Northwest Fire Weather Operating Plan

Oregon
Washington

May 2017

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AGENCY SIGNATURES / EFFECTIVE DATES OF THE ANNUAL OPERATING PLAN

This AOP shall be effective on the date of the last signature on this page and will remain in effect until the date the last signature is placed on this page the following year. Updates or amendments may be added in the interim upon agreement of all signatories. Usually, the effective dates are May 1 through May 1 the following year.

Approved by:

Robert W Johnson

Date: 6-21-17

Robert Johnson
Chair, Pacific Northwest Wildfire Coordinating Group

K. J. Cook

Date: 28 June, 2017

~~Logan Johnson~~ Kirby Cook AMIC
Meteorologist-in-Charge, National Weather Service, Seattle WFO
State Liaison Officer for Washington

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Date: 2017.06.22 08:47:15 -07'00'

Date:

David Bright
Meteorologist-in-Charge, National Weather Service, Portland WFO
State Liaison Officer for Oregon

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Chapter 1
Administrative

INTRODUCTION

a. The Pacific Northwest Fire Weather Annual Operating Plan (AOP) constitutes an agreement between the Pacific Northwest Wildfire Coordinating Group (PNWCG), which is comprised of state, local government and Federal land management agencies charged with the protection of life, property and resources within the Pacific Northwest from threat of wildfire; and the National Weather Service (NWS), National Oceanic and Atmospheric Administration, U.S. Department of Commerce, charged with providing weather forecasts to the Nation for the protection of life and property.

   The AOP provides specific procedural and policy information for the delivery of fire weather information to the fire management community in the Pacific Northwest. It is the objective of the NWS and PNWCG to ensure that quality of service is maintained through a mutual analysis of services provided. The NWS and PNWCG work closely in all phases of the fire weather forecast and warning program to resolve concerns and avoid potential inconsistencies in products and services prior to delivery to fire agency customers. The goal of all agencies is to maximize firefighter and public safety through a coordinated delivery of consistent services.

   Fire weather services are a critical building block to fire management agencies in decision-making because human lives and valuable natural resources are at risk. It is the role of the NWS to provide fire weather services and products to fire managers. It is the role of the fire management agencies to analyze and interpret fire weather forecasts into fire danger and fire potential predictions when making decisions essential to the success of fire management actions.

   It is to the mutual advantage of PNWCG and NWS and in the public interest and for firefighter safety to coordinate efforts for weather services for fire management activities in the Pacific Northwest to minimize duplication of efforts and improve efficiency and effectiveness.

b. The general relationship between the NWS and the interagency fire management community is set forth in the following reference documents:

   Interagency Agreement for Meteorological Services Among the Bureau of Land Management, Bureau of Indian Affairs, U.S. Fish and Wildlife Service, and National Park Service of the U.S. Dept. of Interior, the Forest Service of the U.S. Dept. of Agriculture, and the National Weather Service of the U.S. Dept. of Commerce (National MOA or National Agreement);

   National Weather Service NWSI 10-4: Fire Weather Services;

2016 National Mobilization Guide; and

Pacific Northwest Mobilization Guide

c. The PNWCG is comprised of the following Federal and State fire agencies: State of Oregon, Department of Forestry; State of Washington, Department of Natural Resources; USDA Forest Service, Pacific Northwest Region; USDI, National Park Service, Pacific West Region; USDI, Fish and Wildlife Service, Pacific Region; USDI, Bureau of Indian Affairs, Portland Area Office; USDI, Bureau of Land Management, Oregon and Washington.

NWS SERVICES AND RESPONSIBILITIES

The National Weather Service will collaborate with the fire agencies when proposing alterations to the fire weather program and services provided in the Pacific Northwest. NWS-developed proposals are provided to PNWCG for review, assessment, and comment prior to adoption and implementation. NWS considers any concerns expressed by PNWCG, especially as related to performance integrity, in its assessment of change proposals in the fire weather program and other services provided.

Fire Weather Services

1. **Core grids and web-based fire weather decision support**
   National Digital Forecast Database (NDFD) grids are used to produce a wide variety of products and services for fire weather support. Operational status of NWS grid elements is available at the following website:

   http://www.weather.gov/ndfd/resources/NDFD_element_status.pdf

   NWS offices produce several web-based digital planning tools to assist fire weather customers. These include FARSITE weather input data, hourly weather graphs, point forecast matrices, activity planners, hourly weather graphs, and 48-hour element meteograms. Please contact your local servicing NWS office with any questions or for more information.

   NWS fire weather grids for the Pacific Northwest are graphically displayed at http://graphical.weather.gov/sectors/pacnorthwestFireDay.php#tabs.

2. **Fire weather watches and red flag warnings**
   Fire weather watches and red flag warnings are issued when the combination of dry fuels and weather conditions support extreme fire danger and/or fire behavior. These statements alert land management agencies to the potential for widespread new ignitions which could overwhelm initial attack activities, or conditions which could cause control problems on existing fires, etc. Any of these outcomes could pose a threat to life and property.

Fire Weather Watch: A fire weather watch is issued when there is a high potential for the development of a red flag event. A watch is issued 18 to 96 hours in advance of the expected onset of criteria. The watch may be issued for all, or selected portions within a fire weather zone or region. The overall intent of a fire weather watch is to alert forecast users at least a day in advance for the purposes of resource allocation and fire fighter safety.

Red Flag Warning: A red flag Warning is used to warn of impending or occurring red flag conditions. Its issuance denotes a high degree of confidence that weather and fuel conditions consistent with local red flag event criteria will occur in 48 hours or less. Longer lead times are allowed when confidence is very high or the fire danger situation is critical. Forecasters can issue a warning for all or selected portions within a fire weather zone.

Prior to issuance, all red flag warnings are coordinated with affected agencies and neighboring fire weather offices, in order to assess fuel conditions and general fire danger. Each issuance, update or cancellation of a fire weather watch or red flag warning is also relayed by telephone to the dispatch office(s) affected by the watch/warning. Red flag warnings and fire weather watches will be issued using a bulleted format.

3. Spot forecasts

Spot forecasts are site specific forecasts issued by the NWS in support of wildfire suppression and natural resource management. Spot forecasts may also be issued for hazardous materials incidents, search and rescue missions and other threats to public and responder safety. All spot forecast requests should be accompanied by a representative on-site weather observation.

Issuance Criteria: Spot forecasts are non-routine products issued at the request of the user. WFOs 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, WFOs will provide spot forecast service under the circumstances and conditions outlined in NWS Instruction 10-401. Spot forecasts will not be provided to private citizens or commercial entities not acting as an agent of a government agency.

Requesting a Spot Forecast: Spot forecast requests are normally made via the Internet through local NWS fire weather pages. When web access is not available, spot forecasts may be requested and disseminated via fax - using the spot forecast request form D-1 (NWSI-401) in Appendix E. An electronic fillable pdf version of WS form D-1 can be found at: 6 http://www.srh.noaa.gov/ridge2/fire/docs/WS_FORM_D_SPOT.pdf

The requestor must provide information about the location (latitude/longitude), slope aspect, drainage name, fuel type(s), top and bottom elevations of fire or project, size of fire or project, ignition time, and contact names and telephone numbers of the responsible land management personnel. **It is critically important that each spot forecast request also include quality, representative observations at, or near, the site. A detailed description of the observation location relative to the project (if not at the site) should be provided. The description should include, at a minimum, distance and direction from the project or fire site, station elevation and aspect.**

An exception to the rule regarding on-site weather observations is as follows: a spot forecast request can be made without an observation if it is on an initial attack fire of less than two hours, there are red flag warnings or fire weather watches in effect, or the available fire weather forecasts is not representative of what is observed at the site. Even in this situation, a representative observation will result in a better forecast.

Fire agencies are strongly encouraged to call the WFO after submitting a spot request to ensure it was received properly. The WFO will attempt to notify field personnel and/or the dispatch office whenever there is a significant change in the expected weather.

For detailed instructions submitting a Spot Forecast Request, go to: http://www.wrh.noaa.gov/sew/NW_SpotRequestInstructions.pdf

Updates to Spot Forecasts: Spot forecasts are considered one-time requests, and are not routinely updated. Spot forecasts may be updated when new representative observations are available to the forecaster or if the forecaster deems the current forecast does not adequately represent current or expected weather conditions. Land or emergency management personnel are encouraged to contact the appropriate WFO for a spot update if forecast conditions appear unrepresentative of the actual weather conditions. The spot forecast will be corrected when a typographical or format error is detected that could confuse the intended meaning. Updated and corrected spot forecasts will be delivered to users in the same manner as the original spot forecast when possible.

Spot Forecast Feedback: Good communication between fire managers and the NWS is critical for quality spot forecast services. Land management personnel should provide feedback to the NWS forecasters about the quality and accuracy of the spot forecast. Responsibility for providing fire line observations for the verification of forecast accuracy rests with the land management agencies. Onsite observations taken during the operational period the forecast is valid for are to be provided back to the WFO via the feedback box online spot forecast form, or by phone, fax or e-mail.

Hysplit Trajectory Output: Hysplit trajectory output is available when requesting a Spot Forecast. See Appendix F for details.

4. **Fire weather planning forecasts**

The Fire weather planning forecast is a zone-type product used by land management personnel primarily for input in decision-making related to pre-suppression and other planning. The decisions impact firefighter safety, protection of the public and 7 property, and resource allocation. Weather parameters represent average conditions across the given zone.

Headlines are included in the fire weather planning forecast (FWF) whenever a red flag warning or fire weather watch is in effect or to highlight other critical weather information. A brief, clear, non-technical discussion of weather patterns that will influence the forecast area will begin the forecast with the emphasis on the first two days of the forecast period. A discussion of latter periods will be included if significant weather is expected to impact safety or operations. Sky and weather, maximum and minimum temperature and relative humidity, wind speed and direction, Haines index, lightning activity level and chance of wetting rain are included in the FWF by all of the WFOs in the Pacific Northwest. Several offices also forecast mixing height and transport winds.

Two forecasts will be issued daily during fire season – a morning forecast between 5 AM and 9 AM and an afternoon forecast around 3 PM. Once-a-day forecasts will continue through the spring and fall burning seasons at the request of the land managers with some offices continuing land management forecasts through the winter. Local start and stop dates shall be coordinated between the NWS offices and fire weather customers, including the geographic area Predictive Services Units.

5. **NFDRS forecasts**

The National Weather Service role in NFDRS is providing weather forecast input, which combined with fire agency input, allows the NFDRS software in WIMS to predict the next day's fire danger indices. These indices impact agency resource management decisions, firefighter safety, and protection of the public and property.

Numerical point forecasts for NFDRS stations are prepared and disseminated to WIMS by 1540 each afternoon from April or May through early October. The point forecasts are used to compute the expected NFDRS indices valid the following day. The number of NFDRS point forecasts made by the weather office depends only on the number of NFDRS observations input into WIMS by the fire agencies. If observations are not entered into WIMS by 1500 however, a forecast may not be produced for those stations. A weather forecaster may also not produce a forecast for sites with highly questionable observations.

6. **Phone briefings**

All Pacific Northwest NWS Offices provide daily fire weather phone briefings each morning during fire season. Local Fire weather users are encouraged to participate in these briefings. The forecaster hosting the briefing will verbally highlight current and forecast fire weather conditions with the help of weather graphics on an internet web page or through a GoToMeeting® webinar. Briefing times, conference call telephone numbers and passcodes can be obtained by contacting the local WFO. A link to the web briefings can be found on the local fire weather page.

7. **Forecast verification**
   Routine verification is made on Red Flag Warnings and NFDRS forecasts. Results of the verification will be published in the Fire Weather Annual Summary. Spot forecast turnaround time and other statistics are available from your local NWS office.

8. **Incident Meteorologist services**
   Each WFO in the Pacific Northwest has 2 or more Incident Meteorologists (IMETs) on staff available for wildfire, HAZMAT, Search and Rescue or other emergency dispatches. To request an IMET, contact the appropriate fire agency dispatch office.

9. **Social media**
   Each NWS office in the Pacific Northwest has a Facebook page, Twitter account, and a YouTube channel. Current information about Fire Weather may be included in social media feeds as time allows, but such information is intended as supplemental information for the general public; NWS use of social media is not intended to meet the specialized needs of the wildland firefighting community.

10. **Non-forecast services**
    Several duties fall into the non-forecast services including, but not limited to: teaching assignments, customer meetings, customer consultations, preparation of annual reports, preparation of annual operating plans, program management, research and in-house training of personnel. Experienced Fire Weather Forecasters will be available to help instruct the weather sections of standard fire behavior training courses offered by federal, state and local government fire agencies. These include S-190 through S-590 and other courses. In addition, a forecaster will be available for special speaking engagements and customer consultations. For scheduling purposes, requests for an instructor or speaker should be made at least three weeks in advance. Requests for NWS personnel to provide training should be accompanied by a separate reimbursement or advance of funds Agreement, if overnight travel is necessary. Every effort should be made to acquire invitational travel orders for the NWS resource, provided by the requesting Agency. Additional information can be found in the National Fire Weather Annual Operating Plan: http://www.weather.gov/fire under the Admin tab, or in Appendix C.

WILDLAND FIRE AGENCY SERVICES AND RESPONSIBILITIES

Provide coordination and recommendations for interagency fire weather activities in Oregon and Washington through the PNWCG. Continually review standards of performance for applicability and adequacy.

Provide weather observations seven days a week during fire season and coordinate and cooperate with the NWS in fire weather forecasting. The agencies will seek the advice and counsel of the NWS regarding observational issues (e.g. moving remote automatic weather stations).

Recognize that other severe weather emergencies may require the services of the fire weather forecaster to assist in WFO operations.

1. User agency responsibilities:

There are several responsibilities of the user agencies including:

- Entering of 1300 LST NFDRS observations in WIMS
- Site observations for Spot Forecast requests
- Quality Control of RAWS observations
- Timely maintenance of RAWS sites

JOINT RESPONSIBILITIES

Work cooperatively as partners to maintain and improve fire weather services to assure full compliance with mutually established performance, reliability, priority, and time standards.

Recognize that lands for which the States are responsible for wildland fire protection in Oregon and Washington, and the lands for which the respective Federal Agencies are responsible, are intermingled or adjacent in some areas, and wildland fires on these intermingled or adjacent lands may present a threat to the lands of the other. Recognize the primary role of the States in administering smoke management plans in their respective states.

Prepare an Annual Operating Plan (AOP – this document) that includes each WFO with fire weather areas of responsibility in Oregon and Washington as required in the National Fire Weather Agreement and fire and smoke management responsibilities (as appropriate) of DNR, ODF and NWCC Predictive Services. Fire weather zone and Predictive Service Area maps will be included in the AOP. The AOP will meet the guidelines specified in NWSI 10- 404.

Annually review the performance of the NWS and NWCC Predictive Services in meeting the needs of the fire management community. This review will be used to help determine what program adjustments are needed and appropriate. PNWCG directed subject matter experts (SMEs) and the NWS MICs from Boise, Medford, Pendleton, Portland, Seattle and Spokane shall conduct the review. NWCC Predictive Service, the

NWS, PNWCG SMEs and any interested members of the fire community shall meet annually around February. The meeting will evaluate the past season fire weather services and recommend changes for the next fire season. Proposed changes in fire weather services for the upcoming fire weather season will be discussed and if agreed upon reflected in the AOP. AOP sections from individual offices are expected to be finalized no later than April 1st (drafts are requested the February meeting) so that the compiled Pacific Northwest AOP can be submitted to the PNWCG and NWS signatories for final approval. Changes after April 1st should, if at all possible, be held off until after fire season. If extenuating circumstances require significant additional changes to be made for the current fire season, the AOP will need to be reapproved by the signing officials.

Respond to the other party's proposals within thirty (30) days, or advise the other party when the proposal will be addressed if the NWS or the PNWCG are unable to meet or discuss the proposal within their respective groups in that time frame. Except when necessary to meet emergency needs, significant proposals are expected to be discussed at the annual meetings.

Cooperate and coordinate plans for the weather-related training of fire personnel and fire weather forecasters to ensure that training needs are met.

Collaborate in fire weather research and development.

Chapter 2
Operating Plans

The Hayes Fire as seen from Hurricane Ridge during an east wind event. August 24, 2016.

NWCC PREDICTIVE SERVICES

MISSION

The Predictive Services Program supports the wildland fire community and incident coordination system with decision support information. This typically includes a synthesis of fire danger, fire weather, fire intelligence, and fire management resource information. Information generated by NWCC typically revolves around decision support information for determining regional preparedness level and distribution of fire management resources.

GOALS AND RESPONSIBILITIES

Predictive Services provides decision support and tools which enable proactive, safe and cost effective fire management. Predictive services actively partners with state and federal wildland fire agencies, cooperating agencies, research, academia, and the private sector to ensure the relevance of predictive services' products and program.

LOCATION

Northwest Interagency Coordination Center
150 SW Harrison St. Suite 400
Portland, OR 97201

OPERATING HOURS

FIRE SEASON (mid-June through early October)
0700-1700 PDT 7 days a week

NON FIRE SEASON
0700-1530 PDT 5 days a week

STAFF AND CONTACT

The NWCC Predictive Services program is interagency. It encompasses two meteorologists, a Fire Management Analyst and assistants, an Intelligence Officer and a Geographic Information System (GIS) specialist and assistants from the different federal and state land management agencies.

METEOROLOGY
John Saltenberger Program Manager
Vacant

Various Detailers during fire season

INTELLIGENCE/FIRE MANAGEMENT
Mike Powell Fire Management Analyst
Vacant Intelligence Officer
Various Detailers during fire season

GIS
Barbra Haney GIS specialist
Various detailers during fire season

WORLD WIDE WEB
http://gacc.nifc.gov/nwcc/

EMAIL
jsaltenb@blm.gov
mike_r_powell@nps.gov
bhaney@blm.gov

FORECAST AREA

Washington and Oregon, statewide. Forecast zones are divided into Predictive Service Areas (PSAs), which are defined at the end of this plan.

FIRE WEATHER SERVICES

Predictive Services provides national and geographic area specific products primarily designed to meet regional and national interagency needs such as GACC coordinators, Multi-Agency Coordination groups, NWS forecasters, incidents, and to a lesser extent, local fire management users. Predictive Services analyzes situational information, fuels conditions and fire danger, fire weather, and ignition data in order to produce and disseminate fire potential decision support products. These products are produced so that fire managers can make pro-active fire management decisions

Daily Fire Activity Forecast: Updated daily, the Fire Activity Forecast summarizes anticipated fire load over the next five days by projecting:

- the number of new ignitions expected in each PSA
- the probability of new significant fires in each PSA

7-Day Significant Fire Potential: The 7-Day Significant Fire Potential product combines fire weather, fire danger, ignition potential, and resource status information into a projection of significant fire potential for the next week. “Significant fires” are defined in the NWCG glossary as those fires large and costly enough to warrant movement of firefighting resources from outside the area where the fire originates.

PSAs undergoing maximum foreseeable risk of a significant wildland fire event are denoted in red or orange “high risk” symbol depending on the contributing factors mentioned above. PSAs highlighted in red are at risk of new significant fires due to a

large number of new ignitions. PSAs highlighted in orange are at risk due to the severity of the burn environment (such as strong winds or instability combined with high fire danger).
The daily 7-Day Significant Fire Potential product is available at:

Northwest: http://gacc.nifc.gov/nwcc/content/products/fwx/guidance/dl.pdf
National: http://psgeodata.fs.fed.us/forecast/#/outlooks?state=map

The Fire Activity Forecast and 7-Day Significant Fire Potential products were developed using objective data sources such as the FPA fires database, Fire Family Plus, and detailed meteorological data on grid domain centered over the Pacific Northwest. Over a decade's worth of data were gathered and compared to identify patterns of weather, ignitions, and fire danger that combine to boost the risk of large fire events.

Environmental elements that were commonly identified as consistent contributors for *initiation* of significant fires in various PSAs include:

- Absolute values and fluctuations in fire danger
  - Energy Release Component
  - 100-hr dead fuel moisture
- General winds across the landscape
- Instability in the middle atmosphere
- Dryness in the atmosphere
  - Vapor pressure deficit
- Sufficient numbers of ignitions concentrated in a 24hour period.
  - Lightning
  - Human

Note: The 7-Day Significant Fire Potential Forecast is *not* intended to be interpreted as a fire weather forecast or a fire behavior forecast. It is not intended to be used for firefighter or public safety. It does not necessarily reflect extreme conditions. Rather, it simply depicts the daily risk of fires growing to meet the 'significant' size criteria in each PSA based on historical combinations of past contributing factors.

Regional Preparedness Level Forecast: Daily Preparedness Level for the Northwest geographic area is determined by the NWCC center manager and/or Operations Manager with guidance from the NWCC Predictive Services unit.

That guidance is based on objective assessment of the current demand and forecasts for future need of fire management resources from NWCC's Fire Activity Forecast. Analysis of historical usage of fire management resources since 2004 was blended with numbers of reported ignitions and resulting large fires to model resource demand when similar conditions repeat themselves in the future.

The daily Preparedness Level Forecast is available at: http://gacc.nifc.gov/nwcc/brief

Monthly and Seasonal Significant Fire Potential Outlooks: The Monthly and Seasonal significant Fire Potential outlook identifies geographic regions across the US likely to expect above average, average, or below average significant fire load during the next month and through the following three months. Significant fires are defined as those severe enough to require mobilization of firefighting resources from outside the area the fire originates.

http://gacc.nifc.gov/nwcc/content/products/fwx/MonthlySeasonal.pdf
http://gacc.nifc.gov/nwcc/content/products/fwx/MonthlySeasonal.ppt

A narrated audio/video webcast of the Monthly and Seasonal Significant Fire Potential outlook is routinely updated at:
http://gacc.nifc.gov/nwcc/content/videos/Monthly_Seasonal.mp4

Monthly and Seasonal outlooks (maps and narratives) for the entire US are at:
http://www.predictiveservices.nifc.gov/outlooks/outlooks.htm

Fire Behavior and Fuels Advisories: When fire behavior is known or anticipated to be severe over a large section of the Geographic Area Predictive Services assists in the issuance of any fuels/fire behavior advisories. Fire Behavior and Fuels advisories can be seen at:
https://www.predictiveservices.nifc.gov/fuels_firedanger/Fuels_FireBehavior_Advisories.png

Fuels and Fire Danger Information: Links to fuels and fire danger related information used to evaluate fire potential are located here.
https://gacc.nifc.gov/nwcc/predict/fire_fuel.apsx

Intelligence reports: During fire season NWCC's Predictive Services intel unit publishes regular updates of fire activity, resource status, situation reports, and large fire maps at:
http://gacc.nifc.gov/nwcc/predict/intelligence.aspx

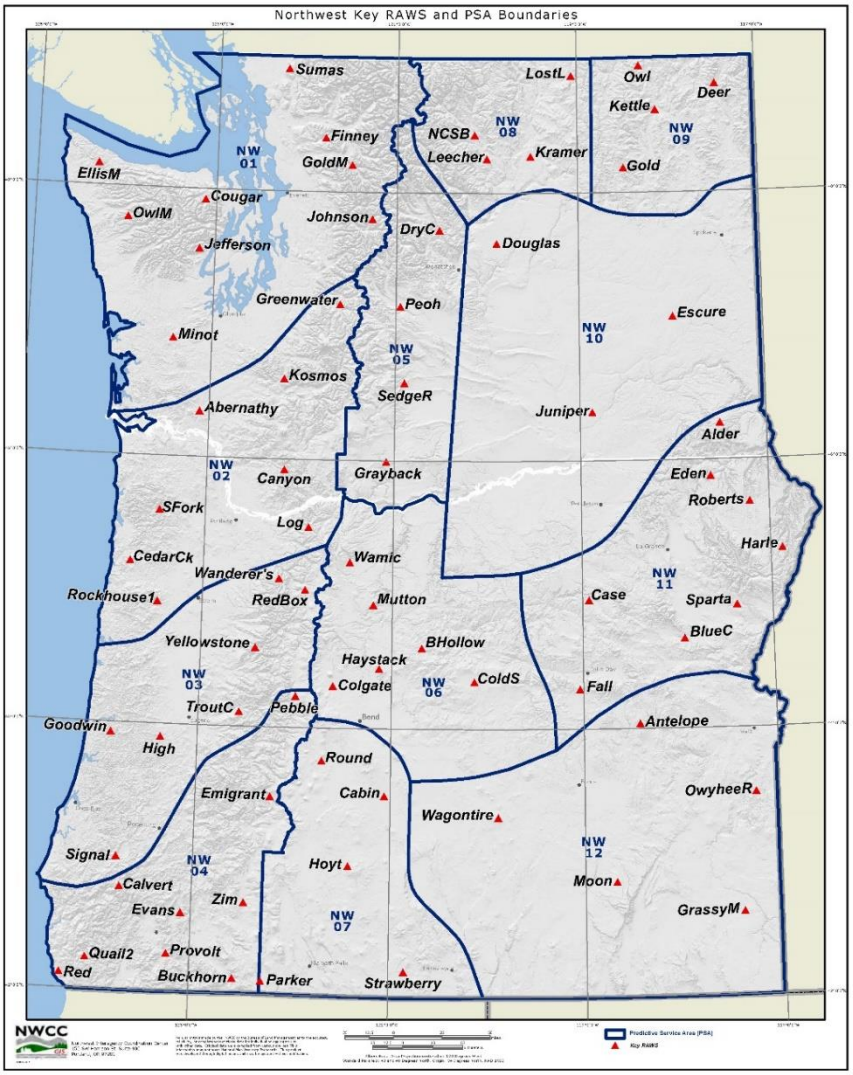
GIS: NWCC's Predictive Services Geographic Information Systems unit gathers, decodes archives, and plots a plethora of fire and weather information daily during fire season. This includes:

- Active fire mapping and fire perimeters in Google Earth
- NFDRS summary maps
- Daily lightning strikes
- Daily rainfall total maps

Further documentation of NWCC's GIS unit can be accessed at:
https://gacc.nifc.gov/nwcc/predict/gis.aspx

NWCC Predictive Services Fire Danger Rating Operating Plan and Supporting Documentation: A detailed explanation of NWCC Predictive Services' fire potential system is at:
https://gacc.nifc.gov/nwcc/content/products/fwx/fdrop/FDROP.pdf

PREDICTIVE SERVICE AREAS (PSAs)



Twelve Predictive Service Areas (PSAs) were designated from a climatological study of daily relative humidity fluctuations over a period of more than a decade. Within each PSA "key" NFDRS sites have been selected to contribute to daily evaluations of fire danger averaged across each PSA. All key stations are given equal weighting as an NFDRS "sig" group. 'Key' NFDRS sites were determined by an objective study that compared stations and identified redundancy.

Most of NWCC's Predictive Service fire potential products are based on these PSAs. Note that PSAs do not correspond to fire dispatch area perimeters, agency ownership, or political boundaries. They simply reflect large scale daily weather and fire danger fluctuations.

NATIONAL WEATHER SERVICE BOISE

WHAT'S NEW

- New SPOT page is operational nationwide. Please see the NWS Boise Fire Weather web page for training videos. They are located here.

HOURS OF OPERATION

Once-a-day issuance of the Planning Forecast (FWF) will begin early-to-mid May, but will be dependent on ongoing weather and fuel conditions. These forecasts will be issued Monday through Friday by 0730 PDT (0830 MDT).

Starting dates for the full complement of fire weather products, including NFDRS Forecasts and twice-daily Planning Forecasts, will depend on variables such as fuel dryness and customer needs. This typically occurs in late May or early June.

Staff meteorologists are available anytime; 24 hours a day, 7 days a week. The fire weather desk is staffed from 0630 to 1430 PDT (0730 to 1530 MDT).

LOCATION

Boise Weather Forecast Office
NIFC – National Weather Service
3833 S. Development Ave., Bldg. 3807
Boise, ID 83705-5354

STAFF AND CONTACT INFORMATION

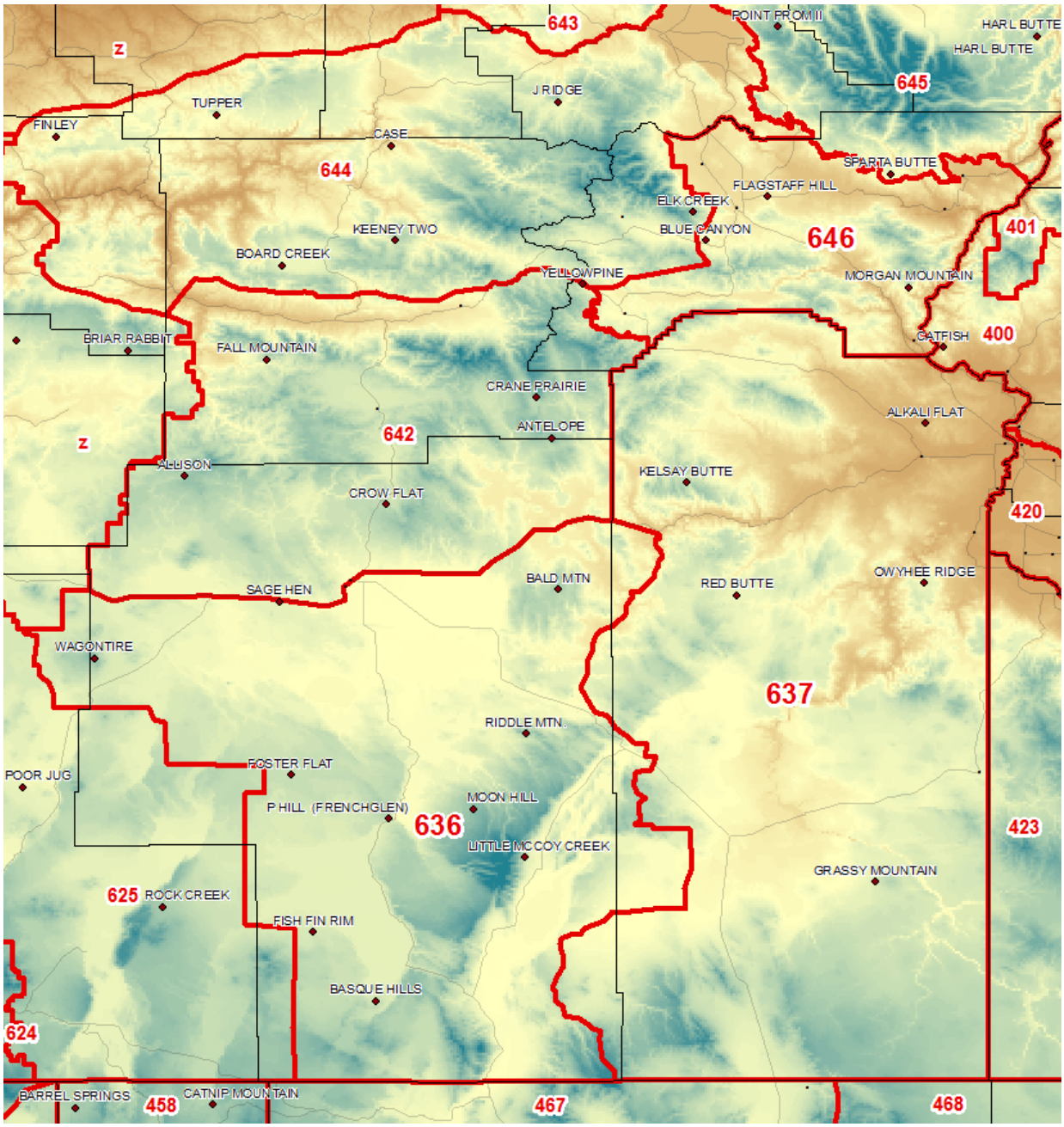
Chuck Redman Fire Weather Program Leader/IMET
Chuck.Redman@noaa.gov
Megan Thimmesch Fire Weather Program Leader /IMET
Megan.Thimmesch@noaa.gov
Michael Cantin Meteorologist-in-Charge
Michael.Cantin@noaa.gov

Phone:
Fire Weather Webpage: http://www.wrh.noaa.gov/firewx/?wfo=boi
Facebook Page: https://www.facebook.com/US.NationalWeatherService.Boise.gov
Twitter Page: https://twitter.com/NWSBoise
Twitter Handle: @NWSBoise

FORECAST AREA

Fire weather zones OR636, OR637, and OR646, all located in Oregon. See map below:

Map of the Boise Fire Weather District within the NWCC, OR636, OR637, & OR646.



FIRE WEATHER SERVICES

Product Schedule

Product: **Issuance time: (MDT) / (PDT)**

Morning planning forecast	0830 / 0730
Internet briefing	0930 / 0830
Afternoon planning forecast	1530 / 1430
NFDRS point forecast	1530 / 1430
Fire Weather Watch / Red Flag Warnings	Event Driven
Spot forecasts	Upon Request

Red Flag Events: High to extreme fire danger and dry fuels (defined by agency input), in combination with the following weather conditions:

- Areal thunderstorm coverage of scattered or greater (>25%), implying LAL of 4 or greater (see below).
- High Haines index of 6 in combination with RH<15%. **(*Zone 646 only*)**
- Strong winds and low humidity. (See matrix below for sustained criteria.) In addition to sustained strong winds from the matrix, wind gusts >35 mph, combined with relative humidity 10% or less, are considered Red Flag Criteria. Red Flag Criteria are considered to be met if conditions are observed at any three RAWS stations within a combined area of Fire Weather Zone 636 and 637 for >3 hours (not necessarily consecutive). Alternatively, if a RFW is issued separately for Fire Weather Zones 636 and 637, it is considered to verify if conditions are met at three RAWS stations in Zone 636 or two RAWS stations in Zone 637 and 646.

SUSTAINED 20 FT WIND (10-MINUTE AVERAGE in MPH)

	10 mph	15 mph	20 mph	25 mph	30 mph
20%					W
15%				W	W
10%			W	W	W

Lightning Activity Level: The chart listed below will be used to forecast Lightning Activity Level (LAL):

LAL = 1	No Thunderstorms
LAL = 2	Isolated Thunderstorms
LAL = 3	Isolated Thunderstorms (Increased Confidence/Threat)
LAL = 4	Scattered Thunderstorms
LAL = 5	Numerous Thunderstorms
LAL = 6	Scattered (But Exclusively Dry) Thunderstorms

Interagency Coordination: Before the issuance of a Fire Weather Watch or Red Flag Warning, there will be coordination with the affected agencies and neighboring NWS Forecast Offices in order to assess fuel conditions and general fire danger.

Dissemination of Fire Weather Watches and Red Flag Warnings: Each issuance, update, or cancellation of a Fire Weather Watch or Red Flag Warning will be relayed by telephone to the dispatch office(s) affected by the Watch/Warning.

Spot Forecasts: Please reference LAT/LON when requesting spot forecasts. Follow-up phone calls are always encouraged and feedback is extremely useful.
Weather Briefings: A daily briefing will be conducted each day at 0930 MDT (0830 PDT) for all agencies via a GoToMeeting. If there is not sufficient interest in a daily briefing during pre-fire season and low fire-activity periods, it will be held only on Mondays and Thursdays.

The briefing will include a general discussion of weather conditions and forecasts for the current day, as well a brief discussion of the extended period. Model data, satellite loops, and other items of interest will be addressed for the forecast period. The briefing will usually be about 10-15 minutes, but may be longer during active fire periods.

NATIONAL WEATHER SERVICE MEDFORD

WHAT'S NEW

- Wording in "Staff" section was adjusted for accuracy and for change of IMET
- Wording in "Forecast Services" section was updated. Services have been parsed out for clarity and links have been updated, to include the link for the new Spot Weather Request page.
- More information was added regarding the Daily Fire Weather Briefing.

HOURS OF OPERATION

24 hours a day, year round. Meteorologists are on duty 24 hours a day, 7 days a week. Additional forecasters will be brought in to staff for severe weather, to include that related to wildfire. Under the provisions of the National Fire Weather Agreement, special service provided by the Medford office will be done on a reimbursable basis.

LOCATION

National Weather Service Medford
4003 Cirrus Drive
Medford, Oregon 97504

STAFF AND CONTACT INFORMATION

The Medford office is staffed with 19 full-time meteorologists. 15 of these forecasters participate in producing fire weather forecasts after each has completed the training, which includes correspondence courses, computer-based Fire Weather Training Modules, mesoscale analysis, climatological and terrain familiarization, and spot forecast training.

Management staff:

John Lovegrove	Meteorologist-in-Charge

Certified Fire Weather Forecaster staff:

Michael Stavish	Science and Operations Officer
Ryan Sandler	Warning and Coordination Meteorologist
Brett Lutz	Meteorologist / Fire Weather Program Leader
Frederic Bunnag	Senior Met. / Asst. Fire Program Leader/IMET
Sven Nelaimischkies	Senior Met. / Marine Program Lead & Webmaster
Ken Sargeant	Internet Technical Officer (ITO)
Jay Stockton	Senior Meteorologist
Tom Wright	Senior Meteorologist, IMET Trainee

Connie Clarstrom	Senior Meteorologist
Shad Keene	Meteorologist
Mike Petrucelli	Meteorologist / Aviation Program Leader
Marc Spilde	Meteorologist
Dan Weygand	Meteorologist
Brian Nieuwenhuis	Meteorologist / Asst. Marine Program Leader
Bradley Schaff	Meteorologist

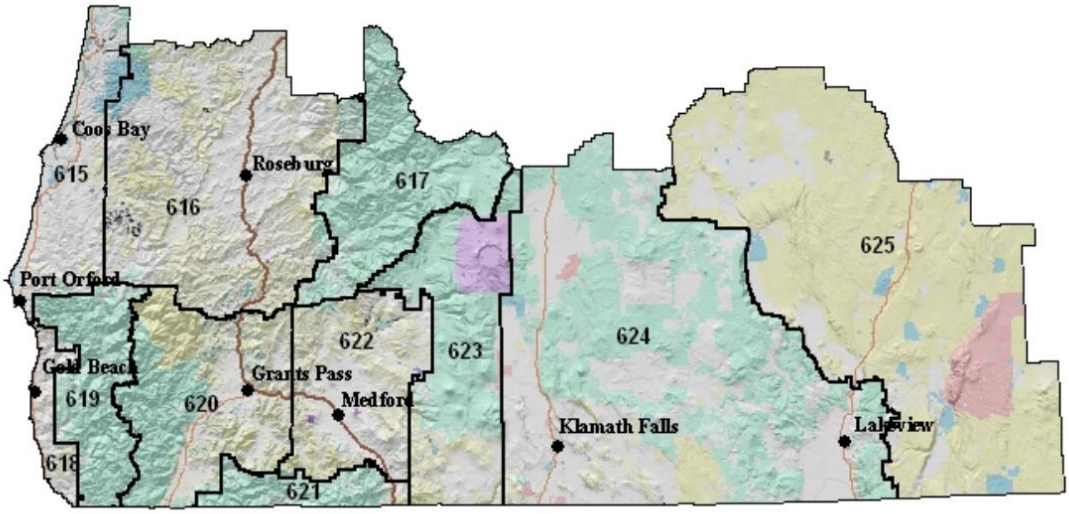
Meteorologist Interns and Fire Weather Forecaster Trainees:

Misty Duncan	Climate Program Leader
Michelle Cohen	
Charles Smith	

NWS Medford Homepage: http://www.wrh.noaa.gov/mfr
Facebook Page: https://www.facebook.com/NWSMedford?ref=ts
Twitter Page: https://twitter.com/NWSMedford
Twitter Handle: @NWSMedford

FORECAST AREA

Southern Oregon, fire weather zones 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, and 625.



FIRE WEATHER SERVICES

Fire Weather and Land Management Forecasts: The Land Management Forecast/Fire Weather Planning Forecast is issued during the off-season, usually from mid-October through early May. This forecast is available on the webpage once daily by

0700 local time. The frequency of the Land Management Forecast and the forecast elements may be increased as the fire season approaches. The Fire Weather Program Leader will inquire with the user agencies as weather and fuel conditions warrant during the off season to determine as to when additional forecast elements and/or forecasts are needed. During the fire season, the Fire Weather Forecasts will be issued twice daily at 0700 and 1500 PDT.

ECCDA Forecasts: The Medford Weather Forecast Office also issues the grid-based Dispatch Area Forecast (ECCDA) twice a day by 0700 and 1530 local time, year-round. These forecasts are tailored to the operational area of each dispatch center and may also be accessed via the following link: http://www.wrh.noaa.gov/mfr/fire/eccda.php

NFDRS Trend Forecasts: NFDRS Trend Forecasts are accomplished when needed by the fire agencies. This is usually from sometime in May through September, but can vary greatly from year to year. These trend forecasts are sent to WIMS by 1545 PDT with forecast parameters typically available from WIMS by 1600 PDT.

Medford WFO Daily Fire Weather Briefing Webinar: The Medford NWS Office will continue to produce once per day, recorded Daily Fire Weather Briefings, via a GoToWebinar format, during declared fire season (usually June 1st to Sep 15th). These briefing will focus on important elements in the forecast as they relate to fire weather, both in the short term forecast and up to one month out, when pertinent. Additionally, these briefings may be done on an as needed basis prior to and after fire season has been declared if weather significant to fire operations is anticipated. The briefing is held at 930am and can be registered for via the following link:
https://attendee.gotowebinar.com/register/838288937963031041

A recorded version of this daily webinar will be posted each day, usually by 1030am, at the following link:
http://www.wrh.noaa.gov/mfr/fire/Briefing.wmv

If you experience any difficulties registering or viewing, please contact the Medford NWS Office Fire Weather Desk at 541-776-4332.

Spot Weather Forecasts: Spot Weather Forecasts can be requested at
http://www.weather.gov/spot/request/

Please provide on-site observations whenever possible and/or note the nearest representative RAWS in the “REMARKS” section. Spot forecasts for wildfire suppression and/or public safety take precedence over all office activities, except a Tornado Warning. Please request prescribed burn spot requests at least 2 hours in advance or, preferably, the day prior to the burn, whenever possible. Please call the office on the direct fire line at 541-776-4332 after submitting a request if there are peculiarities with or sensitivities that cannot be detailed in the request. Detailed instructions for completing the Request Form and access links are available at:

http://www.wrh.noaa.gov/sew/NW_SpotRequestInstructions.pdf An overview of the Spot Forecast program begins on page 5 of this document.

Fire Weather Watches and Red Flag Warnings: Fire Weather Watches and Red Flag Warnings will be issued when the following weather criteria are expected, in conjunction with certain fuel situations.

Fuel Conditions: Fuel conditions must be determined to be receptive/dry enough for lightning fire starts during the occurrence period of the lightning event such that there will be an initial attack problem for the fire agencies in the Fire Weather Zone(s) in question. Fuel dryness/receptiveness can be determined by the following methods, in ranking level of importance:

- From the local Fuels Management Officer (FMO) for the Fire Weather Zone or Zones in question, or portion of the Fire Weather Zone or Zones in question. If the local FMO(s) determine(s) fuels are dry enough to constitute an initial attack problem in all or part of a zone, then it is dry enough to issue a Fire Weather Watch/Red Flag Warning.

- High to Extreme Fire Danger as determined by the local fire management agency.

- The Fuel Dryness of the Northern California Geographical Area Coordination Center (GACC) and/or the Fire Environment (FEN) level of the Northwest Interagency Coordination Center's 7-Day Significant Fire Potential Outlook. These Outlooks should only be used as part of the decision making process. Fuel Dryness and/or Fire Environment level on the chart in the yellow, brown, or red categories support issuance of a Watch or Warning. If the Fuel Dryness and/or Fire Environment level in the chart is green, the forecaster must determine if there will be an initial attack concern due to fuel dryness over all or part of the Fire Weather Zone or Zones. In rare cases, fuels may be or, may become, too wet for an imminent large fire concern for the GACC, but are still dry enough to be an initial attack concern.

Weather Conditions:

A. **Abundant lightning:** Abundant lightning (scattered thunderstorm coverage or greater) in conjunction with sufficiently dry fuels (fuels remain dry or critical during and immediately after a lightning event). Thunderstorms must have forecast areal coverage of at least 25%. Warnings may be issued for isolated events (<25% areal coverage) when little or no precipitation is expected to reach the ground.

   The LAL for all lightning based Fire Weather Watches and Red Flag Warnings must be three (3) or greater. Forecasters should have a high degree of confidence (~50% for watch, 70% for warning) that the Red Flag event will occur.

B. Strong wind and low relative humidity associated with a marine push, dry cold front, or passage of an upper level trough:

- Zones 615, 618: Min RH < 30% AND 10-minute sustained wind 15+ mph and/or gusts 30+ mph lasting for 2 or more hours.

- Zones 616, 617, 619, 620, 621, 622, 623: Min RH < 15% AND 10 minute sustained wind 10+ mph or peak winds to 20+ mph lasting for 2 or more hours.

- Zone 624: Min RH < 15% AND sustained wind 15+ mph or gusts 25+ mph lasting for 2 or more hours.

- Zone 625: Min RH < 10% AND sustained wind 20+ mph for 2 hours or more. Min RH < 10-14% AND sustained wind 25+ mph for 2 hours or more. Min RH < 15-19% AND sustained wind 30+ mph for 2 hours or more.

C. Poor relative humidity recovery with easterly winds

- Zones 616, 617: Min RH < 30% AND sustained wind 10+ mph lasting 2+ hours.

- Zones 618: RH recovery < 25% AND sustained wind 15+ mph and/or gusts 25+ mph lasting 2+ hours.

- Zones 619 and 620: RH recovery < 30% AND sustained wind 15+ mph and/or gusts 25+ mph lasting 2+ hours.

- Zones 621, 622, 623: RH recovery < 25% AND sustained wind 10+ mph lasting 2+ hours.

D. Haines 6 Conditions = Very Dry and Unstable Airmass

Haines Index forecast of 6 in conjunction with an ongoing fire.

The Medford Office will issue watches and warnings for the areas expected to experience watch or warning conditions rather than by entire fire weather zone. Thus, if only a portion a fire weather zone will be affected, the watch or warning will only be valid for that portion of the fire weather zone. All attempts will be made to coordinate a Fire Weather Watch or Red Flag Warning with the affected agencies and neighboring fire weather offices prior to issuance. In the event a Red Flag Warning must be issued before the coordination process can be completed, we will contact the affected agencies and neighboring forecast offices shortly afterward. Updates or cancellations of a Fire Weather Watch or Red Flag Warning will also be relayed by telephone to the dispatch office(s) affected by the watch/warning.

FIRE WEATHER ZONES:

AREA 1...COAST (Zones 615 and 618):
This area extends from the Pacific Ocean to the foothills of the Coast Range, which rises to a crest of 2500 feet, about 10 to 20 miles inland.

- Zone 615: South-Central Oregon coast. This zone extends from southern border of the Siuslaw National Forest in southern Lane county through Coos County to Humbug Mtn State Park in northern Curry County…and inland from the coast to about 10 to 20 miles inland. Elevations range from near sea level to 2500 feet.

- Zone 618: Southern Oregon coast. This zone extends from Humbug Mtn State Park along the coast to the California state line, and inland for 10 miles. Elevations range from near sea level to 2800 feet.

AREA 2...UMPQUA BASIN AND UMPQUA NF (Zones 616 and 617):
This is the area between the Coast Range of south-central Oregon in Coos and Douglas counties and the crest of the Cascade Mountain. The western portion of the area, mainly Zone 616 Umpqua Basin, extends from the Coast Range through the Umpqua valley to the foothills of the Cascade Mountain just east of Interstate 5, and varies in elevation with zone 616 ranging between 150 near Roseburg to almost 4000 feet in the Cascade foothills. The eastern portion, zone 617 which encompasses all of the Umpqua NF, rises from 1500 feet to 6000 feet with peaks reaching as high as 7400 feet in the Cascade Range.

AREA 3...SOUTHWEST INTERIOR INCLUDING THE CASCADE AND THE SISKIYOU MOUNTAINS (Zones 619-623):
This area has complex terrain. The western boundary begins with the Coast Range, and includes the Kalmiopsis Wilderness Area where elevations range from 3000 to 5000 feet. The northern boundary is the Umpqua Divide which separates the Rogue Valley from the Umpqua Valley. The area's eastern boundary includes the Cascade Mountains, where elevations can reach 6500 feet with a few peaks over 8000 feet high. Crater Lake is in the very northeast corner of this area. The southern part of the area is bounded by the Siskiyou Mountains, where elevations can reach 7000 feet. Mount Ashland is in the southern portion of this area.

- Zone 619: Southern Oregon coastal mountains. Elevations range from 200 feet in coastal valleys to 4600 feet.

- Zone 620: Western Rogue Basin including the Illinois Valley. Elevations range from 650 feet in western Rogue Valley to 5700 feet in the Siskiyou Mountain in southern Josephine County.

- Zone 621: Siskiyou Mountains, including the Siskiyou Fire Zone of the Rogue RiverSiskiyou NF. Elevation ranges from 1800 feet to 7000 feet.

- Zone 622: Eastern Rogue Basin. Elevations range from 1200 feet in the valley to 5200 feet in the Cascade and Siskiyou Mountains.

- Zone 623: Southern Oregon Cascades including Crater Lake NP, the High Cascades Fire Zone of the Rogue River-Siskiyou NF and the Klamath District of the Fremont-Winema NF. Elevation ranges from 2400 feet to 8500 feet.

AREA 4...EAST OF THE CASCADE MOUNTAIN (Zones 624 and 625):
This area extends from the eastern foothills of the Cascade Mountains, eastward through the Klamath Basin and the Fremont-Winema NF, to the south-central Oregon desert. The eastern part of the area closely follows the border between Lake County and Harney County, is representative of high plateaus with desert-like climate and includes the Warner Valley which is the northwestern rim of the Great Basin.

- Zone 624: Klamath Basin and the Fremont-Winema National Forest. Elevation ranges from around 4000 feet in the Klamath Basin to the higher peaks of 8200 feet.

- Zone 625: South Central Oregon Desert including the Klamath-Lake District of the BLM and the Lakeview Unit of the State Forestry. Elevation ranges from 4200 feet to 7600 feet

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ZONE	NAME	Type	NUMBER	OWNER	LAT	LON	ELEV
615	Long Prairie	R	352819	CFPA	42.95	-124.22	1180
615	Seven Mile Creek	R	352820	ODF	43.21	-124.32	506
616	Mt. Yoncalla	R	353043	BLM	43.64	-123.33	1799
616	Signal Tree	R	352816	BLM	43.01	-123.78	3294
616	Charlotte Ridge	R	353046	ODF	43.67	-123.94	1220
616	Silver Butte	R	353041	BLM	42.86	-123.38	3973
616	Burnt Mountain	R	353044	BLM	43.22	-123.84	2240
616	Devil's Playground	R	353047	BLM	43.72	-123.63	1550
616	North Bank	R	353048	BLM	43.36	-123.19	1913
617	Sugarloaf	R	352546	USFS	43.23	-122.40	3500
617	Cinnamon	R	353031	USFS	43.26	-122.15	4636
617	Grandad	R	353036	USFS	43.41	-122.57	2900
617	Toketee	R	353038	USFS	43.23	-122.39	3360
617	Buckeye	R	353040	USFS	43.04	-122.64	2400

618	Flynn Prairie	R	352922	ODF	42.40	-124.39	1625
618	Red Mound	R	352920	BLM	42.12	-124.30	1753
619	Bald Knob	R	352813	USFS	42.40	-124.04	3630
619	Quail Prairie	R	352915	USFS	42.24	-124.04	3033
619	Agness	R	352916	USFS	42.33	-124.02	150
620	Calvert Peak	R	352919	BLM	42.78	-123.73	3822
620	Merlin	R	353122	BLM	42.50	-123.37	1044
620	Onion Mountain	R	353114	USFS	42.28	-123.38	4438
620	Provolt	R	353120	BLM	42.28	-123.23	1176
620	Illinois Valley Airport	R	353115	BLM	42.11	-123.67	1389
621	Squaw Peak	R	353213	USFS	42.07	-123.01	4964
622	Buckhorn	R	353230	BLM	42.12	-122.56	2900
622	Evans Creek	R	353228	BLM	42.63	-123.06	3200
623	Parker	R	353344	BLM	42.11	-122.28	5250
623	Mt. Stella	R	353209	USFS	42.93	-122.43	4715
623	Zim	R	353227	USFS	42.70	-122.39	4106
623	Seldom Creek	R	353339	USFS	42.41	-122.19	4875
624	Klamath NWR	R		BLM	42.95	-121.58	4531
624	Timothy	R	353337	USFS	43.20	-121.37	6020
624	Summit	R	353421	USFS	42.20	-120.25	6147
624	Chiloquin	R	353310	USFS	42.58	-121.89	4517
624	Gerber Reservoir	R	353328	BLM	42.20	-121.14	4940
624	Hoyt	R	353343	USFS	42.97	-121.42	5445
624	Silver Lake	R	353412	USFS	43.12	-121.06	4381
624	Coffee Pot	R	353422	BLM	42.53	-120.64	5250
624	Strawberry	R	353423	USFS	42.20	-120.85	5590
624	Summer Lake	R	353429	USFS	42.72	-120.75	5400
624	Calimus	R	353307	USFS	42.63	-121.56	6622
625	Catnip	R	260109	USFS	41.93	-119.50	5740
625	Rock Creek	R	353424	FWS	42.55	-119.66	5640
625	Fish Fin Rim	R	353516	BLM	42.47	-119.18	4900
625	Fort Rock	R	353406	BLM	43.43	-120.84	4430

NATIONAL WEATHER SERVICE PENDLETON

WHAT'S NEW

- Staff changes
- Hours of operation

HOURS OF OPERATION

The Pendleton Fire Weather Program is committed to a program with staff trained to respond to incident needs 24 hours per day, 7 days a week. Fire Weather shifts are currently scheduled during the following times with end dates remaining flexible to meet conditions and the needs of the community:

Spring / Fall Burning Seasons: 7:30 AM - 3:30 PM Monday - Friday
April 3rd – May 26th and October 2nd – October 27th

Summer Peak Wildfire Season: 7:30 AM - 3:30 PM 7 days a week
May 27th – October 1st

LOCATION

National Weather Service Office
2001 NW 56th Dr.
Pendleton, OR 97801

STAFF AND CONTACT INFORMATION

Mike Vescio	Meteorologist-in-Charge	michael.vescio@noaa.gov
Aaron Allen	Science and Operations Officer	zaaron.allen@noaa.gov
Dennis Hull	Warning Coordination Meteorologist	dennis.hull@noaa.gov
Mary Wister	Fire Weather Program Leader/IMET	mary.wister@noaa.gov

All forecasters are certified to issue spot forecasts and will remain annually proficient. Mary Wister will provide the majority of Fire Weather Planning forecasts through fire season, with remaining shifts filled by the following certified fire weather forecasters:

Gordon Hepburn	Senior Forecaster
Robert Cramp	Senior Forecaster
Diann Coonfield	Journeyman Forecaster

George Perry Journeyman Forecaster
Michael Murphy Journeyman Forecaster

Phone:
Office Homepage: http://www.weather.gov/pendleton
Fire Weather Webpage: http://www.wrh.noaa.gov/firewx/?wfo=pdt
Facebook Page:
https://www.facebook.com/US.NationalWeatherService.Pendleton.gov
Twitter Page: https://twitter.com/NWSPendleton
Twitter Handle: @NWSPendleton
(Statement on use of Social Media)

FORECAST AREA

The Pendleton Fire Weather District covers the east slopes of the Cascade Mountain range from the Deschutes National Forest north to the alpine reaches of the Yakama Indian Reservation, Central Oregon, the northeast quadrant of Oregon (including Wallowa county, portions of Baker county, and Harney county north of highway 20), and Southeast Washington (Benton, Franklin, Klickitat, Yakima, Walla Walla, Columbia, Garfield, and Asotin counties).

FIRE WEATHER SERVICES

Weather Briefings: Internet based weather briefings will be held at 0930 PDT beginning May 1st. The briefing page is located at: http://www.wrh.noaa.gov/pdt/forecast/fwxBriefing.php and also live through GoToWebinar.

To join the conference call: 1-877-996-7187 passcode: 564222#

During spring and fall burning seasons, briefings will be held Monday, Wednesday, and Friday. During peak fire season, normally mid-June-September, briefings will be held daily. Please call (541) 276-8134 for information on how to join the GoToWebinar.

Phone briefings are available 24 hours per day, year round, by calling the fire weather desk.

Forecast Grids/Graphics: In addition to the core fire weather elements and forecast grids, this office produces a Ventilation Index grid and graphic. These graphics are found at:
http://www.wrh.noaa.gov/pdt/forecast/fwxGraphicalVentilation.php?wfo=pdt .

Additionally, several Fire Weather Threat Index grids and graphics attempt to graphically illustrate the potential for Red Flag criteria being met under the Wind/RH and Haines/RH categories. These graphics are found on the briefing web page listed above.

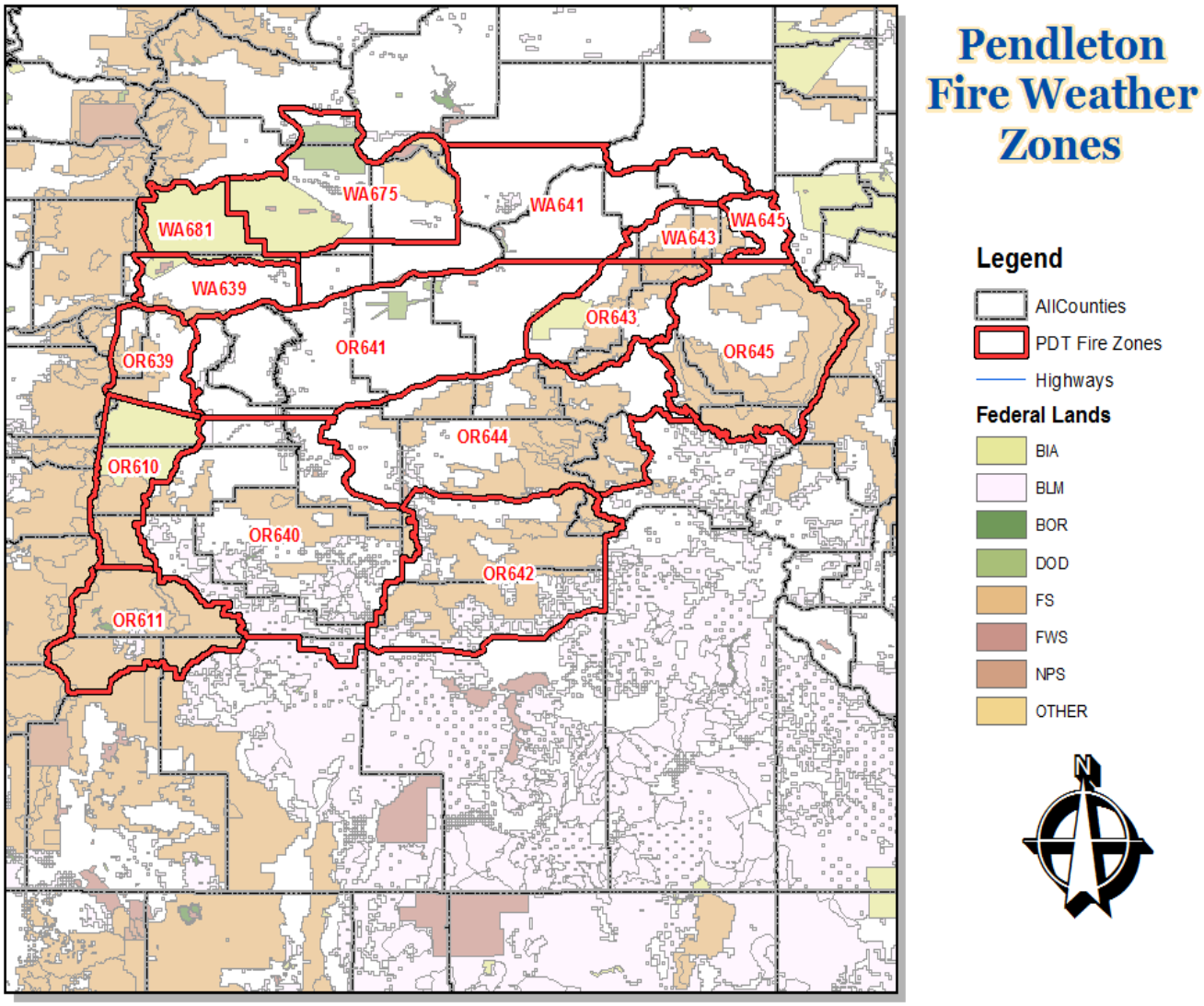
Fire Weather Planning Forecasts: Fire Weather Planning Forecasts are routinely issued when the Fire Weather desk is staffed. They are available twice a day Monday through Friday no later than 0900 PDT and 1515 PDT during the spring/fall burning seasons, and 7 days a week during peak fire season.

The Pendleton Fire Weather forecast area of responsibility is sectioned by Fire Weather Zones. OR639/WA639, OR641/WA641, OR643/WA643, and OR645/WA645 will typically be combined into single zone forecasts unless conditions warrant separating them. This usually results in 11 separate zone forecasts. These zones are based on terrain, elevation, weather characteristics, and political boundaries. Please see the district map on the following page for specific outlines of the Fire Weather Zones.

The zone names are as follows:

OR639 – East slopes of the northern Oregon Cascades
WA639 – East slopes of the southern Washington Cascades
OR610 – East slopes of the central Oregon Cascades
OR611 – Deschutes National Forest
OR640 – Central Oregon Mountains
OR641 – Columbia Basin of Oregon
WA641 – Lower Columbia Basin of Washington
OR642 – Southern Blue and Strawberry Mountains
OR643 – Northern Blue Mountains of Oregon
WA643 – Blue Mountains of Washington
OR644 – Central Blue Mountains
OR645 – Wallowa District
WA645 – Asotin County
WA675 – Eastern Washington southern Columbia Basin
WA681 – Yakama Alpine District

Map on fire weather zones on next page


Pendleton
Fire Weather
Zones
WA675
WA641
WA681
WA645
WA643
WA639
OR643
OR641
OR639
OR645
OR644
OR610
OR640
OR642
OR611
Legend
AllCounties
PDT Fire Zones
Highways
Federal Lands
BIA
BLM
BOR
DOD
FS
FWS
NPS
OTHER
N

Fire Weather Watch and Red Flag Warnings: Specific Red Flag criteria differ for each situation and district. The following are criteria that would warrant the issuance of a Fire Weather Watch or Red Flag Warning in the Pendleton Fire Weather area of responsibility:

*Underlying conditions***:**
Fire Weather Watches or Red Flag Warnings are issued when the fuels will readily burn and weather conditions will promote extreme burning. The three steps below are forecaster guidelines for determining the need for a watch/warning.

1. Refer to GACC "Overall Fire Environment" for probability of large fires. Levels should not be Green (less than 1% chance).
2. The forecaster is required to check with fire/land management agencies to ensure fuels are considered critically dry enough to carry or spread fire. Usually, the fire weather program manager will have already done this and declare when a zone is eligible for RFWs for the remainder of the season. However, if a forecaster strongly feels that a RFW is needed but a zone has not yet been declared eligible, the forecaster can check with the fire/land management agencies themselves via the morning briefing call or with individual phone.
3. Forecasters should have a high degree of confidence (60% for watch, 80% warning) that the Red Flag weather event will occur.

Red Flag Warning Criteria:
Any single event, or a combination, of the following events combined with critically dry fuels is criteria for the issuance of a Fire Weather Watch or a Red Flag Warning depending on the lead time:

- **LIGHTNING:** Abundant lightning in conjunction with sufficiently dry fuels (fuels remain dry or critical during and after a lightning event). Warnings are not typically issued for isolated coverage events. Warnings not typically issued for events that will be accompanied by significant rain (greater than 0.25 inches). However, if a lightning event will occur with significant rain, but is then followed by very hot and dry conditions, a warning may be issued if holdover/sleeper fires are a concern.

  Resulting Impact of the Event: Numerous fire starts can spread fire resources too thin resulting in a greater likelihood of a start becoming a large and potentially costly wildfire.

- **DRY & UNSTABLE AIRMASS:** High elevation Haines Index of 6 in combination with RH of 15% or less over half or more of a zone. Warnings may also be issued for a Haines 5 in situations where large fires may be impacted. Ground truth indicates that there is very little to no difference in fire activity between Haines 5 and Haines 6 days.

  Resulting Impact of the Event: Very dry and very unstable conditions create a high likelihood that a fire start will exhibit explosive growth and extreme

burning conditions. Extreme fire behavior is possible including rotating smoke columns and fire whirls (a.k.a. fire tornados) along with an increased threat to fire fighter safety. Note: this event does not start fires but can have a significant impact to ongoing fires.

- **WIND & LOW HUMIDITY:** Significant sustained winds combined with low relative humidity (this includes significant dry cold frontal passages) that meets the criteria as defined below at **TWO** or more RAWS locations simultaneously for two consecutive hours. Other supplementary locations (converted to RAWS 20 foot/10 minute average wind standards) may also be used if they are deemed representative of burning conditions at the time.

  Zones OR/WA639: Relative Humidity at 20% or less **AND** sustained wind speed 10 mph or greater. Greyback RAWS (located in zone WA681) will be included for verification purposes in this zone as well.

  Zone OR610: Relative Humidity at 15% or less **AND** sustained wind speed 10 mph or greater. Haystack RAWS (located in zone OR630) will be included for verification purposes in this zone as well.

  Zone OR611: Relative Humidity at 15% or less **AND** sustained wind speed 10 mph or greater. Timothy RAWS (located in zone OR624) will be included for verification purposes in this zone as well.

  Zones OR640, OR/WA641, OR642, OR/WA643, OR644, OR/WA645, WA675, & WA681: Refer to the following tables:

Columbia Basin - Zones OR/WA641 and WA675

		Sustained Wind (MPH) Over Widespread Area				
		10	15	20	25	30+
RH	35%					W
	30%				W	W
	25%			W	W	W
	20%		W	W	W	W
	15%		W	W	W	W
	10%		W	W	W	W

The Central and Northeast Oregon Mountains / Yakama Alpine - Zones OR640, OR642, OR/WA643, OR644, OR/WA645, and WA681

		Sustained Wind (MPH) Over Widespread Area				
		10	15	20	25	30+
RH	30%					W
	25%				W	W
	20%			W	W	W

	15%		W	W	W	W
	10%		W	W	W	W

Zone OR/WA 639, Zone OR/WA 641, Zone OR/WA 643, and Zone OR/WA 645 are considered combined zones for Wind/RH verification purposes. For example, if OR 639 verifies, WA 639 is also considered verified.

Red Flag Warning Dissemination:
A Red Flag Warning dissemination call list has been established in order to rapidly disseminate Fire Weather Watches, Red Flag Warnings, or other rapidly changing weather conditions that do not necessarily meet Red Flag criteria, but will affect fire control or pose a safety threat. **NWS Pendleton will contact the affected dispatch centers who will then contact other affected land management agencies in those zones per the following table**:

Red Flag Warning dissemination call list to Dispatch Centers

NWS PDT

ORBMC		**ORCOC**	**ORJDC**	**WACCC**	**WACWC**	**WAHNC**
UMF	WWF	DEF	95S JDY	MHF	SES	HFD
97S PDT	97S LGD	OCH	BFZ→BUD	CGF		MCR
UMA BIA	97S BKE	95S ODF	JDP			
CTUIR	97S WAL	99S WRP	MAF			
WMP	VAD BLM	PRD BLM				
		ODF TDL				

Zone WA = Washington OR = Oregon	**ORBMC 541-963-7171**	**ORCOC 541-416-6800**	**ORJDC 541-575-1321**	**WACCC 360-891-5140**	**WACWC 509-884-3473**	**WAHNC 509-373-3221**	**ORWSC 541-553-2413**	**WAYAC 509-865-6653**
WA 639				▲	▲	▲		
OR 639		▲		▲				
610		▲					▲	
611		▲						
640	▲	▲						
WA 641	▲				▲	▲		
OR 641	▲	▲				▲		
642	▲	▲	▲					
WA & OR 643	▲							
644	▲	▲	▲					
WA & OR 645	▲							
675					▲	▲		▲
681								▲

▲ Indicates to call Dispatch Center(s) based on which zone(s) warning(s) issued for. Updated 02/2014

ORBMC = Blue Mountain Interagency Dis.
ORCOC = Central Oregon Dispatch
WAHNC = Hanford Fire
WACCC = Columbia Cascade Dispatch
ORJDC = John Day Dispatch
WACWC = Central Washington Dispatch
WAYAC = Yakama BIA Dispatch
ORWSC = Warm Springs BIA Dispatch

IMET Support: Forecasters at National Weather Service Pendleton will provide 24-hour forecast support to IMETs that may be dispatched in the local area. Forecasters will communicate either through direct phone calls, or the use of NWSChat. The chat room that should be used is pdtfire.

NON-FORECAST SERVICES

All requests for teaching assignments, customer meetings, and customer consultations will be honored provided they are scheduled more than three weeks ahead of time. Every effort will be made to honor requests made within a period of less than three weeks depending on schedule availability. Please contact Mary Wister at NWS Pendleton (541) 276-8134, or by e-mail (mary.wister@noaa.gov) to schedule these services.

Pendleton NFDRS Fire Weather Station Index

Zone	Name	NFDRS	Type	Agency	Lat	Long	Elev	Slope/Aspect
WA639	Goldendale	452408	RAWS	DNR	45.8672	120.7230	1650	Flat knob-S
WA639	The Dalles	452406	Metar	FAA	45.6190	121.1657	210	W-E valley
OR639	Middle Mtn	350812	RAWS	ODF	45.5794	121.5970	2500	N-S Ridge
OR639	Pollywog	350912	RAWS	USFS	45.4586	121.4464	3320	Lwr slope-S
OR639	Wamic Mill	350913	RAWS	USFS	45.2333	121.4500	3320	Upr slope-S
OR639	Wasco Butte	350919	RAWS	ODF	45.6167	121.3353	2345	Butte top
OR610	Sidwalter	350909	Manual	BIA	44.925	121.5347	3600	Butte top-NW
OR610	Mt Wilson	350916	RAWS	BIA	45.0397	121.6736	3780	Midslope-SW
OR610	Mutton Mtn	350917	RAWS	BIA	44.9255	121.1978	4100	S-N Ridge
OR610	He He 1	350920	RAWS	BIA	44.9559	121.4992	2689	Flat
OR610	Shitike Butte	352102	Manual	BIA	44.7449	121.6106	5000	Butte top

OR610	Eagle Butte	352106	Manual	BIA	44.8399	121.2338	3100	Butte top
OR610	Warm Springs	352108	RAWS	BIA	44.7750	121.2541	1632	Valley
OR610	Metolius Arm	352110	RAWS	BIA	44.6275	121.6147	3440	Butte-SW
OR610	Colgate	352620	RAWS	USFS	44.3156	121.6022	3280	Flat
OR611	Round Mtn	352605	RAWS	USFS	43.7575	121.7102	5900	Butte top
OR611	Lava Butte	352618	RAWS	USFS	43.9253	121.3429	4655	Butte top-S
OR611	Tepee Draw	352622	RAWS	USFS	43.8322	121.0842	4740	Lwr slope-E
OR611	Black Rock	353342	RAWS	USFS	43.527	121.8090	4880	Lwr slope-S
OR611	Cabin Lake	353402	RAWS	USFS	43.4956	121.0597	4545	Flat
OR611	Tumalo Ridge	352621	RAWS	ODF	44.0493	121.4001	4000	Ridge-NW
OR640	Haystack	352107	RAWS	USFS	44.4494	121.1297	3240	Flat
OR640	Brown’s Well	353428	RAWS	BLM	43.5628	121.2360	4500	Flat knob-SW
OR640	Cold Springs	352701	RAWS	USFS	44.3550	120.1335	4695	Flat
OR640	Salt Creek	352712	RAWS	BLM	44.0467	120.6694	4200	Flat
OR640	Badger Creek	352711	RAWS	USFS	44.0311	120.4083	5680	Midslope-flat
OR640	Slide Mountain	352207	RAWS	USFS	44.4622	120.2945	5700	Upr slope-NE
OR640	Brer Rabbit	352208	RAWS	USFS	44.333	119.770	5900	Valley-S
OR640	Board Hollow	350915	RAWS	ODF	44.6038	120.6847	4200	Ridge-flat
WA641	Juniper Dunes	453201	RAWS	BLM	46.3575	118.8683	950	Flat
WA641	Walla Walla AP	453302	Metar	FAA	46.0945	118.2858	1166	Flat
OR641	Patjens	351001	RAWS	BLM	45.3219	120.9292	2230	Ridge-SW

OR641	North Pole Rdg	350915	RAWS	BLM	45.0329	120.5357	3500	Ridge-W
OR641	Umatilla NWR	351316	RAWS	USFWL	45.9180	119.5675	270	Flat
OR641	Pendleton AP	351307	Metar	FAA	45.6975	118.8344	1482	Ridge-flat

OR642	Crow Flat	353515	RAWS	USFS	43.8413	118.9521	5130	Valley-S
OR642	Allison	353501	RAWS	USFS	43.9214	119.5964	5320	Valley-S
OR642	Fall Mountain	353524	RAWS	USFS	44.2970	119.0370	5949	SW-NE Ridge
OR642	Antelope	353524	RAWS	BLM	44.0384	118.4163	6460	N-S Ridge
OR642	Crane Prairie	352305	RAWS	USFS	44.1601	118.4704	5373	Valley-S
OR642	Yellowpine	352124	RAWS	USFS	44.5263	118.3230	4200	Lwr slope-E
WA643	Alder Ridge	453803	RAWS	USFS	46.2685	117.4983	4550	Ridge-S
OR643	Eden	351518	RAWS	USFS	45.8763	117.6160	3500	Upr slope-S
OR643	Black Mtn Rdg	351319	RAWS	USFS	45.5738	118.2385	4965	Ridge-Sw
OR643	LaGrande 1	351417	RAWS	ODF	45.5508	118.0133	3079	Lwr slope-E
OR644	Case	352329	RAWS	USFS	44.9711	118.9297	3800	Ridge-flat
OR644	Tupper	351202	RAWS	USFS	45.0667	119.4925	4200	Lwr slope-S
OR644	Board Creek	352330	RAWS	BLM	44.5930	119.2770	5000	Ridge
OR644	Keeney 2	352332	RAWS	USFS	44.6661	118.9219	5120	Ridge
OR644	J Ridge	351414	RAWS	USFS	45.1135	118.4051	5180	Upr slope-SE
OR644	Elk Creek	352126	RAWS	USFS	44.7577	117.9711	6576	Upr Slope
OR645	Point Prom 2	351419	RAWS	USFS	45.3547	117.7044	6600	N-S Ridge
OR645	Minam	351416	RAWS	USFS	45.3539	117.6328	3590	SE-NW Vly

OR645	Roberts Butte	351520	RAWS	USFS	45.6811	117.2067	4300	N-S Ridge
OR645	Harl Butte	351502	RAWS	USFS	45.3282	116.8774	6071	Butte top-S
OR645	Sparta Butte	352418	RAWS	USFS	44.8850	117.3383	4300	Midslope-SW
WA675	Saddle Mtn	452701	RAWS	USFWL	46.6944	119.6936	650	Flat
WA675	High Bridge	452318	RAWS	BIA	46.0811	120.5440	2106	Midslope-N
WA681	Signal Peak	452307	RAWS	BIA	46.2269	121.1375	5052	Ridge-S
WA681	Mill Creek	452304	RAWS	BIA	46.2625	120.8622	2928	Midslope-flat
WA681	Teepee Creek	452317	RAWS	BIA	46.1642	121.0331	2980	Midslope-flat
WA681	Grayback	452404	RAWS	DNR	45.9908	121.0838	3766	Ridge

NATIONAL WEATHER SERVICE PORTLAND

WHAT'S NEW

- Creation of new fire zone 663 – Eastern Gifford Pinchot
- New zone numbers for Washington portions of 601, 602 and 604

HOURS OF OPERATION

The National Weather Service Office is open 24 hours a day, 7 days a week. The fire weather duty desk will be staffed with a **CERTIFIED** fire weather forecaster between the hours of 0630 and 1530 seven days a week during fire season, normally from Memorial Day through mid-October. The fire weather desk is staffed with a **CERTIFIED** fire weather forecaster from 0700 to 1600 Monday through Friday during Spring burning (mid to late March through Memorial Day), and also during the fall burning period (mid-October through early November).

LOCATION

National Weather Service Forecast Office
5241 NE 122nd Avenue
Portland, OR 97230-1089

STAFF AND CONTACT INFORMATION

David Bright Meteorologist in Charge
Tyree Wilde Warning Coordination Meteorologist
Scott Weishaar Fire Weather Program Leader / IMET
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Phone:
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Facebook page: http://www.facebook.com/US.NationalWeatherService.Portland.gov
Office Twitter page: https://www.twitter.com/NWSPortland
Twitter handle: @NWSPortland

FORECAST AREA

Portland services Oregon fire weather zones 601-608 and 612. Portland also covers Washington fire weather zones 663-665, and 667. This area covers:

Northwest Oregon and Southwest Washington, North Oregon Cascades including the Columbia River Gorge (to about Hood River). South Washington Cascades and adjacent lowlands of Clark County.

See the attached map for a graphic description of individual areas/zones of the Portland district.

AGENCIES SERVED

U.S. Forest Service (USFS)
U.S. Bureau of Land Management (BLM)
Oregon Department of Forestry (ODF)
Washington Department of Natural Resources (WDNR)
Various urban and rural local fire districts

FIRE WEATHER SERVICES

Fire Weather Grids: Fire Weather grids from the Portland Fire Weather Office can be found at: http://digital.weather.gov

Red Flag Warning/Fire Weather Watch: Fuels must be critically dry and fire danger moderate to high before a Red Flag Warning or Fire Weather Watch is issued from the Portland office. Evaluations of fuel conditions will be made in accordance with current NFDRS Energy Release Component (ERC) values and in consultation with fire managers.

Fuels Status Determination: Since 2015, NWCC no longer produces 7-day Dryness Level forecasts. Instead, NWCC will issue a 7-day Significant Fire Potential or Overall Fire Environment forecast. The Overall Fire Environment includes the former Dryness Level inputs, but also incorporates stability, wind and forecast lightning amounts. Thus, another objective means to determine fuel availability had to be determined.

The Portland Forecast Office will continue to experiment with a concept similar to the NWCC Dryness Levels, using zone-average ERC percentiles. The ERC values for all RAWS sites within the Portland Fire weather area will be evaluated daily, and then an overall zone color-code assigned: For a YELLOW or BROWN zone designation, one-half or more RAWS within a zone must have an individual ERC value at or above the 71st percentile.

70th PERCENTILE VALUE or less = GREEN
71st – 79th PERCENTILE VALUE = YELLOW
80th PERCENTILE or greater = BROWN

Assuming these conditions are met, Fire Weather Watches and Red Flag Warnings are issued for the following events:

A. COMBINATION OF WIND AND LOW HUMIDITY

Daytime: RH 25% or less **AND** 10-minute wind speed 10 mph AND/OR frequent gusts to 20 mph or more for 4 hours.

Night: RH 35% or less **AND** 10-minute wind speed of 15 mph AND/OR gusts to 25 mph or more for 3 hours.

B. DRY AND UNSTABLE AIR MASS

Mid and/or High level Haines 6, RH 25% or less, AND critical fuel conditions.

C. LIGHTNING

Scattered thunderstorm coverage, critical fuels **AND** no appreciable change in fuel conditions after the event.

Red Flag Verification: Red Flag warnings will be verified using the following criteria:

A. COMBINATION OF WIND AND LOW HUMIDITY
NIGHTTIME CRITERIA:

ZONES 601, 602, 664 AND 665: Two stations (RAWS) must report 35% humidity or less **AND** 10-minute wind speed of 10 mph **AND/OR** gusts to 20 mph or more for three hours in an 8-hour time block. ***Key RAWS***: Cedar Creek, Rockhouse1, and South Fork.

ZONES 603 AND 612: Rockhouse1 RAWS reporting 35% humidity or less **AND** 10-minute wind speed of 15 mph **AND/OR** gusts to 25 mph or more for four hours in an 8-hour block **AND** one other RAWS reporting 35% humidity or less **AND** 10-minute wind speed of 10 mph **AND/OR** gusts to 20 mph or more for two hours***. Key RAWS***: Rockhouse1, Goodwin Peak, High Point, and Cannibal Mountain.

ZONE 604 and 667: Two stations (airports) must report 30% humidity or less **AND** 2-minute wind speed of 15 mph **AND/OR** gusts to 25 mph or more for at least four hours in an 8-hour block. Typically occurs in the north part of the valley***. Key STATIONS***: Troutdale, Portland, Vancouver, and Hillsboro.

ZONES 605, 607, AND 660: One station (RAWS) must report 35% humidity or less **AND** 10-minute wind speed of 10 mph **AND/OR** gusts to 20 mph or more for four hours in an 8-hour block, **AND** at least **TWO** other stations reporting 35% humidity or less **AND** 10-minute wind of 10 mph **AND/OR** gusts to 20 mph for at least **TWO** hours. **Key RAWS**: Horse Creek, Log Creek, Wanderer's Peak, Kosmos, Canyon Creek, Orr Creek, Elk Rock, and 3-Corner Rock. NOTE: Includes stations from zone 659.

ZONE 663: Buck Creek RAWS must report 35% humidity or less **AND** 10-minute wind speed of 10 mph **AND/OR** gusts to 20 mph or more for four

hours in an 8-hour block. Dry Creek RAWS (eastern 660) must also report 35% humidity or less **AND** 10-minute wind speed of 10 mph **AND/OR** gusts to 20 mph or more for at least **TWO** hours.

ZONES 606 AND 608: One station (RAWS) must report 30% humidity or less **AND** 10-minute wind speed of 10 mph **AND/OR** gusts to 20 mph or more for at least four hours in an 8-hour block, **AND ONE** other station must report the same conditions for at least **ONE** hour. **Key RAWS**: Brush Creek, Trout Creek, Yellowstone, and Emigrant.

DAYTIME CRITERIA (ALL ZONES):
At least two stations within a zone must report 25% humidity or less **AND** wind-speed of 10 mph or more OR gusts to 20 mph or more (except 15 mph or gusts to 25 mph or more in zones 604 and 667) for at least four hours in an 8-hour block.

Typically for east wind (offshore flow), but can occur in the Coast Range and central/south Willamette Valley with north to northeast wind. Can also occur in the Central Cascades and foothills with shallow marine surges (west to northwest wind).

B. CRITICALLY DRY AND UNSTABLE AIR MASS (HAINES OF 6)
At least **ONE** station within a zone must report 25% humidity or less, measure a mid and/or high-level Haines 6, or exhibit inferred mid and/or high-level Haines 6 characteristics, **AND** fuel conditions are in the "BROWN", or "YELLOW" based on forecaster discretion.

C. LIGHTNING IN COMBINATION WITH DRY FUELS

"Dry thunderstorm" Red Flag criteria is defined as follows: *Abundant lightning in conjunction with sufficiently dry fuels*.

Abundant Lightning:
1) Number of lightning strikes that meet climatologically significant criteria, or
2) Areal coverage of lightning such as "Scattered" or $\geq$ 25%

Sufficiently Dry Fuels:

1) No appreciable change in fuel conditions the day of and the day following a thunderstorm event, or
2) ERC or BI values meeting climatologically significant percentiles, or
3) Land management declaration

This is a very rare event which, climatologically, has the highest likelihood of occurrence in the south half of the Willamette N.F.

Fuel Conditions **SHOULD** be in the "BROWN", and expected lightning frequency such that multiple starts (5-7) are expected. (Typically "scattered" thunderstorm coverage). Under unusual or extreme conditions, a Red Flag Warning can also be issued when fuel conditions are "YELLOW". Basically, "scattered" thunderstorms that do not produce enough precipitation to appreciably change the overall fuel conditions from "BROWN" or high-end "YELLOW".

Spot Forecasts: Detailed weather information beyond what is presented in the general forecast may be obtained with a spot forecast request. Spot forecasts may be requested by a telephone call to the fire weather forecaster or through the spot forecast request web page available on the Portland fire weather web page at: **http://www.weather.gov/spot/**

New spot forecast page: Click on the ***"Submit Spot Request"*** box to get to the spot request form. To monitor existing spots and to check the status of spot requests, click on the ***"Monitor"*** box. Contact the Portland Fire Desk for any questions or guidance using the new spot page.

General Forecasts:
Fire Season: Regularly scheduled general fire weather forecasts are issued twice per day by certified fire weather forecasters at 0900 and 1445.

Prescribed Burning Season: Regularly scheduled land management forecasts are issued by certified fire weather forecasters Monday through Friday at 0900 and 1430.

The Portland office will include wind gusts when the 10-minute wind speed is 10 mph or greater.

"Overall Fire Environment" (as developed by the Northwest Coordination Center) for the NWS Portland forecast district will no longer be included in the morning forecast. Refer to the NWCC Predictive Services web site for more information. www.nwccweb.us

NFDRS Trend Forecasts: Numerical point forecasts for NFDRS stations are prepared and disseminated to WIMS by 1530 each afternoon from April through mid-October. The point forecasts are used to compute the expected NFDRS indices valid the following day. The number of NFDRS point forecasts made by the weather office depends only on the number of NFDRS observations input into WIMS by the fire agencies. If observations are not entered into WIMS by 1500 however, a forecast will not be produced for that station.

Telephone Briefings:
Daily internet conference call: Portland fire weather conducts a daily weather briefing at 0940 PDT via a conference call from about early June through early October. Fire weather users are encouraged to participate. The forecaster hosting the briefing will

verbally highlight current and forecast fire weather conditions with the help of an internet web page. Conference call participants can follow along with the discussion while viewing graphics displayed on the web page. Conference telephone numbers (and passcodes) can be obtained by contacting the Portland weather office. The URL for the briefing graphics is: **http://www.wrh.noaa.gov/pqr/fwb.php**. Graphics will be available by 0700 PDT.

Unscheduled telephone briefings: Verbal weather briefings can also be obtained at any time. A certified fire weather forecaster should be requested to conduct the briefing during fire weather hours. Otherwise, a briefing will be available from the general forecast staff.

IMET Support: Portland has three certified Incident Meteorologists (IMETs) on staff available for wildfire, HAZMAT, or other emergency dispatches. To request an IMET, contact the appropriate fire agency dispatch office or the National Fire Weather Operations Coordinator (NFWOC) in Boise, ID.

NON-FORECAST SERVICES

Fire Weather Training and Lectures: An experienced fire weather forecaster will be available to help instruct the weather sections of standard fire behavior training courses offered by federal, state and local government fire agencies. This includes S-190 through S-590 and other courses. In addition, a forecaster will also be available for special speaking engagements. For scheduling purposes, requests for an instructor or speaker should be made at least three weeks in advance.

To request an instructor contact Shawn Weagle at Portland NWS Forecast Office at (503) 326-2420 or by email at shawn.weagle@noaa.gov.

Social Media: NWS Portland has a Facebook page, Twitter account, and YouTube Channel. The Office Twitter webpage is Twitter webpage. The Office Twitter handle is: **@NWSPortland**

A YouTube weather briefing may be available during critical fire weather events. Web links to these briefings will be disseminated to users when applicable.

Information about current Fire Weather may be included in these social media feeds, but such information is intended as supplemental information for the general public; it is not intended to meet the specialized needs of the wildland firefighting community.

PORTLAND FIRE WEATHER ZONES

GEOGRAPHIC ZONE DESCRIPTIONS

Zone 601 – North Oregon Coast

Represents the North Oregon coastal strip including adjacent west slopes of the Oregon Coast Range. This zone includes the north portion of the Siuslaw N.F. and ODF protected private land.

Extends east-west from the crest of the Oregon Coast Range to the Pacific Ocean. Extends north-south from the Columbia River to Oregon State Highway 22 along the eastern boundary of ODF regulated use area NW-2.

Zone 664 – South Washington Coast including the West Willapa Hills

Represents the South Washington coastal strip, including adjacent west slopes of the Willapa Hills. The boundary extends from the Columbia River then north to encompass Pacific County. The zone extends east to include Wahkiahkum County.

Zone 612 – Central Oregon Coast

Represents the Central Oregon coastal strip including adjacent west slopes of the Oregon Coast Range. Includes southern portions of the Siuslaw N.F. and ODF protected private land.

Extends east-west from the crest of the Oregon Coast Range to the Pacific Ocean. Extends north-south from Oregon State Highway 22 to the Umpqua River along the west edge of the Siuslaw National Forest including ODF regulated use area SL-2.

Zone 602 – North Oregon Coast Range

Represents the east slopes of the North Oregon Coast Range. Mostly private land under ODF protection.

Bounded on the west by North Oregon Coast Range crest. Bounded on the east by the west periphery of the Willamette Valley and Columbia River. Extends north-south from the Columbia River to Oregon State Highway 22.

Zone 665 – East Willapa Hills

Represents mostly private land protected by DNR and covers the east slopes of the Willapa Hills. The zone includes western Cowlitz County, bounded on the north by the Cowlitz and Lewis county border. Bounded on the east along a line from near Toutle to Interstate 5 at Castle Rock. Bounded on the south by the Columbia River.

Zone 603 – Central Oregon Coast Range

Represents the east slopes of the Central Oregon coast range. Mostly ODF protected private land.

Bounded on the west by the Coast Range crest. Bounded on the east by the western periphery of the Willamette Valley. The north boundary is along Oregon State Highway 22. The south boundary lies along Oregon State Highway 38.

Zone 604 – Willamette Valley
Bounded on the west and east by the foothills of the Coast Range and Cascades. Extends north-south from the Columbia River to just south of Cottage Grove Reservoir.

Zone 667 – Clark County Lowlands
Bounded on the west by the Columbia River and on the east by the South Washington Cascade foothills. Extends north-south from Lewis County to the Columbia River.

Zone 605 – North Oregon Cascade Foothills
Represents foothill elevations of the North Oregon Cascades. Mostly ODF protected private land.

Bounded by the east periphery of the Willamette Valley on the west and the National Forest boundary of the Mt. Hood and Willamette National Forests on the east. Extends from the Columbia River on the north, to the Crabtree Creek Divide, approximately 10 miles south of Oregon State Highway 22 (Santiam Highway) on the south.

Zone 606 – Central Oregon Cascade Foothills
Represents the foothill elevations of the Central Oregon Cascades. Mostly ODF protected private land.

Bounded by the east periphery of the Willamette Valley on the west (Interstate 5 south of Eugene) and the Willamette Forest boundary, and extreme north Umpqua Forest boundary on the east. Extends from Crabtree Creek Divide roughly 10 miles south of Oregon State Highway 22 on the north to the Lane/Douglas county line on the south.

Zone 607 – North Oregon Cascades
Represents all of the Mt. Hood NF west of the Cascade Crest along with interior Cascade wilderness areas.

Bounded by the Columbia River on the north, the Cascade Crest on the east, and the Mt. Hood forest boundary on the south and west.

Zone 608- Central Oregon Cascades
Represents the Willamette NF in its entirety along with interior high Cascade wilderness areas.

Bounded by the Cascade Crest on the east and the Willamette Forest boundary on the south, west, and north.

Zone 660 – South Washington Cascades and Foothills
Represents the Wind River and St. Helens Ranger Districts of the Gifford Pinchot NF, as well as adjacent Washington state DNR protected Cascade and Green Mountain

foothills to the south and west. This zone excludes the Columbia River lowlands of Clark County, WA and much of the Mt. Adams Ranger District.

Bounded on the east by the Gifford Pinchot forest boundary to the Indian Heaven Wilderness. The zone also includes the northeast peninsula north of Mt. Adams to the southeast boundary of FWZ659 and the northwest boundary of FWZ681. The southeast boundary follows the Columbia River west to the Clark County, WA line. The north and northwest boundary follows the contour of the Cascade Foothills to the Lewis River, then west along the Lewis River to the Columbia River. The zone boundary follows the Columbia River to Kelso, WA. The north boundary extends from Kelso, WA northeast following the contour of the Green Mountain/Cascade foothills to the Lewis County line.

Zone 663 – Eastern Gifford Pinchot including Mt. Adams District

Represents much of the Mt. Adams Ranger District. Bounded north of the Columbia River Gorge, at the boundary of the Columbia Gorge Natural Scenic Area, directly opposite FWZ607 on the Oregon side and including the current south boundary of FWZ660. This zone starts near Augspurger Mtn. and then closely follows the Pacific Crest Trail (PCT) to the south flank of Mt. Adams. The boundary would lie along the west side of the Indian Haven Wilderness. The east boundary would be the existing zone 660 and neighboring WFO zones 639 and 681. The zone includes the community of Trout Lake and includes the Buck Creek RAWS station.

ZONE	NUMBER	NAME	TYPE	AGENCY	LAT	LON	ELEV	ASPECT
601	350208	Tillamook	R	ODF	45.26	-123.5	22	Flat
	350215	Cedar Creek	R	USFS	45.21	-123.77	2240	Ridgetop
664	450404	Willapa	M	DNR	46.6	-123.6	60	W-in valley
	450407	Huckleberry	R	DNR	46.5	-123.4	2500	S-on mid-slope
602	350216	South Fork	R	ODF	45.58	-123.49	2120	S-on ridge
	350308	Miller	R	ODF	46.02	-123.27	1090	S-in valley
	350113	Tidewater	R	ODF	46.01	-123.56	2035	Ridge
	350505	Rye Mountain	R	BLM	45.22	-123.53	1960	S-on ridge

665	451207	Castle Rock	R	DNR	46.27	-122.89	213	S-in valley
	451209	Abernathy Mtn.	R	DNR	46.35	-123.1	2000	Ridgetop
603	351710	Rockhouse1	R	ODF	44.93	-123.47	2000	Midslope
	351811	Wilkinson Ridge	R	USFS	44.33	-123.72	1370	W-on ridge
	352542	Clay Creek	R	ODF	44.02	-123.21	1600	
	352547	Village Creek	R	BLM	44.25	-123.47	1500	SE-on ridge
	353047	Devil's Graveyard	R	BLM	43.72	-123.63	1550	NW-near ridge
	350605	Gellatly	R	ODF	44.61	-123.48	860	NW-lower slope
	352550	High Point	R	BLM	43.91	-123.38	1935	N-on ridge
604	352561	Willow Crk.	R	BLM	44.03	-123.17	456	Valley
	351813	Finley	R	USFWS	44.42	-123.33	330	Valley
667	451306	Vancouver	M	DNR	45.7	-122.7	210	Flat
605	350727	Horse Creek	R	BLM	44.94	-122.4	2000	Ridge
	350728	Eagle Creek	R	ODF	45.37	-122.33	744	SW-midslope
606	352024	Yellowstone	R	BLM	44.6	-122.42	3080	NE-in valley
	352025	Jordan	R	ODF	44.72	-122.69	778	In valley
	352552	Trout Creek	R	BLM	44.11	-122.58	2400	SW-on ridge
	352562	Green Mtn.	R	BLM	43.73	-122.81	3064	Ridge

	352553	Brush Creek	R	BLM	44.28	-122.85	2300	N-on ridge
607	350718	Red Box	R	USFS	45.03	-121.92	3250	SW-on midslope
	350725	Si Si Lookout	M	USFS	44.92	-121.83	5617	SW-on ridge
	350726	Wanderer's Peak	R	USFS	45.11	-122.2	4350	S-on ridge
	350604	Log Creek	R	USFS	45.51	-121.9	2500	W-on midslope
	350902	Clear Lake	M	USFS	45.15	-121.58	4458	W-on ridge
608	352554	Pebble	R	USFS	44.23	-121.98	3560	SW-on midslope
	352557	Fields	R	USFS	43.73	-122.28	3360	Flat-on ridge
	352558	Emigrant	R	USFS	43.47	-122.22	3840	S-on ridge
	351909	Boulder	R	USFS	44.98	-122	3570	Flat-in valley
612	351604	Cannibal	R	USFS	44.35	-123.89	1946	Ridgetop
	352545	Goodwin Peak	R	USFS	43.93	-123.89	1826	Ridgetop
	352559	Dunes	R	USFS	43.96	-124.12	20	Midslope
660	451208	Elk Rock	R	USFS	46.35	-122.6	2500	Ridgetop
	451921	Canyon Creek	R	USFS	45.92	-122.17	2500	W-on ridge
	451929	3 Corner Rock	R	DNR	45.72	-122.04	3000	Ridge
	451924	Dry Creek	R	USFS	45.94	-121.99	2549	SE-on ridge
	451301	Larch Mtn.	R	DNR	45.72	-122.35	1150	Ridge-top

663	451917	Buck Creek	R	USFS	46.06	121.54	2690	Meadow

NATIONAL WEATHER SERVICE SEATTLE

WHAT'S NEW

- The Fire Weather Planning Forecast will no longer include a forecast of High-Level Haines Index for Western Washington Fire Weather Zones, due to its lack of utility in western Washington. The High-Level Haines Index will continue to be included in the Zone 662 forecast (the Stehekin Area). The Mid-Level Haines Index will continue to be provided for all Fire Weather Zones. Our suite of gridded forecasts will continue to include High-Level Haines Index.

- Adjustment to Red Flag Warning criteria for Dry and Unstable conditions in Western Washington Fire Weather Zones is needed due to elimination of High-Level Haines. The criteria now call for 1) *Mid*-Level Haines 6, and 2) less than 50% opaque sky cover, and 3) RH of less than 25% above 2000 feet, or less than 20% below 2000 feet elevation. The Dry and Unstable criteria for Zone 662 remain unchanged.

- A new Spot Forecast webpage is in use in 2017. It can be accessed at http://www.weather.gov/spot/. The old Spot Forecast webpage has been decommissioned.

HOURS OF OPERATION

The National Weather Service (NWS) in Seattle operates 24 hours a day, 7 days a week, every day of the year. During wildfire season, a forecaster is dedicated solely to the Fire Weather Desk from 7:00 a.m. to 5:00 p.m. These are the best hours to submit Spot Forecast requests. However, all NWS Seattle forecasters are trained in Fire Weather and can handle your requests anytime 24/7.

Fire Weather Desk staffing will begin on the first Monday in June and end following the first Friday in October, with no weekend coverage in early- and mid-June. For 2017, those dates are:

June 5: Weekday Fire Weather Desk staffing begins
June 24-25: Weekend Fire Weather Desk staffing begins
October 6: Last day of Fire Weather Desk staffing

Staffing can be extended further into October if environmental conditions warrant.

LOCATION

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

NOAA - National Weather Service
7600 Sand Point Way NE
Seattle, WA 98115-0070

STAFF AND CONTACT

Logan Johnson	Meteorologist-in-Charge	logan.johnson@noaa.gov
Andy Haner	Fire Weather Program Leader/IMET	andrew.haner@noaa.gov
Steve Reedy	Fire Weather Program Leader	steve.reedy@noaa.gov
Brent Bower	IMET (T) / Senior Service Hydrologist	brent.bower@noaa.gov
Ted Buehner	Warning Coordination Meteorologist	ted.buehner@noaa.gov
Kirby Cook	Science and Operations Officer	kirby.cook@noaa.gov

All twelve weather forecasters at NWS Seattle are trained to work the Fire Weather Desk and will rotate through the desk during fire season.

PHONE NUMBERS

Fire Weather Desk
Public Forecaster (24/7)

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Steve Reedy, FW Program Co-Leader	206-526-6095 ext 252

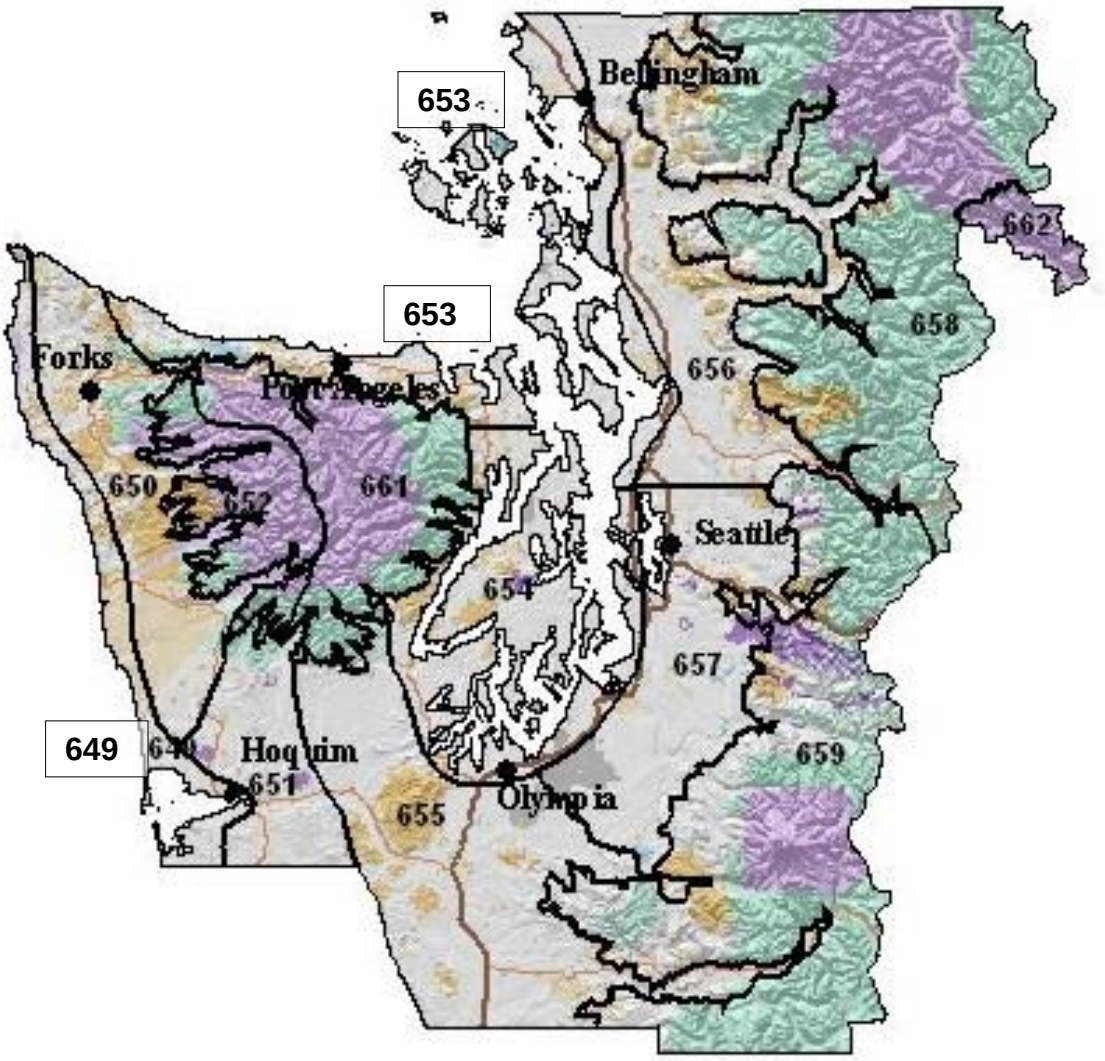
INTERNET

NWS Seattle Homepage: http://www.weather.gov/seattle
NWS Seattle Fire Weather page: http://www.wrh.noaa.gov/firewx/?wfo=sew
Facebook page: https://www.facebook.com/US.NationalWeatherService.Seattle.gov
Twitter page: https://twitter.com/NWSSeattle
Twitter handle: @NWSSeattle
(Statement on use of Social Media)

FORECAST AREA

NWS Seattle has Fire Weather forecast responsibility for western Washington from the Cascade Crest to the Pacific Coast, and from the Canadian Border south through Lewis and Grays Harbor Counties. Responsibility also includes the Cowlitz Valley Ranger District on the Gifford-Pinchot National Forest, as well as the portion of the North Cascades National Park Complex east of the Cascade Crest. NWS Seattle's Fire Weather area of responsibility is divided into 13 Fire Weather Zones. Fire Weather stations in each zone exhibit similar weather changes.

Seattle Fire Weather Zones



FIRE WEATHER SERVICES

Fire Weather Watches and Red Flag Warnings: 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. Further overview of the Fire Weather Watch and Red Flag Warning programs is found on page 4 of this document.

A. LOCAL CRITERIA FOR FUEL DRYNESS

Fire Weather Watches and Red Flag Warnings will be considered in the Seattle Fire Weather District when the Energy Release Component (ERC), as described by the National Fire Danger Rating System (NFDRS), is equal to or greater than the 90th percentile value in the frequency distribution of historical ERCs.

The zone-average ERCs listed below must be occurring or forecast to occur for a Fire Weather Watch or Red Flag Warning to be considered.

Zone 649:	17
Zones 650, 651, 653, 656, 657:	25
Zones 652, 654, 655, 658, 659:	31
Zone 661:	34
Zone 662:	66

B. LOCAL CRITERIA FOR WEATHER

Moderate Breeze and Low Humidity (Westside zones only)

- Nighttime hours (midnight to 7 am):
  Duration: 5+ consecutive hours during AM hours
  Wind Speed: 20-foot /10-min sustained wind >= 10 mph (RAWS)
  - OR –
  30-foot /2-min sustained wind >= 12 mph (ASOS)
  RH: <= 35%

- Daytime hours (7 am to midnight):
  Duration: 4 hours in an 8-hour block
  Wind Speed: 20-foot/10-min sustained wind > 10 mph (RAWS)
  - OR –
  30-foot /2-min sustained wind > 12 mph (ASOS)
  RH: <=30%

Moderate Breeze and Low Humidity (Eastside Zone 662 only)
Duration: 4+ hours
Wind Speed: 20-foot /10-min sustained wind >= 15 mph (RAWS)
RH: <= 25%

Wind and Low Humidity events should be fairly widespread in both time and space across the Fire Weather Zone - as opposed to an isolated incident that lasts affects a small area or last only a couple of hours. Verifying stations for Wind/RH episodes are described in Appendix 3.

Lightning
Weather Criteria for lightning is defined as “abundant lightning, either wet or dry, within a Fire Weather Zone”. The thunderstorm activity must be at least scattered (25+% aerial coverage) or greater within a particular zone; the forecast LAL must be 3 or higher.

Though the designation between wet and dry lightning is not a formal part of the definition, forecasters may view it as a negative consideration if excessive rainfall amounts are expected, e.g. greater than ~ ¾".

By the same token, forecasters may view it as a positive consideration if a lightning event is followed the next day by warm, dry weather.

Very Dry and Unstable Air Mass
Western Washington Fire Weather Zones 649-661:
Mid-Level Haines 6, *and* opaque sky cover < 50%, *and* RH of less than 25% above 2000 feet / less than 20% below 2000 feet.
Eastern Washington Fire Weather Zone 662: High-level Haines 6 *and* RH of 15% or less.

The most current Quillayute, Salem, 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.

Spot Forecasts: An overview of the Spot Forecast program is found on page 5 of this document.

Fire Weather Planning Forecasts (FWF): The following table shows NWS Seattle's anticipated dates, times, and format of Fire Weather Planning Forecasts (FWFs) in 2017:

Dates (2017)	FWFs on Weekends and Federal Holidays?	# of FWFs per day	Issuance Deadline	Format / Parameters Available
January 1 - June 4	No	1	0900 PT	Off-Season
June 5 - June 18	No	2	0830 PT 1530 PT	In-Season
June 19 – October 6	Yes	2	0830 PT 1530 PT	In-Season
October 7 - December 31	No	1	0900 PT	Off-Season

These dates can be adjusted based on user needs and environmental conditions.

Starting in 2017, the Fire Weather Planning Forecast will no longer include High-Level Haines Index for zones west of the Cascade Crest.

Internet-based Briefing Calls: Statewide, Internet-based, Fire Weather briefing calls will be conducted each day at 9:00 AM PDT during peak fire season, and as needed near the beginning and end of the season. These calls are co-hosted by NWS offices in

Seattle and Spokane. Contact this office for the appropriate telephone number and conference ID to participate. A recorded version of this call will be available under the Admin tab of the NWS Seattle's Fire Weather webpage within 15-60 minutes of the briefing's conclusion.

Area Forecast Discussions: The Fire Weather Forecaster will write a Fire Weather section in the Area Forecast Discussion (AFD) when Fire Weather Watches or Red Flag Warnings are in effect, or when conditions are otherwise deemed critical or of interest.

AGENCIES SERVED

U.S. 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 Complex, Olympic National Park, Mount Rainier National Park and San Juan Islands National Historical Park
Bureau of Indian Affairs - Olympic Peninsula Agency and Puget Sound Agency
Washington Department of Natural Resources -
Resource Protection Division, as well as the Northwest, Olympic, South Puget, and Pacific Cascade Regions
Department of Defense – Joint Base Lewis-McChord Forestry Program

Appendix 1: Fire Weather Zone Boundary Descriptions

Appendix 2: NFDRS Fire Weather Station List

Appendix 3: Methodology for Verification of a Red Flag Warning issued for Wind and Low Humidity

Appendix 1
NWS SEATTLE FIRE WEATHER ZONE BOUNDARY DESCRIPTIONS

Zone 649 – **The North and Central Coastal Strip**:
Zone 649 contains land from the Pacific Coastline (including the eastern shores of Grays Harbor) to 5 miles inland, within Clallam, Jefferson and Grays Harbor Counties.

Zone 650 – The North Coastal Lowlands:
Zone 650 contains land from 5 miles inland of the coast to an elevation of 1,500 feet on the west side of the Olympic Mountains. The area includes the Calawah, Bogachiel, Hoh, Clearwater, Queets, Quinault, and the Humptulips River drainages. The southern boundary follows the Humtulips River. The northern boundary reaches the Strait of Juan de Fuca from Neah Bay to west of Sekiu.

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 Grays Harbor - Pacific county line 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 652 – The West Portion of the Olympic Mountains:
Zone 652 includes land at or above 1,500 feet on the west-southwest facing side of the Olympic Mountains in Clallam and Jefferson counties, and the far northeast corner of Grays Harbor County. The area includes the Pacific Ranger District of the Olympic National Forest. Zone 652 represents the wetter, west side of the Olympic Mountains with a greater influence of marine air. The area includes all 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 land at or above 1,500 feet on the east side of the Olympic Mountains. Zone 661 represents the drier side of the Olympic Mountains, experiencing less rainfall, less influence of marine air, and a higher occurrence of lightning activity. The area includes land drained by the Wynoochee, Satsop, North and South Fork Skokomish, Hamma Hamma, Duckabush, Dosewallips, Quilcene, Dungeness, Elwha, and upper portions of the Sol Duc Rivers.

Zone 653 – The Strait of Juan de Fuca, the San Juan Islands and the Northwest Interior Lowlands: Zone 653 includes all land below 1,500 feet on the north side of the Olympic Peninsula from Sekiu on the west to Port Ludlow on the east. Zone 653 also includes land along and west of I-5 in Snohomish, Skagit and Whatcom Counties, as well Whidbey Island, Camano Island, and all of the San Juan Islands.

Zone 654 – The Central and South Puget Sound Lowlands:
Zone 654 represents land near Puget Sound and Hood Canal in Jefferson, Mason, Thurston, Pierce, King and Kitsap Counties. Zone 654 includes the entire Kitsap Peninsula. The western border follows the 1,500-foot contour on the west side of Hood Canal. The eastern and southern borders are near I-5 in King, Pierce, and Thurston Counties to Olympia. The southwest boundary runs northwest along U.S. Highway 101 from Olympia through Shelton to the southeast corner of Olympic National Forest.

Zone 655 – The Black Hills and the Southwest Interior Lowlands:
The western 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. The boundary continues southeast through Pe El to Vader in Lewis County. The boundary then turns east along the Lewis-Cowlitz County line to the 1,500-foot contour along the west slopes of the Cascades. The boundary turns north, wrapping around the Cowlitz River Valley, then north along the 1,500-foot contour to the location where Pierce, Thurston, and Lewis Counties meet near Alder Lake. It then follows the Pierce-Thurston County line northwest to I-5, then west along I-5 and US Highway 101 through Olympia, Shelton, and on to the southeast corner of Olympic National Forest. Zone 655 includes Capitol and Lower Chehalis State Forests, as well as the I-5 corridor south of Olympia through Lewis County.

Zone 656 – Northeast Puget Sound Lowlands Generally Below 1500 Feet:
Zone 656 includes land in Whatcom, Skagit, and Snohomish Counties east of I-5 below an elevation of 1,500 feet. This includes the following river drainages: Nooksack (all forks), Skagit (including Lake Shannon and Baker Lakes in the Baker River drainage), Sauk, Stillaguamish, and the Skykomish east to the town of Skykomish.

Zone 657 – Southeast Puget Sound Lowlands Generally Below 1500 Feet:
Zone 657 includes land below 1,500 feet east of I-5 in King and Pierce Counties. It includes the following river drainages: North, Middle and South Fork of the Snoqualmie, Green, White, Puyallup, and the Nisqually from Elbe to Ashford.

Zone 658 –West Slopes of the North Cascades Generally Above 1500 Feet:
Zone 658 includes land at or above 1,500 feet in Whatcom, Skagit, Snohomish, and the northeast corner 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 –West Slopes of the Central Cascades Generally Above 1500 Feet:
Zone 659 includes land at or above 1,500 feet 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 is the Cascade crest.

Zone 662 – The East Portion of North Cascades National Park and the Lake Chelan National Recreational Area:
Zone 662 includes the North Cascades National Park Complex east of the Cascade crest in Chelan County, including Stehekin and the Lake Chelan National Recreational Area.

Appendix 2

2017 NWS Seattle NFDRS Station Index

ZONE	NAME	TYPE	WIMS NUMBER	OWNER	*LAT*	*LON*	*ELEV*
649	Quillayute	Metar	450120	DNR	47.938	-124.555	194
	Hoquiam	Metar	450314	DNR	46.971	-123.933	18

650	Ellis Mtn.	RAWS	450130	DNR	48.129	-124.305	2671
	Forks	RAWS	450105	DNR	47.955	-124.385	303
	Black Knob	RAWS	450321	BIA	47.414	-124.103	650
651	Minot Peak	RAWS	450306	DNR	46.892	-123.417	1768
652	Toms Creek	RAWS	450121	USFS	48.022	-123.959	2400
	Owl Mtn.	RAWS	450211	DNR	47.766	-123.965	3398
	Humptulips	RAWS	450312	USFS	47.367	-123.758	2400
661	Hurricane Ridge	RAWS	450124	NPS	47.970	-123.499	5262
	Cougar	RAWS	450117	USFS	47.923	-123.108	3000
	Jefferson	RAWS	450911	USFS	47.554	-123.215	2200
	Buck Knoll	RAWS	450131	DNR	48.028	-123.311	1630
653	Bellingham	Metar	451411	DNR	48.799	-122.539	157
	Everett	Metar	451614	DNR	47.923	-122.283	604
	Whidbey Island	Metar	450701	DNR	48.349	122.651	46
654	Bremerton	Metar	450801	DNR	47.490	-122.765	440

	Quilcene	RAWS	450207	USFS	47.823	-122.883	62
	Sea-Tac	Metar	451716	DNR	47.445	-122.314	427
	Tacoma (McChord Field)	Metar	451808	DNR	47.138	-122.476	322
655	Olympia	Metar	451001	DNR	46.973	-122.903	203
	Chehalis	RAWS	451103	DNR	46.610	-122.908	262
656	Sedro Woolley	RAWS	451507	DNR	48.522	-122.224	217
	Marblemount	RAWS	451504	NPS	48.539	-121.446	357
657	Enumclaw	RAWS	451702	DNR	47.220	-121.964	756
	Ashford	RAWS	451809	DNR	46.755	-122.110	1421
658	Kidney Creek	RAWS	451409	USFS	48.920	-121.943	3485
	Hozomeen	RAWS	451412	NPS	48.981	-121.078	1700
	Sumas Mtn.	RAWS	451415	DNR	48.908	-122.223	3200
	Finney Creek	RAWS	451509	USFS	48.392	-121.818	2160
	Gold Hill	RAWS	451613	USFS	48.243	-121.546	3350
	Johnson Ridge	RAWS	451611	USFS	47.801	-121.286	2048

659	Fire Trng Academy	RAWS	451721	USFS	47.457	-121.665	1580
	Stampede Pass	Metar	451711	DNR	47.277	-121.337	3960
	Lester	RAWS	451705	USFS	47.210	-121.489	1637
	Greenwater	RAWS	451718	DNR	47.116	-121.596	2405
	Ohanapecosh	RAWS	451119	NPS	46.731	-121.571	1950
	Kosmos	RAWS	451105	DNR	46.524	-122.190	2100
	Hager Creek	RAWS	451115	USFS	46.564	-121.628	3600
	Orr Creek	RAWS	451919	USFS	46.354	-121.604	3000
662	Stehekin	RAWS	452121	NPS	48.347	-120.720	1230

Appendix 3

Methodology for Verification of a Red Flag Warning issued for Wind and Low Humidity

For Wind and Low RH episodes, Red Flag events will be considered to have occurred when Red Flag criteria are achieved at the following combination of stations:

Zone 649: Any *two* stations within the zone, usually Hoquiam and Quillayute
Zone 650: Any *single* station within the zone – **or -** Quillayute ASOS
Zone 651: At Minot Peak RAWS **– or –** both Shelton and Hoquiam ASOSs
Zone 652: Any *one* station within the zone *and* the Ellis Mtn RAWS
Zone 653: Any *two* stations within the zone
Zone 654: Any *two* stations within the zone (including Olympia ASOS)
Zone 655: Any *one* station within the zone (including Olympia ASOS) **– or –** any *two* of the following sites: Shelton ASOS, Minot Peak RAWS and Hoquiam ASOS

Zone 656: Any *two* stations under 1500 feet within Skagit, Snohomish or Whatcom Counties (including Abbottsford, BC)

Zone 657: Any *two* stations under 1500 feet within King or Pierce County, and east of Puget Sound

Zone 658: Any NFDRS station within the zone **– and –** *one* of the following sites: Mt. Baker avalanche site, Marblemount, Fire Training Academy, and SMP

Zone 659: Any two NFDRS stations within the zone

Zone 661: Any NFDRS station within the zone (not followed within 12 hours by the start of a wetting rain)

Zone 662: At Stehekin RAWS

NATIONAL WEATHER SERVICE SPOKANE

WHAT'S NEW

- A new Spot forecast request page is online and the old page has now been taken down.
- All Fire Weather forecast products will be mixed case.
- There will be a change in the http://www.wrh.noaa.gov/otx/ web pages

HOURS OF OPERATION

Office hours at NWSO Spokane for Fire Weather will be as follows: Daily 24 Hour forecast and briefing coverage

The Fire Desk is staffed daily 0700-1700 Late March - Mid October

LOCATION:

National Weather Service Office
2601 North Rambo Road
Spokane, WA 99224-9164

STAFF AND CONTACT:

Vacant	Meteorologist in Charge
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ronald.miller@noaa.gov	
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Jon Fox	Senior Forecaster/IMET
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Jeremy Wolf	Forecaster/IMET
Paul Bos	Senior Forecaster
Matt Fugazzi	Senior Forecaster
Greg Koch	Senior Forecaster
Jeffrey Cote	Forecaster
Robin Fox	Forecaster
Laurie Nisbet	Forecaster
Rocco Pelatti	Forecaster
Steve Bodnar	Forecaster
Steven Van Horn	Forecaster

Joey Clevenger	Forecaster
Andew Kalin	Forecaster
Bryce Williams	Forecaster

Phone:

All forecasts are available on WIMS, and on Spokane's Internet home page. Customers who do not have access to WIMS, or Internet can still have forecasts faxed to them.

Internet Address:
http://www.wrh.noaa.gov/otx
http://www.weather.gov/spokane
http://www.wrh.noaa.gov/firewx/?wfo=otx

FORECAST AREA

The NWS Spokane office has fire weather forecast responsibility for a large portion of protected lands in eastern Washington. Exceptions are the Blue Mountains area, the Yakama Indian Nation lands, the DOE Hanford Site, and portions of the Southeast Department of Natural Resources (DNR) land. These protected lands are the forecast responsibility of the National Weather Service Office Pendleton Fire Weather program.

NWSO Spokane Fire Weather's area of responsibility for Eastern Washington is divided into six districts for fire weather forecasting. In addition, these forecast districts are further sub-divided into ten fire weather zones. See the map for general locations of districts and zones for eastern Washington. The weather zones are comprised of fire danger stations with similar weather and similar trends in weather changes.

NWSO Spokane has forecast responsibility for the Central and Northern Idaho Panhandle. This district has one (1) zone (101) covering the Idaho Panhandle National Forests, Idaho State Lands, and Coeur d'Alene Indian Agency lands.

AGENCIES SERVED:

Land management agencies served by the Spokane Fire Weather Office include:

USFS....	Colville NF
	Wenatchee NF
	Okanagan NF
	Idaho Panhandle NF
BLM....	Spokane District
	Coeur d'Alene District
BIA....	Confederated Tribes of the Colville Reservation
	Spokane Indian Tribe of Indians
	Coeur d'Alene Tribe of Indians
	Kalispel Tribe of Indians

NWR...	Turnbull National Wildlife Refuge Columbia National Wildlife Refuge Kootenai National Wildlife Refuge Lake Pend Oreille Wildlife Refuge Sinhalekin Wildlife Refuge
Washington DNR...	Northeast Area Resource Protection Division Southeast Area Resource protection Division
Idaho...	Department of State Lands
Other Public Agencies...	Coulee Dam National Recreation Area Lake Chelan National Recreation Area

FIRE WEATHER SERVICES:

Fire Weather Watches and Red Flag Warnings: Red Flag criteria for eastern Washington and Northern Idaho are as follows:

- "Dry thunderstorm" Red Flag criteria is defined as *abundant lightning in conjunction with sufficiently dry fuels*.

  "Abundant" and "Sufficient" are locally defined and verified by NWS offices and their fire agency customers using the following GACC AOP-wide guidelines:

  Abundant Lightning:
  1) Number of lightning strikes that meet climatologically significant criteria, or
  2) Areal coverage of lightning such as "Scattered" or ≥ 25%

  Sufficiently Dry Fuels:
  1) ERC or BI values meeting climatologically significant percentiles or
  2) Land management declaration

- Sustained surface winds exceeding a 10-minute average of 15 mph combined with relative humidity less than:
  - 15% in the Columbia Basin (zone 673)
  - 25% in the mountainous areas
  - 20% in the lower valley zones (including zone 674)

  This is typically (but not always) associated with a dry cold front passage. These conditions must be verified by at least 2 observation sites (RAWS, METAR, DOT, Agrimet etc) for 2 consecutive hours. **For Idaho Zone 101 the criteria will be at least 2 observations sites for any 3 hours in an 8 hour period.** When using

observation sites other than RAWS sites wind speeds will be converted to 10 minute averages.

Special consideration will be given whenever very hot temperatures are combined with very low relative humidity.

- Haines Index of 6 when combined with low relative humidity, typically 15% or below.

- Strong winds that will overcome the environment no matter what the relative humidity.

- An unusually unstable atmosphere This would be associated with a strong thermal trough which typically forms along the east slopes of the Washington Cascades.

The issuance of Red Flag Warnings will take into account fuel conditions, and will be coordinated with land management agencies and other applicable fire weather offices. Typically when 1000 hour fuels are at or below 11%, 100 hour fuels are at or below 6-8% and Live Fuels at or below 120%.

Spot Forecasts: Detailed instructions for completing the Spot Request Form and access links are available on our Fire Weather Web page in the upper left hand corner or at: https://www.youtube.com/watch?v=4Or6flTaAHM&feature=youtu.be

Valid times for spot forecasts will be twelve hours from forecast issuance.

The spot forecast request web page available on the Spokane fire weather web page at: http://www.weather.gov/spot/monitor/

Weather Briefings: nternet based weather briefings are available from the Spokane office as needed. During peak fire season, normally mid June-early October briefings will be daily at 0900 PDT. These briefings will be recorded and should be available on the Fire Weather Page by 030 PDT. During Land Management season briefings are available by customer request and are usually held twice per week for planning purposes. The phone number is 877-783-9070. The passcode is available by calling our office. Phone briefings are available 24 hours per day by calling 509-244-5031.

Social Media: NWS Spokane has a Facebook page, Twitter account, and a YouTube channel. Information about current Fire Weather may be included in these social media feeds, but such information is intended as supplemental information for the general public; it is not intended to meet the specialized needs of the wildland firefighting community. www.twitter.com/NWSSpokane

GEOGRAPHICAL ZONE DESCRIPTIONS

The National Weather Service Office in Spokane has fire weather forecast responsibility for protected lands in the northern and central part of eastern Washington and the northern and central Idaho Panhandle. Exceptions are the Blue Mountains area, the Yakama Indian Reservation, and portion of the Southeast Department of Natural Resources (DNR) protected lands. Forecasts for these areas are handled out of the National Weather Service office in Pendleton (see zone descriptions below).

WFO Spokane's eastern Washington fire weather area is divided into six districts. In addition, these forecast districts are further sub-divided into eleven fire weather zones. See the map for general locations of districts and zones for eastern Washington. The fire weather zones are comprised of fire danger stations with similar weather and similar trends in weather changes.

South Central District:
This district consists of two zones. Zone 676 lower elevations and Zone 680 higher elevations. The south central district covers those areas of the southern Washington Cascades north of the Yakama Indian Reservation to Mission Ridge. The district boundary also runs west to east from the Cascade crest to Interstate 82. This includes the Naches and Cle Elum Ranger Districts of the Wenatchee National Forest. This district has pronounced climate differences, from the marine air influence near the Cascade crest, to the dry arid climate of the valleys. This district has a relatively low frequency of lightning, and averages about 7-10 storm-days per season from June through September.

Central District:
This district has two zones. Zone 677 lower elevations and Zone 682 are the two zones in this district. This district extends from Mission Ridge north to Sawtooth Ridge, and from the Cascade crest east to the Columbia River. It includes the northern part of the Wenatchee NF. Lightning frequency averages around 10-15 storm-days per season. The summer climate is similar to the South Central District, but winds tend to be stronger and more persistent, and day to day weather changes are more pronounced. This district contains some of the highest fire hazard areas in the Pacific Northwest.

Northern District:
This district has three zones. Zone 687 is the Okanogan Highland zone. Zone 684 lower elevations, mainly the Okanogan River Valley, and zone 685 higher elevations of the North Cascades. This district extends across the north part of eastern Washington from the Cascade crest to the Kettle River Ranger District on the east. It includes the Okanogan NF, the Republic Ranger district of the Colville NF, land under the protection of Northeast Department of Natural Resources, and the western and central parts of the Confederated Tribe of the Colville Indians. The marine influence is minimal in this district compared to the south central and central districts due to its more continental

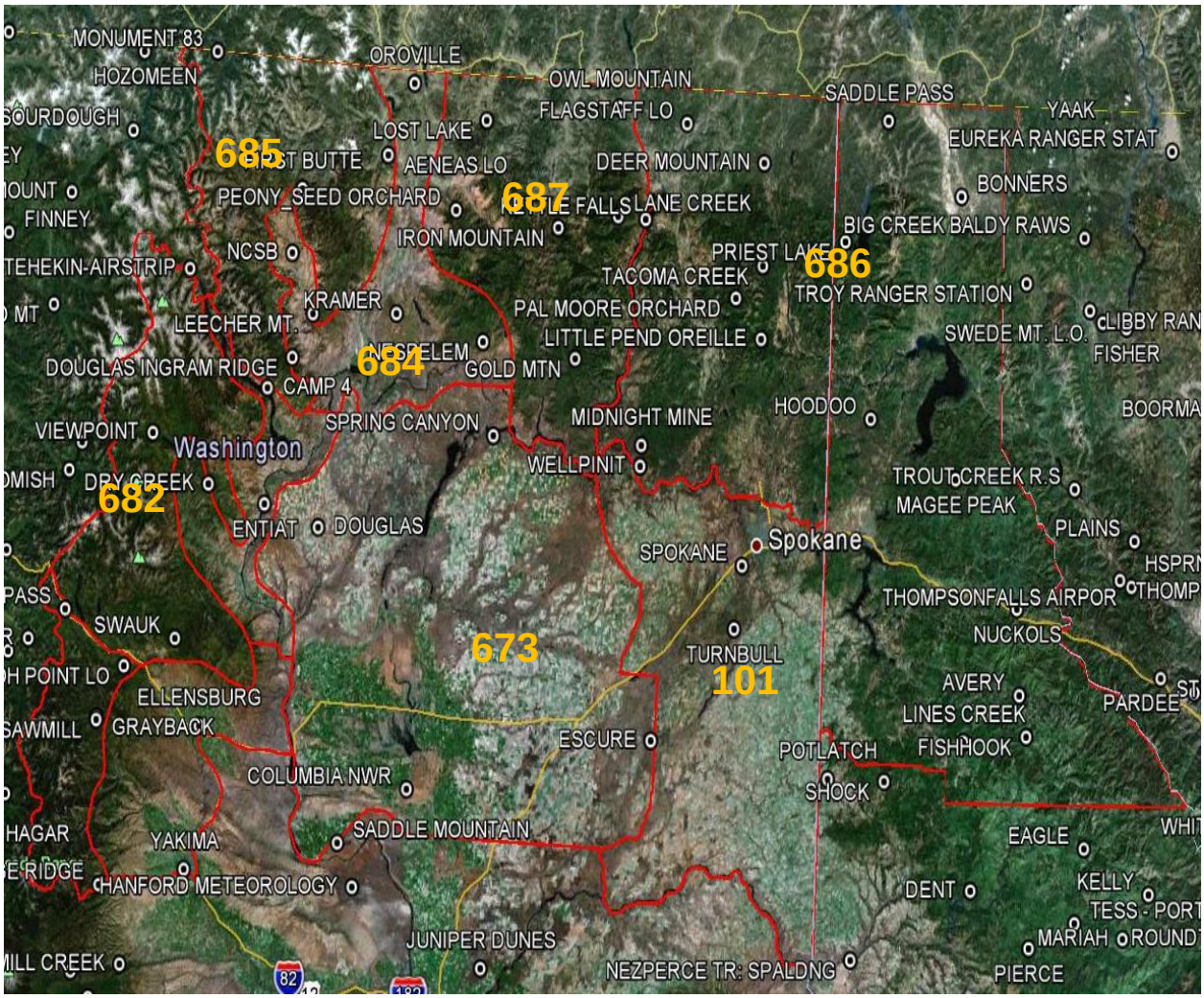
location. Winds are generally lighter than central and south central districts. Lightning activity though is greater, averaging about 15 storm-days per season.

Northeast District:
Zone 686. The northeast district extends from the Kettle River to the Idaho border, and south to the Spokane and Little Spokane rivers. It covers the remainder of the Colville NF and The Confederated Tribe of Colville Indians, as well as lands under the jurisdiction of Northeast DNR and the Spokane Tribes of Indians. This district is normally a bit wetter than the other districts since it extends into the western foothills of the Rocky Mountains. The southern portion around the lower elevations in the vicinity of Deer Park is slightly drier, windier section of this district. Lightning frequency is the greatest of any of the districts averaging 15-20 storm-days per season.

Northern Columbia Basin District:
This district has two zones. Zone 673, and A NEW Zone 674 (See map on next page). Pendleton weather office has responsibility for a large portion of Washington State DNR Southeast Region lands, Yakama IA, and DOE Hanford. The southern boundary is I-90 for that part of the Yakima Firing Center in Kittitas County then follows county lines west to east across Grant, Adams, and Whitman Counties. The western part of the district boundary is the Columbia River at the Grant County line. The northern boundary is the same as previous years following the Columbia River to the eastern Ferry County then south across the northeast part of Lincoln County to Highway-2 near Davenport then east along the Spokane and Little Spokane rivers to Idaho state line. Fuels in this district consist of mainly grass and sage with areas of mixed conifer developing for the northeast portion of zone 674. Zone 673 includes the Waterville Plateau which contains low ridges and coulees and the lower Columbia basin. Most of the district is at fairly low elevations between 900 and 3,000 ft...the exception being Badger Mountain near Waterville at 4,221 feet. Zone 674 includes the Washington Palouse to the south…the west Plains near Spokane and Mica peak to the north. This zone is slightly higher and wetter than zone 673 with elevations from 900-100- feet near the Snake river with several buttes and small mountains above 3000 feet with the highest point at Mica Peak at over 5000 feet. Due to the relatively low elevations and locations, these are the warmest and driest districts. Winds in some areas can be very strong. Lightning activity is the least of the districts, averaging about 6 storm-days per season.

Northern and Central Idaho Panhandle District:
This District is part of Region 1 and has one zone. Northern and Central Idaho Panhandle Zone 101 - Northern and Central Idaho Panhandle. This zone includes...Idaho Panhandle National Forests, Coeur d'Alene Tribes of Indians, and Idaho State protected lands in the following counties: Boundary, Bonner, Kootenai, Benewah, Shoshone, and the northern part of Latah County where a part of the St. Joe District resides. Zone 101 is broken into three (3) separate zones the Northern zone, Central zone and Southern zone. This area averages 12-15 thunderstorm days per season.

Spokane Fire Weather Forecast Zones in Washington



WS Spokane NFDRS Station Index

ZONE	NAME	Type	NUMBER	OWNER	LAT	LON	ELEV
673	Escure	R	453601	BLM	47.07	-117.98	1725
673	Columbia NWR	R	453102	FWS	46.87	-119.33	890
673	Spring Canyon	R	453002	NPS	47.93	-118.93	1340
673	Saddle Mtn	R	452701	FWS	46.69	-119.69	650

673	Douglas	R	452601	BLM	47.62	-119.90	2530
674	Escure	R	453601	BLM	47.07	-117.98	1725
674	Turnbull Wildlife	R	453506	FWS	47.41	-117.53	2250
674	Spokane Airport	M	453505	NWS	47.60	-117.50	2365
676	Ellensburg	M	452203	DNR	47.03	-120.54	1560
677	Dry Creek	R	452134	USFS	47.72	-120.53	3480
677	Camp 4	R	452132	USFS	48.02	-120.23	3773
677	Entiat	R	452136	USFS	47.67	-120.21	796
680	Peoh Point	R	452206	DNR	47.15	-120.95	4020
680	Sawmill Flats	R	452221	USFS	46.98	-121.08	3500
680	Sedge Ridge	R	452306	DNR	46.58	-120.90	4300
682	Viewpoint	R	452128	USFS	47.85	-120.87	3760
682	Swauk	R	452219	USFS	47.25	-120.67	3773
682	Dry Creek	R	452134	USFS	47.73	-120.54	3661
684	NCSB	R	452030	USFS	48.43	-120.14	1650
684	Oroville	R	452039	BLM	48.96	-119.49	1360
684	Nespelem	R	452009	BIA	48.21	-119.02	1782
684	Douglas Ingram Rdg	R	452035	USFS	48.12	-120.10	3460
684	Kramer	R	452040	BIA	48.27	-119.52	2720

685	Leecher	R	452020	USFS	48.25	-120.00	5019
685	First Butte	R	452006	USFS	48.62	-120.11	5500
685	Aeneas	R	452001	DNR	48.74	-119.62	5185
686	Midnite Mine	R	452913	BLM	47.94	-118.09	2693
686	Pal Moore Orchard	R	452915	USFS	48.39	-117.43	3120
686	Kettle Falls	R	452916	NPS	48.61	-118.12	1310
686	Tacoma Creek	R	453413	USFS	48.49	-117.43	3300
686	Little Pend Oreille	R	453416	FWS	48.27	-117.43	2020
686	Deer Mountain	R	453412	USFS	48.80	-117.45	3300
686	Wellpinit	R	452918	BIA	47.88	-118.10	2240
686	Cedar Creek Orchard	R	452917	USFS	48.99	-117.49	4300
686	Teepee Seed Orchard	R	453414	USFS	48.66	-117.48	3280
686	Flowery Trail	R	453145	USFS	48.30	-117.41	2680
686	Kettle Falls	R	452916	USFS	48.58	-118.11	1310
686	Fairchild 36 RQF	R		BLM	48.42	-117.36	2450
687	Peony	R	452038	USFS	48.59	-119.21	3600
687	Brown Mountain Ochd	R	452514	USFS	48.54	-118.69	3210
687	Owl Mountain	R	452513	USFS	48.94	-118.30	4400
687	Lane Creek	R	452511	USFS	48.61	-118.28	4500
687	Gold Mountain	R	452510	BIA	48.18	-118.49	4636
687	Iron Mountain	R	452512	USFS	48.56	-118.62	4325
687	Lost Lake	R	452029	USFS	48.87	-119.06	3760

101	Bonners Ferry	R	100101	USFS	48.72	-116.35	2310
101	Magee Peak	R	100425	USFS	47.89	-116.31	4856
101	Fish Hook	R	100421	USFS	47.86	-115.91	4700
101	Hoodoo	R	100208	USFS	48.05	-116.84	2270
101	Lines Creek	R	100424	USFS	48.15	-116.29	5120
101	Nuckols	R	100423	USFS	47.54	-115.97	4000
101	Priest Lake	R	100204	USFS	48.60	-116.96	2600
101	Saddle Pass	R	100107	USFS	48.98	-116.79	5120

OREGON DEPARTMENT OF FORESTRY WEATHER

HOURS OF OPERATION

The Oregon Department of Forestry's Salem Weather Center office hours vary depending upon fire and prescribed fire activity. The office is open from 0630 - 1700, five days a week between about November 25 - March 31 and July 1 - September 30. During the spring and fall burning periods, the office is staffed from 0630 - 1700, six days a week. Exact dates of five and six day-a-week service vary and are responsive to user needs for smoke management and other fire danger rating services.

LOCATION

Oregon Department of Forestry
2600 State Street
Salem, OR 97310

STAFF AND CONTACT

Nick Yonker	Meteorology Manager	Nick.J.Yonker@oregon.gov
Pete Parsons	Meteorologist	Peter.G.J.Parsons@oregon.gov
Tom Jenkins	Meteorologist	Thomas.S.Jenkins@oregon.gov
Teresa Alcock	Fire Program Analyst	Teresa.Alcock@oregon.gov
Christina Clemons	Field Coordinator	Christina.T.Clemons@oregon.gov

Telephone:
Nick Yonker
Pete Parsons
Tom Jenkins
Teresa Alcock
Christina Clemons
Forecast Desk
Fax

Internet: http://www.oregon.gov/ODF/Fire/Pages/Burn.aspx

FORECAST AREA

The ODF Salem Weather Center provides services statewide, supporting prescribed burning/smoke management activities on nearly all private, state, county and federal forestland in Oregon. The fire weather zones that are serviced are described below in

this operating plan. The Center also provides fire danger, fire severity and specialized weather (e.g. heavy rain, snow, wind, etc.) support to all ODF districts.

Note that prescribed burning on all forestland in Oregon comes under the jurisdiction of ODF Smoke Management Plan. Prescribed burning must follow the requirements of the Smoke Management Plan, regardless of the party or agency that is responsible for the ownership or management of the land. Forecasts and service provided by the National Weather Service should only be used for fire management purposes and not for smoke management approval.

AGENCIES SERVED

Oregon Department of Forestry (ODF)
Private forest land owners
U.S. Bureau of Land Management (BLM)
U.S. Forest Service (USFS)
U.S. National Park Service (NPS)
U.S. Fish and Wildlife Service (USFWS)
Bureau of Indian Affairs (BIA)

FORECAST SERVICES

General Forecasts:
Fire Season: ODF meteorologists provide smoke forecasts during major wildfire events statewide on a case-by-case basis. Wildfire smoke forecasts are issued as needed. Special fire severity statements are issued on an as needed basis. ODF contracts with the Oregon Department of Agriculture to provide field burning forecasts from July through September in the north Willamette Valley, Jefferson County and Union County.

Prescribed Burning Season (which may overlap fire season): Smoke management forecasts and prescribed burning instructions and advisories are issued daily by 1500. Updated forecasts are released on an as needed basis, normally by 0800. Forecasts and burning instructions provide detailed information on a zone by zone basis. Forecasts describe the expected weather in detail for the next day and provide two to four day outlooks in more general terms. Three separate forecasts are issued daily for different areas of the state:

1. Western Oregon and the Deschutes National Forest (Zones 601-623, 639)
2. Northeast Oregon (Zones 640-646)
3. South-Central Oregon (Zones 624 and 625)

Open Burning Season: Open burning forecasts in support of the Oregon Department of Environmental Quality's open burning program for the Willamette Valley north of Lane County are issued by 0730 year-round.

Off-season: Forecasters issue forecasts or special weather statements as needed in support of special prescribed burning requests and safety of agency personnel.

Smoke management spot forecasts: Detailed weather information beyond what is presented in the general smoke management forecast may be obtained with a spot forecast request. Smoke management spot forecasts are normally handled through oral briefings by contacting the duty forecaster at the forecast desk phone number shown above.

Telephone briefings: Telephone briefings may be provided by the ODF duty forecaster. These verbal weather briefings may be obtained at any time by calling the forecaster desk phone number shown above.

NON-FORECAST SERVICES

Smoke Management Training and Lectures: ODF forecasters are available to provide weather and smoke management training and program information at field locations. These sessions would generally have to occur during the seasons when prescribed burning is not occurring.

Annual Summary and Operating Plan: The Smoke Management Annual Report is published by the staff of the Center. It provides a summary of prescribed burning activities for all landowners/land managers throughout the state.

An annual operating plan (this document) describing Salem Weather Center services, responsibilities, and procedures will be published each year. The operating plan is available on the ODF internet page shown in the "Contact" section of this plan.

GEOGRAPHICAL ZONES

Forecast zones may be found at the following web site:
http://www.oregon.gov/ODF/Documents/Fire/FIRE_WEATHER_ZONE_2015.pdf

WASHINGTON DEPARTMENT OF NATURAL RESOURCES FIRE DANGER

HOURS OF OPERATION

The WA DNR meteorologists and fire danger staff are in the office Monday through Friday, from 0700 to 1730. When fire season dictates, a meteorologist is generally present during the same hours on the weekend as well.

LOCATION

Wildfire Division, WA Dept. of Natural Resources
1111 Washington Street SE
MS: 47037
Olympia, WA 98504

STAFF AND CONTACT

Management Staff:

Bob Johnson	Division Manager, Wildfire
Karen Arnold	Ass. Div. Manager, Predictive Services

Fire Danger Staff:

Josh Clark	Meteorologist, Program Manager	josh.clark@dnr.wa.gov
David Grant	Fuels Analyst	david.grant@dnr.wa.gov
Kirk Davis	GIS Lead	kirk.davis@dnr.wa.gov
Jason Mustard	Smoke Management Meteorologist	

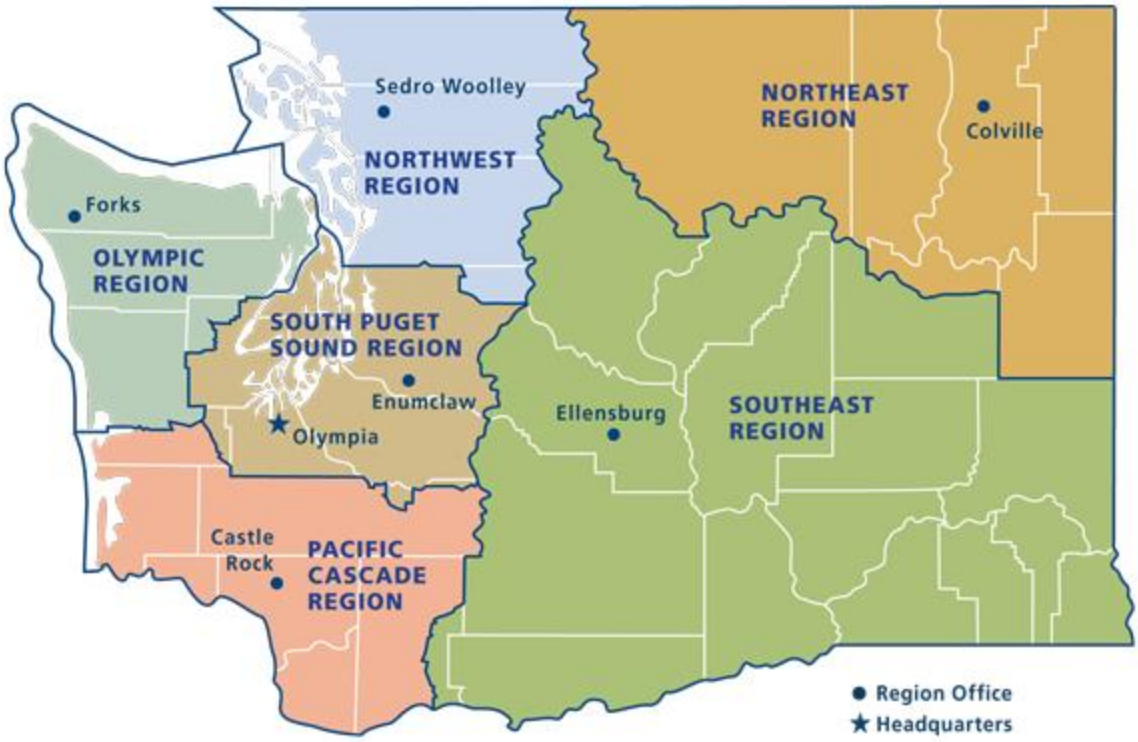
jason.mustard@dnr.wa.gov

Telephone:
Josh Clark
David Grant
Kirk Davis
Jason Mustard
Fax

Internet: http://www.dnr.wa.gov/programs-and-services/wildfire-resources
Twitter: https://twitter.com/waDNR_fire

FORECAST AREA

For fire danger and meteorological support, all DNR-managed or protected lands (13.1 million acres) in Washington, divided in six regional jurisdictions: Pacific Cascade, South Puget Sound, Olympic, Northwest, Southeast, and Northeast.



For smoke management/burn requests, all forested lands (public and private) in the state which meet the requirements for DNR approval as outlined in Washington RCW 76.04 and the State Smoke Management Plan or those which pay a Forest Fire Protection Assessment tax.

AGENCIES SERVED

Washington Department of Natural Resources (from executive leadership to individual fire units)
Washington Department of Ecology
Washington Emergency Management Division
Washington Military Department
Washington State Fire Marshal's Office
Other USFS, NPS, BIA, BLM, and local partners

SERVICES

Operational Weather Forecasting and Climate Interpretation: During fire season, generally between July and October, the meteorologist provides a daily weather briefing to the executive and regional leadership of the Washington Department of Natural Resources, Emergency Management Division, and State Fire Marshal's office. The meteorologist also provides a weather forecast for DNR aviation operations.

Outside of fire season, weather forecasts and briefings are provided to agency leadership when a reasonable impact to natural resources operations can be expected. This includes: landslides, significant wind events, severe weather, earthquakes, and other weather scenarios.

Smoke Management Approvals: The smoke management meteorologist and weather program manager approve all state silvicultural burns over 100-tons in Washington. Additionally, the meteorologists support the 2928 Forest Resiliency Pilot Burning Project by providing advance approvals and on-site meteorological support. Smoke management requests and approvals may be made via SMOKEM here: https://fortress.wa.gov/dnr/protection/burnrequests/.

Our forecasters, given enough notice, are available to support natural and broadcast type burns on-scene. We have a full complement of portable RAWS, handheld weather instruments, a remote observing system consisting of and an E-Sampler to provide continuous meteorological support for firefighter safety, satisfying burn plan objectives, or assessing air quality/smoke dispersion.

Note: the current state smoke management plan is being rewritten this year, which may result in changes to DNR's role in smoke management in 2018.

Fire Danger: A new web/mobile fire danger toolbox is scheduled to be implemented during the 2017 fire season. This application will display forecast energy release component, burning index, severe fire weather potential index, RAWS observations, and other calculated fire danger indices for 24-hr, 48-hr, and 72-hrs out. This application will likely be extended in late 2017-2018 to provide better prescribed fire and smoke management support as well.

RAWS Management: The Washington DNR currently maintains 31 RAWS (27 fixed and 4 portables), making it the fourth largest state fire network in the U.S. We also pride ourselves in having one of the more dependable and accurate networks in the nation. The meteorologist and fuels analyst are responsible for the quality of the data and indices that these stations produce. The DNR has six radio technicians which are responsible for the maintenance of sensors. For any issues with RAWS, please e-mail DNRDLRPRAWS@dnr.wa.gov and the appropriate technician will reply shortly.

We provide a status report monthly to all RAWS data consumers detailing the previous month's quality control, known issues, or network updates. If you are interested in receiving this report, please e-mail josh.clark@dnr.wa.gov.

Incident Support: Aside from the smoke management capabilities listed above, our group currently maintains the following NWCG qualifications: IMET-trainee, GISS, GISS-trainee, FFT2, COMT, and RADO.

Seasonal Outlooks: Beginning in April, the meteorologist provides a monthly outlook for Washington's fire season. This outlook is normally published during the first week of the month and continues through October. Accompanying video or webinar style briefings are available as needed to any agency requesting one. Outlooks are also available to media or various communications staff.

Fire Staff Training: We provide support (either full course or individual units) for S-130, S-190, S-290, and S-390. We are also available for RT-130s as needed.

Annual Operating Plan: The meteorologist produces an annual operating plan, typically during January, outlining the duties and products offered by the section.

Appendices

Picturesque Mt. Hood – Mt. Hood Complex August, 2006 – Photo by Scott Weishaar

APPENDIX A

Links to Fire Weather Agreements and Documents

Interagency Agreement for Meteorological Services and other Technical Services
http://www.srh.noaa.gov/ridge2/fire/docs/2012_National_Agreement.pdf

NWS Fire Weather Services Directives

- Product Specifications (NWS Instruction 10-401)
  http://www.weather.gov/directives/sym/pd01004001curr.pdf
- On-site Support (NWS Instruction 10-402)
  http://www.weather.gov/directives/sym/pd01004002curr.pdf
- Coordination and Outreach (NWS Instruction 10-403)
  http://www.weather.gov/directives/sym/pd01004003curr.pdf
- Annual Operating Plan and Report (NWS Instruction 10-404)
  http://www.weather.gov/directives/sym/pd01004004curr.pdf
- Training and Professional Development (NWS Instruction 10-405)
  http://www.weather.gov/directives/sym/pd01004005curr.pdf
- Zone Change Process (NWS Instruction 10-407)
  http://www.weather.gov/directives/sym/pd01004007curr.pdf
- Western Region Forecast Office Fire Weather Services (WR Supplement to 10-401)
  http://www.weather.gov/directives/sym/pd01004001w042005curr.pdf

Electronic copy of the NWS D-1 spot forecast request form
http://www.wrh.noaa.gov/sew/D1_V2005.pdf

National Mobilization Guide
http://www.nifc.gov/nicc/mobguide/index.html

Northwest Interagency Mobilization Guide
http://www.nwccweb.us/admin/publications.asp

Link to Washington DNR Fire Information
http://dnr.wa.gov/programs-and-services/wildfire-resources

APPENDIX B

Forecast and Service Performance Measures

A. NFDRS Forecast Accuracy Performance Measures

The following performance measures are suggested as baseline standards for improvement over persistence forecasts on an annual basis for zone averages or key stations within a fire weather zone. The verification methodology will be consistent between all NWS offices (e.g. MAE, bias scores).

	Suggested Annual Baseline Goals
Parameter	Improvement over persistence forecast
Temperature:	35%
Relative Humidity:	25%
Wind speed:	10%

Wetting Rain: A "yes" or "no" field, correct 80% of the time as verified by the PD1 and PD2 forecast forecasts in NFDRS.

Lightning: A “yes” or “no” field, correct 70% of the time as verified by the LAL forecast. For verification purposes, an LAL forecast of 2 or more will be considered a “yes.” This verification effort will be a collaborative effort between NWCC and NWS.

B. Spot Forecasts for Wildfires, Prescribed Fires and other activities

Spot Forecast verification will be based on relevant agency provided observations at the fire site (e.g. a forecast for a 7 p.m. temperature must be validated by a 7 p.m. observation.) Suggested verification criteria are as follows:

Temperature:	MAE <=5 degrees Fahrenheit
Relative Humidity:	MAE of following values:
	RH 30%: <= 4%
	RH 30-50%: <= 7%
	RH > 50%: <=10%
Wind Speed:	MAE <= 3mph for user defined measurement height (20 foot wind or eye-level).

C. Red Flag Warning and Fire Weather Watch

Red Flag Warnings and Fire Weather Watches will be verified in accordance with NWSI 10-401 http://www.weather.gov/directives/sym/pd01004001curr.pdf and 10-401 WR Supplement.

http://www.weather.gov/directives/sym/pd01004001w042005curr.pdf.
Verification statistics will be included in the Annual Report.

APPENDIX C

Reimbursement for NWS-Provided Training

IMETs and other NWS staff are frequently requested to provide fire weather training for fire crews as part of such interagency fire behavior courses as S190 and S290. Policy guidelines for fulfilling these requests are outlined in NWSI 10-403.

Requests for training by NWS personnel are not made using resource orders. Rather, both the USDA Forest Service and Department of Interior utilize training request forms that can be used by the NWS to obtain reimbursement for travel costs associated with the provision of weather training. The USDA Forest Service uses Form AD-672.

The Department of Interior does not have a single, standard form. However, a template Form 1681-3 is available that can be presented to the DOI requestor. It is the responsibility of the requesting agency to provide an appropriate agreement document for training.

If the request for training comes via a state agency, the NWS must use a NOAA General Counsel template. Training requests from California, Oregon and Washington do not need to use this form as their requests are covered by the same agreement used for IMET dispatches for those states.

There are no standard forms for gaining travel expense reimbursements from local agencies or colleges. Requesting agencies should pre-pay all travel expenses for instructors who must travel to the course, or at least cover lodging costs.

A secondary, more cumbersome option is for requesting agencies to reimburse the NWS by writing a check to the U.S. Department of Commerce for the amount of the travel voucher. If this is done however, the WFO must attach a “Gifts and Bequeaths Form” to the voucher prior to submission to their Finance Office. **Under no circumstances can the requesting entity personally reimburse the NWS instructor for travel costs.**

APPENDIX D

Incident Meteorologist Billing Points of Contact for Washington and Oregon

USDA Forest Service:
Elizabeth Martin
USDA Forest Service; Incident Business
101B Sun Avenue NW
Albuquerque, NM 87109

National Park Service, US Fish and Wildlife Service, Bureau of Indian Affairs, and Bureau of Land Management
David R. Burley
BLM, Incident Business Lead
National Interagency Fire Center
3833 S. Development Avenue
Boise, ID 83705

APPENDIX E

Spot Forecast Request Form D-1

WS FORM D-1 (1-2005) (Supersedes Previous Editions)

SPOT REQUEST (See reverse for instructions)

U.S. Department of Commerce NOAA National Weather Service

Please call the NWS Weather Forecast Office (WFO) when submitting a request and also after you receive a forecast to ensure request and forecast were received.
Please provide feedback to WFO on forecast.

1. Time†	2. Date	3. Name of Incident or Project	4. Requesting Agency

5. Requesting Official	6. Phone Number	7. Fax Number	8. Contact Person

9. Ignition/Incident Time and Date

10. Size (Acres)

11. Type of Incident
- ☐ Wildfire
- ☐ Prescribed Fire
- ☐ Wildland Fire Use (WFU)
- ☐ HAZMAT
- ☐ Search And Rescue (SAR)

12. Reason for Spot Request (choose one only)
- ○ **Wildfire**
- ○ **Non-Wildfire** Under the Interagency Agreement for Meteorological Services (USFS, BLM, NPS, USFWS, BIA)
- ○ **Non-Wildfire** State, tribal or local fire agency working in coordination with a federal participant in the Interagency Agreement for Meteorological Services
- ○ **Non-Wildfire** Essential to public safety, e.g. due to the proximity of population centers or critical infrastructure.

13. Latitude/Longitude:

14. Elevation (ft, Mean Sea Level)
Top: **Bottom:**

15. Drainage

16. Aspect

17. Sheltering
- ☐ Full
- ☐ Partial
- ☐ Unsheltered

18. Fuel Type: __Grass __Brush __Timber __Slash __Grass/Timber Understory __Other_____
Fuel Model: 1,2,3 4,5,6,7 8,9,10 11,12,13 2,5,8

19. Location and name of nearest weather observing station (distance & direction from project):

20. Weather Observations from project or nearby station(s): (Winds should be in compass direction e.g. N, NW, etc.)

Place	Elevation	†Ob Time	20 ft. Wind Dir	20 ft. Wind Speed	Eye Level Wind. Dir	Eye Level Wind. Speed	Temp. Dry	Temp. Wet	Moisture RH	Moisture DP	Remarks *(Relevant Weather, etc)*

21. Requested Forecast Period
Date

Start _____

End _____

Forecast needed for:
- ☐ Today
- ☐ Tonight
- ☐ Day 2
- ☐ Extended

22. Primary Forecast Elements (Check all that are needed) ***(for management ignited wildland fires, provide prescription parameters):***

	Needed:
Sky/Weather	☐
Temperature	☐
Humidity	☐
20 ft Wind	☐
Valley	☐
Ridge Top	☐
Other (Specify in #23)	☐

23. Remarks (other needed forecast elements, forecast needed for specific time, etc.)

24. Send Forecast to:
ATTN:

25. Location:

26. Phone Number:
Fax Number:

27. Remarks (Special requests, incident details, Smoke Dispersion elements needed, etc.):

EXPLANATION OF SYMBOLS: † Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215; 10:15 a.m. = 1015
Indicate local standard time or local daylight time

WS FORM D-1, January 2005 INSTRUCTIONS:

I. Incident Personnel:

1. Complete items 1 through 27 where applicable.
   a. Example of weather conditions on site:

13. Weather Observations from project or nearby station(s):											
Place	Elevation	†Ob Time	20 ft. Wind		Eye Level Wind.		Temp.		Moisture		Remarks *(Relevant Weather, etc.)*
			Dir	Speed	Dir	Speed	Dry	Wet	RH	DP	
Unit G-50	1530'	0830	NW	6-8	NW	3-5	32		72		Observations from unit RAWS station, 50% cloud cover.

   b. If the incident (HAZMAT, SAR) involves marine, put the wave/swell height and direction in the Remarks section.
2. Transmit in numerical sequence or fax to the appropriate Weather Forecast Office. (A weather forecaster on duty will complete the special forecast as quickly as possible and transmit the forecast and outlook to you by the method requested)
3. Retain completed copy for your records.
4. **Provide feedback to NWS utilizing separate page.** Be sure to include a copy of the spot forecast with any feedback submission including forecaster's name. Feedback to NWS personnel is imperative to assist with future forecasts. Remember, feedback on correct forecasts is equally as valuable as feedback on incorrect forecasts! If spot forecast is significantly different than conditions on site, a second forecast may be required.

II. ALL RELAY POINTS should use this form to insure completeness of date and forecast. A supply of this form should be kept by each dispatcher and all others who may be relaying requests for forecasts or relaying completed forecasts to field units.

III. Forms are available from your local National Weather Service Weather Forecast Office. They may also be reproduced by other agencies as needed, entering the phone number and radio identification if desired.

NOTICE: Information provided on this form may be used by the National Weather Service for official purposes in any way, including public release and publication in NWS products. False statements on this form may be subject to prosecution under the False Statement Accountability Act of 1996 (18 U.S.C. § 1001) or other statutes.

APPENDIX F

Hysplit Request Instructions

HYSPLIT is a model which determines trajectories for parcels at a given height above ground level. An easy method has been developed to take advantage of the base information that is already input into the spot request form to generate automated HYSPLIT Trajectory forecasts. The HYSPLIT trajectories can be used for many purposes (i.e. HAZMAT, smoke, etc.).

The HYSPLIT output represents computer model forecasts without any human interaction. They do not take into account information on burn size or fuels, thus generate trajectory forecasts for 500, 1500, and 3000 meters AGL without regarding for whether the fire plume height will reach those altitudes.

To utilize this feature, simply add the word Hysplit with your email address into the remarks section of a spot request:

Example: Hysplit to very.windy@web.address

Any email address works.

It is recommended that you try this procedure and get a feel for its content before using it for actual guidance on a burn or fire. For more information, please visit http://www.srh.noaa.gov/ridge2/fire/docs/HYSPLITone-pager_final_woSMEs.docx. If you have any questions, please contact your local fire weather program leader.