

# 2009

## Seattle Fire Weather

# Operating Plan

### **Changes for 2009:**

*New Fire Weather Watch/Red Flag Warning Criteria for a Very Dry and Unstable Air Mass amended for Fire Weather Zone 662.*

### **LOCATION**

The National Weather Service Forecast Office in Seattle is located at the NOAA Western Regional Center in northeast Seattle. The address is:

National Weather Service  
7600 Sandpoint Way N.E.  
Seattle, WA 98115-0070

### **HOURS OF OPERATION**

The National Weather Service Office in Seattle is open 24 hours a day, 7 days a week, every day of the year. During fire season, the Fire Weather desk is staffed by a certified and experienced Fire Weather forecaster between the hours of 7:00 a.m. and 5:00 p.m. In 2009, weekday fire desk staffing and twice-a-day Fire Weather Planning Forecasts will begin around May 22 (the Friday before Memorial Day). 7-day-a-week Fire Weather desk staffing will begin on Monday, June 29. The need for continuation of Fire Weather desk staffing will start being evaluated around the first or second week of October. The exact dates of Fire Weather desk staffing can be adjusted based on weather conditions and user requirements or requests.

After hours during fire season and during the off-season, Spot Forecast support or phone briefings will be handled by staff meteorologists, trained in fire weather forecasting, on a 24/7 basis. A Fire Weather forecaster can be made available with prior arrangements.

### **Certified Fire Weather Forecast Staff**

Brad Colman – Meteorologist in Charge  
Ted Buehner – Warning Coordination Meteorologist  
Kirby Cook – Science and Operations Officer  
Brent Bower - Service Hydrologist  
Jim Prange – Fire Weather Program Leader/IMET  
Andy Haner– Asst. Fire Weather Program Leader/IMET  
Carl Cerniglia – Asst. Fire Weather Program Leader/IMET  
Danny Mercer – Fire Weather Forecaster/Instructor  
Jeff Michalski – Fire Weather Forecaster

### **PHONE NUMBERS**

RING THROUGH (24/7)	(206) 526-6095, then follow voice options.
Brad Colman, Meteorologist in Charge	(206) 526-6095 ext 222
Jim Prange, Program Leader	(206) 526-6095 ext 252
Andy Haner, Asst. Program Leader	(206) 526-6095 ext 251
Carl Cerniglia, Asst. Program Leader	(206) 526-6095 ext 233

### **E-MAIL**

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### **INTERNET**

Our Internet home page can be found at:

<http://www.wrh.noaa.gov/sew/> or <http://www.weather.gov/seattle>

Click the fire weather link on the main menu to access fire weather products.

Statewide, Internet-based, fire weather briefings will be conducted routinely Monday through Friday at 9:00 a.m. during the fire season. Additional daily, weekend and holiday Internet briefings may be conducted during critical fire weather episodes as coordinated with the land management agencies. Contact this office for the appropriate telephone number and conference ID to participate in the conference calls.

Requests for spot forecasts can be made via our Internet web site at "<http://www.wrh.noaa.gov/firewx/?wfo=sew>". Click the "Spot Request" Button then "Submit a new Spot Request" and fill out the form. Instructions for completing the Spot Request Form are under the "ADMIN" button. Completed spot forecasts will be posted to the web server as soon as possible after the original request is received. This provides a one-stop-shopping method for requesting and obtaining spot forecasts. The Internet web site is the preferred format for requesting Spot Forecasts. Please notify the NWS Seattle if no spot forecast is received within a reasonable amount time. *If at all possible, spot forecasts should be accompanied by an onsite weather observation. It should be understood that the quality of a spot forecast is highly dependent upon getting initial, accurate onsite weather conditions.*

## **FORECAST DISTRICT**

The Seattle Fire Weather Office has forecast responsibility for most state and federal land in Western Washington. The Portland Fire Weather Office handles the Gifford Pinchot National Forest south of a line from Mt. St. Helens to Mt. Adams to the Oregon border. The Seattle fire weather district is divided into 5 distinct areas or districts for fire weather forecasting. The areas are further divided into 13 separate fire weather zones. Each fire weather zone is comprised of fire weather stations that exhibit similar weather and/or weather changes. However, not all of the fire weather stations report on a regular basis.

## **FORECAST PRODUCTS**

### **1. FIRE WEATHER PLANNING FORECASTS**

During the "fire season", twice-daily Fire Weather Planning Forecasts are issued by 8:30 AM PT and 3:30 PM PT. NFDRS Zone Trend forecasts are issued daily with the afternoon Fire Weather Planning Forecast. A modified Fire Weather Planning Forecast will be issued Monday through Friday during the "off-season", normally from about mid-October to early- May. The off-season forecasts are available in WIMS and on the Internet by 9:00 AM PT.

### **2. FIRE WEATHER WATCHES AND RED FLAG WARNINGS**

Mission Connection: Fire Weather Watches and Red Flag Warnings will be issued when the combination of dry fuels and weather conditions support extreme fire danger and/or fire behavior. These conditions alert land management agencies to the potential for widespread new ignitions, overwhelming Initial Attack activities, control problems with existing fires, etc; any of which could pose a threat to life and property.

Fire Weather Watches and Red Flag Warnings will be issued during Fire Season in the Seattle Fire Weather District, ***when the Energy Release Component***, as described by the National Fire Danger Rating System, ***is equal to or greater than the 90th percentile value in the frequency distribution of historical ERCs.*** Also, for the fire

weather zones above 1500 feet msl, the *Northwest GACC Dryness Levels* will be considered when in the “YELLOW OR BROWN” under extreme or unusual weather conditions.

The conditions described below must either be occurring or forecast to occur within the next 72 hours. The table below shows the 90th percentile ERC values that will be used for each fire weather zone.

### **90th Percentile ERC**

Zone 649:	17
Zone 650, 651, 653, 656, 657	25
Zone 652, 654, 655, 658, 659	31
Zone 661	34
Zone 662	73

### **Strong East Winds and Low Humidity (Westside zones only)**

- Nighttime hours (midnight to 7 am):

Duration: 5 hours

Wind Speed: 20 ft /10 min avg. wind greater than or equal to 10 mph (RAWS)  
- **OR** –  
30 ft /2 minute avg. wind greater than or equal to 12 mph (ASOS)

RH: less than or equal to 35%.

#### SUFFICIENTLY DRY FUELS

- Daytime hours (7 am to midnight):

Duration: 4 hours in an 8 hour block

Wind Speed: 20 ft/10 min average wind greater than 10 mph      - **OR** –  
30 ft /2 min average wind greater than 12 mph

RH: less than or equal to 30%, except less than or equal to 25% on the Gifford-Pinchot NF south of the Cowlitz River.

#### SUFFICIENTLY DRY FUELS

### **Verifying Stations for East Wind episodes**

Many fire weather stations in Western Washington do not show good exposure to strong east winds. Therefore, Red Flag Warnings for East Wind episodes will

verify in the following zones when criteria are met at the following defined stations. A station is considered any ***NFDRS*** site. Additional METAR, DOT, DOE, etc., weather sites will also be queried to add additional wind, temperature and relative humidity data to enhance the verification process and document the East Wind Event.

- Zone 649: Any two stations within the zone
- Zone 650: Any single station within the zone **or** Quillayute ASOS
- Zone 651: At the Minot RAWs site – **or** –  
at both the Shelton and Hoquiam ASOS sites.
- Zone 652: Any two stations within the zone – **or** –  
at both the Ellis Mtn and Hurricane Ridge RAWs sites.
- Zone 653: Any two stations within the zone
- Zone 654: Any two stations within the zone (including Olympia ASOS)
- Zone 655: Any station within the zone – **or** –  
at both of the Shelton ASOS and Minot Peak RAWs sites.
- Zone 656: Any single station under 1500 feet within Whatcom, Skagit, or Snohomish County
- Zone 657: Any single station under 1500 feet within King or Pierce County
- Zone 658: Any single station within the zone – **and** –  
one of the following sites: Greenwater, Lester, Stampede Pass, and Kosmos Mountain
- Zone 659: Any two stations within the zone
- Zone 661: Any single station within the zone – **or** –  
*both* the Ellis Mtn. and Minot Peak RAWs sites.

**Strong West Winds and Low Humidity (Eastside zone 662 only)**

- Duration: at least 4 hours
- Wind Speed: 20 ft /10 minute average wind greater than or equal to 15 mph
- RH: less than or equal to 25%.

**SUFFICIENTLY DRY FUELS**

Stehekin and Camp Four RAWs will be used to verify Red Flag Warnings in zone 662.

The conditions described above should be fairly widespread in both time and space across the fire weather zone - as opposed to an isolated incident or a diurnal occurrence that lasts for only a few hours.

## **Lightning**

Dry lightning (LAL 6) occurs when the environment below the cloud base is so dry that passing thunderstorms produce little or no precipitation at the surface. A Fire Weather Watch or Red Flag Warning will be issued for the combination of sufficiently dry fuels and the occurrence of significant lightning, wet or dry, within a particular Fire Weather Zone, to cause a threat to life and property. The thunderstorm activity must be at least **scattered (25-54% aerial coverage) or greater** within a particular zone.

### **Very Dry and Unstable Air Mass**

***Western Washington Fire Weather Zones 649-661:*** Mid and High-level Haines of a 5 or 6, RH at 25% or less, **AND** sufficiently dry fuels.

***Eastern Washington Fire Weather Zone 662:*** High-level Haines of a 6, RH at 15% or less, **AND** sufficiently dry fuels.

The most current Quillayute and Spokane soundings will be used to produce the mid and high level Haines values used to issue and verify this Red Flag Warning event.

***Each potential Red Flag event will be coordinated with local land management agencies to ensure environmental conditions are sufficiently critical to justify the issuance of a watch or warning.***

### **3. SPOT FORECASTS**

**Mission Connection:** WFO Seattle will issue spot forecasts in support of wildfire suppression and natural resource management. These forecasts aid the land management and fire control agencies in protecting life and property during wildland fires, hazardous fuels reduction, and rehabilitation and restoration of natural resources. Spot forecasts may also be issued for hazardous materials incidents, search and rescue missions and other threats to public safety. All spot forecasts should be accompanied by an onsite weather observation.

**Issuance Criteria:** Spot forecasts are non-routine products issued at the request of the user. WFO Seattle will provide spot forecast service upon request of any federal, state, tribal, or local official who represents the spot forecast is required to support a wildfire.

For non-wildfire purposes, resources permitting, WFO Seattle will provide spot forecast service under the following circumstances and conditions:

a. Upon request of any federal official who represents that the spot forecast is required under the terms of the Interagency Agreement for Meteorological Services (NWS Instruction 10-406).

b. Upon request of any state, tribal, or local official who represents that the spot forecast is required to carry out their wildland fire management responsibilities in coordination with any federal land management agency participating in the Interagency Agreement for Meteorological Services (NWS Instruction 10-406).

c. Upon request of any public safety official who represents the spot forecast is essential to public safety, e.g. due to the proximity of population centers or critical infrastructure. A “public safety official” is an employee or contract agent of a government agency at any level (federal, state, local, tribal, etc.) charged with protecting the public from hazards including wildland fires of whatever origin and/or other hazards influenced by weather conditions such as hazardous material releases.

WFO Seattle will not provide spot forecasts to private citizens or commercial entities not acting as an agent of a government agency.

Information required by the fire weather forecaster from the requesting agency is found on WS Form D-1. Spot forecasts for wildfire suppression will take precedence over normal office routines.

## **AGENCIES SERVED**

The Seattle Fire Weather Office serves the following state and federal land management agencies:

**United States Forest Service** - Olympic National Forest, Mt. Baker-Snoqualmie National Forest, Gifford-Pinchot National Forest and Okanogan-Wenatchee National Forest

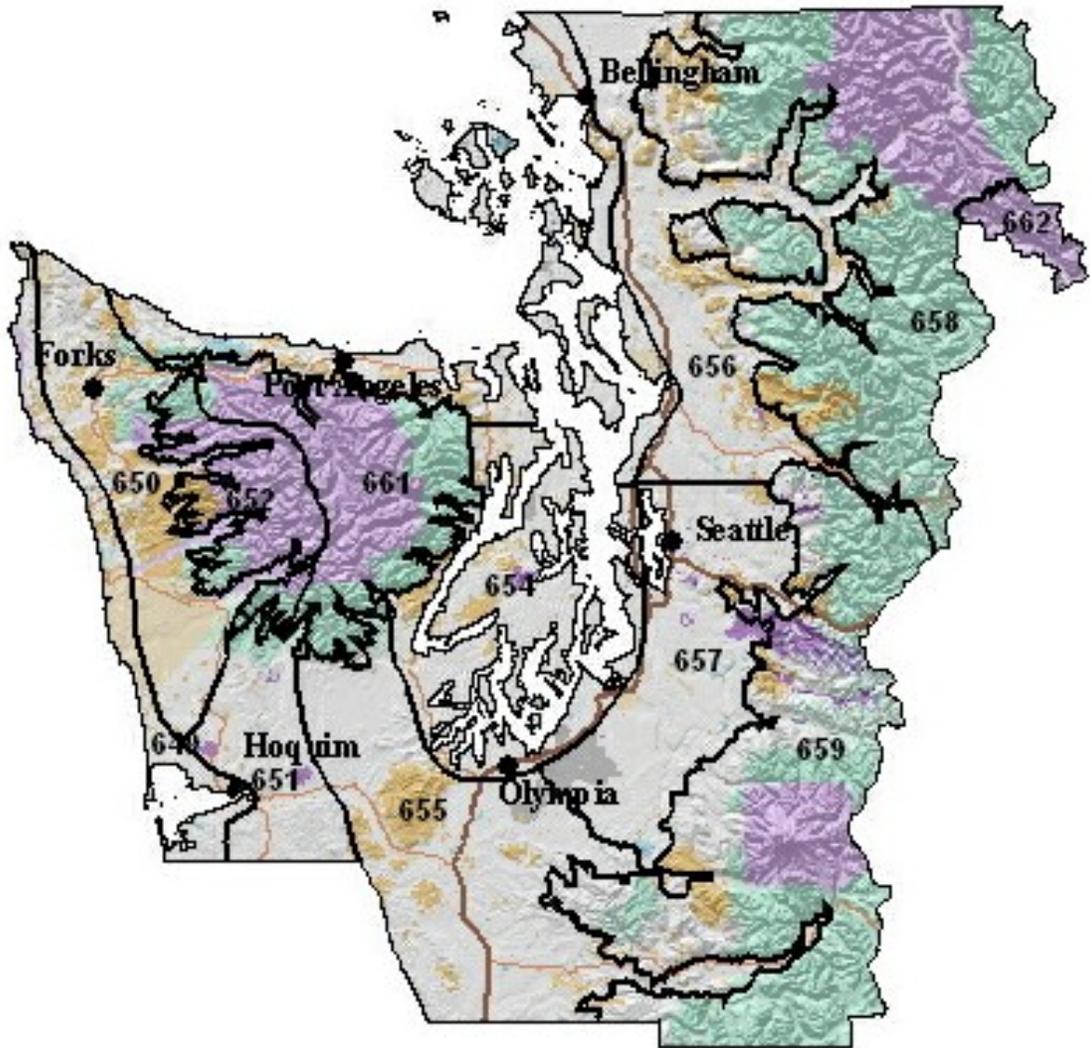
**National Park Service** - North Cascades National Park, Olympic National Park, Mt. Rainier National Park and San Juan Islands National Park

**Bureau of Indian Affairs** - Olympic Peninsula Agency and Puget Sound Agency

**Washington Department of Natural Resources** - Resource Protection Division and the Northwest, Olympic, South Puget Sound, and Pacific Cascade regions.

**United States Army** – Ft. Lewis Wildland Fire Program.

## Seattle Fire Weather Zones



**Appendix 1: Fire Weather Zone Descriptions**

**Appendix 2: NFDRS Fire Weather Station List**

## **Appendix 1**

### **FIRE WEATHER ZONE BOUNDARY DESCRIPTIONS**

**Zone 649 – The North and Central Coastal Strip:** The western boundary of fire weather zone 649 is the Pacific coastline in Clallam, Jefferson, and Grays Harbor counties. The eastern boundary includes all Federal, State and private land within 5 miles of the Pacific coastline in Clallam, Jefferson, and Grays Harbor Counties. It extends south along the eastern border of the Makah Indian Reservation and the east shore of Ozette Lake to the town of Quillayute in Clallam County. In Jefferson County, the eastern boundary crosses US Highway 101 approximately 5 miles east of the Hoh Indian Reservation, and then parallels the coast south until crossing US Highway 101 again along the border between Jefferson and Grays Harbor counties 5 miles inland from the coast. The eastern border continues south in Grays Harbor County until it crosses highway 101 at New London and US Highway 12 approximately 5 miles east of Aberdeen. The boundary then turns south, following US Highway 101 to the southern border of Grays Harbor County.

**Zone 650 – The North Coastal Lowlands:** Zone 650 includes all State, Federal and private land 5 miles inland from the coast to an elevation of 1500 ft on the western side of the Olympic Mountains in Clallam, Jefferson, and Grays Harbor Counties. The area includes the low elevation portion of the Calawah, Bogachiel, Hoh, Clearwater, Queets, Quinault, and the Humptulips River drainages below 1500 ft. The southern boundary begins where the Humptulips River crosses the southern boundary of Zone 652, stretching southwest along the Humptulips River until it intersects the eastern boundary of zone 649 in Grays Harbor County.

**Zone 651 – The Central Coastal Lowlands:** The western boundary of zone 651 follows the Humptulips River and the eastern boundary of zone 649 in Grays Harbor County. The 1,500-foot contour interval on the south side of the Olympic Mountains forms the northern border of zone 651. The county line between Grays Harbor County and Pacific County forms the southern boundary. The eastern border follows the West Fork of the Satsop River south across US Highway 12 near the town of Satsop, continuing south along the west side of the Lower Chehalis State Forest. Zone 651 is mostly State and Private land, but also includes Forest Service land below 1500 ft in the Humptulips and Wynochee River drainages.

**Zone 652 – The West Portion of the Olympic Mountains:** Zone 652 includes US Forest Service, National Park Service, and Washington State lands at or above 1500 feet located in the western half of Clallam and Jefferson counties, and the far northeast corner of Grays Harbor County. The area includes the Pacific Ranger District office on the west and southwest side of the Olympic National Forest. Zone 652 is the wetter, west side of the Olympic Peninsula that reflects a greater influence of marine air in both weather and fire danger. The area includes all private, federal and state lands at or above 1,500 feet drained by the Calawah, Sitkum, Bogachiel, Hoh, Clearwater, Queets, Quinault, and Humptulips rivers in Clallam, Jefferson, and Grays Harbor counties.

**Zone 661 – The East Portion of the Olympic Mountains:** Zone 661 includes private, federal and state land at or above 1,500 feet on the east side of the Olympic Peninsula. The area typically exhibits higher fire danger than zone 652 due to less rainfall, less influence of marine air, and a higher occurrence of lightning activity. The area includes lands at or above 1,500 feet drained by the Wynoochee, Satsop, North and South Fork Skokomish, Hamma Hamma, Duckabush, Dosewallips, Quilcene, Dungeness, and the Elwha rivers.

**Zone 653 – The Strait of Juan de Fuca, the San Juan Islands and the Northwest Interior Lowlands:** Zone 653 includes all lands below 1500 ft msl on the north side of the Olympic Peninsula from the town of Sekiu on the west to a point just south of Discovery Bay on the east. The boundary extends southeast across Admiralty Inlet, east across the northern tip of the Kitsap Peninsula and Puget Sound to Interstate 5 along the border between King and Snohomish Counties. The eastern boundary of zone 653 parallels I-5 north through Snohomish, Skagit and Whatcom counties to the Canadian border.

**Zone 654 – The Central and South Puget Sound Lowlands:** Zone 654 includes lowland areas below 1,500 feet near the central and southern portion of Puget Sound and Hood Canal. The eastern boundary parallels I-5 south through King and Pierce counties, west through Olympia in Thurston County, then northwest along U.S. Highway 101 to city of Shelton. The boundary continues northwest from Shelton to the southeast corner of the Olympic National Forest in Mason County, then follows the 1500 ft contour northeast along the Hood Canal in Mason and Jefferson Counties.

**Zone 655 – The Black Hills and the Southwest Interior Lowlands:** The eastern border of zone 655 follows the West Fork of the Satsop River south across US Highway 12 near the town of Satsop, continuing south along the west side of the Lower Chehalis State Forest to the town of Brooklyn in northeast corner of Pacific County. From Brooklyn the boundary extends southeast to the town of Pe El in the eastern portion of Lewis County and then continues southeast to the town of Vader in Lewis County. The border then runs east along the southern border of Lewis County to the 1,500-foot contour along the west slopes of the Cascades. The boundary follows the contour on the north and south sides of the Cowlitz river valley. It then continues north along the 1,500-foot contour to the boundary between Thurston and Lewis Counties. The zone boundary then extends east to the intersection of Pierce, Thurston, and Lewis Counties. It then follows the Pierce/Thurston County boundary northwest to the intersection of I-5 and then west along I-5 to US Highway 101. Zone 655 then extends northwest paralleling 101 to the southeast corner of the Olympic National Forest in Mason County. The area includes the Capitol State Forest and the Lower Chehalis State Forest.

**Zone 656 – The West Slopes of the North Cascades below 1,500 feet:**

Zone 656 includes all State and Private lands in Whatcom, Skagit, and Snohomish Counties east of I-5 below an elevation of 1500 feet. This includes the following river drainages...North, Middle and South Forks of the Nooksack River, Skagit River from town of Sedro Woolley to the town of Marblemount (including Lake Shannon and Baker

Lakes in the Baker River drainage), Sauk River from the confluence of the Sauk and Skagit Rivers south along SR 530 to the town of Darrington, the Stillaguamish River from Darrington to the town of Arlington, and the Skykomish River along US Highway 2 from the town of Monroe to six miles east of the town of Skykomish.

**Zone 657 – The West Slopes of the Central Cascades** *below* 1,500 feet:

Zone 657 includes land below 1500 ft east of I-5 in King and Pierce Counties. The southern border of the zone follows the border between Pierce and Thurston Counties. This area includes the following river valleys below 1500 ft that reach into the Cascade Mountains...North, Middle and South Fork of the Snoqualmie River, White River including Mud Mountain Lake, Puyallup River, and the Nisqually River to the town of Ashford.

**Zone 658 – The West Slopes of the North Cascades** *above* 1,500 feet:

Zone 658 includes Federal, State and Private lands at or above 1500 feet in Whatcom, Skagit, Snohomish, and the northeast portion of King County in the Skykomish River drainage. The area includes the North Cascades National Park and the Ross Lake National Recreational Area, and the Mt. Baker, Darrington, and Skykomish Ranger Districts of the Mt. Baker-Snoqualmie National Forest. The eastern boundary is the Cascade crest.

**Zone 659 – The West Slopes of the Central Cascades** *above* 1,500 feet:

Zone 659 includes Federal, State and Private lands at or above 1500 ft in King, Pierce, and Lewis Counties, and the extreme northern portion of Skamania County. This includes the North Bend and White River Ranger Districts of the Mt. Baker-Snoqualmie National Forest, Mt. Rainier National Park, and the Cowlitz Valley Ranger District of the Gifford Pinchot National Forest. The eastern boundary of this zone runs along the crest of the Cascades.

**Zone 662 – The East Portion of North Cascades National Park and the Lake Chelan National Recreational Area:**

Zone 662 includes federal lands managed by the North Cascades National Park east of the Cascade crest in Chelan County. This area includes the Lake Chelan National Recreational Area and the North Cascades National Park South Unit.

**Appendix 2**  
**2009 NWS Seattle NFDRS Station Index**

<b>ZONE</b>	<b><u>NAME</u></b>	<b><u>TYPE</u></b>	<b><u>NUMBER</u></b>	<b>OWNER</b>	<b>LAT</b>	<b>LON</b>	<b>ELEV</b>
<b>649</b>	Quillayute	Metar	450120	DNR	47.937	124.563	194
	Hoquiam	Metar	450314	DNR	46.930	123.933	18
	Black Knob	RAWS	450321	BIA	47.414	124.103	650
<b>650</b>	Ellis Mtn.	RAWS	450130	DNR	48.129	124.305	2671
	Forks	Manual	450105	DNR	47.955	124.385	303
<b>651</b>	Minot Peak	RAWS	450306	DNR	46.883	123.416	1768
<b>652</b>	Toms Creek	RAWS	450121	USFS	48.018	123.918	2400
	Owl Mtn.	RAWS	450211	DNR	47.766	123.965	3398
	Humptulips	RAWS	450312	USFS	47.367	123.467	2400
<b>661</b>	Hurricane Ridge	RAWS	450124	NPS	47.970	123.498	5200
	Cougar	RAWS	450117	USFS	47.917	123.117	3000
	Jefferson	RAWS	450911	USFS	47.550	123.167	2200
	Buck Knoll	RAWS	450131	DNR	48.028	123.311	1630
<b>653</b>	Bellingham	Metar	451411	DNR	48.793	122.538	170
	Everett	Metar	451614	DNR	47.906	122.282	606
	Navy Whidbey	Metar	450701	DNR	48.352	122.656	47
<b>654</b>	Bremerton	Metar	450801	DNR	47.4.90	122.765	444
	Quilcene	RAWS	450207	USFS	47.567	124.152	62
	Sea-Tac	Metar	451716	DNR	47.449	122.309	433
	Tacoma (McChord AFB)	Metar	451808	DNR	47.138	122.476	322
<b>655</b>	Olympia	Metar	451001	DNR	46.969	122.903	209
	Chehalis	RAWS	451103	DNR	46.610	122.908	245
<b>656</b>	Deming ( Abbotsford)	Metar	451402	DNR	48.829	122.229	220
	Sedro Woolley	Manual	451507	DNR	48.524	122.225	160
	Marblemount	RAWS	451504	NPS	48.539	121.446	357
<b>657</b>	Enumclaw	RAWS	451702	DNR	47.220	121.964	742
	Elbe	Manual	451803	DNR	46.763	122.067	1754
<b>658</b>	Kidney Creek	RAWS	451409	USFS	48.920	121.943	3000

	Hozameen	RAWS	451412	NPS	48.981	121.078	1700
	Sumas Mtn.	RAWS	451415	DNR	48.910	122.231	3201
	Finney Creek	RAWS	451509	USFS	48.403	121.790	1900
	Gold Hill	RAWS	451613	USFS	48.243	121.546	3020
	Johnson Ridge	RAWS	451611	USFS	47.800	121.272	2000
<b>659</b>	Fire Training Acad.	RAWS	451721	USFS	47.454	121.666	1570
	Stampede Pass	Metar	451711	DNR	47.277	121.337	3967
	Lester	RAWS	451705	USFS	47.208	121.525	1615
	Greenwater	RAWS	451718	DNR	47.155	121.611	2400
	Ohanapecosh	RAWS	451119	NPS	46.731	121.569	1900
	Kosmos	RAWS	451105	DNR	46.528	122.201	2100
	Hagar Creek	RAWS	451115	USFS	46.567	121.631	3600
	Orr Creek	RAWS	451919	USFS	46.351	121.601	3000
<b>662</b>	Stehekin	RAWS	452121	NPS	48.347	120.720	1230

