View Lake Complex

Mt. Hood National Forest

Long Term Assessment and Implementation Plan

August 29, 2010

By R6 Long-term Assessment Team

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Table of Contents

Executive Summary

- Fire near Rock Cone on the Confederated Tribes of Warm Springs Reservation (CTWS) has received suppression action and is in mop-up phase. The long-term analysis shows that the threat for further fire spread on the CTWS is very low. Continued monitoring of the eastern edge of Pyramid fire is warranted.
- Fire in Olallie Lake Scenic Area on the Mt. Hood has been suppressed and in mop-up phase. The long-term analysis shows that the threat for further spread is very low.
- Spread of the Pyramid Fire to the south toward Mount Jefferson is slowed by the natural barriers principally rock.
- From this assessment, the highest probability for extensive fire spread is from the Pyramid Fire to the northeast. There is a need to monitor this section of the fire if fire behavior increases. Checking actions may be needed to slow or delay the fires spread to the power-lines and other values at risk.
- Fire spread to values in the Breitenbush drainage are well outside the FSPro probability for the next 14 days.
- Longer term weather outlooks do not predict any unusual patterns, precipitation should be near normal and temperatures may trend to slightly below normal.
- Low humidity is needed to support aggressive fire spread. Thermal troughs are the most likely event that leads to aggressive fire spread. Poor nighttime humidity recovery is a key indicator.
- The season ending event analysis indicates a 97% probability of season end on October 26. One or two fire slowing precipitation events should be expected in September.

Introduction

This document presents the results of a long term assessment of fire growth potential and recommendations for management considerations of the Mt. Jefferson Wilderness fires. The fires are located on the Mt. Hood and Willamette National Forests and Confederated Tribes of Warm Springs Reservation. The assessment takes advantage of current fire modeling tools and techniques, supplemented with the expertise of experienced modelers and fire managers, in hopes of providing the three jurisdiction staff with a sound plan for management of these fires for the remainder of the 2010 fire season.

The View Lake Complex started from a lightning storm on August 17, 2010 that tracked up the Cascade Crest. Two fires near Olallie Lake initially emerged as potentially large fires near View Lake and were prioritized for suppression action. The fires were combined into a complex and a Type III Incident Management Team (IMT) was called to handle suppression operations. Pyramid and Dinah-mo fires were in the Mt. Jefferson Wilderness and did not show significant fire behavior or growth until a frontal passage. After the passage of the front the fires grew in size. A Type I IMT was ordered to manage all the fires in Olallie Lake Scenic Area and Mt. Jefferson Wilderness. With the change in condition of fires in wilderness, the Forest recognized the potential for a long duration event and requested preparation of a long-term risk assessment.

The Long Term Assessment Team (LTAT) was ordered on Saturday August 21, and received an in-briefing on Sunday, August 22. The team received a letter of direction from the Agency Administrator (Bill Westbrook). A second letter of direction from the Agency Administrator was given to do another assessment for the View Lake Complex on August 26. This direction assigned 4 tasks to the team with the following statements:

- Do your part to provide for public and firefighter safety by recommending appropriate actions and strategies, implementing LCES appropriate for your assignment, and managing fatigue within your team.
- Develop a long term assessment for incidents in the View Lake Wilderness Area, including a projection of fire growth, risk assessment, estimate of costs, and recommendations for future actions and their associated triggers.
- Base your recommendations on my priorities for firefighter and public safety, managing costs appropriate to the values at risk, recognizing and respecting the values of our neighbors and land management partner agencies, and managing fire to restore/maintain ecosystem processes within the Mt. Hood National Forest.
- Work with the IMT and the local unit to help provide for protection of cultural, historic, developed sites, and other resource values indicated in the Mt. Hood National Forest Fire Management Plan and Land and Resource Management Plan or as requested by Agency personnel.

Objectives and Risk Assessment

In addition to the objectives given the team, we identified several other key questions for the long term assessment:

- How does fire season 2010 compare to other recent seasons of note? How severe is the 2010 season compared to average and severe years?
- How long until a season-ending event can be expected? What is a season ending event?
- What are the weather events associated with fire growth? How long do these events last, how frequently do they occur, and how can they be anticipated?

Risk Assessment Considerations

Values at risk were identified by the local unit, in collaboration with the LTAT. The following lists of values were then used by the LTAT to evaluate risks:

- Structures and improvements at Olallie Lake and within Olallie Lake Scenic Area
- Fire movement outside of the Wilderness Area into areas of the Forest that are more intensively managed
- Powerlines located north and northwest of the Mt. Jefferson Wilderness Area.
- Timber values on the Warms Springs Reservation.

Fire Behavior

The section will discuss fuels, weather, and topography likely to affect fire behavior in the planning area through the season ending event. In summary:

- On most days fire spread will be from a combination of short range spotting and slow surface spread in a layer of compact timber litter. Overall spread rates will be slow and confined to a short afternoon burn period.
- The observed fire behavior is solidly correlated to humidity and fine fuel moisture.
- One or two days of big fire growth should be expected in September (thermal trough/high Haines Index conditions). Forward fire spread could be up to 2 miles, but daily spread distances of .5 to 1 mile are more likely.

Topography

The View Lake Complex is on the Mt. Hood NF, Willamette NF, and Warm Springs Reservation at the crest of the Cascades Mountains in northern Oregon. The fires are burning in the 5000 to 6000 foot elevation range that is mostly covered in timber. The Olallie Lake Scenic Area is nearly flat terrain with numerous lakes. Flat to gentle slopes of the lakes basin contrast with the more typical steep slopes of the Cascade Mountains in the areas to the south and west of the Scenic Area. The southern extent of the planning area has increasing amounts of steep slopes without vegetation or fuel.

The Breitenbush River drainage lies to the south and west of the fires, and is aligned east to west.

Fuels

The fuels discussion occurs in two sections: 1) the natural fuel complexes associated with the immediate fire vicinity and 2) the surrounding areas.

Fire Vicinity

The fuels in the fire area are mixed conifer forest consisting of lodgepole pine and subalpine fir vegetation types. The understory consists of a mixture shrub and herbaceous species, understory coverage in some locations may be close to 100%. The surface fuel layer is well compacted from the annual heavy wet snow load. The litter layer is predominately short needle litter layer and moss. The litter layer is the primary carrier of fire. Fuel Model 8 is the representative fuel model and models the observed spread rates of the fires very well. This is a very sheltered situation shading the fuels and reducing the winds significantly at eye level. Fuels are discontinuous and irregular. These factors tend to make this a rather slow spreading fuel.

The fuels on steeper slopes tend to be increasing discontinuous with rocky areas more common. Rocky areas will not be barriers, but certainly slow the overall fire spread. The Landfire representation of fuels shows a highly variable fuels profile across the planning area.

Surrounding Area

One area of concern is the Breitenbush River Drainage. The upper portion of the drainage will have fuels very similar to the fire area. Lower into the drainage Douglas fir vegetation types will increase in dominance. Fuel continuity will increase. Mature stands are mixed with past harvest units, with varying ages of reproduction. The timber Fuel

Model 8 and 10 will be the best fit for surface fire spread. Past harvest units may present as brush (FM-5) or light slash (FM-11).

Observed Fire Behavior

The Pyramid and Dinah-mo fires started from an extensive lightning event on August 17th. Observed fire behavior for the period of 8/17–22 consisted of creeping and smoldering with occasional single tree torching.

A thermal trough started to influence the fire area on Wednesday 8/24/10. The airmass became significantly dry with poor nighttime humidity recover (see figure x). With the very dry, unstable (Haines 6) conditions significant fire growth resulted. Fire growth continued into the evening and overnight into Thursday the 26th.

The dry unstable conditions were replaced by a moist and much cooler airmass on the 26th. Fire spread was much reduced with no acreage growth detectable. Fire growth stopped with high humidity without measurable precipitation. No growth occurred on the 27th with minimal spread on the 28th.

Fire Spread Scenarios

Recognizing how fire may spread in the planning area will be important to both strategic and tactical decision making.

Fire spread in surface fuels Diurnal patterns account for about 80% of the days in the Pacific Northwest. Fine fuels become sufficiently dry to burn well in the afternoon period. Fire spread rapidly decreases as humidity values increase each evening.

Dead fuel profiles Surface fuels in timber models 8 or 10 will be sheltered from the wind and shaded from solar heating. Continuity of fuels is poor contributing to spotty incomplete burns.

Tree mortality Bug killed trees are present throughout the area and effect fire spread. Mountain pine beetles have been causing mortality throughout the area for at least 20 years, which effect available fuel in several ways. Principally surface fuels will be less shaded and sheltered, surface fuel loading will increase, expecting loading similar to fuel model 11. Recent mortality causes very flammable increases in aerial fuels contributing to passive and active crown fire. There is very little recent mortality with red crowns, but the older mortality is adding to the surface loading.

Live fuel contributions Measured live fuel moistures are averaging 130% for conifer fuels and 150% for hardwoods and the 10 hour dead fuels are 13%. Modeled live fuel moisture values available for Predictive Service Area (PSA) W3 are in the 90 to 100% range; indicating higher fire danger than the actual measured values. These LFM are generally not available fuels, they are a heat sink. As the fire season progresses into September the live fuel moistures (LFM) of the brush species may lower enough to become more available to burn and contribute more to the fires spread. Slope and aspect will have an effect on how these areas will react as well, with possible upslope runs.

Passive crown fire Ladder and aerial fuels both contribute to the likelihood of single and group tree torching. The principle tree species of lodgepole pine and subalpine fir are sources of prolific lofted embers. Short range spotting is likely on most days when lichen and moss are present in the tree canopy. Much of the daily perimeter growth can be attributed to torching trees with short range spotting rather than surface fire spread alone.

Active crown fire High intensity fire occurred during the thermal trough on the 26th. Extensive crown fire and rapid fire spread are unlikely with the typical diurnal pattern because the dry (low humidity) period does not last long enough before fire fuels begin to recharge to recharge with moisture. Two low humidity conditions can provide the opportunity for aggressive fire spread.

East wind events These events have a formal definition established by the National Weather Service. An "east wind event" is different from a wind a blowing from the east.

- The Daytime Criteria for all zones is: at least two stations within a zone must report 25% humidity or less **and** wind-speed of 10 mph or more for at least four hours in an 8-hour block.
- Nighttime Criteria in zones 606 and 608: One RAWS station must report 30% humidity or less **and** 10-minute wind speed of 10 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.

Thermal trough Dry to very dry airmass with poor nighttime humidity recovery drives the drying of all fuel classes through both day and night. The thermal trough caused free burning fires on the Bull of the Woods Complex to progress .5, .75, and 1.0 miles respectively; fire movement was confined to the very tops of the ridges. The Pyramid Fire may have moved east to west for about 2 miles.

Expected Fire Behavior

Short term There is a slight chance of some light precipitation over the weekend. This moist cool pattern is expected to be in place until Tuesday the 31st followed by a brief return to near normal conditions. The fire behavior during this cooler period is expected to reduce greatly with very little spread occurring. Average or normal weather conditions should produce surface spread with some single and group tree torching. Generally the morning period will have benign fire behavior, with best burning conditions confined to the late afternoon when fuels become the driest. As warmer conditions return the fire behavior will increase in intensity and extend the duration of good fire spread. This pattern of up and down fire behavior is expected to continue into the fall. [See NWCC Fire Behavior Outlook 8-26]

In the next seven days, large fire spread from east wind events, cold front passages, or thermal troughs is unlikely.

Longer term The fire behavior mechanisms described above will effect fire spread and intensity, and be responsive to the actual weather and fuel moisture conditions.

Fire Intensity/Severity

There has been a wide range of fire intensities ranging from very low intensity under burning to patches of stand replacement burns, resulting in a mosaic burn pattern across the landscape. The effects on critical habitat areas and values at risk will vary as well with higher fire intensity/severity occurring on the larger fire growth days.

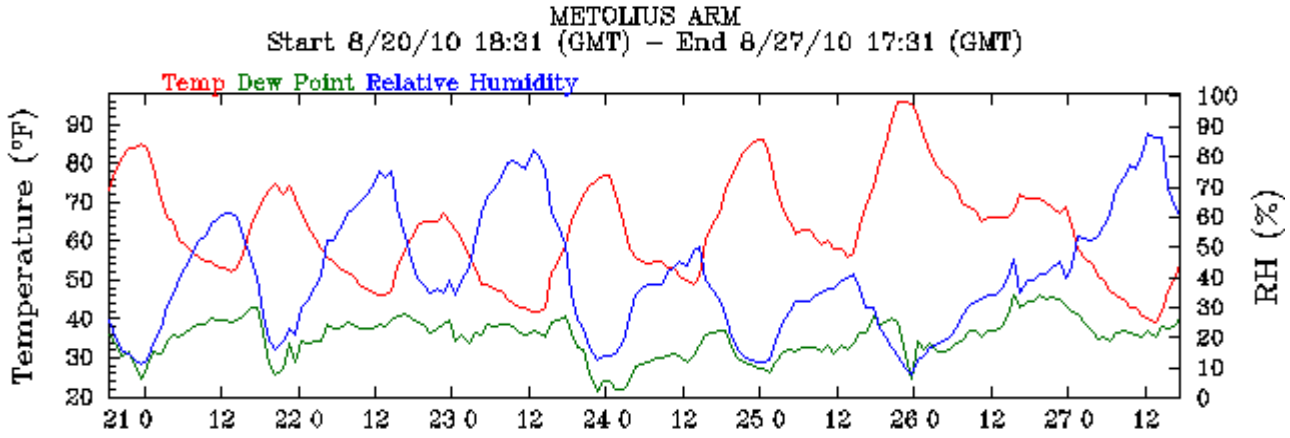


Figure 1 Metolius Arm RAWS shows poor overnight Rh recovery.

Long Term Risk Assessment

Summary

The long-term risk assessment includes these primary findings:

- Conditions through September are expected to reflect long-term climatological average precipitation, an increase of 2-3 times August average precipitation, and below normal temperatures.
- Spread events are associated with thermal troughs and wind events. Thermal troughs will decrease into September and wind events will increase in mid to late-September. Increase of wind events coincides with increasing probability of season-end.
- September has 1-2 fire-slowing events on average (rain 0.1-0.25") and though short duration wind events are possible, most fire growth in September is through average daily spread which whine down with decreasing temperatures and day lengths.
- A conservative assessment of fire season end was performed; there is a 80% probability that the season ends by October 6, and a 97% probability that it ends by October 26.
- The risk of fire reaching the Olallie Scenic Area is low for the expected life of the fire.

- FSPro indicates a tendency for the Pyramid Fire to move along ridgelines to the northwest; similar to runs on the Bull of the Woods fire and corroborated by currently available fuels found on the upper 1/3 of slopes.

Key strategic containment considerations include:

- Direct hand fireline construction is difficult and escape routes and safety zones are few in the wilderness area. Impacts to wilderness values would increase as more ground crews are deployed. Containment opportunities exist outside of the Wilderness boundary along roads and ridgelines.

Current Assessment

The current fire risk assessment analyzes fuels, weather and fire behavior for the Pyramid fire on the View Lake Complex. The Pyramid and Dinah Mo fires burned together on August 26th.

The purpose of this assessment is to describe long-term fire behavior and spread potential by examining:

- Current and projected seasonal severity,
- Probabilities of critical spread events,
- Probabilities of fire slowing events,
- Timing of season end and
- Risks to specific points of concern.

Seasonal Severity

Seasonal severity is based on various indicators of drought and fuel dryness that influence the probability that fires will start, grow and exhibit rapid and intense fire growth through crowning and medium- to long-range spotting. The more severe the season, the more likely that new starts will escape initial attack and that existing fires will be difficult to control.

The Drought Monitor integrates several different measures of short- and long-term drought such as stream and reservoir levels, soil moisture, snowpack, precipitation, and professional judgment by regional climatologists. According to the August 24 Drought Monitor (Figure 2), the Mt. Hood National Forest area is currently free from abnormal dryness or drought. The latest Drought Outlook, constructed in mid-August, indicates that drought conditions are not expected to develop in the area for the remainder of the fire season.

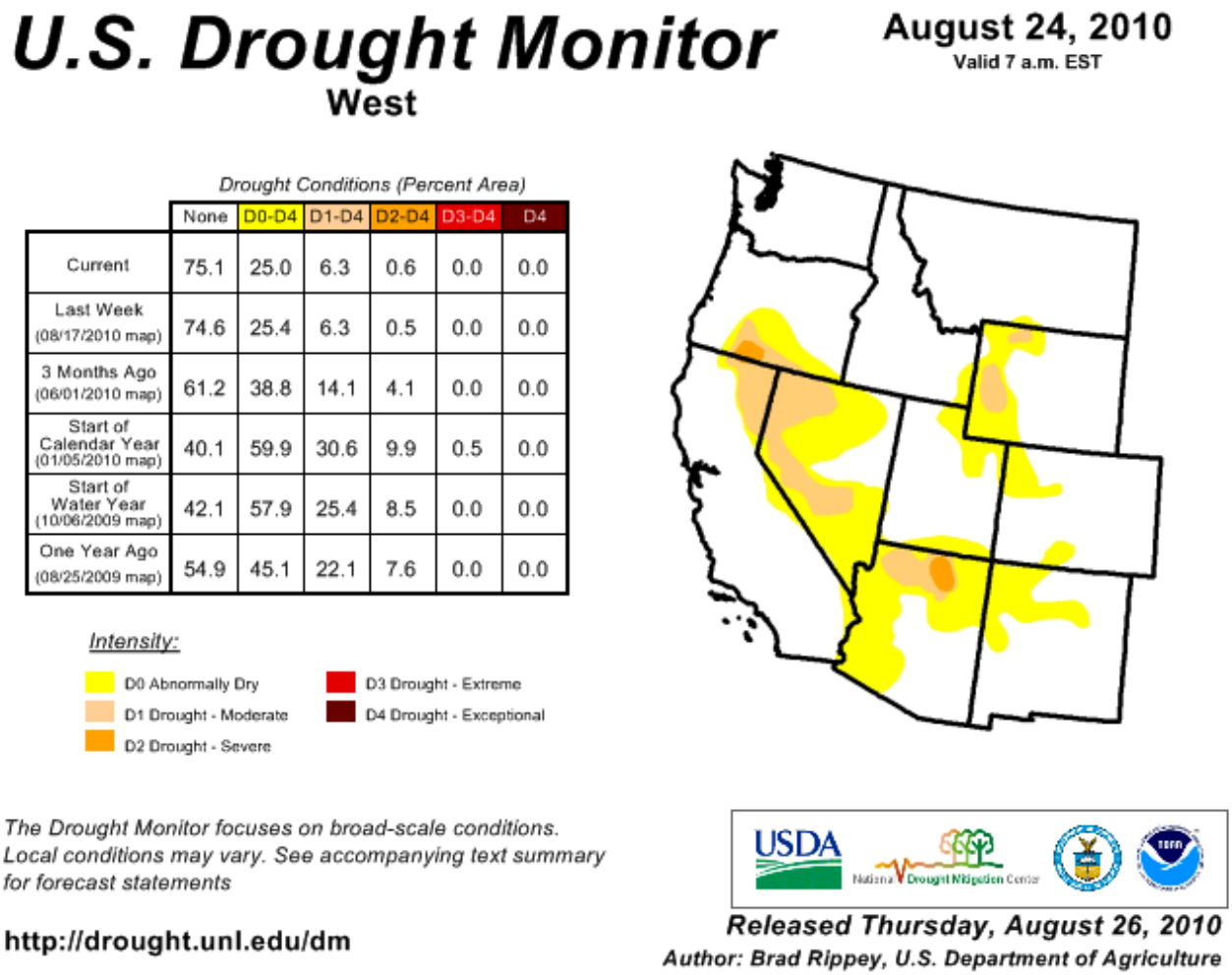


Figure 2. US Drought Monitor for August 24, 2010. No drought is currently present in western Oregon.

Snotel data from the Clackamas Lake SNOTEL site (Figure 3) show the current water year started out near average, but both precipitation and snowpack moved to below average in November and remained slightly below until May when late spring moisture in May and June moved precipitation values to near average. The most telling information is that the snow water equivalent has remained below average since November of 2009. Currently, water year precipitation amounts are just below average (95%).

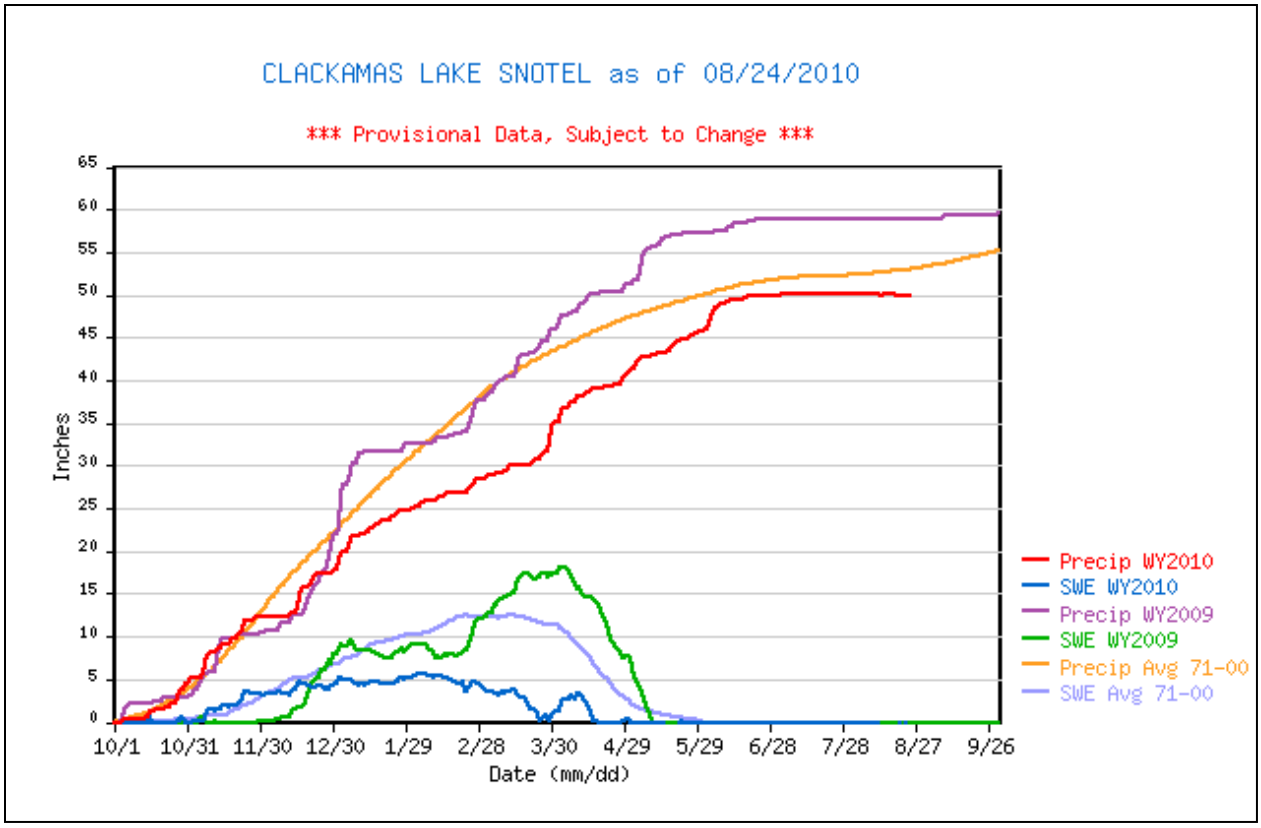


Figure 3 Snow pack remained below to near average in November then near the end of June little additional precipitation was realized.

Weather

The fire is in fire weather forecast zone ORZ607, in the Portland, Oregon forecast area. Weather forecasts and outlooks specific to the management of the Pyramid fire are available at http://www.wrh.noaa.gov/firewx/?wfo=pqr.

Weather Stations

Weather data from remote area weather stations (RAWS) was analyzed for temperature, relative humidity, and wind direction. Several RAWS were consulted to find a station that could approximate the mix of moister west side and drier east side weather found along the Cascade Crest. Based on onsite observations and known fire behavior for the Pyramid Fire, Boulder Creek was found to best trend with fire observations. Metolius Arm, Mt. Wilson and Shitike RAWS east of the crest were also consulted; these sites were drier than conditions observed on the fire. Results from Boulder Creek could represent a slightly moister condition than seen at the fire site over the life of the fire, though for the time during this analysis, Boulder Creek represented the fire site fairly well. The period of record used in this analysis for Boulder Creek is June 1-October 31, 1985 to 2009 with the current year overlain. (See Table 1)

STATION	RAWS NUMBER	ELEVATION	DISTANCE
Boulder Creek	351909	3570’	10 miles WSW
Metolius Arm	352110	3440’	13 miles SE
Mt. Wilson	350916	3780’	20 miles NNE
Shitike	352101	3580’	9 miles E

Table 1. RAWS sites analyzed and compared to fire behavior in the Wilderness.

The wet weather pattern in May, June and early to mid-July is reflected in the seasonal Energy Release Component (ERC) trace for this year (Figure 4). Energy release component is a measure of the potential energy available to a fire and serves to indicate longer-term fuel dryness, particularly of large fuels and live fuels. Late July and August have been characterized by pulses of warm, dry weather interspersed with marine flow. These are well reflected below. Live woody and 1000-hour fuel moistures have tracked moister than seasonal averages until mid-August and are currently tracking at average. Current observations on the fire indicate incomplete consumption of heavy, dead fuels.

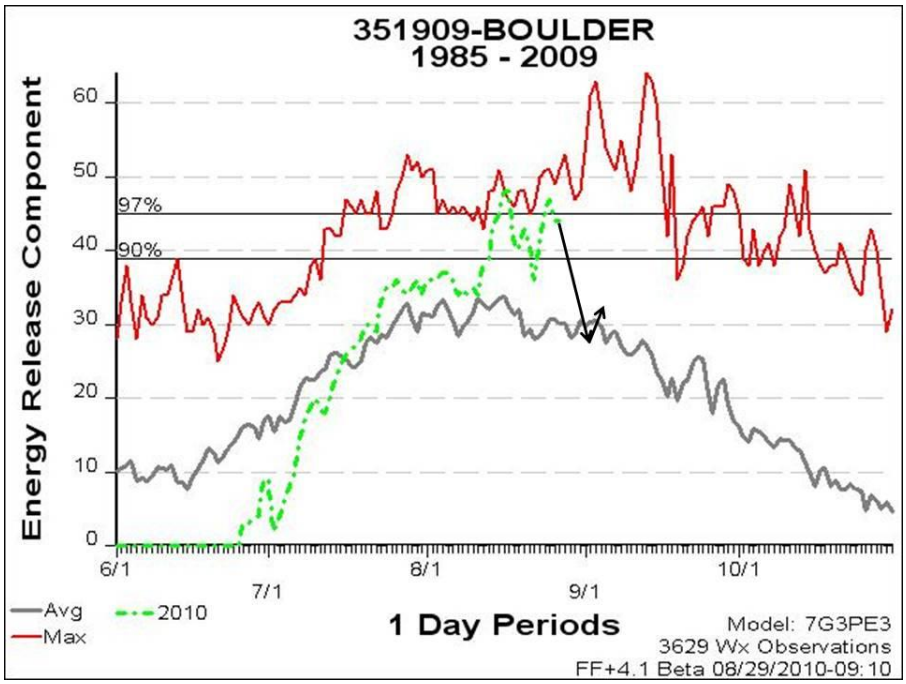


Figure 4. ERC peak for the current year thus far occurred on August 16th and the View Lake Complex fires began on the 17th with ERC over the 97th percentile for the Boulder Creek RAWS. Expect the current year index to drop to average (projection – black arrows) with the cool, moist forecast for August 29-September 2.

Outlooks

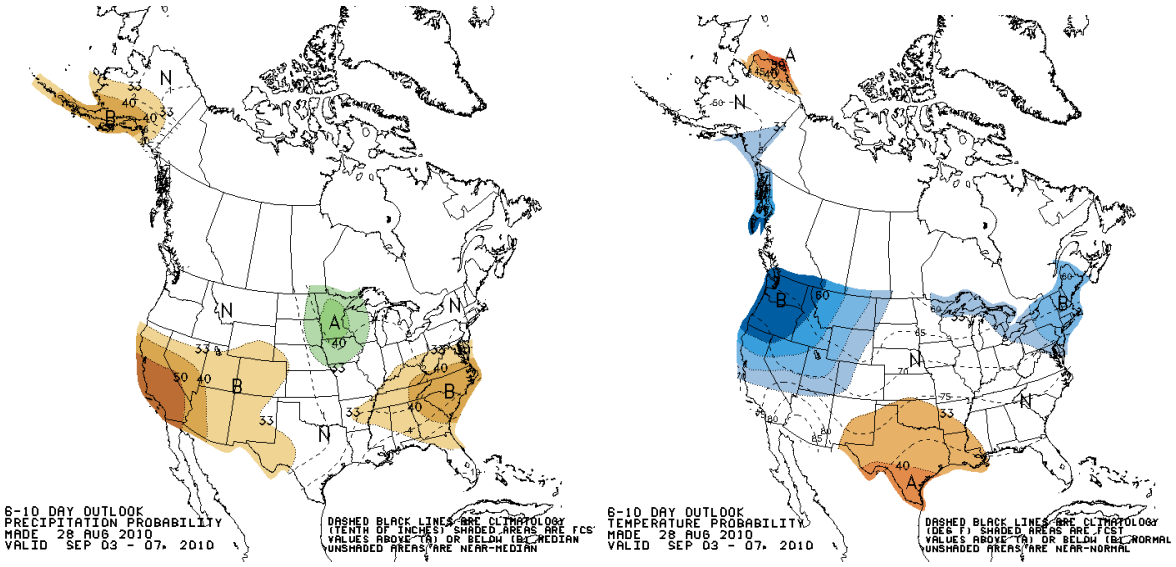


Figure 5. Six-ten day outlook valid September 3-7.

Figure 5 is the 6-10 day outlook for precipitation and temperatures compared to normal for the continental U.S. Equal chances of below, above or normal precipitation and below normal temperatures are forecast.

Longer term outlooks are depicted in Figure 6 below for the month of September and the three month period September through November. September is forecasted for below normal temperatures and equal chances of above, below or normal precipitation. The three month period September through November is forecast for normal temperatures and above normal precipitation; this model likely depends upon the set-up of the predicted La Nina.

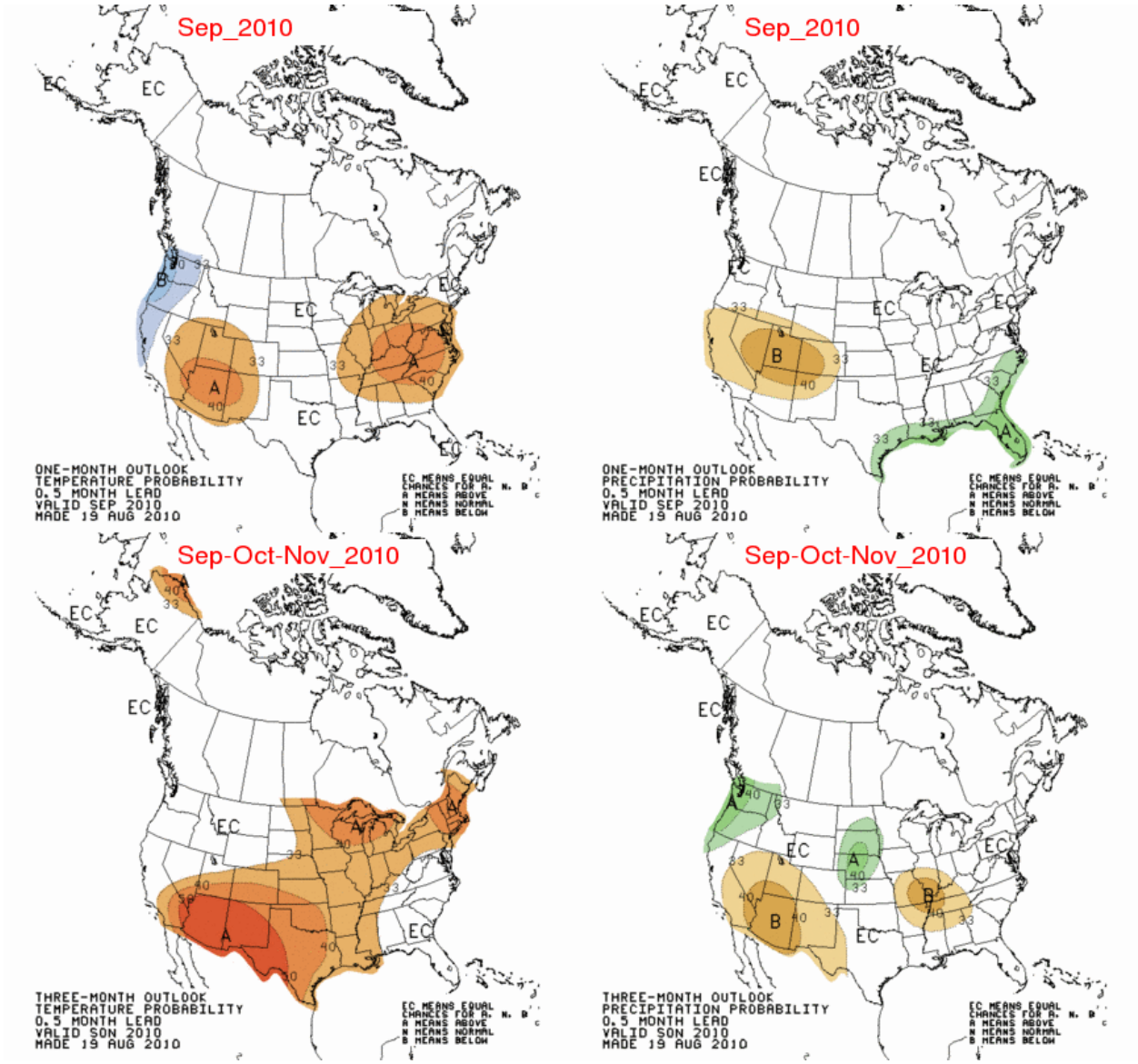


Figure 6. Four-panel temperature and precipitation outlooks for September and the three-month period September through November.

Critical Events

A long-duration fire faces several potentially critical events – periods of large spread, rain sufficient to slow fire spread for a few days and the end of the season.

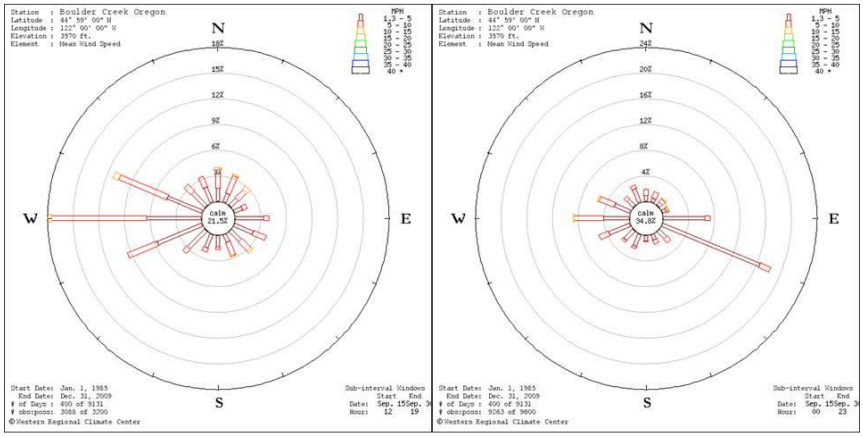
Large Fire Growth and Season End

Large fire growth locally is wind and/or thermal trough driven. East winds, a concern in this area, do not show up in the RAWS sites analyzed during the month of August or early September, but do begin to manifest in mid-September. For the RAWS situated in the area, big east wind events are not well recorded. Based on discussions with local personnel, big East wind events are more common on the southern Willamette National Forest than the northern portions of the Willamette or the southern portions of the Mt. Hood National Forest. Local channels may funnel and strengthen these winds, particularly the Breitenbush drainages in the fire area, but

hard data is lacking and local experience expects those kind of events later in the season, typically beyond predicted season end (early October).

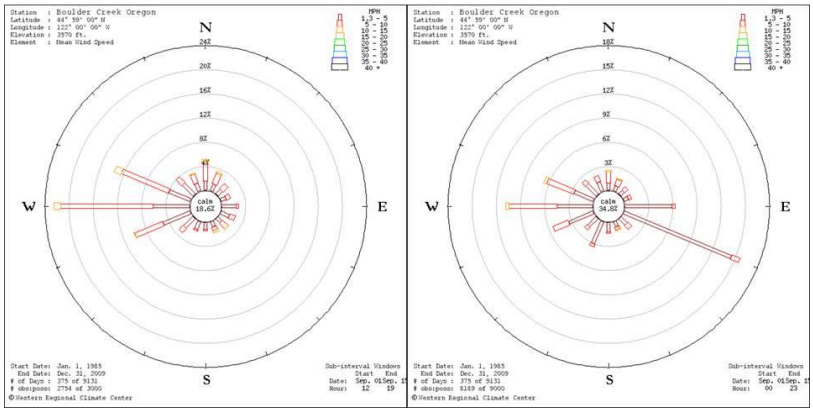
Wind roses are depicted below for the Boulder Creek RAWS. East winds are depicted in September, but are recorded by the RAWS as easterly flow, low speed winds occurring outside of the daytime burn period and coinciding with cool temperatures and shortening day lengths. Based on discussions with local personnel, we feel that east winds are likely strengthened and funneled in the Breitenbush drainages, but not likely until late September. Dominant burn period winds at Boulder Creek are westerly.

Boulder RAWS – September 15-30 Winds



Burn Period Winds 1200-2000 24 hour winds

Boulder RAWS – September 1-15 Winds



Burn Period Winds 1200-2000 24 hour winds

Figure 7. Wind Rose for Boulder Creek RAWS depicting westerly burn period winds and low speed, easterly flow overnight winds (diurnal flow off Cascade Crest).

Large Spread Events

Large spread events in the Cascades tend to be driven by both wind and instability, these may act separately or together. The instability may be created through strong heating or an unstable atmosphere (high Haines). Both types of instability are hard to tease out of the climatological record. The current fires have been largely driven by instability associated with thermal troughs (heating) and much of this fire spread is driven by low overnight humidity recovery.

For the purposes of this analysis and to depict spread event probabilities for the remainder of the season, large spread events in September were defined for analysis in FireFamily Plus as temperatures greater than 87 degrees and relative humidity less than 17%. Both temperature and RH value reflect the 90th percentile weather condition for Boulder Creek RAWS.

For the 25 year period analyzed at Boulder Creek RAWS, 11 of the years (<50%) had events meeting the warm dry criteria in September. A better way potentially to prepare for a spread day would likely be asking for forecasts that include a low overnight RH recovery as compared to average.

On the day the fires started (August 17), Boulder Creek RAWS recorded a maximum temperature of 95˚ and 15% minimum relative humidity. The Pyramid Fire spread event on the 25th of August occurred with weather conditions at Boulder Creek of 96°F and 14% RH, overnight recovery the evening prior had been low for the station, 74%.

In general, as the season progresses into September, thermal trough events will decrease with lower sun angle and decreased heating and winds increase into fall with changing seasonal weather patterns.

Haines Index and Fire Growth

Haines Index (HI) is a numerical value that indicates the potential for large wildfires to experience extreme fire behavior. The HI combines both the instability and dryness of the air by examining the lapse rate between two pressure levels in the atmosphere and the dryness of one of the pressure levels (definition from National Weather Service).

The significance of HI to the View Lake Complex is how it may promote large fire growth prior to a season sending event. Considering the large amount of fuels in the fire area and the low probability of significant (+1") moisture to reduce the fire intensity before the season ending event there is a opportunity for Haines condition to affect the fire.

Historically September produces at least one day that has a Haines Index of 5 and at least one day with Haines of 6. Figure 8 identifies the likelihood of a Haines 5 or 6 based on data from 1961 to 2000.

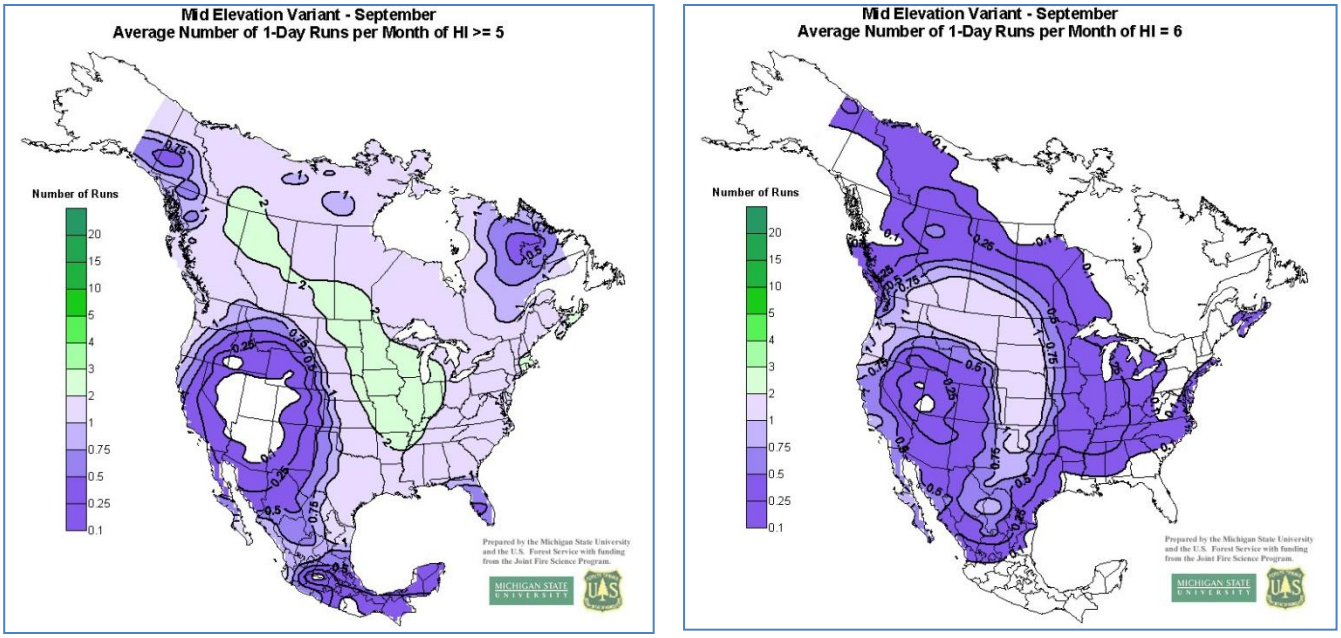


Figure 8. Probability of Haines 5 and 6 for September across North America.

This likelihood of a moderate (5) to high (6) Haines condition in this instance is significant. A fire that may have remained dormant, with little spread for many weeks could move explosively under Haines 5 or 6 conditions of one of two days.

Conditions to consider under Haines 5 or 6

- The amount of residual heat remaining inside the perimeter
- Where in the topography the fire has progressed to and how drainage patterns could influence the fires flow if it becomes plume dominated under a Haines 5 or 6

Fire Slowing Events

In terms of predicting fire growth over the remainder of the season, precipitation events that slow fire spread are as important as those events that cause significant spread. We used the two most common fire-slowing event types in the western United States for analysis:

- 0.10-0.25 inches – slows fire for 1-3 days
- 0.25-0.50 inches - slows fire for 3-6 days

We used the Event Locator tool in FireFamily Plus to find the likelihood of each type of event for the months of September and October. The probability of a fire-slowing event of any type would likely increase using 2 or 3 days cumulative precipitation instead of a single day, so the use of a single day provides a more conservative expectation.

	Slowing 1-3 days	**Slowing 3-6 days**
September	1	1
October	1-3	1-3

Table 2. Expected number of fire-slowing events for September and October by type based on data from Boulder Creek RAWS.

Figure 9 below from the Three Lynx weather station corroborates the increase in precipitation probability through September into the fall season. Coop weather stations throughout the area have similarly increasing precipitation probability charts. Average precipitation across these same coop weather stations reflects a two to three-fold increase in precipitation in September as compared to August.

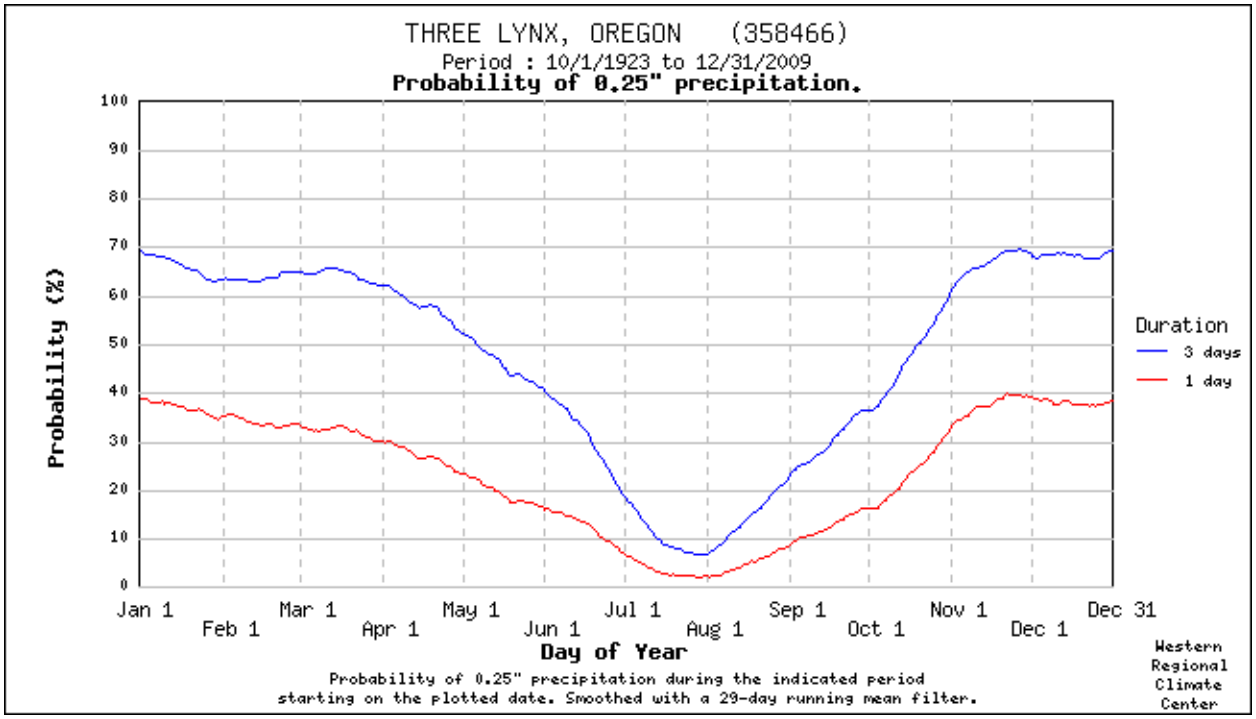


Figure 9: The chance of any precipitation is minimal in early to mid-August, but begins to increase in late August and continuing through fire season end (and beyond).

Season End

The season ending event criteria used was developed by the State and Regional Fire Ecologist Louisa Evers for the 2006 Mount Hood Complex. The conservative analysis evaluates ERC falling below the 75th percentile and not recovering for the remainder of the season. The liberal analysis evaluates the date of first fall below the 75th percentile regardless of whether it later recovered above that point. The purpose of the season end event in this type of assessment is to determine when critical spread events (100 acres or more) are unlikely either on new starts or ongoing fires. Fires can still start and spread after this type of event. Two term files reflecting the conservative and liberal approach were developed for the Boulder Creek RAWS (Figure 10). Table 3 below highlights the season end dates from each approach. In general, season end occurs early October in the liberal approach and early November for the conservative approach. Local expertise corroborates an early October season end for all but the most severe seasons.

Season End	‘Conservative’ Approach	‘Liberal’ Approach
80% probability	10/6	8/25
97% probability	10/25	9/20

Table 3. Season end dates for Boulder Creek RAWS using two approaches for estimating when large spread events are unlikely to occur for the remainder of the fire season.

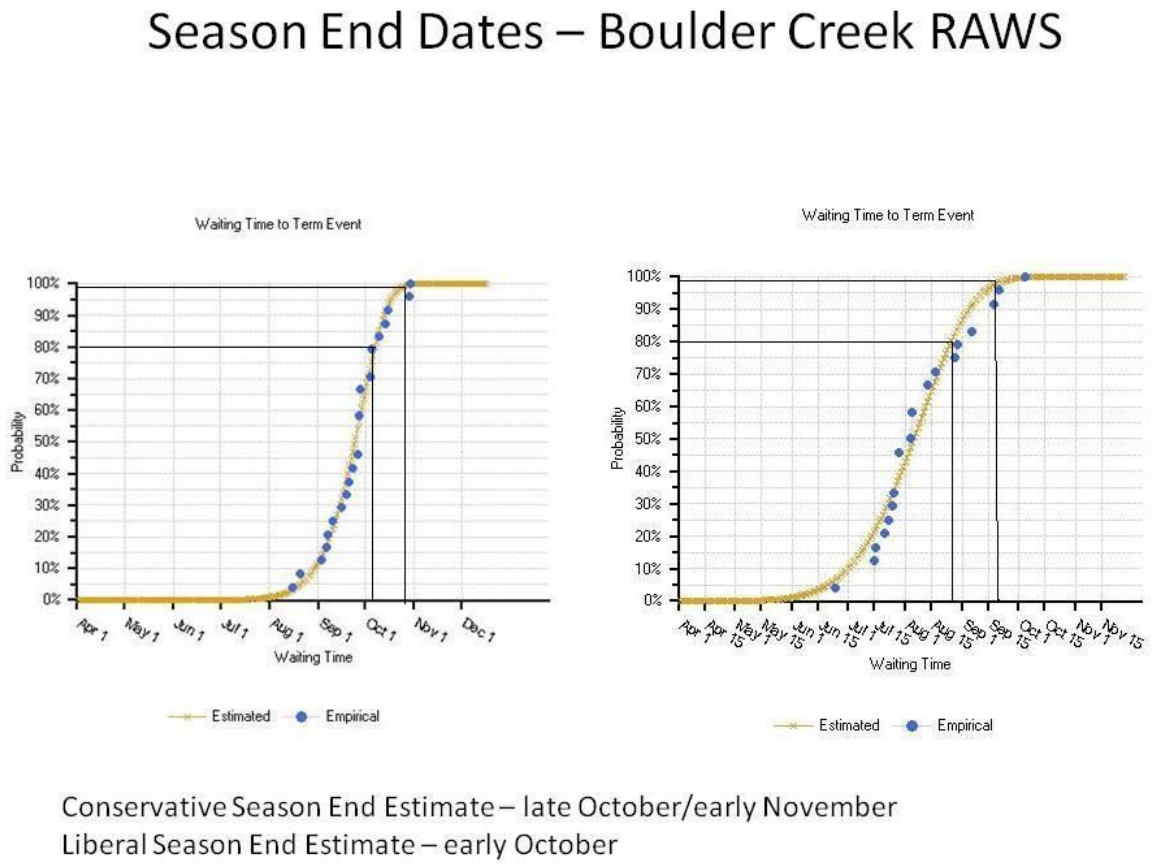


Figure 10. Waiting time to season event charts. ‘Conservative’ approach is on the left and the ‘liberal’ approach is on the right.

Along with changing temperatures and relative humidity, changing sun angles and day lengths contribute to the decay and eventual end of potential for large fire growth. In addition to reduced solar heating of fuels and reduced burning periods, small rain events begin to have a significant impact on fire spread potential on the lower 1/3 of slopes and north and east aspects. North aspects in particular that receive a wetting rain after about September 15 are unlikely to dry sufficiently to carry fire except on the upper 1/3 of the slope. South and west aspects at the bottom of very narrow drainages may be similarly affected.

Management Considerations

Operational Objectives-

Contain fire on the north side of the 4220 Rd.
Control the spot fire located on the Confederated Warm Springs Tribal Lands
Contain the fire on the west flank using control and check lines
Contain the fire on the east flank utilizing natural barriers
Monitor fire spread south in the Jefferson Wilderness

Long-term tactical considerations:

North of Rd 4220:

- Contingencies north of the 4220 Rd to protect recreation sites at Horseshoe Lake and Olallie Lake – Two options to examine in this area to limit fire spread to the northeast from the North Fork Breitenbush drainage include:
    - Establishing a control line using small lakes to the northwest from the View Lakes fire perimeter.
    - Utilizing the Double Peaks trail, from the Pyramid fire perimeter northwest past Double Peaks along the ridgeline.
    - FSPro shows no potential for spread to the northeast toward Olallie Lake. The primary fire growth continues down the north ridgeline above the North Fork Breitenbush drainage. Without the opportunity to fly this portion of the Planning Area, it is difficult to recommend immediate action on these contingency lines at this time.

Wilderness Contingencies:

A key decision is required regarding forest direction from the Mt Hood NF and Willamette NF detailing suppression actions allowed within their respective Wilderness boundaries. The IMT needs direction as to whether suppression tactics such as point protection or check-line construction will be allowed within the Wilderness. Without permission for limited suppression action in the Wilderness, engagement of the fire would occur at the Wilderness boundaries to the east and west of the fire.

Additional considerations associated with suppression actions outside the Wilderness boundaries include: Resource values in Breitenbush recreational area, Olallie Scenic Area, and the Warm Springs Reservation.

- Western flank of Wilderness-
    - FSPro shows little probability for fire spread within the North Fork Breitenbush drainage itself. There is some perimeter growth down the ridgeline itself, albeit, with lower probabilities. There are scab areas with little fuel as well as silvicultural treatments that can reduce fire spread within the model. The bench area between the river and the primary ridge shows little fire spread potential.
    - Some road systems exist outside the wilderness area between the North Fork and South Fork Breitenbush Rivers, providing some opportunity for control. The model assigns a low probability for fire growth outside the Wilderness boundary down to the

road system. Overall, there are few topographical features oriented north-south outside the forest boundary that offer control solutions.
    - There is no historical evidence of significant east-wind events in the Planning Area.
    - FSpro shows little spread into the South Fork Breitenbush drainage.

- Eastern flank of Wilderness-
    - Fire history shows two previous fires on the reservation within the last 10 years; the Dark fire and the WSA Lightning Complex. South from Campbell Butte shows the Shitike and Whitewater River drainages. As with the western flank of the Wilderness there are few north-south topographical features. Type 1 firefighters and helicopters are best suited for this area of the reservation, which can increase suppression costs significantly. FSPro shows little perimeter growth along this flank. The model reflects some growth from the spot fire located on the reservation, but current suppression actions on the spot fire preclude any real threat.

- South flank of in Wilderness-
    - The terrain and fuels directly south of the fire shows scabby terrain with discontinuous fuels. The fire will continue its slow perimeter growth pattern southward with no major fire runs. There may be more significant fire behavior and growth associated with higher Haines occurrences, but overall, the fire poses little threat of leaving the wilderness boundary.

Recommendations

- The Wildland Fire Decision Support System (WFDSS) has been started for this complex of fires. We recommend that the decisions, analysis, strategic risk assessment, and periodic validations of strategy be posted and maintained on this site for these fires.
- Periodic reassessment – this assessment has a limited shelf life. We recommend that a reassessment be completed in14 days, or if the situation changes dramatically. Reassessment should be a relatively short exercise, even with new FSPro runs, because the base information and work has already been completed.

Appendix A – FSPro

FSPro and Gridded Wind Analysis for Pyramid Fire

(Mt. Hood NF, Willamette NF, and Confederate Tribes of Warm Springs)

Location: Sandy, OR | Date: Aug. 29, 2010 | Analyst: Rick Stratton (rdstratton@fs.fed.us)

Purpose

The purpose of this paper is to provide FSPro and gridded wind analysis for the Pyramid fire for inclusion in the long-term assessment plan. The FSPro analysis is associated with fire #264 in WFDSS.

FSPro

Model Inputs

- Number of days: 14 days (Aug. 27 – Sept. 9)
- Number of fires: 3,000
- Ignition information was obtained from a perimeter layer developed by the ICT1 GIS staff from the IR flight on the Aug. 26th (2255 hrs) and field intelligence.

Fuels

- LANDFIRE National (Sept. 29, 2009) and Rapid Refresh fuel model data was evaluated. National was selected because it (1) delineated the plantations adequately, and (2) National incorporates recent calibration workshops. Adjustments to the data include: converting fuel model 185 (High load conifer litter) to 183 (Moderate load conifer litter) in the drainages, reducing canopy cover by 25%, increasing the crown bulk density (1.5 times), and accounting for the WSA lightning fire (2007)—converted to a 181 (Low load compact conifer litter). The Olallie Lake Complex (2001) (Dark Lake Fire and Powerline 2 fire) were in an area of lava flows and were mapped as a 99 (Barren Ground) and 161 (Low load dry climate timber-grass-shrub).
- Default NFDRS calculated live and dead fuel moistures were used.
- The burn period was increased from the defaults in the upper ERC bins to reflect recent burning conditions.
- The defaults for spotting probability were used.

<u>Weather</u>

- Fuel moisture and historic weather (including ERC) and wind were obtained from Boulder RAWS (351909) (1985-2010) (Figure 11).
- A 4-day forecast was obtained from the National Digital Forecast Database via WFDSS. This forecast had ERCs in the 70th to 80th percentile and winds moderate to high out of the west and northwest.
- Winds were filtered by Aug. 15 – Sep. 15 form 1200 to 1900. Ten-minute winds and gusts were used by selecting "both" (Figure 12).

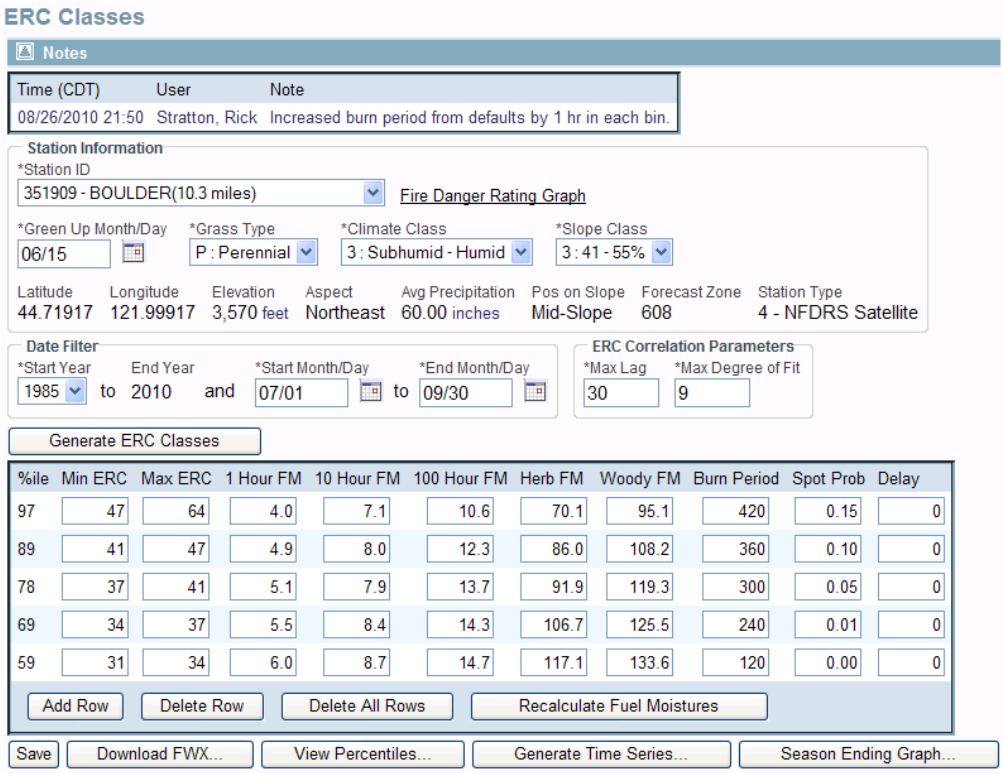


Figure 11 Screen capture from WFDSS of ERC classes using Boulder RAWS.

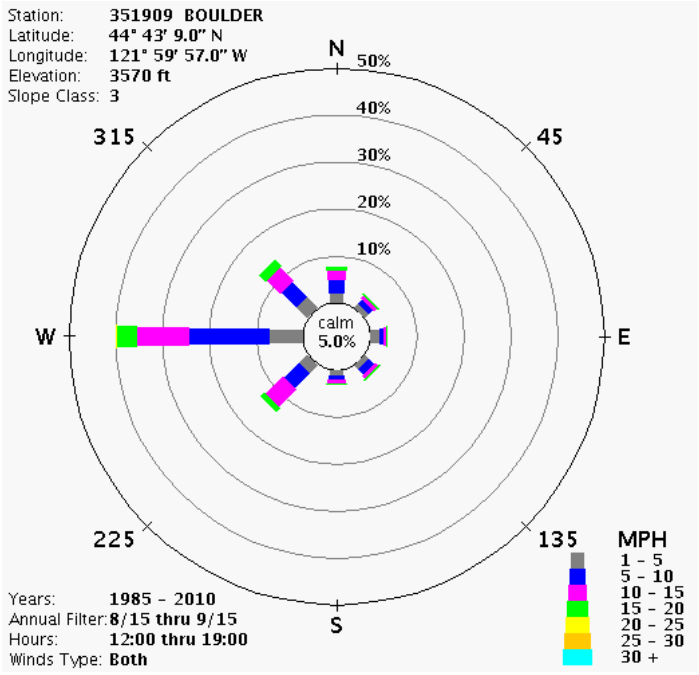


Figure 12 Wind rose for Boulder RAWS.

Modeling Discussion

- Significant impediments to fire spread are present throughout the fire area. These include glacial moraines, rock screes, lakes and ponds, rivers, lava flows, previous fires, and cold segments of the Pyramid fire perimeter (Figure 13).

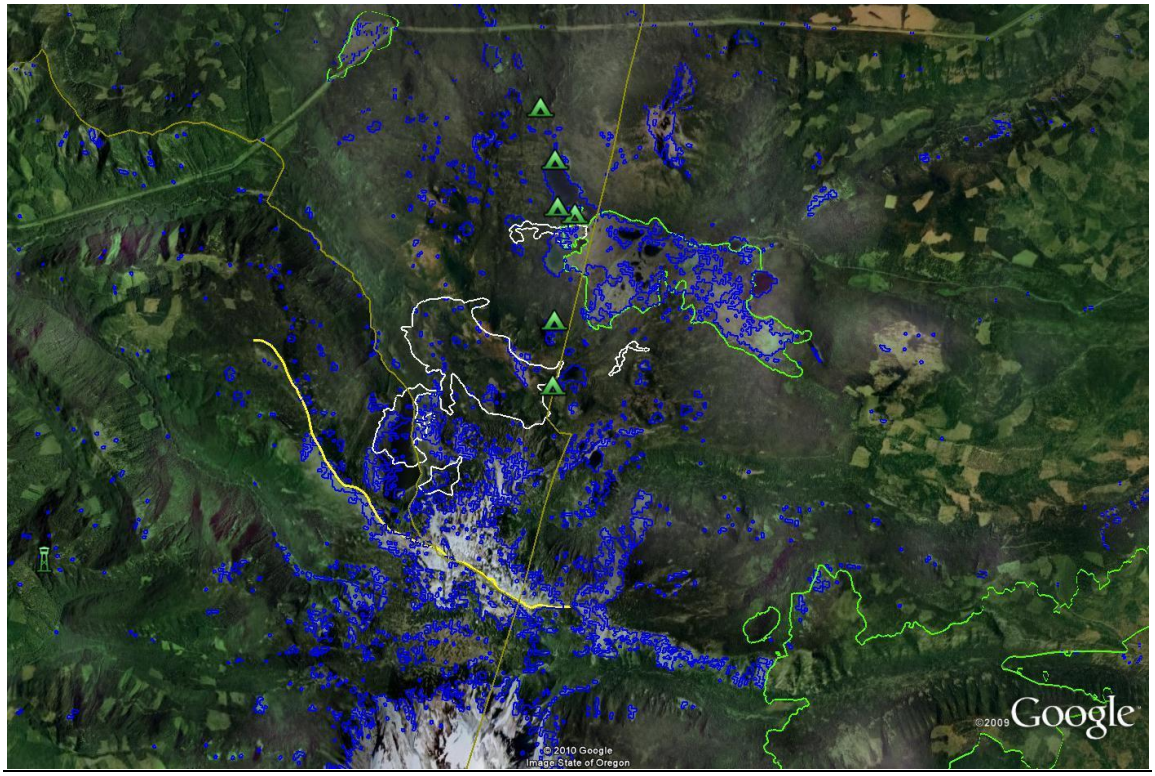


Figure 13 Graphic showing impediments to fire spread: non-burnable areas in blue (rock, ice, snow, and water), historical fires (green), pyramid fire perimeter (white), and the transverse ridgeline to the south and southwest (yellow).

FSPro Output

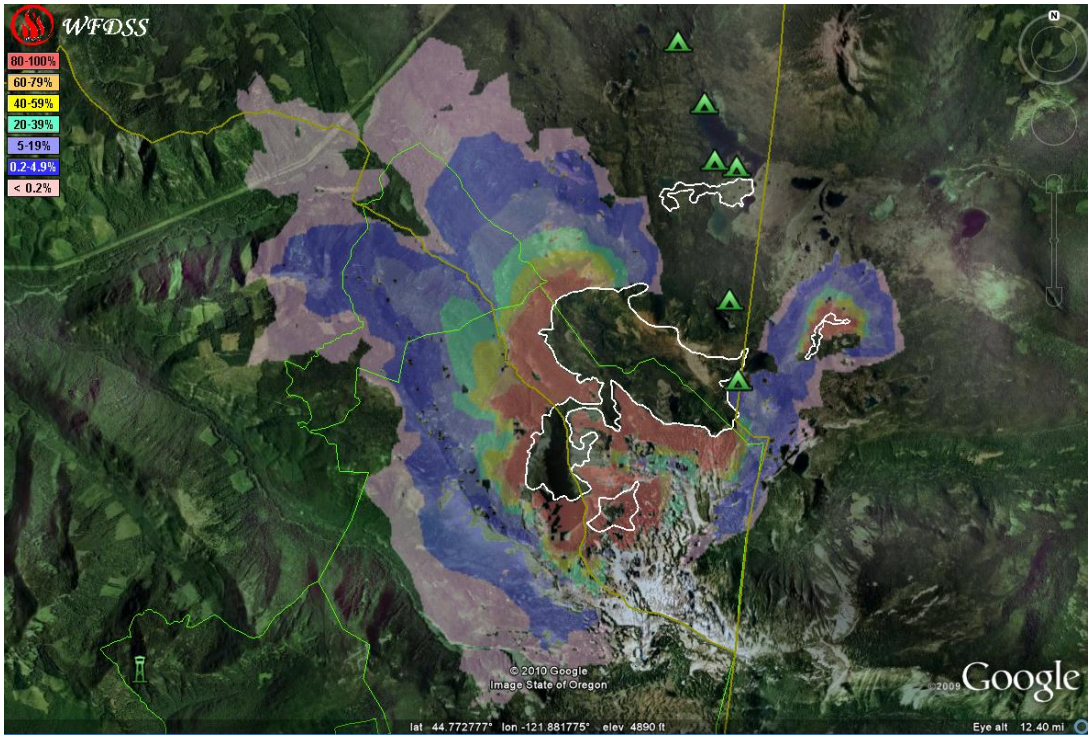


Figure 14 FSPro output for 14 days (Aug. 27 – Sept. 9). The fire perimeter is shown in white (created Aug. 27 at 2100), including the spot on the reservation to the east and the View Lake Fire to the North next to the Olallie Scenic Area. The campgrounds, wilderness area, forest and reservation boundaries, and transmission line are visible.

- Northern Spread. The northern flank of the Pyramid fire (Division F) was used as a barrier to fire spread in the latest FSPro run (black considered cold). Spread to the north is checked by the cold black, the lava flows, and to some degree the Olallie Complex. The View Lake Fire, numerous ponds and lakes, and higher fuel moistures will be a moderating influence if the pyramid fire spreads to the north towards Olallie Scenic Area.
- Eastern Spread. The spot fire on the Warm Springs Reservation was modeled in FSPro, although it is being actively suppressed. This spot, the lava flows, numerous ponds and lakes and associated higher fuel moistures, and to a lesser degree the Olallie Complex, will check spread to the east if the main fire advances in this direction.
- Southern and Southwesern Spread. FSpro indicates minimal spread to the south due to the fragmented landscape (glacial moraines, rock screes, ice and glacial fields, prominent rocky ridgelines). The low frequency of north winds and these impediments make significant spread to the south unlikely.
- Western and Northwestern Spread. FSpro indicates this direction is the most likely spread direction. The fire has a propensity to move on the southwest facing slope north of Slideout and Mildred Lake to Forest Road 310 and along the bench paralleling Forest Road 4220. Spread to NW in these areas needs to be carefully monitored so that fire does not get well-established at the mouth of the Forest Road 46/transmission line corridor and 46/380/4220 junction; doing so would expose the fire to a east wind event or the prevailing west winds hooking it into Olallie Scenic Area. WindWizard shows flow from the east (top image) and west (bottom) in these areas of concern (Figure 15 and 16).

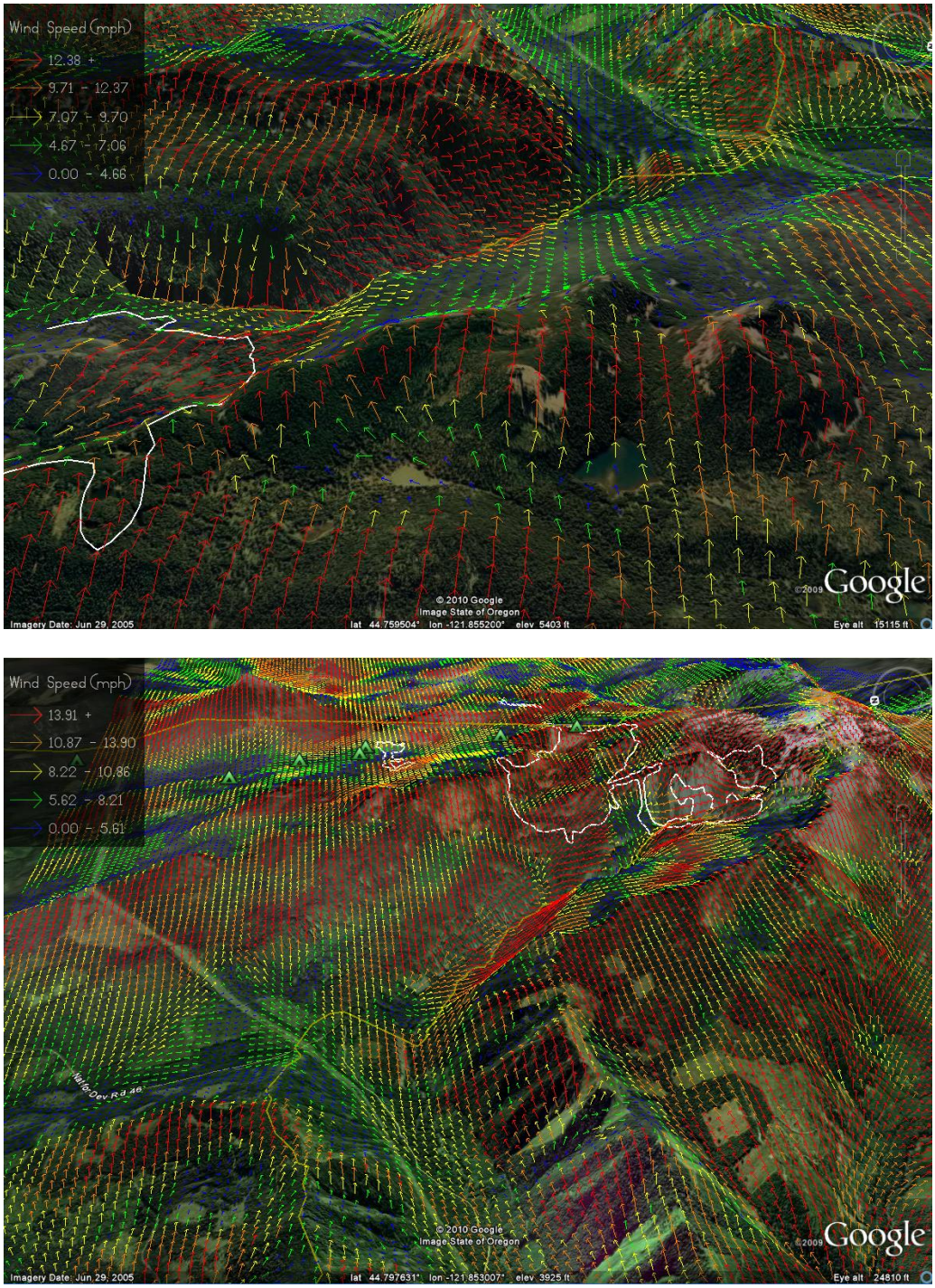


Figure 15 and 16 WindWizard output looking east (top) and west (below). In the eastern image, note the strong channeling wrapping around the Forest Road 46/transmission corridor. In the western image, note the strong channeling on the ridge to the west towards Olallie Scenic Area

- Attention needs to be given to thermal trough development and an east wind event. These weather phenomena can result in rapid fire growth and is not reflected adequately in RAWS data, hence not modeled sufficiently in FSPro.

Appendix B – LTAT Incident Action Plan Map