPES NORTHERN CASCADES (ZONE)	6/10/11	400	Landslide		0	0	0	0
CHELAN CO.	6/10/11	930	Flood		0	0	1000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	6/10/11	1115	Landslide		0	0	10000	0
CHELAN CO.	7/25/11	600	Heavy Rain		0	0	0	640000
EAST SLOPES NORTHERN CASCADES (ZONE)	8/17/11	1400	Wildfire		0	0	0	0
WENATCHEE AREA (ZONE)	12/27/11	1600	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/18/12	330	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/18/12	730	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/22/12	900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/24/12	800	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/28/12	1600	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	2/21/12	2230	Strong Wind	32	0	0	3000	0
WENATCHEE AREA (ZONE)	2/28/12	1900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/12/12	700	Heavy Snow		0	0	0	0
CHELAN CO.	4/5/12	1610	Funnel Cloud		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/5/12	1330	Wildfire		0	0	0	0
CHELAN CO.	7/17/12	1900	Debris Flow		0	0	100000	0
CHELAN CO.	7/20/12	1315	Debris Flow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/5/12	1100	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	9/8/12	1800	Wildfire		0	0	1500	0
EAST SLOPES NORTHERN CASCADES (ZONE)	9/8/12	2100	Wildfire		0	0	0	0

EAST SLOPES NORTHERN CASCADES (ZONE)	9/16/12	1506	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/1/12	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/1/12	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/1/12	0	Wildfire		0	0	1500	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/2/12	1400	Strong Wind	43	0	0	5000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/18/12	1900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/6/12	400	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/16/12	1600	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/16/12	1600	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/17/12	0	Winter Weather		0	0	5600000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/19/12	500	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/8/13	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	4/10/13	1600	Strong Wind	44	0	0	500	0
CHELAN CO.	6/24/13	800	Heavy Rain		0	0	0	20000
CHELAN CO.	6/29/13	1325	Flash Flood		0	0	0	0
CHELAN CO.	6/29/13	1605	Debris Flow		0	0	10000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/4/13	1430	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/19/13	1800	Wildfire		0	0	1500000	0
WENATCHEE AREA (ZONE)	7/27/13	700	Wildfire		0	2	3500000	0
WENATCHEE AREA (ZONE)	8/1/13	0	Wildfire		0	0	3500000	0
CHELAN CO.	8/4/13	1830	Debris Flow		0	0	30000	0
WENATCHEE AREA (ZONE)	8/9/13	2200	Wildfire		0	0	0	0
CHELAN CO.	8/10/13	1150	Debris Flow		0	0	30000	0
CHELAN CO.	8/10/13	2040	Flash Flood		0	0	50000	0
CHELAN CO.	8/10/13	2158	Thunderstorm Wind	52	0	0	20000	0
CHELAN CO.	8/10/13	2320	Debris Flow		0	0	0	0

CHELAN CO.	8/10/13	2340	Debris Flow		0	0	0	0
CHELAN CO.	8/11/13	1725	Debris Flow		0	0	700000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/19/13	1300	Wildfire		0	0	0	0
CHELAN CO.	9/5/13	1900	Flash Flood		0	0	700000	0
CHELAN CO.	9/5/13	2000	Flash Flood		0	0	43430	0
CHELAN CO.	9/5/13	2030	Flash Flood		0	0	10000	0
CHELAN CO.	9/5/13	2030	Flash Flood		0	0	40000	0
CHELAN CO.	9/5/13	2100	Flash Flood		0	0	50000	0
CHELAN CO.	9/5/13	2215	Flash Flood		0	0	330000	0
CHELAN CO.	9/5/13	2230	Debris Flow		0	0	40000	0
CHELAN CO.	9/5/13	2300	Flash Flood		0	0	110000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/10/14	1900	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/11/14	2000	Strong Wind	41	0	0	1000	0
WENATCHEE AREA (ZONE)	1/28/14	2230	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	2/6/14	1830	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/8/14	1800	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/10/14	500	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/11/14	1800	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/14/14	130	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/15/14	1200	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/16/14	1900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/18/14	800	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/19/14	1200	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/22/14	1700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	3/1/14	2200	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	6/8/14	2300	Wildfire		0	0	50000	0

EAST SLOPES NORTHERN CASCADES (ZONE)	7/14/14	1330	Wildfire		0	0	800000	10000
EAST SLOPES NORTHERN CASCADES (ZONE)	7/15/14	600	Wildfire		0	0	60000	0
CHELAN CO.	7/23/14	1320	Debris Flow		0	0	0	0
CHELAN CO.	7/23/14	1330	Debris Flow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/1/14	0	Wildfire		0	0	60000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/1/14	0	Wildfire		0	0	2000000	20000
EAST SLOPES NORTHERN CASCADES (ZONE)	8/1/14	1330	Wildfire		0	0	300000	0
CHELAN CO.	8/12/14	2255	Debris Flow		0	0	100	0
CHELAN CO.	8/13/14	100	Debris Flow		0	0	5000	0
CHELAN CO.	8/13/14	100	Debris Flow		0	0	0	0
CHELAN CO.	8/13/14	515	Debris Flow		0	0	2000	0
CHELAN CO.	8/14/14	750	Flash Flood		0	0	5000	0
CHELAN CO.	8/22/14	1925	Debris Flow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/21/14	800	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	11/21/14	800	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	11/21/14	800	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	11/21/14	800	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	11/21/14	800	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/21/14	900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/21/14	900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/21/14	900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/25/14	0	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/25/14	0	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/25/14	0	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/25/14	0	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/19/14	200	Winter Weather		0	0	0	0

EAST SLOPES NORTHERN CASCADES (ZONE)	12/19/14	200	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/19/14	200	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/19/14	200	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/19/14	200	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/19/14	200	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/19/14	1400	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/27/14	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/27/14	700	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/27/14	700	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/27/14	700	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/27/14	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/27/14	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/27/14	700	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/27/14	800	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/3/15	2200	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/3/15	2200	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/3/15	2200	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/3/15	2200	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/4/15	100	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	1/4/15	100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/4/15	2000	Ice Storm		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/4/15	2200	Winter Storm		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/4/15	2200	Winter Weather		0	0	0	0
CHELAN CO.	1/5/15	1200	Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/15/15	1600	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/15/15	1600	Winter Weather		0	0	0	0

WENATCHEE AREA (ZONE)	1/15/15	1600	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	1/15/15	1600	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/15/15	1600	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	1/15/15	1600	Astronomical Low Tide		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/15/15	1600	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/15/15	1600	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	1/15/15	1600	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/15/15	1600	Astronomical Low Tide		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Astronomical Low Tide		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/15	1100	Winter Weather		0	0	0	0

EAST SLOPES NORTHERN CASCADES (ZONE)	1/29/15	100	Freezing Fog		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	2/1/15	900	Winter Weather		0	0	0	0
CHELAN CO.	5/29/15	1455	Hail	0.75	0	0	0	0
CHELAN CO.	5/29/15	1500	Hail	0.75	0	0	0	0
CHELAN CO.	5/29/15	1507	Hail	1	0	0	0	0
CHELAN CO.	5/29/15	1530	Hail	1.25	0	0	0	0
CHELAN CO.	5/29/15	1530	Debris Flow		0	0	0	0
CHELAN CO.	5/29/15	1530	Heavy Rain		0	0	0	0
WENATCHEE AREA (ZONE)	6/28/15	1430	Wildfire		0	0	0	0
WENATCHEE AREA (ZONE)	6/28/15	1430	Wildfire		0	0	0	0
WENATCHEE AREA (ZONE)	7/1/15	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/2/15	1300	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/3/15	1500	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/1/15	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/14/15	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/14/15	0	Wildfire		0	0	0	0
WENATCHEE AREA (ZONE)	8/14/15	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	9/1/15	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	9/1/15	0	Wildfire		0	0	0	0
WENATCHEE AREA (ZONE)	9/1/15	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	9/1/15	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	10/1/15	0	Wildfire		0	0	0	0
CHELAN CO.	10/31/15	0	Flood		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/17/15	1300	High Wind	61	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/17/15	1350	High Wind	63	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/17/15	1400	High Wind	63	0	0	0	0

EAST SLOPES NORTHERN CASCADES (ZONE)	11/17/15	1420	High Wind	53	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/17/15	1445	High Wind	71	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	11/17/15	1600	High Wind	56	0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/2/15	0	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/2/15	1901	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/2/15	1901	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/2/15	1901	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/2/15	1901	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/2/15	1901	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/4/15	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/4/15	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/4/15	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/4/15	800	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/4/15	1100	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/5/15	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/5/15	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/5/15	700	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/5/15	700	Heavy Snow		0	0	0	0
CHELAN CO.	12/8/15	0	Debris Flow		0	0	0	0
CHELAN CO.	12/9/15	700	Flood		0	0	0	0
CHELAN CO.	12/9/15	715	Debris Flow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/12/15	0	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/12/15	1200	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/12/15	1200	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/17/15	0	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/17/15	400	Heavy Snow		0	0	0	0

EAST SLOPES NORTHERN CASCADES (ZONE)	12/20/15	600	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/20/15	600	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/21/15	400	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/21/15	400	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/21/15	400	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	12/21/15	400	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/21/15	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/21/15	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/21/15	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/21/15	700	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	12/22/15	1700	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/3/16	1900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/3/16	1900	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/3/16	1900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/3/16	1900	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/3/16	1900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/3/16	1900	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/3/16	1900	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/3/16	1900	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/12/16	1600	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/12/16	1600	Heavy Snow		0	0	0	0
WENATCHEE AREA (ZONE)	1/15/16	2200	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/15/16	2200	Winter Weather		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/17/16	700	Winter Weather		0	0	0	0
WENATCHEE AREA (ZONE)	1/19/16	1200	Heavy Snow		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	1/20/16	2300	Heavy Snow		0	0	0	0

CHELAN CO.	3/7/16	220	Debris Flow		0	0	15000	0
CHELAN CO.	3/9/16	2000	Debris Flow		0	0	500	0
CHELAN CO.	7/19/16	1619	Debris Flow		0	0	7000	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/22/16	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	7/29/16	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/1/16	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/1/16	0	Wildfire		0	0	0	0
EAST SLOPES NORTHERN CASCADES (ZONE)	8/21/16	0	Wildfire		0	0	0	0

Earthquake Events From PNSN (Pacific Northwest Seismic Network)

Magnitude	Time Local	Distance From	Lat	Lon	Depth Km	Depth Mi
3.4	2015/11/25 13:20:37 PST	32.1 km (19.9 mi) ESE (116. azimuth) from Darrington, WA	48.1238	-121.215	3.8	2.3
3	2015/11/25 12:11:58 PST	33.0 km (20.5 mi) ESE (114. azimuth) from Darrington, WA	48.1305	-121.196	9.6	6
2.7	2015/06/14 22:51:35 PDT	8.3 km (5.2 mi) W (280. azimuth) from Entiat, WA	47.6748	-120.333	3.7	2.3
2.5	2015/05/15 17:27:11 PDT	10.7 km (6.7 mi) N (7. azimuth) from Entiat, WA	47.7573	-120.206	6.5	4
2.7	2014/12/29 15:33:10 PST	10.1 km (6.3 mi) W (267. azimuth) from Entiat, WA	47.6565	-120.357	3.5	2.2
2.1	2013/11/22 19:23:32 PST	6.7 km (4.2 mi) NW (322. azimuth) from Entiat, WA	47.7095	-120.278	3.2	2
3.1	2013/10/29 04:24:14 PDT	42.2 km (26.2 mi) WNW (293. azimuth) from Entiat, WA	47.8067	-120.744	7.6	4.7
2.7	2013/09/24 08:15:06 PDT	41.7 km (25.9 mi) WNW (293. azimuth) from Entiat, WA	47.8093	-120.735	8.2	5.1
2.3	2013/06/26 21:21:43 PDT	41.8 km (25.9 mi) WNW (295. azimuth) from Entiat, WA	47.8172	-120.731	8	4.9
4.2	2013/06/26 19:45:35 PDT	39.3 km (24.4 mi) WNW (298. azimuth) from Entiat, WA	47.8242	-120.689	7.5	4.7
2.2	2013/05/28 08:55:12 PDT	3.9 km (2.4 mi) N (349. azimuth) from Entiat, WA	47.696	-120.233	5.6	3.5
2	2013/05/12 22:47:09 PDT	9.9 km (6.1 mi) N (10. azimuth) from Entiat, WA	47.7493	-120.2	2.5	1.5
2.8	2012/12/19 14:00:28 PST	12.0 km (7.5 mi) NE (41. azimuth) from Entiat, WA	47.7428	-	-0.7	-0.4

				120.117		
2.4	2012/12/02 05:18:11 PST	7.3 km (4.5 mi) NNE (27. azimuth) from Entiat, WA	47.7202	-120.179	-0.2	-0.1
3	2012/08/07 16:59:45 PDT	6.7 km (4.2 mi) WNW (298. azimuth) from Entiat, WA	47.6903	-120.302	7.7	4.8
2.1	2012/07/17 19:09:18 PDT	7.4 km (4.6 mi) NNE (14. azimuth) from Entiat, WA	47.7262	-120.2	-0.6	-0.4
2	2012/04/14 14:50:09 PDT	40.6 km (25.3 mi) ENE (64. azimuth) from Skykomish, WA	47.8638	-120.872	7.2	4.4
2.4	2012/01/04 08:01:46 PST	9.5 km (5.9 mi) N (352. azimuth) from Entiat, WA	47.746	-120.24	-0.2	-0.1
2.2	2010/11/13 12:31:01 PST	11.1 km (6.9 mi) NW (318. azimuth) from Entiat, WA	47.736	-120.323	3.3	2
2.1	2010/11/12 20:08:33 PST	9.9 km (6.1 mi) SSW (208. azimuth) from Entiat, WA	47.5833	-120.284	8	5
2.2	2010/08/05 21:08:25 PDT	25.2 km (15.6 mi) NNW (329. azimuth) from Entiat, WA	47.8555	-120.397	11.6	7.2
2	2009/09/24 04:21:56 PDT	7.3 km (4.5 mi) SSW (213. azimuth) from Chelan, WA	47.7867	-120.065	-0.4	-0.2
2.4	2009/09/17 03:55:28 PDT	28.8 km (17.9 mi) SE (130. azimuth) from Darrington, WA	48.0857	-121.306	15.3	9.5
2.2	2009/04/03 22:52:36 PDT	45.5 km (28.3 mi) WNW (303. azimuth) from Entiat, WA	47.884	-120.734	0.1	0.1
2.6	2008/10/13 20:32:20 PDT	8.6 km (5.4 mi) NNW (334. azimuth) from Entiat, WA	47.7315	-120.274	2.5	1.5
2.3	2008/10/03 08:02:12 PDT	3.9 km (2.4 mi) SSW (213. azimuth) from Entiat, WA	47.6325	-120.252	2.6	1.6
2.8	2008/07/29 01:09:59 PDT	3.2 km (2.0 mi) NNE (29. azimuth) from Entiat, WA	47.6872	-120.202	3.1	1.9
2	2008/07/14 10:56:45 PDT	45.9 km (28.5 mi) NW (311. azimuth) from Chelan, WA	48.1117	-120.479	2.2	1.4

2.5	2008/04/08 22:58:37 PDT	12.7 km (7.9 mi) W (279. azimuth) from Entiat, WA	47.6788	-120.391	-0.5	-0.3
2	2008/03/17 17:24:24 PDT	57.2 km (35.6 mi) NE (46. azimuth) from Skykomish, WA	48.0648	-120.812	4.2	2.6
3.3	2008/03/17 16:58:48 PDT	57.7 km (35.9 mi) NE (45. azimuth) from Skykomish, WA	48.0697	-120.81	-0.5	-0.3
2.2	2008/02/12 23:56:08 PST	14.3 km (8.9 mi) SW (223. azimuth) from Entiat, WA	47.5668	-120.353	5.3	3.3
2	2008/01/22 23:10:45 PST	59.4 km (36.9 mi) NE (43. azimuth) from Skykomish, WA	48.0985	-120.822	6.6	4.1
2	2008/01/07 14:03:21 PST	56.7 km (35.2 mi) NE (45. azimuth) from Skykomish, WA	48.0677	-120.826	4.8	3
2.7	2008/01/07 14:02:08 PST	57.2 km (35.5 mi) NE (46. azimuth) from Skykomish, WA	48.0623	-120.81	-0.3	-0.2
2	2007/06/27 22:04:02 PDT	10.5 km (6.5 mi) NE (34. azimuth) from Entiat, WA	47.7398	-120.144	-0.5	-0.3
2.5	2006/12/14 17:42:00 PST	6.9 km (4.3 mi) WNW (282. azimuth) from Entiat, WA	47.6745	-120.313	-0.6	-0.4
2.5	2006/11/30 09:50:59 PST	2.8 km (1.7 mi) NNE (33. azimuth) from Entiat, WA	47.6825	-120.203	-0.5	-0.3
2.1	2006/08/02 03:42:58 PDT	11.8 km (7.3 mi) WNW (301. azimuth) from Entiat, WA	47.716	-120.358	4.7	2.9
3.1	2006/07/24 23:13:37 PDT	3.0 km (1.9 mi) SSE (157. azimuth) from Entiat, WA	47.6368	-120.207	5.4	3.3
2	2006/04/06 10:34:43 PDT	1.9 km (1.2 mi) NW (318. azimuth) from Entiat, WA	47.6747	-120.241	-0.8	-0.5
2.1	2006/03/14 02:44:14 PST	13.2 km (8.2 mi) W (274. azimuth) from Entiat, WA	47.6697	-120.399	-0.7	-0.5
2.4	2005/11/25 07:57:14 PST	13.4 km (8.3 mi) W (272. azimuth) from Entiat, WA	47.6652	-120.402	-0.6	-0.4
2.6	2005/09/27 15:46:17	38.5 km (23.9 mi) E (92. azimuth) from Skykomish, WA	47.6925	-	4.4	2.7

	PDT			120.849		
2.4	2005/05/19 23:20:58 PDT	6.1 km (3.8 mi) NW (325. azimuth) from Entiat, WA	47.7067	-120.271	2.5	1.5
2	2005/05/19 14:44:02 PDT	8.5 km (5.3 mi) WNW (288. azimuth) from Entiat, WA	47.6852	-120.331	1.9	1.2
2.4	2004/09/16 22:40:37 PDT	2.6 km (1.6 mi) NNE (22. azimuth) from Entiat, WA	47.6832	-120.21	2.6	1.6
2	2004/03/15 23:22:57 PST	0.7 km (0.5 mi) ENE (72. azimuth) from Entiat, WA	47.6638	-120.214	-0.6	-0.4
2.9	2004/02/09 06:33:11 PST	3.6 km (2.2 mi) E (80. azimuth) from Entiat, WA	47.6675	-120.176	-0.5	-0.3
2.1	2004/01/14 04:39:53 PST	11.5 km (7.2 mi) WNW (283. azimuth) from Chelan, WA	47.8647	-120.164	-0.7	-0.4
3.3	2004/01/14 04:13:38 PST	11.5 km (7.1 mi) WNW (281. azimuth) from Chelan, WA	47.8618	-120.164	1.2	0.7
2.1	2003/09/01 11:37:52 PDT	3.7 km (2.3 mi) WNW (290. azimuth) from Entiat, WA	47.6728	-120.27	3.5	2.2
2.9	2003/08/26 11:12:41 PDT	47.0 km (29.2 mi) NW (310. azimuth) from Entiat, WA	47.9307	-120.708	4.7	2.9
2.1	2003/02/06 12:44:09 PST	10.0 km (6.2 mi) SSW (212. azimuth) from Chelan, WA	47.7655	-120.083	2.9	1.8
2.3	2003/01/19 12:08:35 PST	59.1 km (36.7 mi) SE (143. azimuth) from Diablo, WA	48.2897	-120.658	5.4	3.3
2.6	2003/01/13 01:58:00 PST	11.1 km (6.9 mi) SW (229. azimuth) from Chelan, WA	47.7765	-120.126	3.4	2.1
2.7	2002/10/25 06:41:39 PDT	5.3 km (3.3 mi) NNE (30. azimuth) from Entiat, WA	47.7033	-120.188	-0.8	-0.5
2.5	2002/10/04 10:31:32 PDT	2.3 km (1.5 mi) WSW (251. azimuth) from Entiat, WA	47.6548	-120.253	1.7	1.1
2.7	2002/08/23 20:36:16	5.1 km (3.2 mi) W (266. azimuth) from Entiat, WA	47.6588	-	3	1.9

	PDT			120.291		
3.4	2002/06/06 07:42:46 PDT	8.1 km (5.0 mi) NW (323. azimuth) from Entiat, WA	47.72	-120.288	5.8	3.6
2.4	2002/05/27 01:43:58 PDT	42.0 km (26.1 mi) NNW (344. azimuth) from Chelan, WA	48.204	-120.172	0.1	0
2	2002/05/26 03:21:53 PDT	9.5 km (5.9 mi) ENE (60. azimuth) from Entiat, WA	47.7048	-120.113	1.1	0.7
2.3	2002/05/06 18:25:43 PDT	7.5 km (4.6 mi) NNE (28. azimuth) from Entiat, WA	47.7208	-120.176	-0.7	-0.4
2.1	2002/01/31 13:26:15 PST	2.3 km (1.5 mi) E (92. azimuth) from Entiat, WA	47.661	-120.192	-0.6	-0.4
2.2	2001/12/15 02:28:53 PST	59.7 km (37.1 mi) E (95. azimuth) from Darrington, WA	48.199	-120.8	4	2.5
2.2	2001/10/18 06:32:41 PDT	44.9 km (27.9 mi) SSE (153. azimuth) from Newhalem, WA	48.3128	-120.972	7.6	4.7
2.3	2001/06/06 07:52:19 PDT	25.4 km (15.8 mi) WNW (292. azimuth) from Entiat, WA	47.7475	-120.538	11.2	7
3.5	2000/12/24 09:04:58 PST	9.8 km (6.1 mi) NNW (341. azimuth) from Entiat, WA	47.745	-120.266	7.4	4.6
2.2	2000/09/21 15:29:53 PDT	7.8 km (4.9 mi) NNE (17. azimuth) from Entiat, WA	47.729	-120.193	-0.6	-0.4
2.1	2000/01/12 06:03:19 PST	3.0 km (1.8 mi) N (352. azimuth) from Entiat, WA	47.6882	-120.229	-0.5	-0.3
3	1999/12/25 14:50:08 PST	3.5 km (2.2 mi) SSE (153. azimuth) from Entiat, WA	47.6333	-120.202	5.9	3.7
2.8	1999/10/19 05:12:54 PDT	7.3 km (4.5 mi) W (264. azimuth) from Entiat, WA	47.6547	-120.32	3.6	2.2
2.2	1999/09/24 16:12:59 PDT	2.1 km (1.3 mi) SSE (147. azimuth) from Entiat, WA	47.6462	-120.208	-0.3	-0.2
2.6	1999/09/08 00:41:17 PDT	13.8 km (8.6 mi) SW (217. azimuth) from Entiat, WA	47.563	-120.334	6.8	4.2

2.4	1998/06/28 18:36:42 PDT	41.7 km (25.9 mi) WNW (295. azimuth) from Wenatchee, Wa	47.5753	-120.823	7.1	4.4
2.2	1998/06/14 20:55:46 PDT	6.8 km (4.2 mi) N (1. azimuth) from Entiat, WA	47.7225	-120.221	-0.5	-0.3
2.3	1998/06/06 12:40:06 PDT	11.0 km (6.8 mi) WSW (237. azimuth) from Entiat, WA	47.607	-120.346	3.4	2.1
2.2	1998/03/19 00:29:55 PST	9.5 km (5.9 mi) NW (317. azimuth) from Entiat, WA	47.7238	-120.311	1	0.6
2.2	1998/03/10 10:02:33 PST	12.1 km (7.5 mi) NW (320. azimuth) from Entiat, WA	47.7442	-120.328	2.9	1.8
2.1	1998/01/01 14:17:17 PST	56.6 km (35.2 mi) NE (43. azimuth) from Skykomish, WA	48.0793	-120.846	7.8	4.9
3.3	1997/09/03 10:17:26 PDT	4.9 km (3.1 mi) NW (318. azimuth) from Entiat, WA	47.6943	-120.267	-0.5	-0.3
2.3	1997/06/27 13:06:02 PDT	34.8 km (21.6 mi) WNW (286. azimuth) from Entiat, WA	47.7493	-120.67	0.9	0.6
2.3	1997/02/26 18:53:23 PST	7.6 km (4.8 mi) NW (315. azimuth) from Entiat, WA	47.7102	-120.296	5.6	3.5
2.1	1997/02/21 10:01:36 PST	7.5 km (4.6 mi) NW (314. azimuth) from Entiat, WA	47.7082	-120.295	2.9	1.8
2	1996/05/30 23:31:37 PDT	2.4 km (1.5 mi) ENE (73. azimuth) from Entiat, WA	47.6682	-120.192	1.9	1.2
2.8	1996/05/14 16:06:54 PDT	55.8 km (34.7 mi) ESE (103. azimuth) from Darrington, WA	48.1338	-120.871	-0.4	-0.3
2.6	1996/03/24 18:15:41 PST	4.6 km (2.9 mi) N (6. azimuth) from Entiat, WA	47.7032	-120.216	5.6	3.5
2.8	1995/11/20 19:01:05 PST	8.7 km (5.4 mi) NW (315. azimuth) from Entiat, WA	47.7173	-120.305	4.4	2.7
2.2	1995/11/02 10:58:07 PST	5.4 km (3.3 mi) NNE (27. azimuth) from Entiat, WA	47.7048	-120.191	4.4	2.7

2.7	1995/07/17 20:48:41 PDT	6.6 km (4.1 mi) WSW (250. azimuth) from Chelan, WA	47.821	-120.096	1.9	1.2
2.4	1994/09/04 07:33:12 PDT	9.1 km (5.7 mi) N (355. azimuth) from Entiat, WA	47.7433	-120.233	-0.5	-0.3
2	1994/06/23 18:41:54 PDT	2.9 km (1.8 mi) SE (140. azimuth) from Entiat, WA	47.6415	-120.198	3.8	2.4
2.6	1994/05/15 16:31:19 PDT	59.8 km (37.2 mi) WNW (299. azimuth) from Chelan, WA	48.0993	-120.718	7.3	4.5
2.3	1994/05/10 20:57:21 PDT	5.6 km (3.5 mi) NNE (19. azimuth) from Entiat, WA	47.7092	-120.199	4.9	3
2.4	1994/04/27 17:39:06 PDT	2.8 km (1.8 mi) NNE (14. azimuth) from Entiat, WA	47.6865	-120.214	-0.5	-0.3
2.5	1994/02/06 06:54:09 PST	11.2 km (6.9 mi) NW (311. azimuth) from Entiat, WA	47.7278	-120.335	2.4	1.5
2	1993/07/07 09:59:12 PDT	10.0 km (6.2 mi) NNW (347. azimuth) from Entiat, WA	47.7495	-120.254	2.6	1.6
2.3	1993/05/14 08:29:34 PDT	41.6 km (25.9 mi) WNW (289. azimuth) from Entiat, WA	47.7828	-120.75	-1.1	-0.7
2.6	1992/08/14 22:55:25 PDT	5.7 km (3.5 mi) W (276. azimuth) from Entiat, WA	47.6672	-120.299	-0.6	-0.4
2.4	1992/05/13 09:16:34 PDT	9.6 km (6.0 mi) WNW (283. azimuth) from Entiat, WA	47.681	-120.348	3.3	2
2	1992/04/05 05:48:47 PDT	56.0 km (34.8 mi) NE (42. azimuth) from Skykomish, WA	48.0785	-120.857	6	3.7
3.2	1991/11/24 13:11:22 PST	6.5 km (4.1 mi) SSW (192. azimuth) from Entiat, WA	47.6042	-120.241	6	3.7
2	1991/11/10 11:57:58 PST	7.9 km (4.9 mi) SW (218. azimuth) from Chelan, WA	47.7855	-120.078	1.6	1
2.4	1991/05/02 13:00:44 PDT	56.0 km (34.8 mi) ESE (103. azimuth) from Darrington, WA	48.1408	-120.865	4.7	2.9

3.1	1991/04/25 22:30:37 PDT	55.7 km (34.6 mi) ESE (107. azimuth) from Darrington, WA	48.1065	-120.884	-0.6	-0.4
3.3	1991/03/27 16:54:34 PST	8.1 km (5.0 mi) WNW (284. azimuth) from Entiat, WA	47.6797	-120.327	-0.6	-0.3
2.5	1991/01/30 18:10:05 PST	10.8 km (6.7 mi) SW (215. azimuth) from Chelan, WA	47.7618	-120.096	5.6	3.5
2.4	1991/01/17 10:15:12 PST	11.8 km (7.3 mi) W (269. azimuth) from Entiat, WA	47.6597	-120.38	-0.6	-0.4
2.4	1991/01/10 13:29:21 PST	3.1 km (1.9 mi) WNW (291. azimuth) from Entiat, WA	47.6717	-120.262	2.7	1.7
2.6	1990/04/17 01:04:56 PDT	10.7 km (6.6 mi) NNW (341. azimuth) from Entiat, WA	47.7523	-120.27	-0.4	-0.2
2.2	1990/03/24 20:07:32 PST	16.4 km (10.2 mi) WSW (241. azimuth) from Entiat, WA	47.5893	-120.413	6.7	4.2
2.3	1990/03/11 18:38:38 PST	8.9 km (5.6 mi) NW (310. azimuth) from Entiat, WA	47.7135	-120.315	-0.6	-0.4
3.1	1990/02/28 21:39:39 PST	31.3 km (19.4 mi) ENE (76. azimuth) from Skykomish, WA	47.7742	-120.957	-0.3	-0.2
2.3	1990/02/13 04:17:35 PST	5.4 km (3.3 mi) SW (224. azimuth) from Entiat, WA	47.6268	-120.273	4.5	2.8
2.3	1990/02/04 07:22:25 PST	26.7 km (16.6 mi) WNW (300. azimuth) from Wenatchee, Wa	47.5402	-120.625	6.2	3.8
2.4	1990/01/01 15:27:02 PST	10.3 km (6.4 mi) NNW (341. azimuth) from Entiat, WA	47.7492	-120.268	1.6	1
2.3	1989/12/20 02:19:06 PST	53.3 km (33.1 mi) WNW (296. azimuth) from Chelan, WA	48.053	-120.655	-1.1	-0.7
2	1989/10/21 00:29:20 PDT	4.7 km (2.9 mi) N (6. azimuth) from Entiat, WA	47.7037	-120.217	-1	-0.6
2.7	1989/08/07 18:08:59 PDT	3.4 km (2.1 mi) SE (140. azimuth) from Entiat, WA	47.6383	-120.194	7.6	4.7
2.4	1989/07/21 09:27:43	9.0 km (5.6 mi) N (349. azimuth) from Chelan, WA	47.921	-	-0.5	-0.3

	PDT			120.036		
2	1989/06/13 18:42:20 PDT	8.0 km (5.0 mi) NNW (343. azimuth) from Chelan, WA	47.9105	-120.044	-0.5	-0.3
2.6	1989/03/25 22:25:15 PST	2.7 km (1.7 mi) NW (308. azimuth) from Entiat, WA	47.6767	-120.252	6.7	4.1
2.6	1989/03/18 04:20:40 PST	8.3 km (5.2 mi) NNW (345. azimuth) from Chelan, WA	47.9143	-120.041	-0.4	-0.3
2.2	1989/03/15 03:21:53 PST	6.9 km (4.3 mi) W (275. azimuth) from Entiat, WA	47.6672	-120.314	5.7	3.5
2.2	1989/02/17 23:49:41 PST	8.4 km (5.2 mi) NNW (347. azimuth) from Chelan, WA	47.9148	-120.039	-0.5	-0.3
2.8	1988/11/19 04:11:17 PST	8.5 km (5.3 mi) NNW (346. azimuth) from Chelan, WA	47.9162	-120.041	-0.4	-0.3
2.1	1988/09/12 03:53:36 PDT	8.2 km (5.1 mi) ENE (63. azimuth) from Entiat, WA	47.6952	-120.125	4.9	3
3.3	1988/05/04 17:18:13 PDT	7.4 km (4.6 mi) W (261. azimuth) from Entiat, WA	47.6512	-120.321	5.5	3.4
2.5	1988/03/14 16:59:17 PST	40.2 km (25.0 mi) ENE (74. azimuth) from Skykomish, WA	47.807	-120.846	9.2	5.7
2.1	1988/01/24 12:52:25 PST	8.0 km (5.0 mi) NW (322. azimuth) from Entiat, WA	47.7188	-120.288	2.5	1.5
2	1987/11/30 16:41:09 PST	54.1 km (33.6 mi) E (100. azimuth) from Darrington, WA	48.1695	-120.883	7.8	4.9
2	1987/11/28 20:52:33 PST	3.3 km (2.0 mi) NNE (26. azimuth) from Entiat, WA	47.688	-120.204	-0.2	-0.1
2	1987/11/05 10:22:28 PST	55.6 km (34.5 mi) ESE (102. azimuth) from Darrington, WA	48.1447	-120.87	-0.2	-0.1
2.1	1987/09/02 21:09:59 PDT	36.5 km (22.7 mi) NE (42. azimuth) from Skykomish, WA	47.9493	-121.034	-0.3	-0.2
2	1987/08/17 05:35:50 PDT	10.2 km (6.3 mi) NW (309. azimuth) from Entiat, WA	47.72	-120.329	-1.2	-0.7

2.2	1987/08/08 06:32:36 PDT	2.3 km (1.4 mi) SW (232. azimuth) from Entiat, WA	47.649	-120.247	-0.7	-0.4
2.6	1987/02/28 06:56:10 PST	2.8 km (1.7 mi) WSW (250. azimuth) from Chelan, WA	47.8332	-120.048	-0.6	-0.4
2.1	1986/12/01 20:19:05 PST	18.9 km (11.7 mi) W (279. azimuth) from Entiat, WA	47.6867	-120.473	7.9	4.9
2	1986/08/12 03:54:07 PDT	42.0 km (26.1 mi) ENE (76. azimuth) from Skykomish, WA	47.7973	-120.818	0.5	0.3
2.7	1986/06/10 23:12:42 PDT	13.4 km (8.3 mi) NNE (18. azimuth) from Entiat, WA	47.776	-120.168	7.5	4.7
2.2	1986/06/05 13:59:03 PDT	13.7 km (8.5 mi) W (278. azimuth) from Entiat, WA	47.6793	-120.404	7.7	4.8
3.3	1986/04/08 02:57:37 PST	12.1 km (7.5 mi) N (357. azimuth) from Entiat, WA	47.77	-120.23	12.9	8
2.2	1985/11/20 03:18:10 PST	7.0 km (4.3 mi) NNW (330. azimuth) from Entiat, WA	47.7162	-120.27	6.8	4.2
3.2	1985/10/10 03:06:40 PDT	10.2 km (6.4 mi) NNW (342. azimuth) from Entiat, WA	47.7492	-120.266	6.2	3.8
2.1	1985/09/20 02:14:17 PDT	2.5 km (1.5 mi) NE (49. azimuth) from Entiat, WA	47.6763	-120.198	-0.2	-0.1
2.1	1985/08/27 20:53:33 PDT	5.5 km (3.4 mi) W (275. azimuth) from Entiat, WA	47.6658	-120.296	1.8	1.1
2.3	1985/07/29 21:07:25 PDT	6.5 km (4.0 mi) ENE (74. azimuth) from Entiat, WA	47.6778	-120.14	3	1.8
2.1	1985/07/28 12:45:47 PDT	10.7 km (6.6 mi) NW (314. azimuth) from Entiat, WA	47.7278	-120.327	5.8	3.6
2.6	1985/03/23 12:29:51 PST	42.7 km (26.6 mi) ENE (63. azimuth) from Skykomish, WA	47.8805	-120.853	0.7	0.4
2.1	1985/02/05 11:54:21 PST	4.8 km (3.0 mi) ENE (76. azimuth) from Entiat, WA	47.6725	-120.16	-0.2	-0.1
2.1	1984/09/29 17:11:08 PDT	14.1 km (8.7 mi) WSW (255. azimuth) from Entiat, WA	47.6293	-120.405	3	1.9

2.1	1984/09/23 00:02:36 PDT	1.0 km (0.6 mi) SSW (194. azimuth) from Entiat, WA	47.6528	-120.226	1.5	0.9
2.1	1984/09/13 07:47:44 PDT	4.2 km (2.6 mi) E (100. azimuth) from Entiat, WA	47.6552	-120.168	-0.7	-0.4
3	1984/08/23 21:43:07 PDT	31.2 km (19.4 mi) ESE (102. azimuth) from Skykomish, WA	47.6495	-120.955	0	0
2	1984/07/15 17:04:27 PDT	3.0 km (1.9 mi) SE (137. azimuth) from Entiat, WA	47.6418	-120.196	-0.1	-0.1
2	1984/07/15 01:38:22 PDT	8.3 km (5.2 mi) N (3. azimuth) from Entiat, WA	47.7362	-120.217	-0.2	-0.1
2.3	1984/06/13 18:25:13 PDT	60.1 km (37.4 mi) NW (322. azimuth) from Chelan, WA	48.2687	-120.51	6.5	4
2.1	1984/05/09 02:24:37 PDT	9.9 km (6.2 mi) SSW (205. azimuth) from Chelan, WA	47.761	-120.069	0.3	0.2
2	1984/04/22 16:15:55 PST	26.1 km (16.2 mi) WNW (295. azimuth) from Wenatchee, Wa	47.5195	-120.632	-0.1	-0.1
2.1	1984/03/18 05:26:46 PST	12.2 km (7.6 mi) SW (221. azimuth) from Entiat, WA	47.579	-120.331	8.9	5.5
2.3	1984/02/18 18:07:34 PST	25.3 km (15.7 mi) WNW (297. azimuth) from Wenatchee, Wa	47.5233	-120.617	6.2	3.9
2.3	1984/01/29 03:20:31 PST	11.2 km (7.0 mi) WSW (251. azimuth) from Entiat, WA	47.6297	-120.365	3	1.9
2.3	1983/12/25 03:06:37 PST	8.8 km (5.5 mi) NE (51. azimuth) from Entiat, WA	47.7112	-120.131	4.4	2.7
2.2	1983/10/28 00:57:51 PDT	27.2 km (16.9 mi) WNW (295. azimuth) from Wenatchee, Wa	47.5225	-120.645	0.9	0.6
2.6	1983/09/14 03:51:01 PDT	6.9 km (4.3 mi) NNW (327. azimuth) from Entiat, WA	47.7137	-120.273	3.9	2.4
2.5	1983/09/14 02:03:02 PDT	7.1 km (4.4 mi) NNW (329. azimuth) from Entiat, WA	47.7162	-120.272	3.7	2.3

2.4	1983/09/13 13:33:39 PDT	11.7 km (7.3 mi) NW (319. azimuth) from Entiat, WA	47.7403	-120.326	3.2	2
2.2	1983/07/09 02:49:18 PDT	4.9 km (3.1 mi) NNE (33. azimuth) from Entiat, WA	47.6988	-120.188	4.9	3.1
2.1	1983/07/03 18:58:59 PDT	25.5 km (15.9 mi) WNW (299. azimuth) from Wenatchee, Wa	47.53	-120.615	7.6	4.7
2.7	1983/06/10 11:20:07 PDT	4.7 km (2.9 mi) W (263. azimuth) from Entiat, WA	47.6567	-120.285	4.2	2.6
2.2	1983/01/14 19:06:13 PST	14.4 km (9.0 mi) SW (219. azimuth) from Entiat, WA	47.561	-120.344	3.6	2.2
2.3	1982/10/18 13:43:31 PDT	8.4 km (5.2 mi) NNW (341. azimuth) from Chelan, WA	47.9133	-120.05	-0.8	-0.5
2.1	1982/10/15 18:31:15 PDT	24.2 km (15.1 mi) WNW (297. azimuth) from Wenatchee, Wa	47.518	-120.605	5.5	3.4
2.2	1982/10/14 02:24:18 PDT	40.0 km (24.9 mi) ENE (69. azimuth) from Skykomish, WA	47.8358	-120.864	8.9	5.5
2.4	1982/10/14 01:53:39 PDT	6.3 km (3.9 mi) NNE (22. azimuth) from Entiat, WA	47.7147	-120.192	3.1	1.9
2.4	1982/03/04 13:39:48 PST	8.9 km (5.5 mi) NW (319. azimuth) from Entiat, WA	47.7217	-120.301	5.9	3.7
2	1981/11/07 20:44:11 PST	11.3 km (7.0 mi) NNE (11. azimuth) from Entiat, WA	47.7615	-120.193	5.2	3.2
3.2	1981/10/24 20:21:03 PDT	10.9 km (6.8 mi) N (11. azimuth) from Entiat, WA	47.7585	-120.196	6.9	4.3
2.3	1981/07/30 08:39:07 PDT	3.4 km (2.1 mi) E (94. azimuth) from Entiat, WA	47.6597	-120.178	-0.3	-0.2
3	1981/07/21 23:05:50 PDT	13.8 km (8.6 mi) NNW (339. azimuth) from Entiat, WA	47.7775	-120.288	8.8	5.4
2.6	1981/05/26 14:10:23 PDT	4.7 km (2.9 mi) W (264. azimuth) from Entiat, WA	47.6575	-120.286	1.9	1.2

2.7	1981/04/01 08:45:30 PST	8.9 km (5.5 mi) W (279. azimuth) from Entiat, WA	47.6747	-120.341	-0.3	-0.2
2.2	1980/12/03 15:46:22 PST	6.9 km (4.3 mi) ENE (69. azimuth) from Entiat, WA	47.6842	-120.137	1.5	0.9
2.6	1980/09/28 20:53:52 PDT	10.6 km (6.6 mi) N (355. azimuth) from Entiat, WA	47.7567	-120.236	-0.1	-0.1
2.3	1980/04/24 12:59:39 PST	21.0 km (13.0 mi) WNW (300. azimuth) from Entiat, WA	47.7547	-120.467	6.1	3.8
2.5	1980/03/06 18:58:32 PST	13.0 km (8.1 mi) NE (52. azimuth) from Entiat, WA	47.7333	-120.086	1.3	0.8
2.5	1979/07/06 11:10:32 PDT	9.2 km (5.7 mi) W (273. azimuth) from Entiat, WA	47.6663	-120.345	3.9	2.4
2.4	1979/05/19 01:56:31 PDT	6.8 km (4.2 mi) NW (318. azimuth) from Entiat, WA	47.7068	-120.284	6.5	4.1
3.3	1978/04/16 11:45:16 PST	8.4 km (5.2 mi) N (352. azimuth) from Entiat, WA	47.7368	-120.239	4	2.5
3.3	1978/01/24 17:09:20 PST	9.6 km (6.0 mi) NW (310. azimuth) from Chelan, WA	47.8968	-120.112	-0.2	-0.1
2.2	1978/01/18 02:59:32 PST	9.5 km (5.9 mi) NW (309. azimuth) from Chelan, WA	47.8957	-120.112	0	0
2.1	1977/12/21 22:47:57 PST	7.3 km (4.5 mi) WNW (282. azimuth) from Entiat, WA	47.6752	-120.318	5.4	3.4
2.3	1977/08/29 05:40:38 PDT	7.5 km (4.7 mi) NW (323. azimuth) from Entiat, WA	47.716	-120.283	7.1	4.4
2	1977/05/09 16:50:43 PDT	6.6 km (4.1 mi) N (7. azimuth) from Entiat, WA	47.7208	-120.212	0.2	0.1
2	1977/03/10 02:44:53 PST	2.2 km (1.4 mi) ESE (118. azimuth) from Entiat, WA	47.6525	-120.197	6.1	3.8
2	1976/12/22 06:03:52 PST	62.9 km (39.1 mi) SE (141. azimuth) from Diablo, WA	48.2742	-120.605	10.8	6.7

3.1	1976/08/30 09:34:01 PDT	1.9 km (1.2 mi) ESE (118. azimuth) from Entiat, WA	47.6537	-120.2	4.7	2.9
2.3	1976/08/30 05:28:36 PDT	11.7 km (7.3 mi) N (0. azimuth) from Entiat, WA	47.7672	-120.222	-0.2	-0.1
3	1976/06/15 02:08:04 PDT	8.8 km (5.5 mi) WSW (242. azimuth) from Entiat, WA	47.6247	-120.327	0	0
2.1	1976/05/16 18:19:05 PDT	13.3 km (8.3 mi) NW (322. azimuth) from Entiat, WA	47.7557	-120.334	-0.2	-0.1
2.2	1976/05/12 21:33:00 PDT	3.7 km (2.3 mi) ESE (123. azimuth) from Entiat, WA	47.6438	-120.182	8.9	5.5
2.1	1976/04/21 14:33:46 PST	14.4 km (9.0 mi) W (266. azimuth) from Chelan, WA	47.8323	-120.206	-0.3	-0.2
2.4	1975/10/13 02:57:20 PDT	3.0 km (1.9 mi) NNW (331. azimuth) from Entiat, WA	47.6852	-120.243	15.5	9.6
2.6	1975/07/18 15:47:01 PDT	5.5 km (3.4 mi) NE (54. azimuth) from Entiat, WA	47.6908	-120.164	2.5	1.5
2	1972/12/12 09:53:59 PST	8.1 km (5.0 mi) NNW (337. azimuth) from Entiat, WA	47.7287	-120.265	2.2	1.3
2.3	1972/11/15 17:30:36 PST	10.1 km (6.3 mi) NW (318. azimuth) from Entiat, WA	47.7292	-120.313	5.1	3.1
2.2	1972/09/29 21:09:28 PDT	9.4 km (5.9 mi) W (278. azimuth) from Chelan, WA	47.854	-120.138	7.2	4.5
2.3	1972/05/02 22:08:26 PDT	8.6 km (5.4 mi) NW (304. azimuth) from Entiat, WA	47.7055	-120.318	4.3	2.7
2	1971/06/16 07:33:12 PDT	27.3 km (17.0 mi) E (92. azimuth) from Skykomish, WA	47.6975	-120.998	-1.3	-0.8
2.3	1971/03/19 17:03:56 PST	8.2 km (5.1 mi) NNW (340. azimuth) from Entiat, WA	47.7307	-120.26	2.2	1.3
2.7	1971/02/28 17:33:31 PST	5.5 km (3.4 mi) NE (45. azimuth) from Entiat, WA	47.6965	-120.172	8.4	5.2
2.2	1970/10/12 04:12:28	26.3 km (16.3 mi) E (100. azimuth) from Skykomish, WA	47.665	-	10.7	6.7

	PDT			121.017		
3.2	1969/03/19 16:39:12 PST	47.8 km (29.7 mi) ESE (111. azimuth) from Darrington, WA	48.0998	-121	18	11.2