Oregon House Interim Committee on Water
Drought Status and Climate Update
November 17, 2021

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Key points:

(1) Although ongoing, the WY2021 Oregon drought ranks among the 4 worst in state recorded history alongside 1924, 1931, and 1977

(2) Key drivers of the severity of the drought include record high temperatures which fueled high evaporative demand, record low precipitation during spring and summer, and early meltout of the mountain snowpack

Wickiup Reservoir, August 19, 2021
Image Courtesy of The Bend Bulletin

Oregon State University
College of Earth, Ocean, and Atmospheric Sciences

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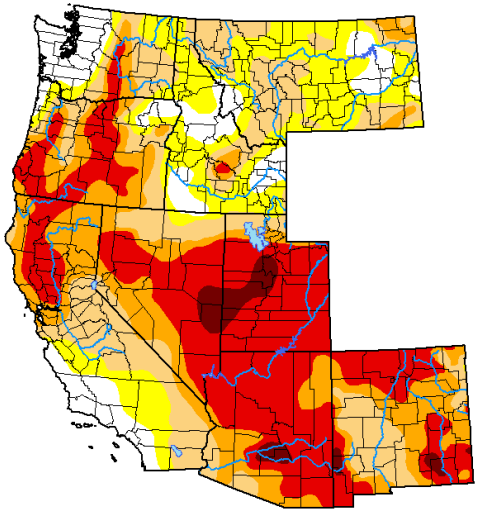
OCS Oregon Climate Service

Drought progression throughout WY2021



U.S. Drought Monitor
West

September 29, 2020
(Released Thursday, Oct. 1, 2020)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	9.96	90.04	73.14	51.29	32.19	2.50
Last Week 09-24-2020	8.99	91.01	70.45	49.65	27.95	1.52
3 Months Ago 07-02-2020	38.10	61.90	42.12	21.57	2.42	0.00
Start of Calendar Year 01-02-2020	60.49	39.51	16.48	6.45	0.00	0.00
Start of Water Year 10-03-2019	71.40	28.60	16.76	3.81	0.00	0.00
One Year Ago 10-03-2019	71.40	28.60	16.76	3.81	0.00	0.00

Intensity:
None
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought

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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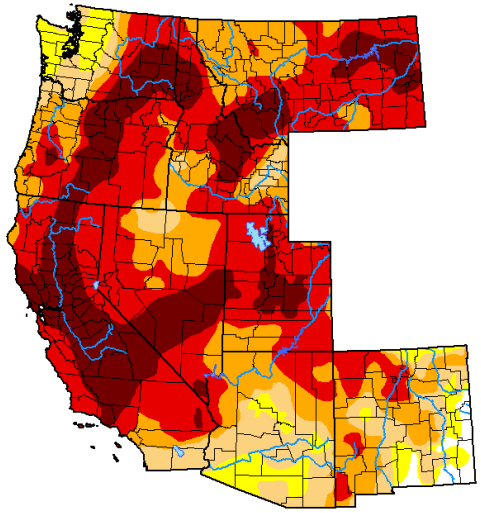
droughtmonitor.unl.edu



U.S. Drought Monitor
West

October 5, 2021
(Released Thursday, Oct. 7, 2021)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	1.26	98.74	92.86	81.03	58.81	21.37
Last Week 09-28-2021	1.32	98.68	93.35	81.07	58.72	21.77
3 Months Ago 07-06-2021	0.76	99.24	93.73	83.03	59.97	26.29
Start of Calendar Year 12-29-2020	13.52	86.48	75.49	63.25	45.40	23.76
Start of Water Year 09-28-2021	1.32	98.68	93.35	81.07	58.72	21.77
One Year Ago 10-06-2020	9.30	90.70	74.17	52.53	33.97	3.66

Intensity:
None
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Author:
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National Drought Mitigation Center

droughtmonitor.unl.edu

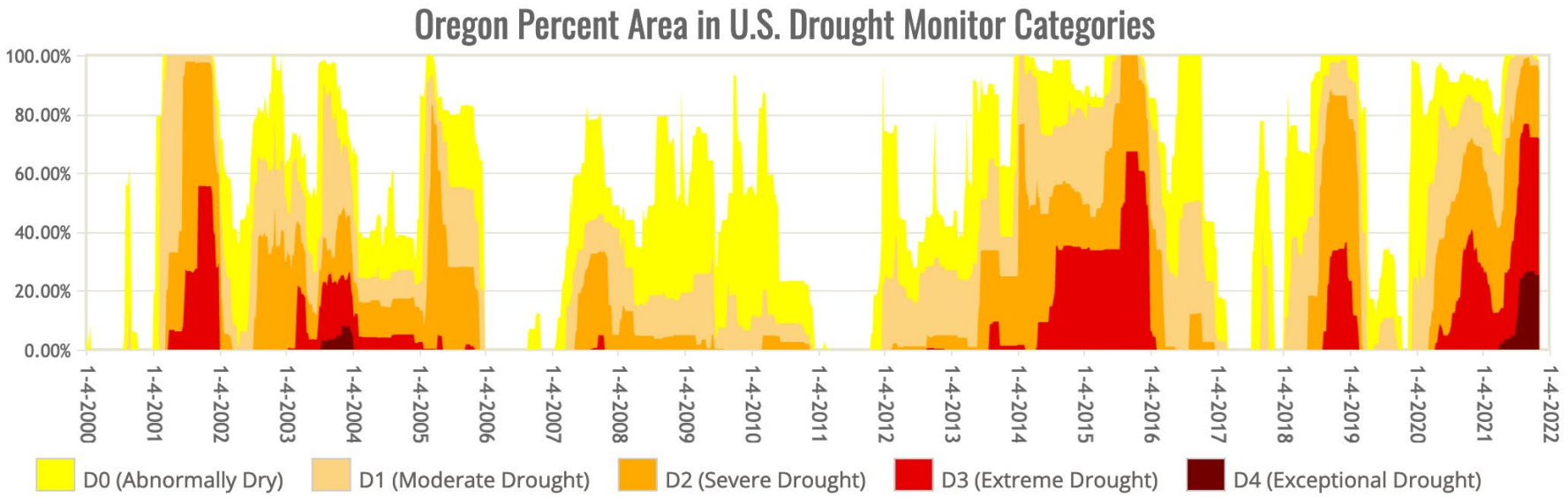
<u>On September 29, 2020:</u>

- Oregon: 6% of area drought-free
  - 34% in D3; 32% in D2; 19% in D1; 9% in D0
- Washington: 37% of area drought-free
  - 6% in D3; 11% in D2; 27% in D1; 19% in D0

<u>On October 5, 2021:</u>

- Oregon: 0% of area drought-free
  - 27% in D4; 46% in D3; 24% in D2; 3% in D1; 0% in D0
- Washington: 0% of area drought-free
  - 25% in D4; 22% in D3; 8% in D2; 18% in D1; 27% in D0

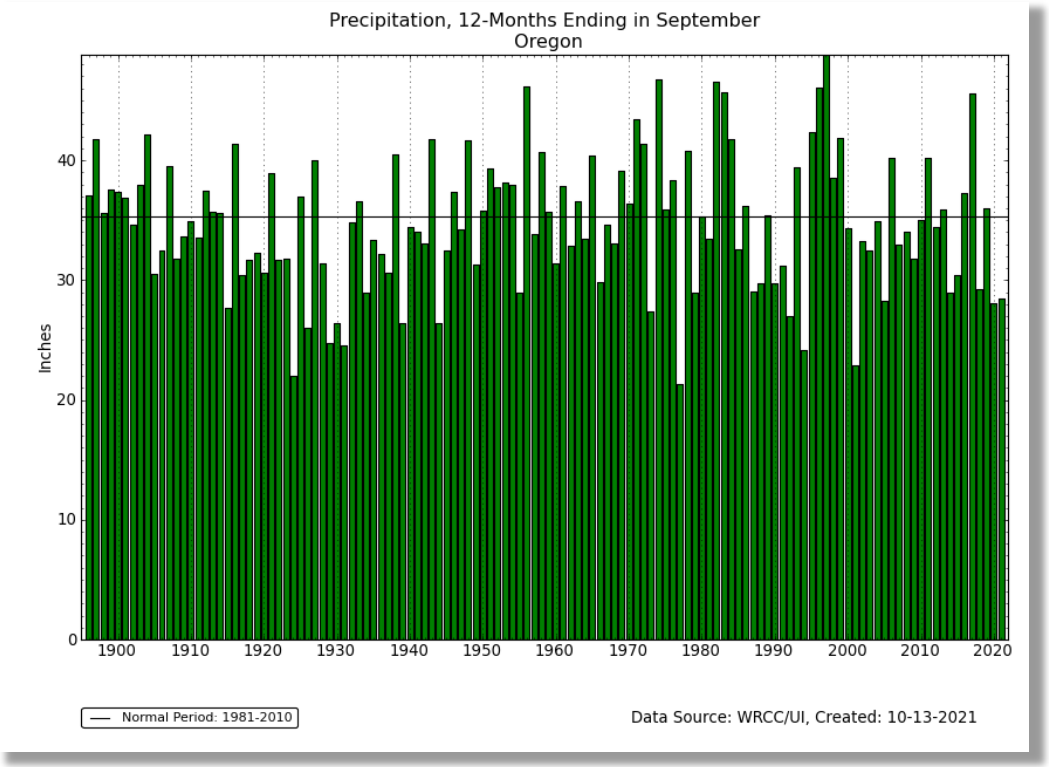
PacNW drought through the ages



This year, since the USDM began weekly drought classification in early 2000:

- Oregon:
  - Had only its second D4 classification
  - Had its most extensive D3+ classification
- At the drought's peak in mid-Sept, D4 covered 27% of Oregon and 38% of Washington

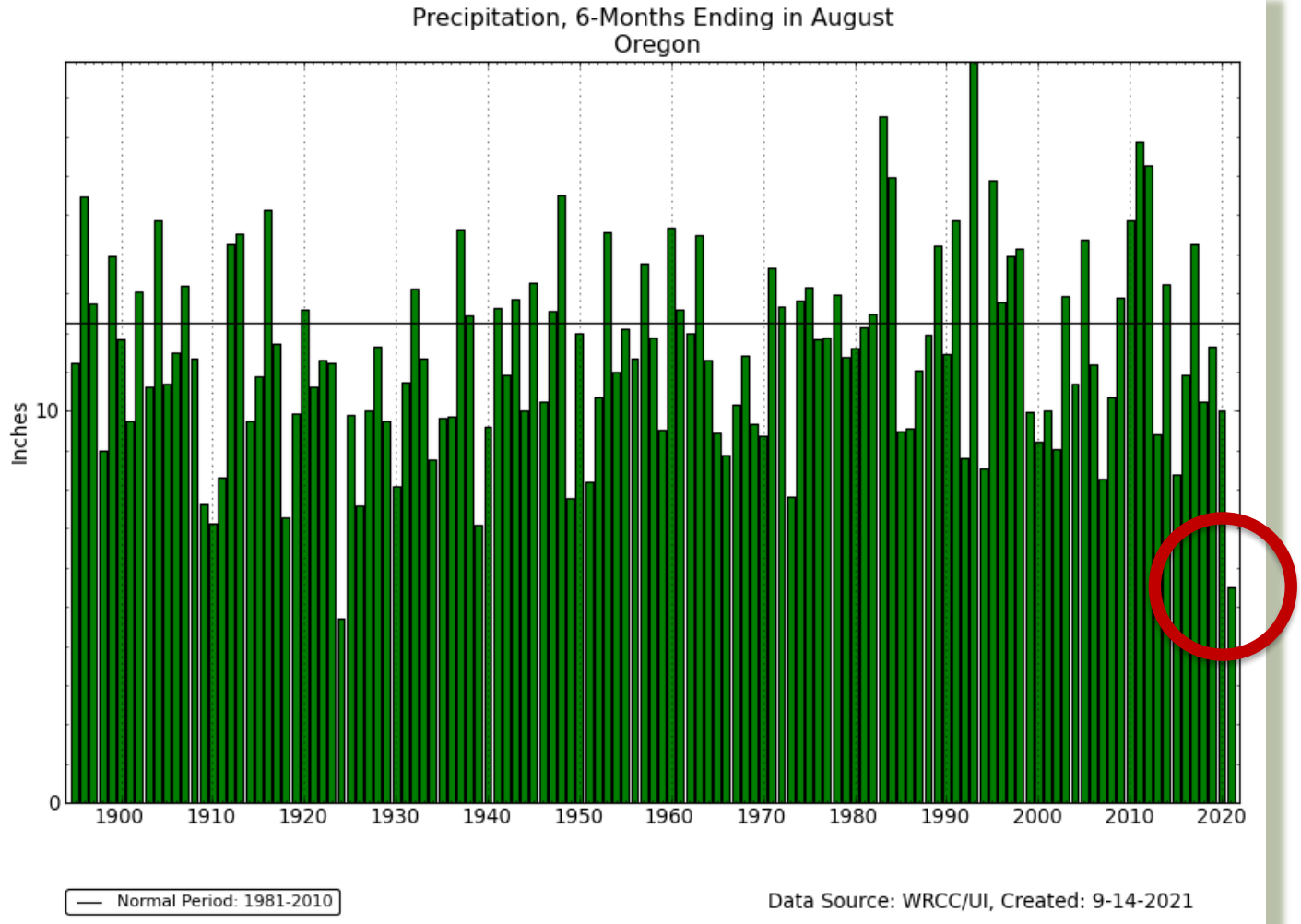
Oregon WY 2021 Total Precipitation



- Oregon received 80.7% of avg precipitation for WY2021
- Ranks 16th lowest out of 127 years
- In 16 out of the last 22 years, Oregon has received below average precipitation
- The last two years have been well below normal, making this a multi-year drought

Source: Westwide Drought Tracker using the PRISM precipitation analysis (preliminary)

2021 Spring & Summer Precipitation



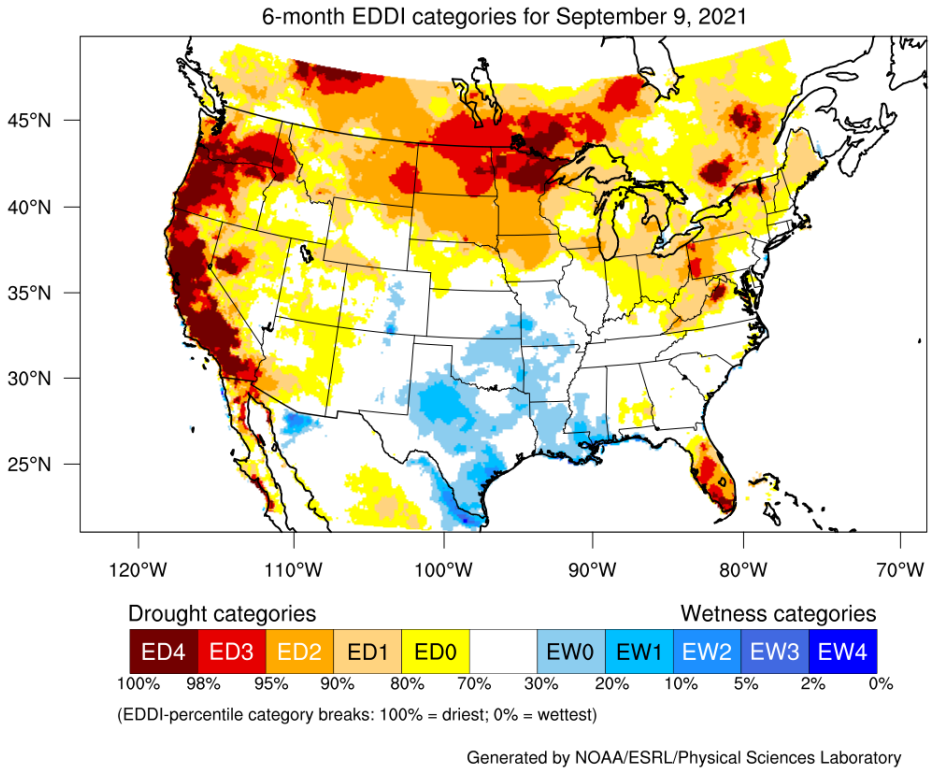
Oregon received the 2nd lowest accumulated precipitation on record during spring/summer 2021

(1924 is the lowest; 1939 is now the 3rd lowest)

Evaporative demand loss

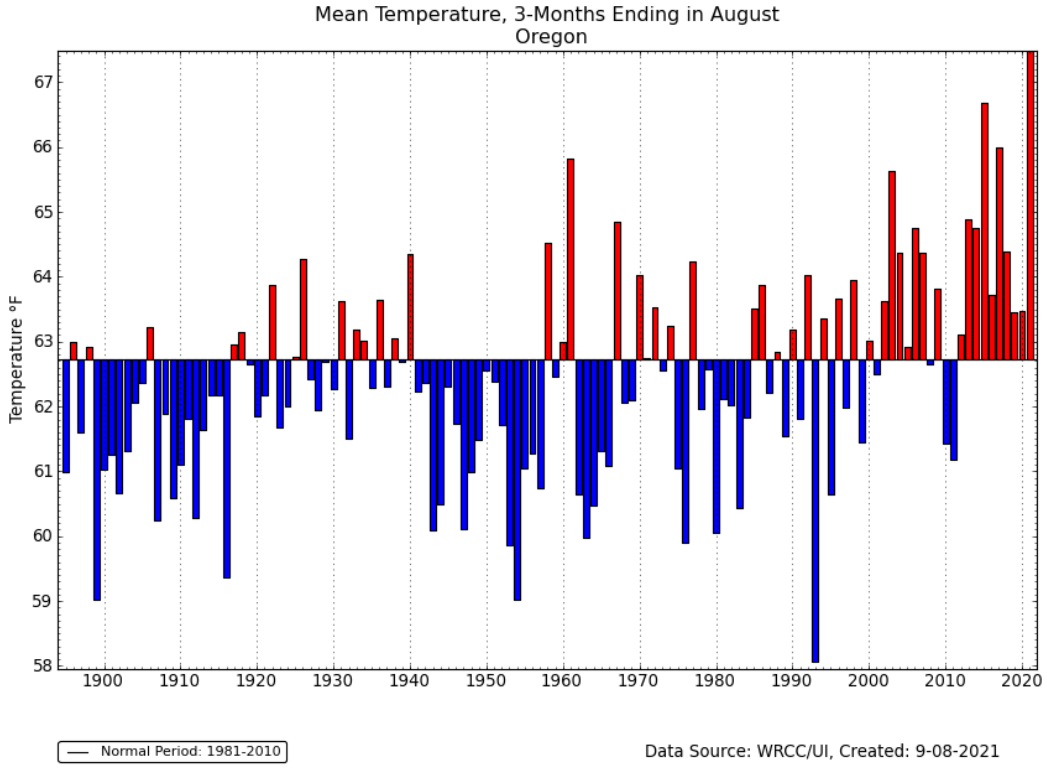
The Evaporative Demand Drought Index (EDDI) provides an estimate of evaporative water loss compared to historical conditions

Dependent on mainly temperature, but also wind speed, radiation, and atmospheric moisture



EDDI indicates in the last 6-12 months, Oregon has experienced much more evaporative water loss compared with historical conditions

Summer mean temperature Averaged statewide for Oregon



This summer, the Oregon statewide averaged temperature was 67.5°F (for June-July-Aug), which was 4.8°F above normal and the warmest on record back to 1895. A distant second place is now 2015, which recorded 66.7°F.

Days above 90°F

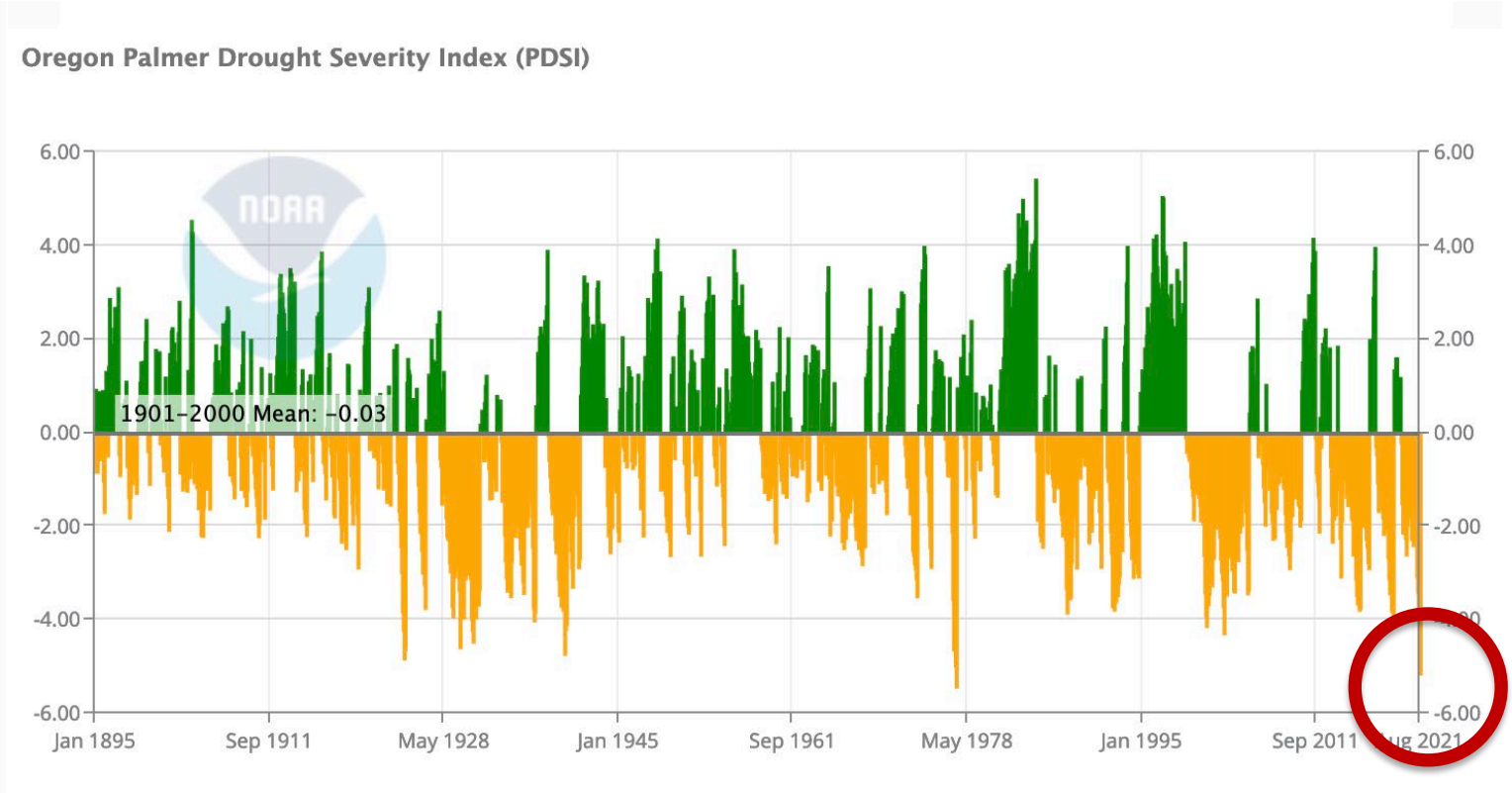
- The record warm summer was not just a product of the June heatwave, but also of prolonged stretches of well above average temperatures

	# of days >=90°F	Rank
Portland	24	Tied-3
Salem	41	1
Eugene	42	1
Roseburg (Riddle)	65	Tied-1
Medford	74	Tied-5
Klamath Falls	53	1
Redmond	57	2
Bend	38	2
Burns	61	1

Data courtesy of NOAA/NCEI

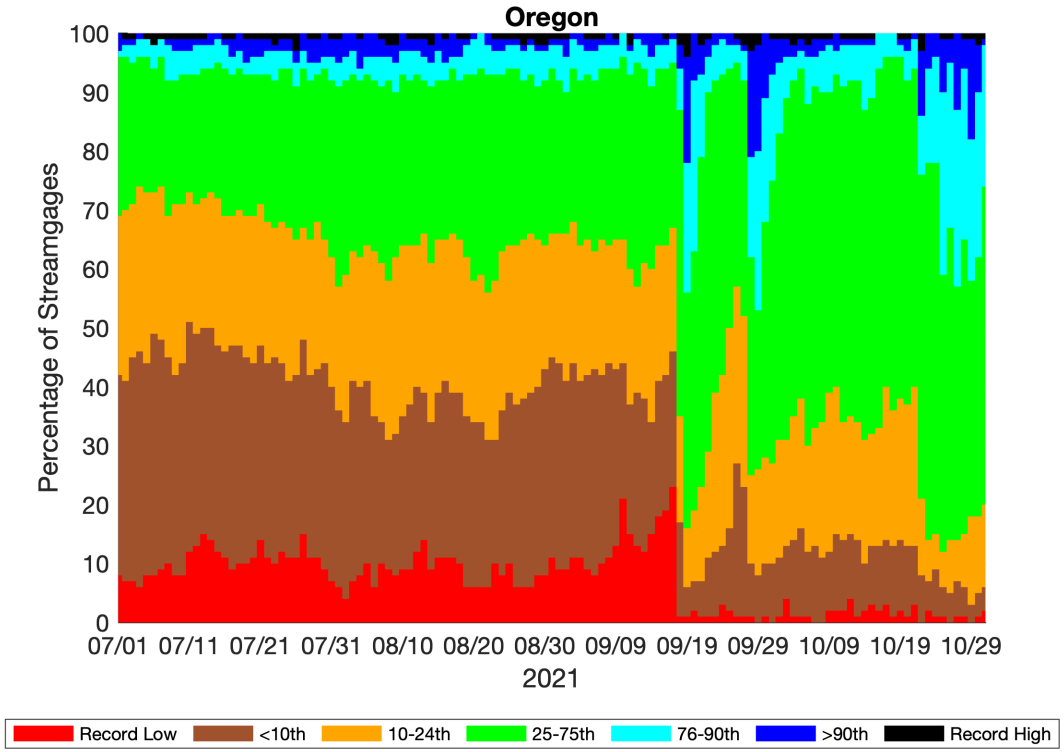
Assessing the 2020/21 drought severity

The Palmer Drought Severity Index (PDSI) estimates drought severity from precipitation and evaporation



- *The state of Oregon recorded its second lowest PDSI on record in August 2021*
- The lowest occurred during 1977 and the third lowest in 1924

USGS daily streamflow percentiles



Time series of the percentage of USGS streamflow gages within each percentile class in all of Oregon

Until the mid-Sept wet period, about 25% of stream gages were recording record low flows and about 70% were recording well below average streamflows

The hydrological drought severity peaked in mid-September

Summary

- WY2021 was the second year of a multiyear drought for Oregon and much of Washington
- Drought metrics show extreme drought development during Spring 2021
- Character of the drought affected by early snow meltout
- Streamflows and soil moisture set record lows for much of the summer
- Adverse impacts were more severe this year compared with last year
- Precipitation did not do as far as it usually does due to record high temperatures and evaporation during summer

2021 Spring & Summer Precipitation County Rankings