

CW3E Event Summary: 14–18 Sep 2020

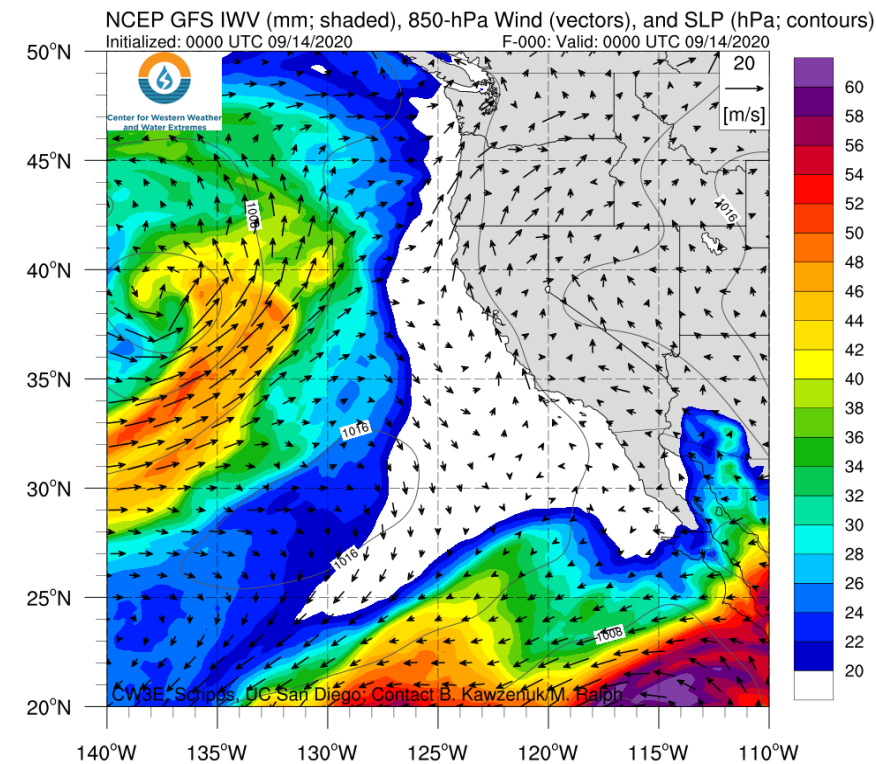
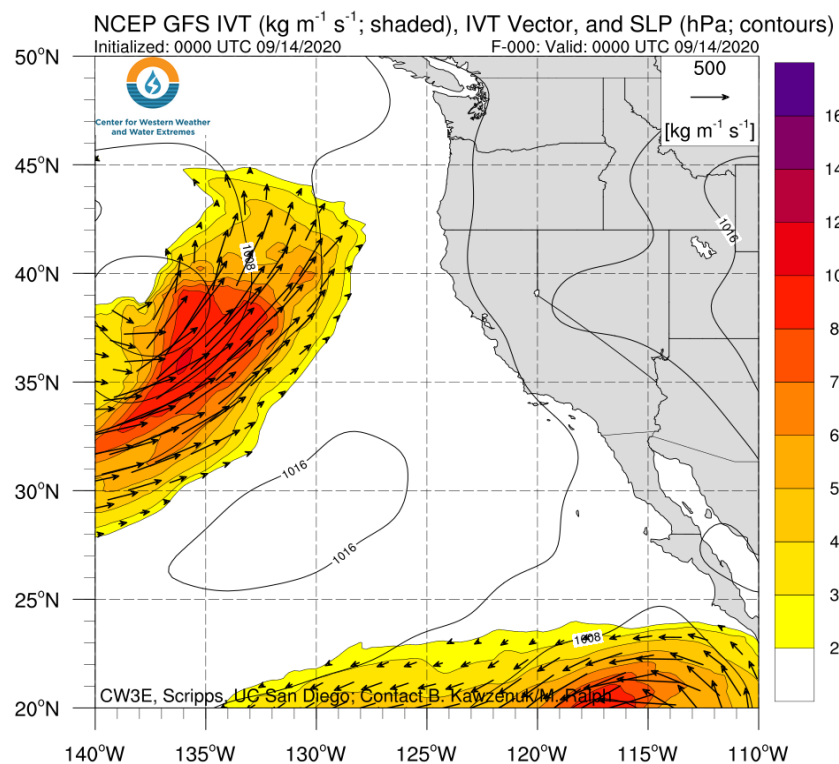


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Landfalling AR and Cutoff Low bring much-needed rainfall and improved air quality to the Pacific Northwest

- A landfalling AR and cutoff low produced light-to-moderate precipitation (0.50–2 inches) over portions of western Washington and Oregon
- Weak-to-moderate AR conditions persisted for more than 48 consecutive hours along the Oregon coast [AR3 based on the Ralph et al. (2019) AR Scale]
- Precipitation and changes in wind direction and humidity significantly improved the air quality and alleviated the wildfire threat in western Washington and Oregon

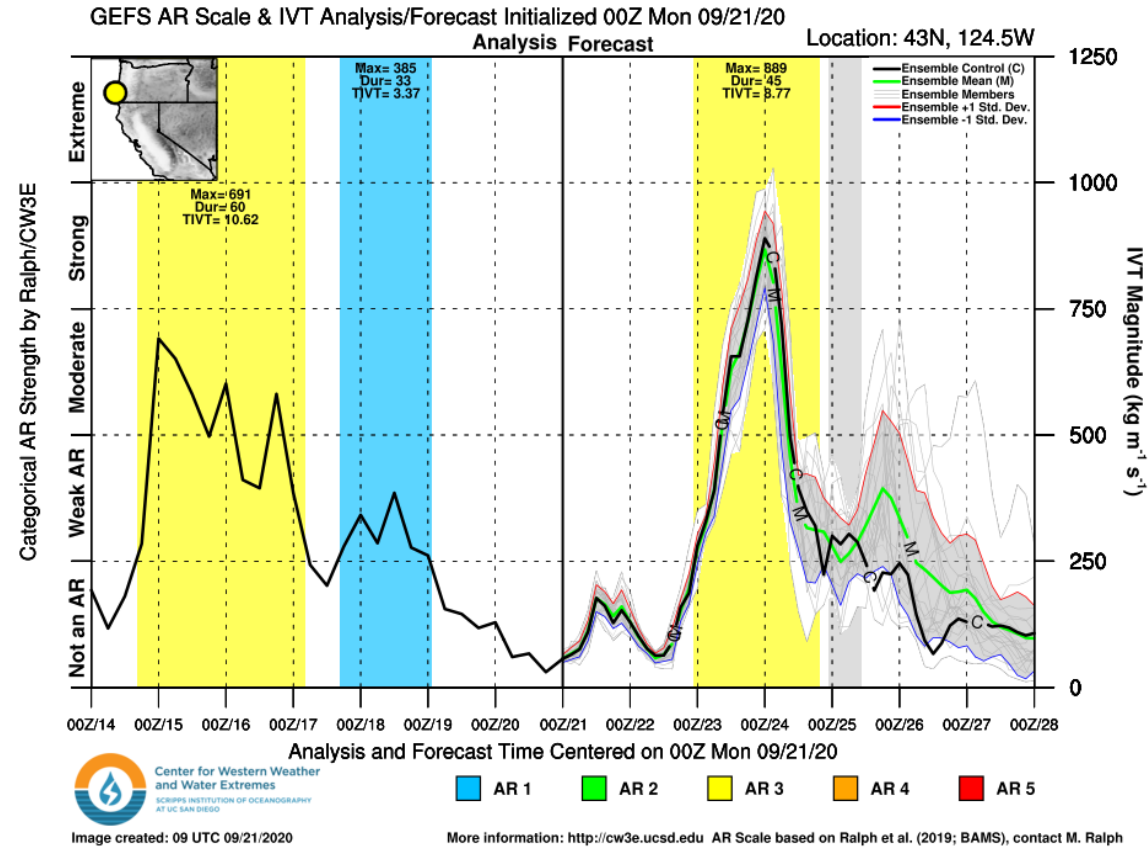
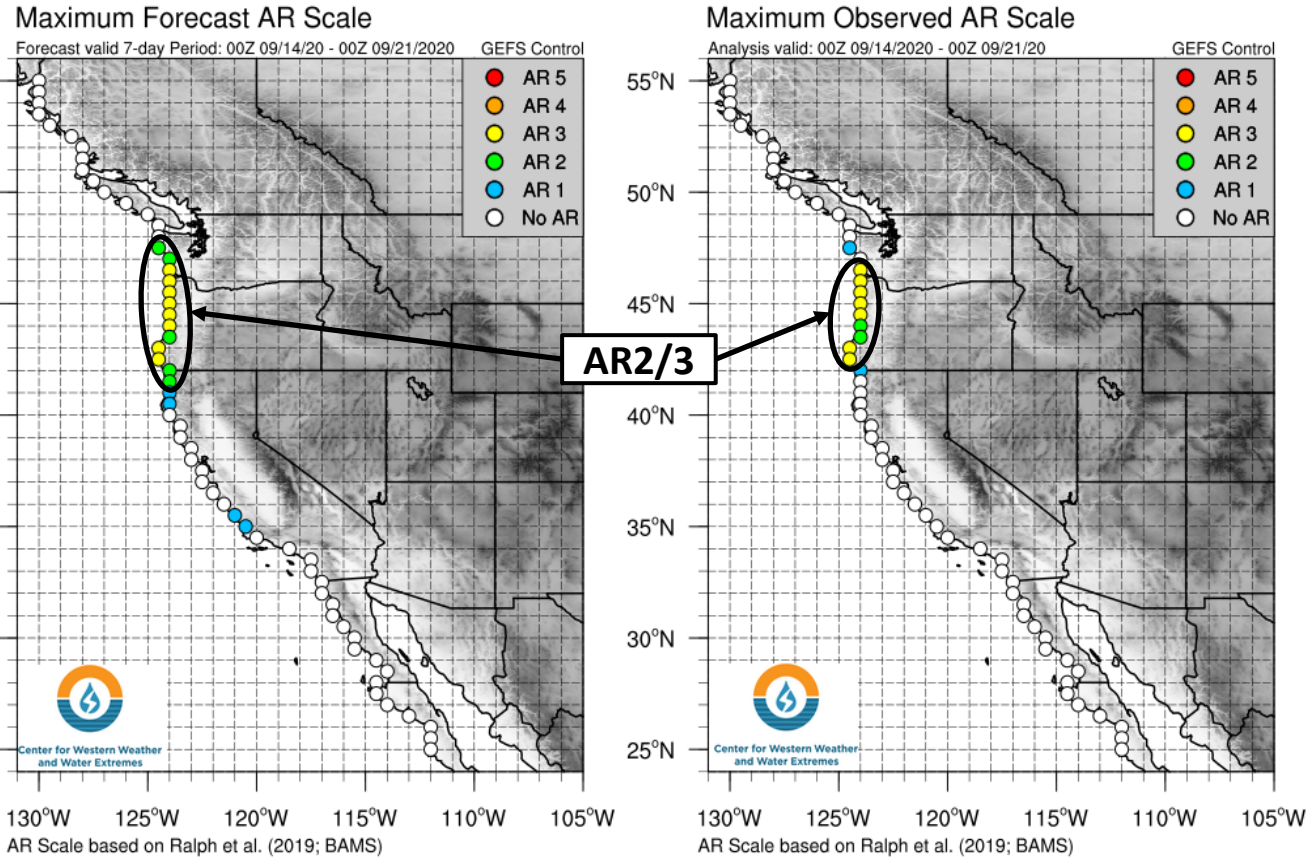


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GEFS AR Scale & IVT Analyses



- A landfalling AR brought a prolonged period of AR conditions to the Pacific Northwest during 14–17 Sep
- Although the IVT magnitude was not especially strong (max IVT < 700 kg m⁻¹ s⁻¹), some locations along the Oregon coast experienced weak-to-moderate AR conditions for more than 48 consecutive hours [AR3 based on the *Ralph et al. (2019)* AR Scale]
- A second period of AR conditions around 00Z 18 Sep was associated with cyclonic flow around an offshore cutoff low

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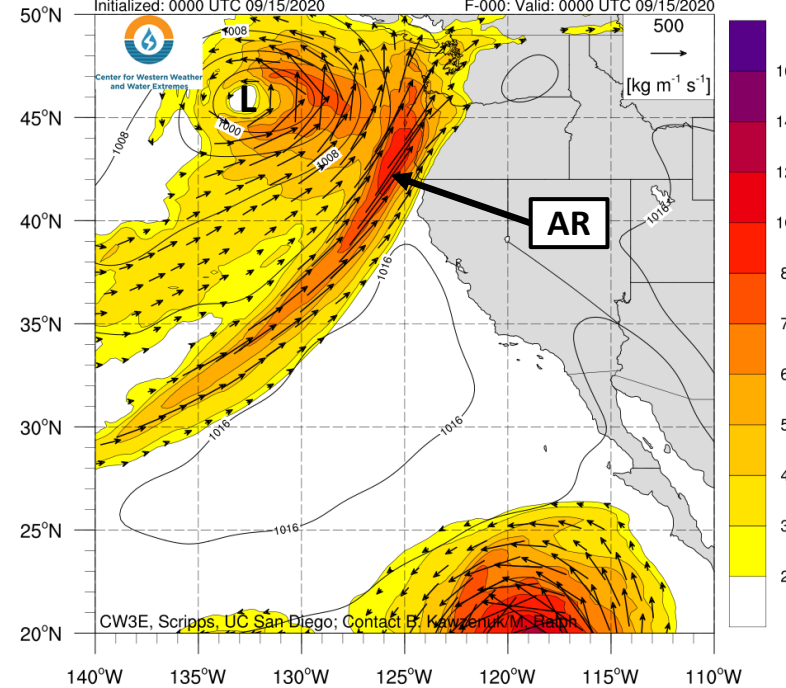
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GFS IVT/IWV Analyses

A) Valid: 0000 UTC 15 Sep

NCEP GFS IVT ($\text{kg m}^{-1} \text{s}^{-1}$; shaded), IVT Vector, and SLP (hPa; contours)

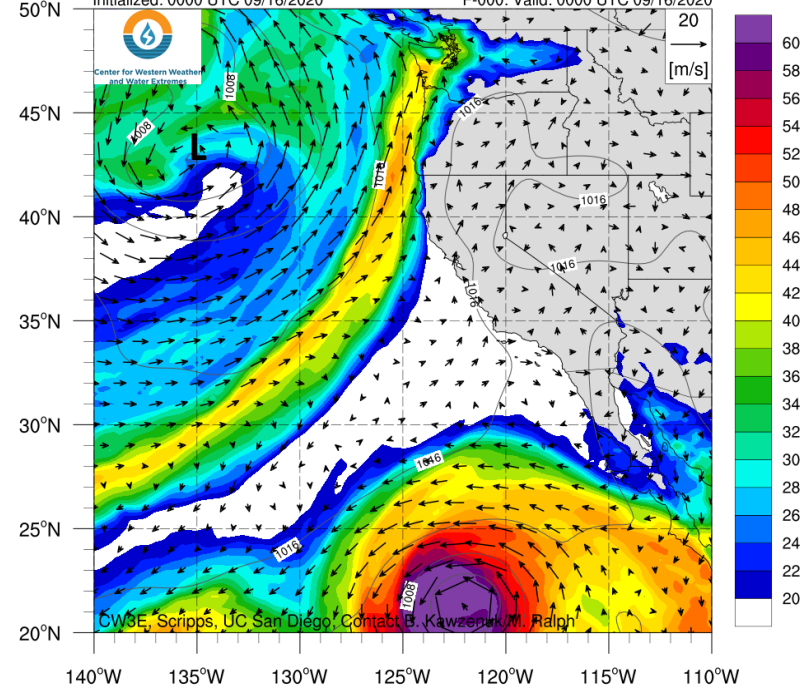
Initialized: 0000 UTC 09/15/2020 F-000: Valid: 0000 UTC 09/15/2020



B) Valid: 0000 UTC 16 Sep

NCEP GFS IWV (mm; shaded), 850-hPa Wind (vectors), and SLP (hPa; contours)

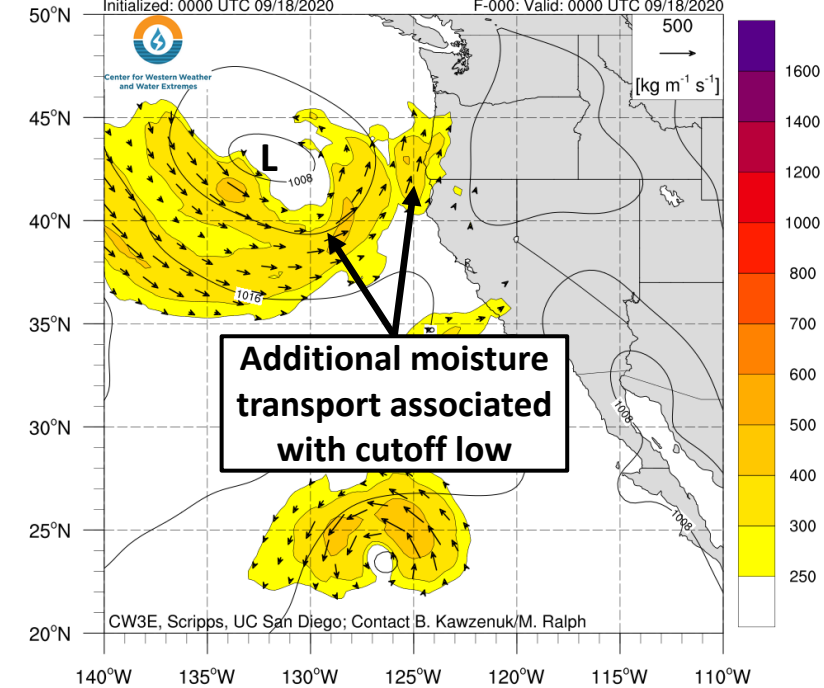
Initialized: 0000 UTC 09/16/2020 F-000: Valid: 0000 UTC 09/16/2020



C) Valid: 0000 UTC 18 Sep

NCEP GFS IVT ($\text{kg m}^{-1} \text{s}^{-1}$; shaded), IVT Vector, and SLP (hPa; contours)

Initialized: 0000 UTC 09/18/2020 F-000: Valid: 0000 UTC 09/18/2020



- An AR associated with a surface cyclone made landfall along the coast of Washington and Oregon on 14 Sep
- Low-to-midlevel southwesterly flow along the AR transported moist air into western Washington and Oregon, finally interrupting the period of very dry weather that had persisted through the first two weeks of September
- After the main AR decayed, additional moisture transport associated with the remnant cutoff low produced a second period of weak AR conditions along the Oregon coast

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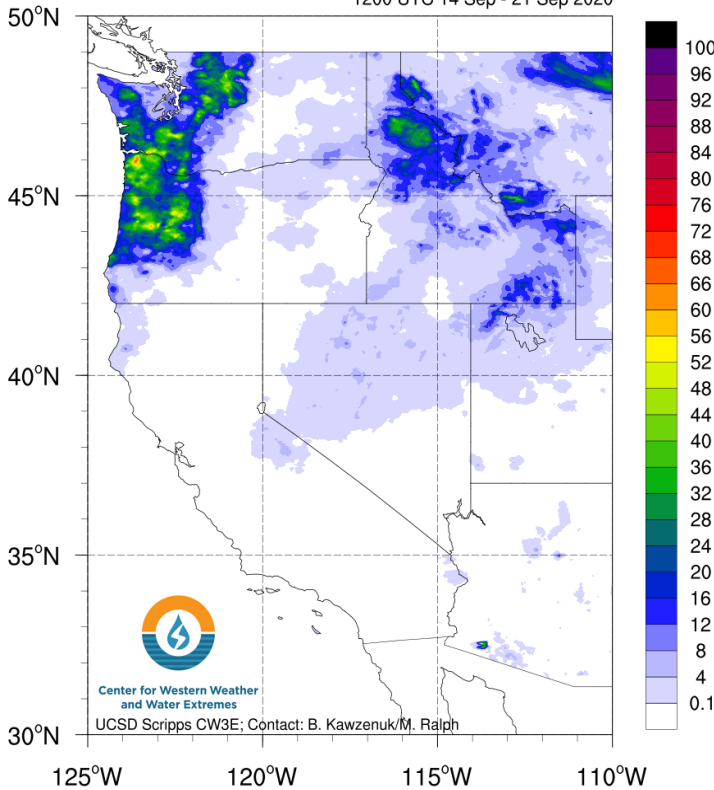


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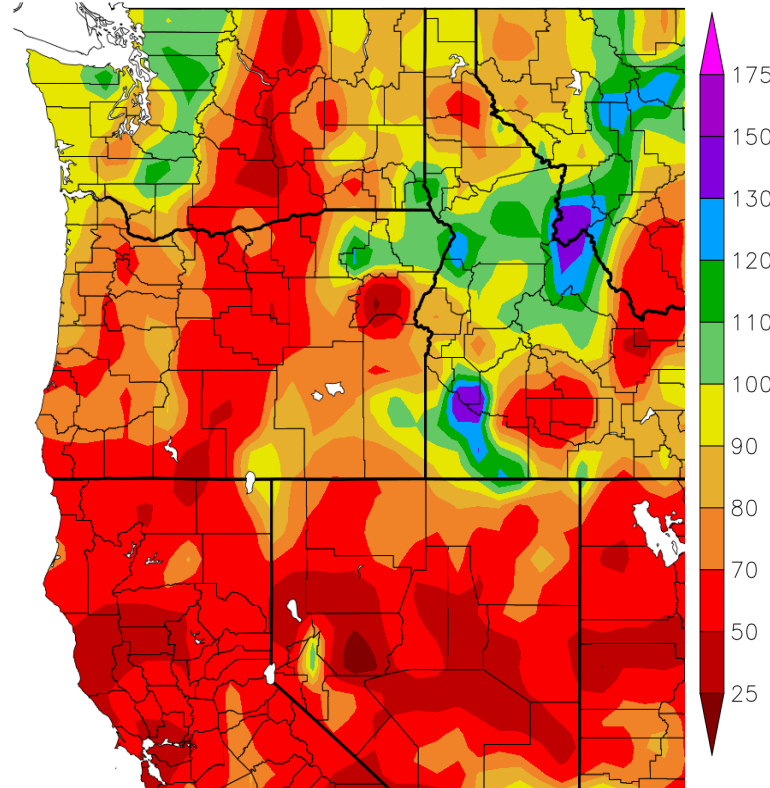
NWS 7-day Stage IV Precipitation: Valid 1200 UTC 14–21 Sep

7-day Accumulated Precipitation (mm)

1200 UTC 14 Sep - 21 Sep 2020

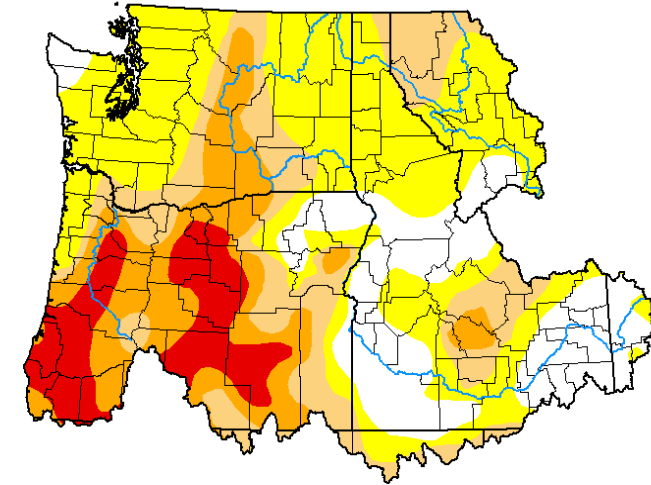


Percent of Normal Precipitation: Since 1 Oct 2019



U.S. Drought Monitor Pacific Northwest Watershed

September 15, 2020
(Released Thursday, Sep. 17, 2020)
Valid 8 a.m. EDT



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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U.S. Department of Agriculture



droughtmonitor.unl.edu

Source: National Drought Mitigation Center, <https://droughtmonitor.unl.edu/>

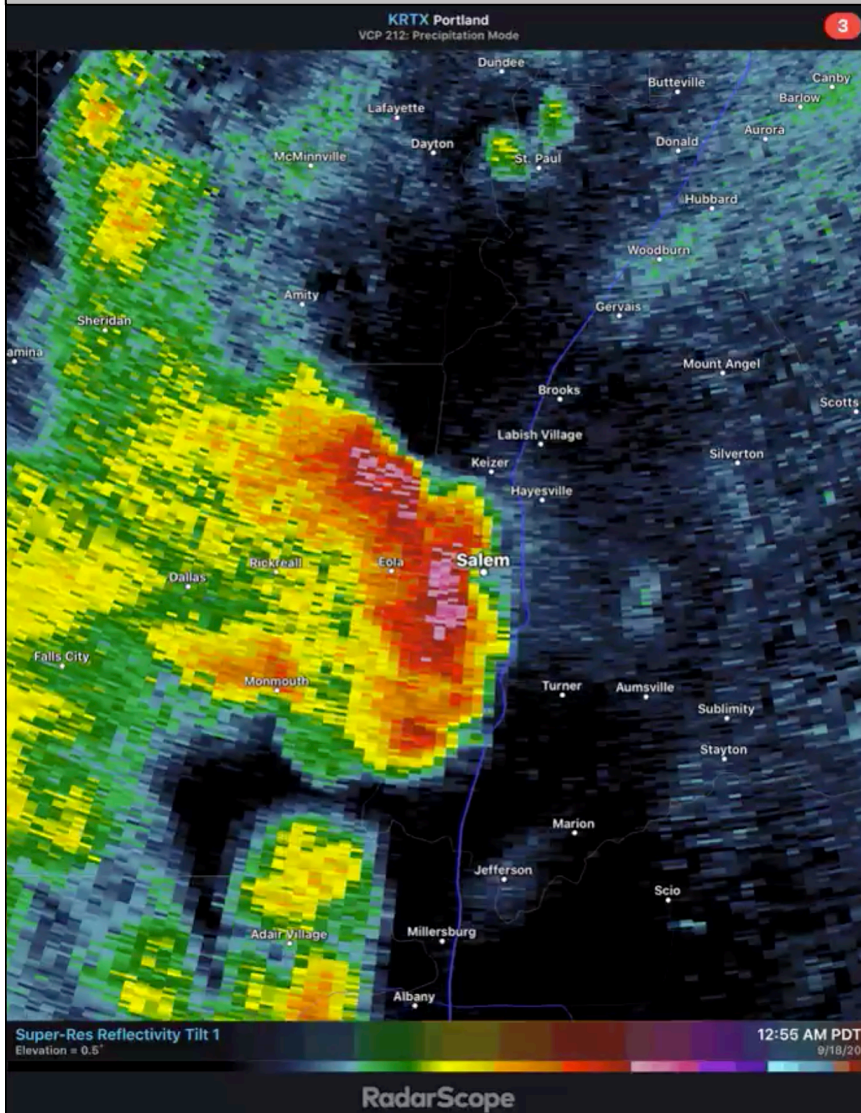
- Despite the prolonged period of AR conditions, only about 0.50–2 inches of total precipitation fell across western Washington and Oregon during the 7-day period ending 1200 UTC (5 AM PDT) 21 Sep
- Portions of Oregon and Washington have experienced significantly drier than normal conditions (< 70% of normal precipitation) since the start of Water Year 2020
- Severe-to-extreme drought conditions have persisted over portions of western and central Oregon since May

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NWS Radar: KRTX Portland (12:55 AM 18 Sep)



Source: NWS Portland, OR, <https://www.weather.gov/pqr/>

- Although total precipitation accumulations were generally light, scattered thunderstorms produced locally heavy downpours, gusty winds, frequent lightning, and small hail in western Oregon during the morning of 18 Sep
- NWS radar indicated a strong thunderstorm near Salem, OR, at approximately 1 AM PDT
- NWS Portland received several reports of wind damage in Linn and Marion Counties
- An NWS employee recorded 1.86 inches of rainfall during a 1-hour period near Happy Valley, OR

SPC Wind Reports: Valid 1200 UTC 17 Sep – 1159 UTC 18 Sep

Time	Speed	Location	County	State	Lat	Lon	Comments
0815	UNK	1 W SALEM	MARION	OR	4492	12304	6–8 INCH DIAMETER TREE BRANCHES BROKEN OFF DECIDUOUS TREES VIA SOCIAL MEDIA PICTURES (PQR)
0815	UNK	6 S NEWBERG	MARION	OR	4521	12297	SMALL TREE BRANCHES BROKEN IN THE TOWN OF ST PAUL VIA SOCIAL MEDIA PICTURES. TIME ESTIMATED (PQR)
0835	UNK	LEBANON	LINN	OR	4453	12290	NUMEROUS TREES SNAPPED AND UPROOTED AROUND TOWN VIA SOCIAL MEDIA (PQR)

Source: NOAA/NWS Storm Prediction Center, <https://www.spc.noaa.gov/>

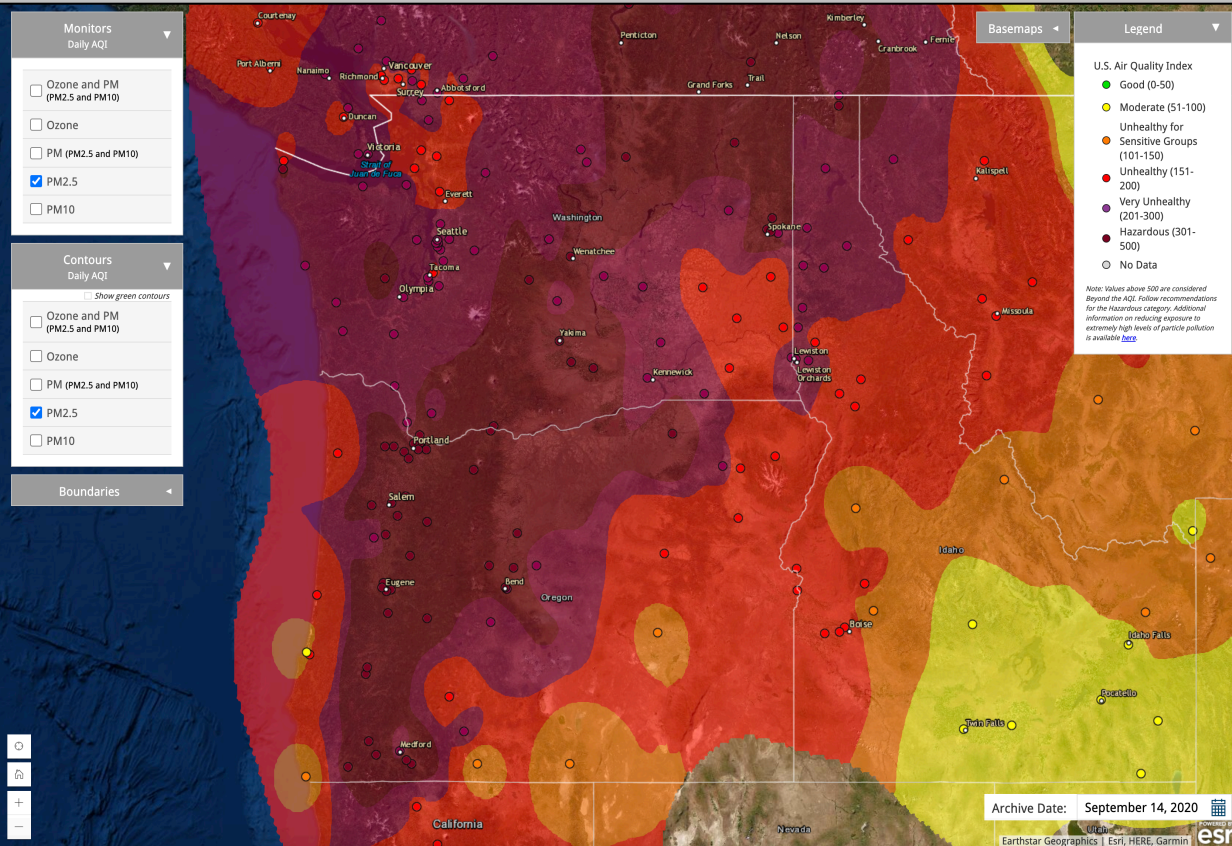
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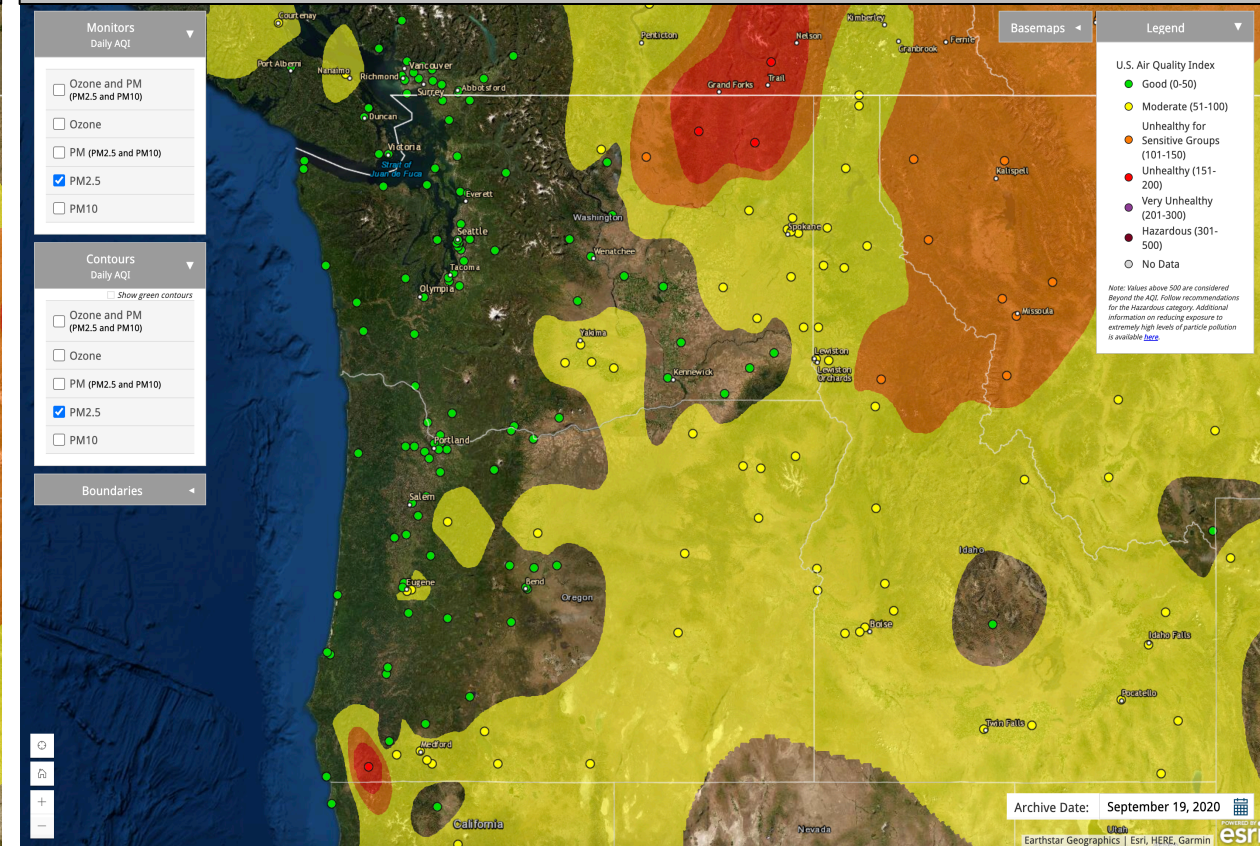
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Daily PM2.5 Air Quality Index: 14 Sep 2020



Daily PM2.5 Air Quality Index: 19 Sep 2020



Source: AirNow (U.S. EPA & Partners), <https://www.airnow.gov/>

- Before this event, air quality over much of Washington and Oregon was in the very unhealthy to hazardous range due to numerous ongoing wildfires
- The precipitation and changes in wind direction and humidity associated with the landfalling AR and cutoff low led to a substantial improvement in air quality in these areas
- As of 21 Sep, there were only 3 active large fires in Washington (down from 13 one week prior)