Western Drought Update

Kyle Bocinsky
Director of Climate Extension
Montana Climate Office
University of Montana

September 2022
Western Drought Summary

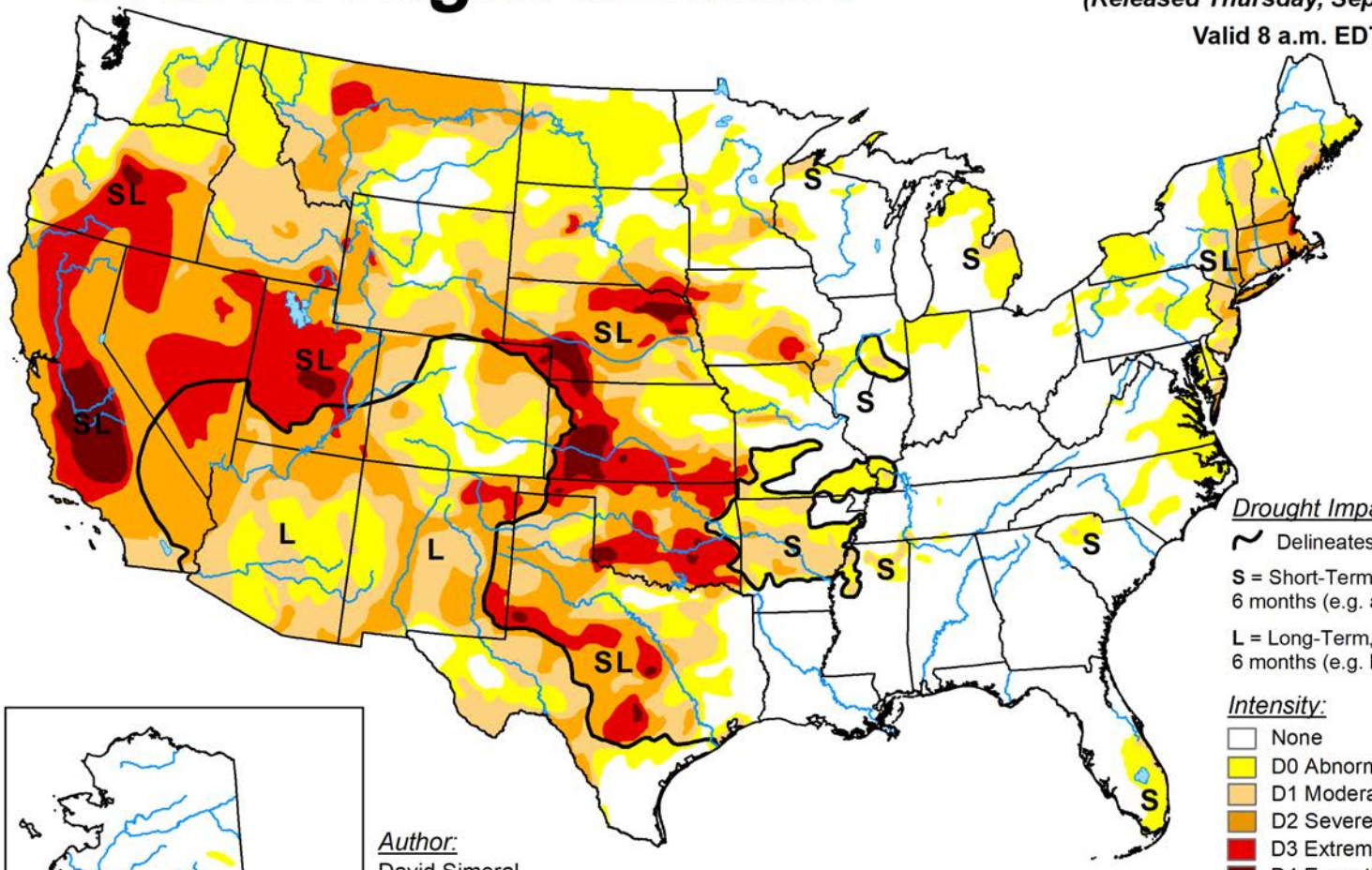
- **Drought conditions continue to dominate** the western US, especially in the Great Basin and central Plains.
- Pacific sea surface temperatures continue to be cooler than normal, indicating **La Niña conditions.** La Niña predicted to persist through early winter, with warmer and drier conditions across the southern US.
- **Drought expected to continue or worsen** across southwestern US and southern plains.
- **Historically low reservoir storage** in the Colorado River basin and much of California going into a La Niña winter.

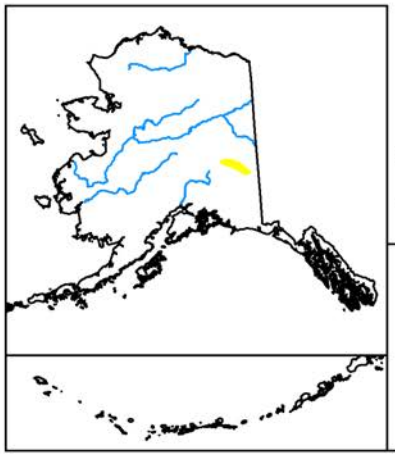
U.S. Drought Monitor

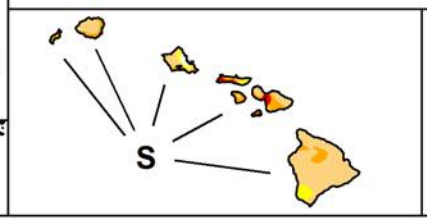
September 13, 2022

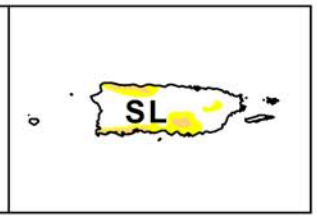
(Released Thursday, Sep. 15, 2022)

Valid 8 a.m. EDT









Drought Impact Types:

Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

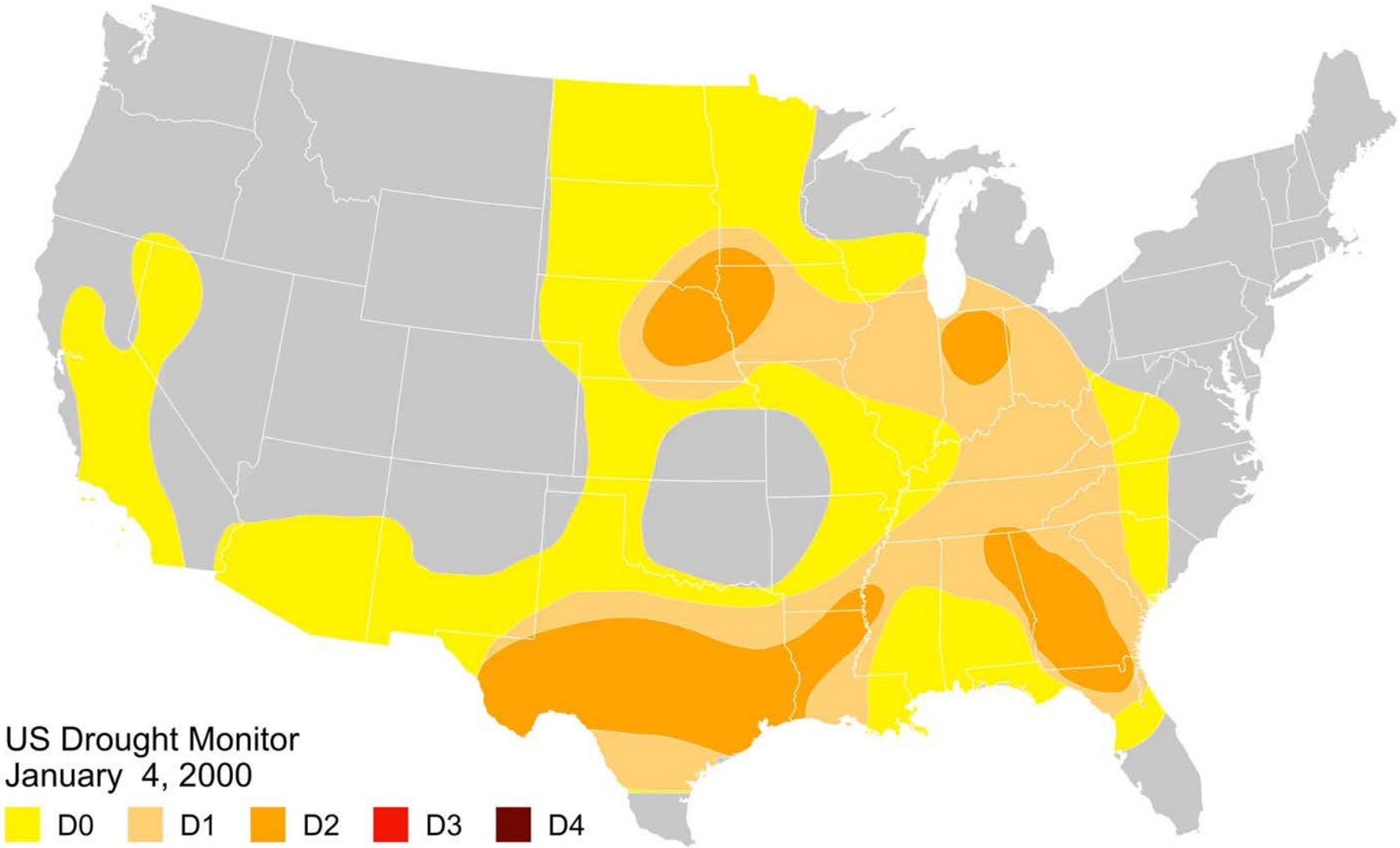
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

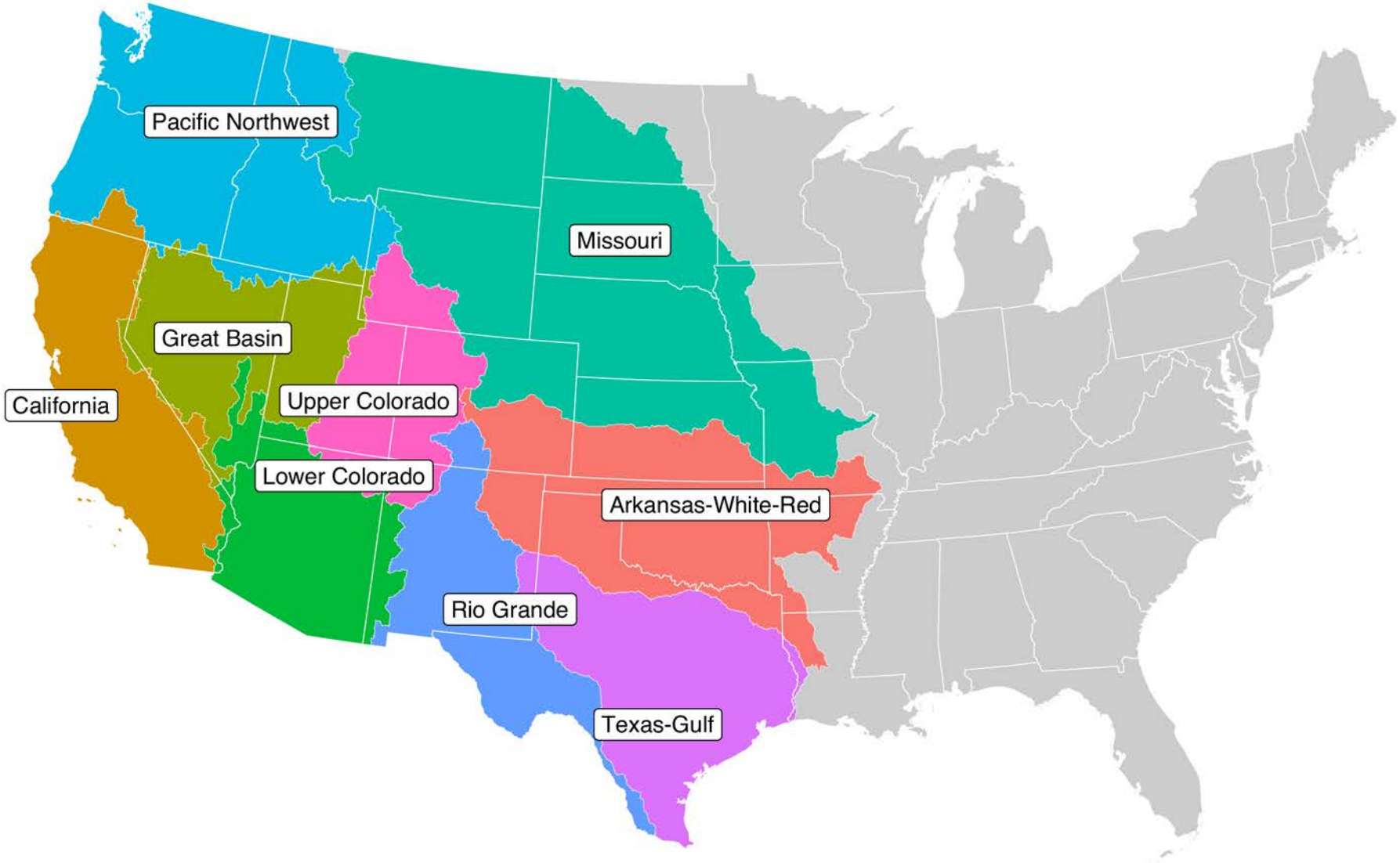
Author:
David Simeral
Western Regional Climate Center

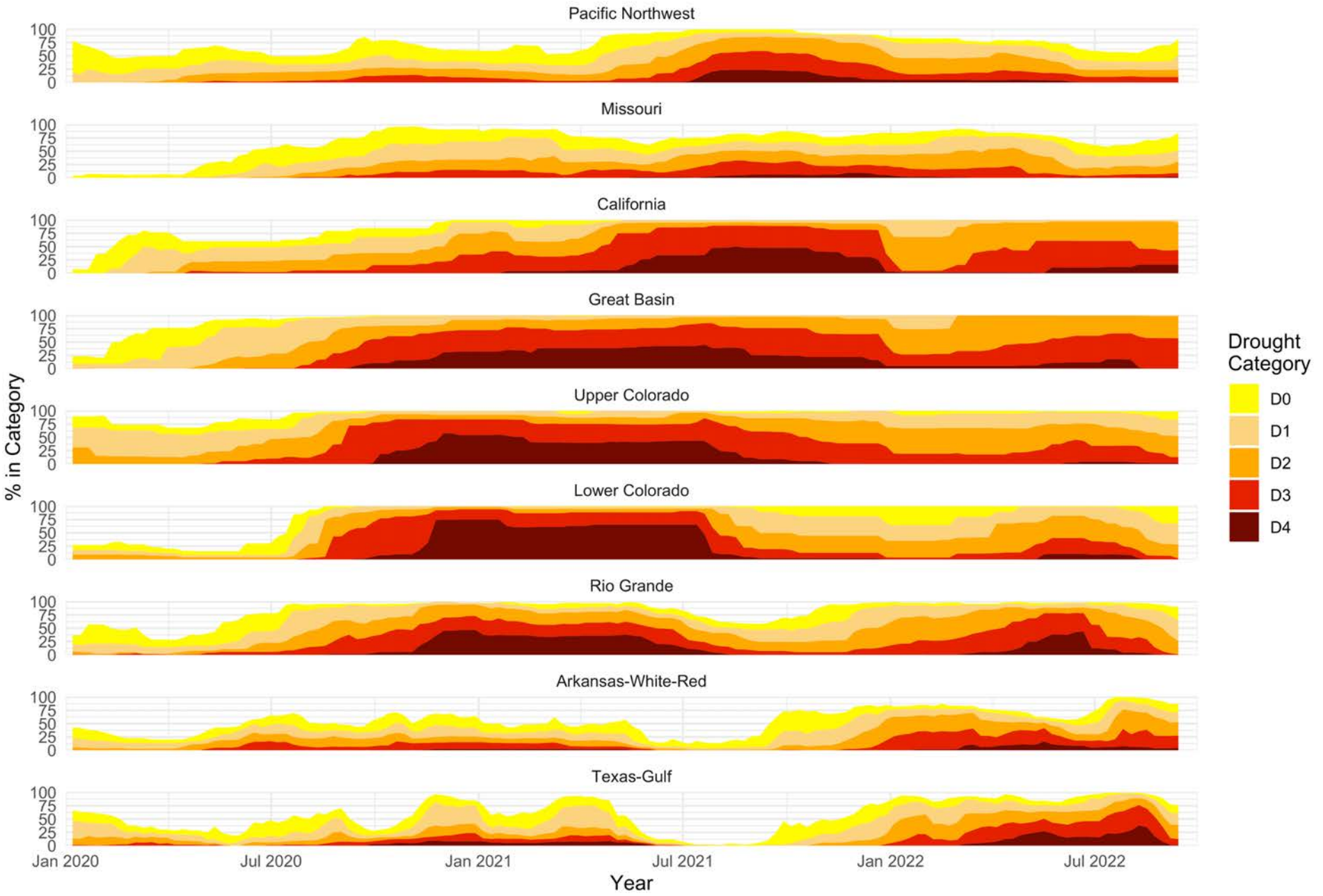
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

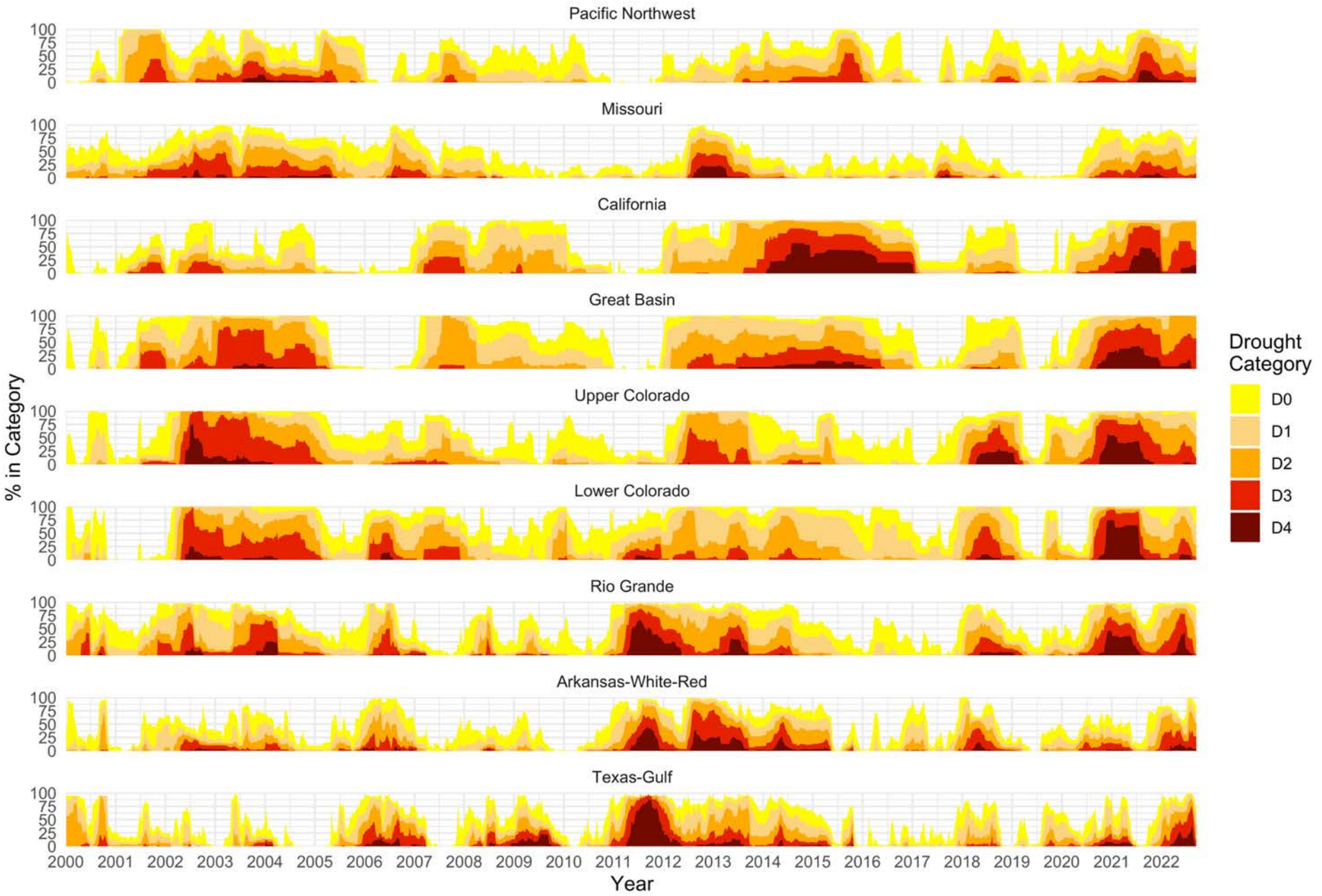
USDA NDMC NOAA

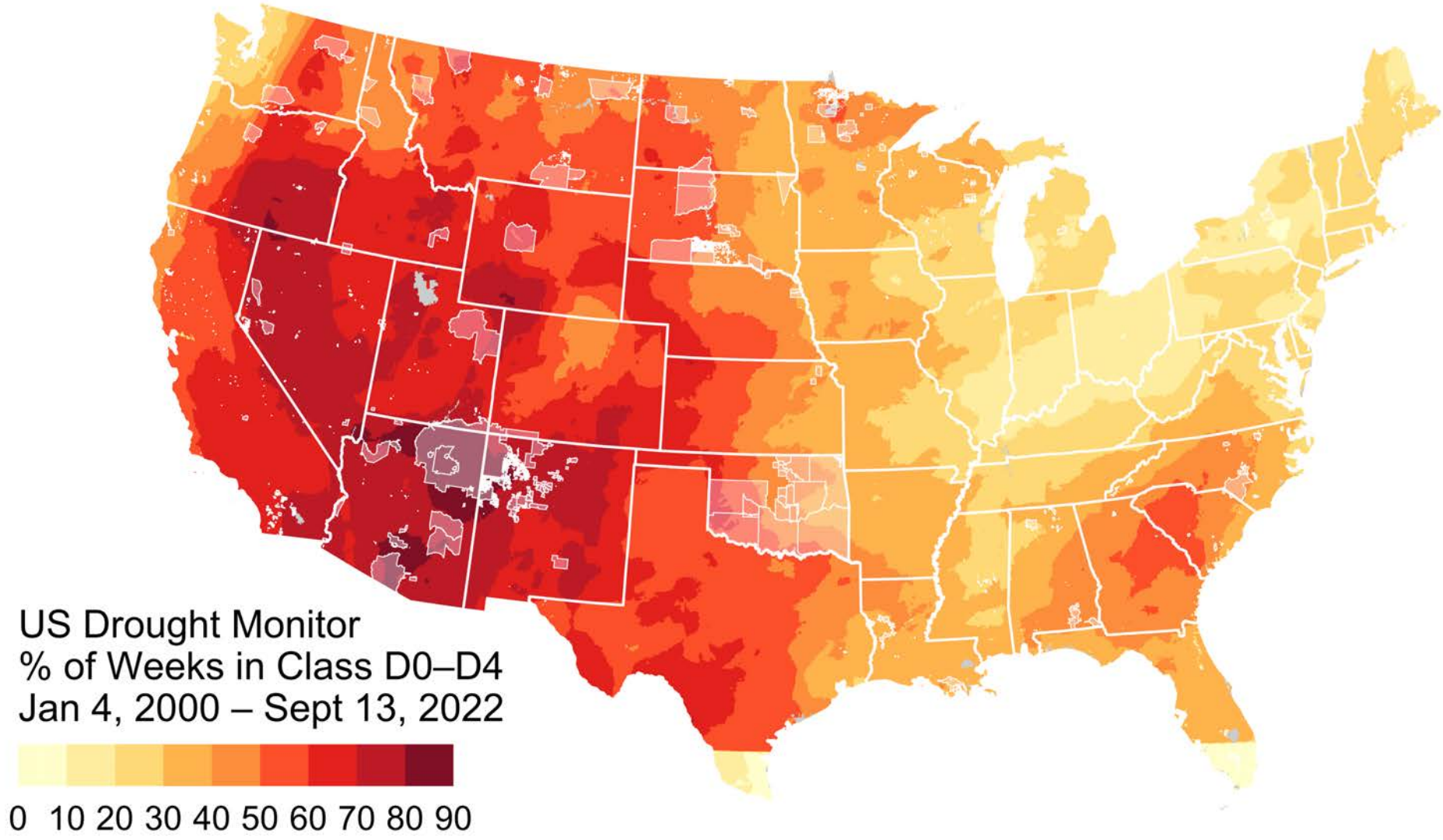
droughtmonitor.unl.edu

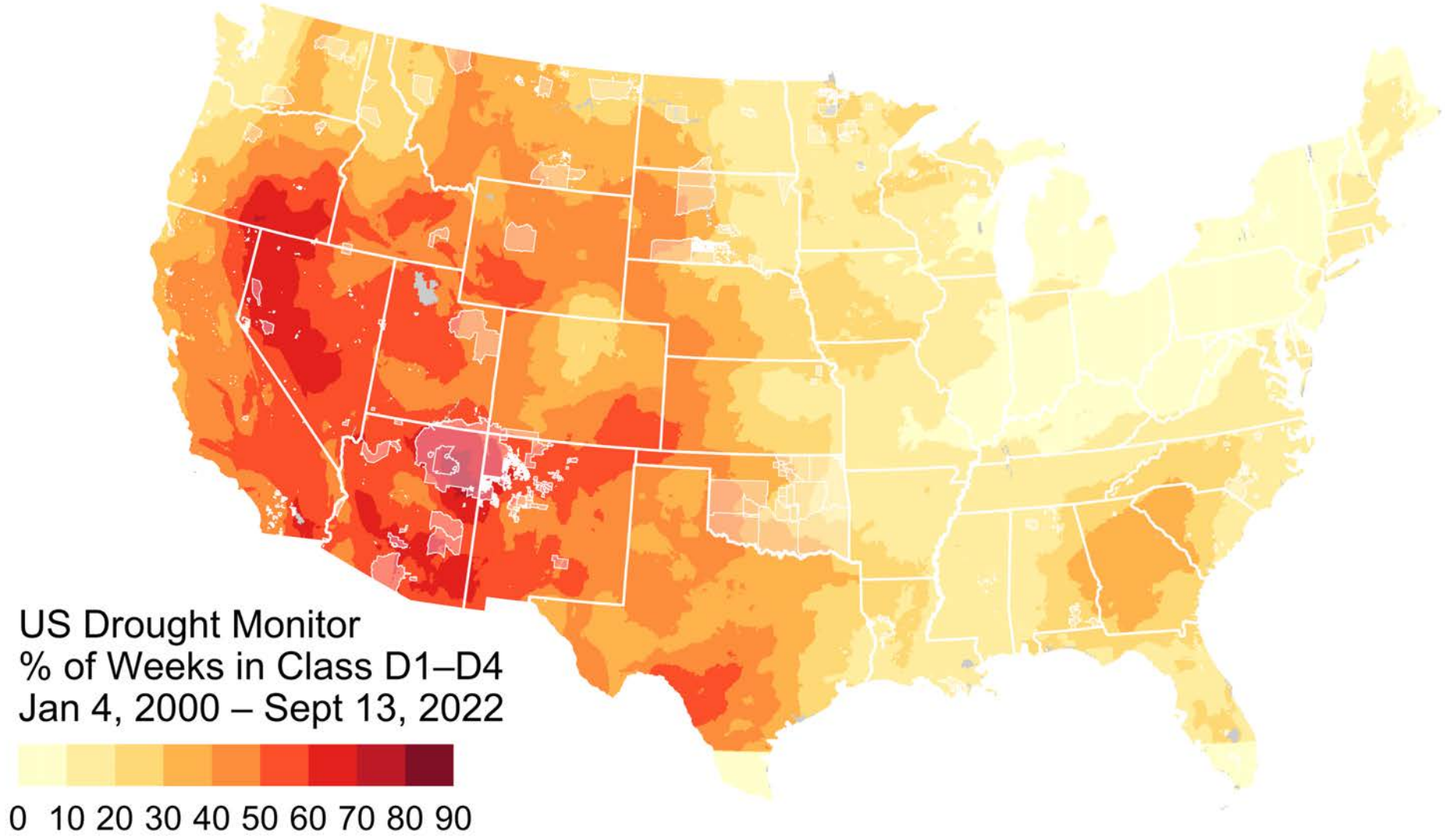

US Drought Monitor
January 4, 2000
D0
D1
D2
D3
D4

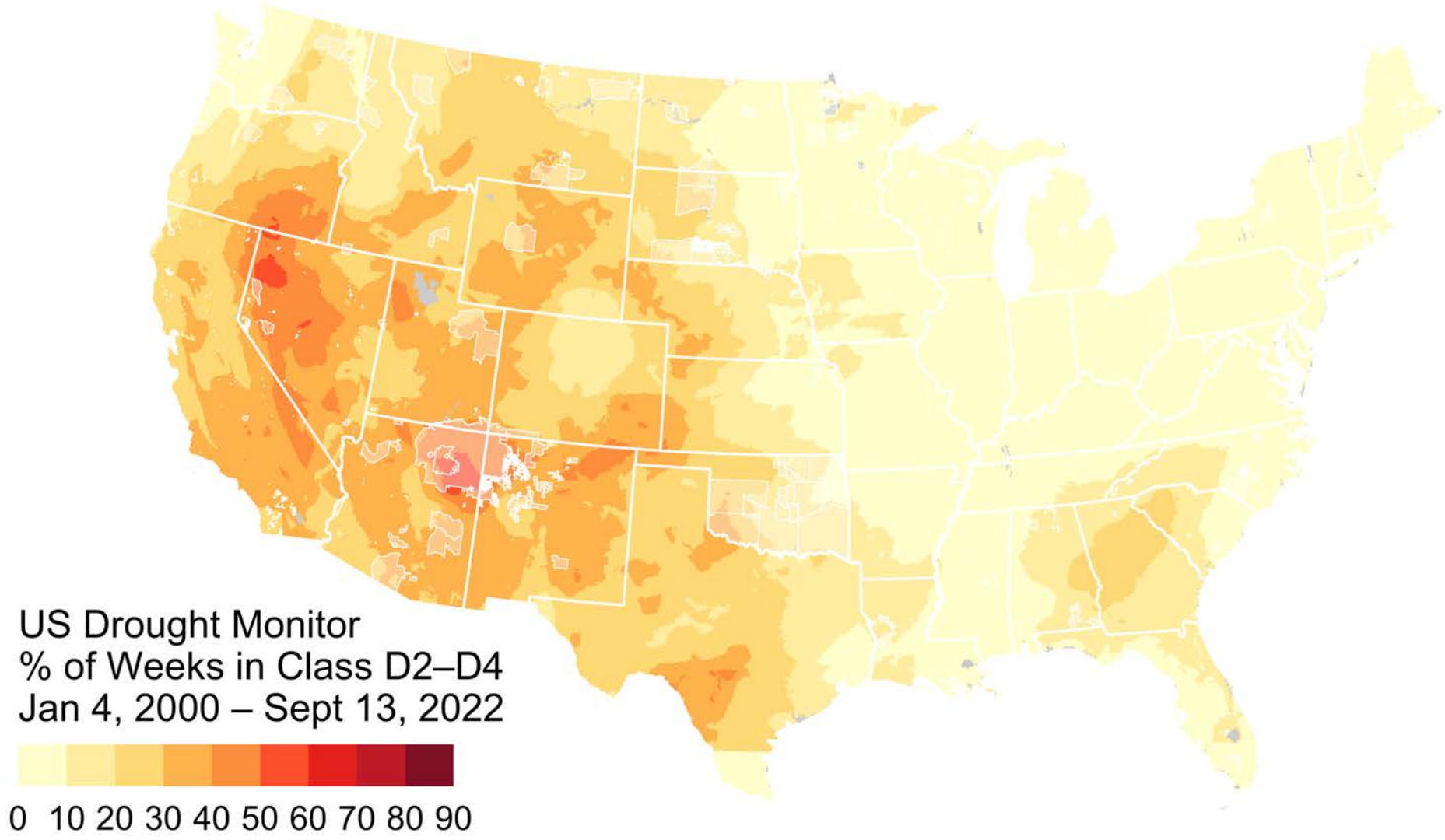

Pacific Northwest
Missouri
Great Basin
California
Upper Colorado
Lower Colorado
Arkansas-White-Red
Rio Grande
Texas-Gulf

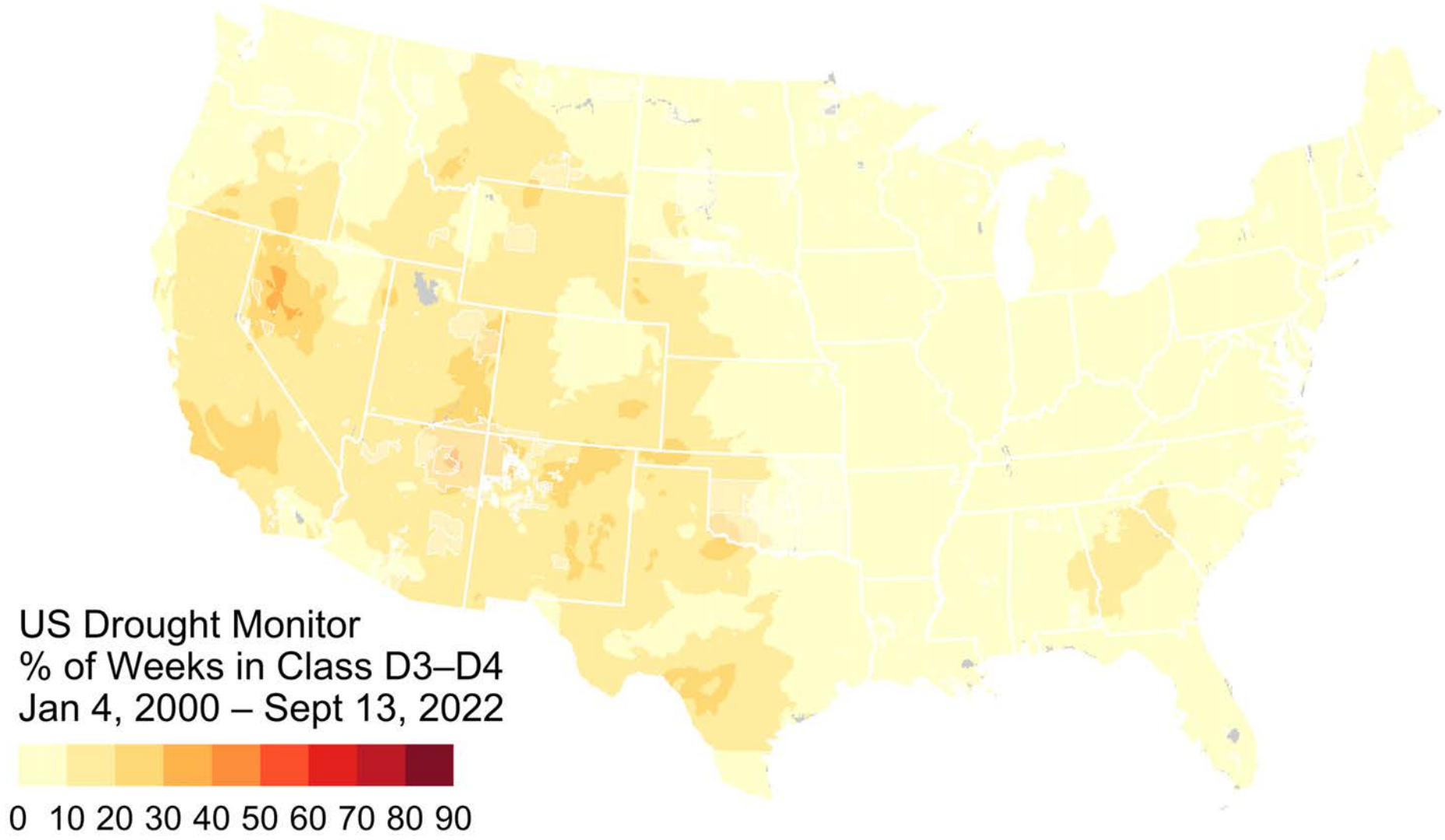

Pacific Northwest
Missouri
California
Great Basin
Upper Colorado
Lower Colorado
Rio Grande
Arkansas-White-Red
Texas-Gulf
100
75
50
25
0
% in Category
Jan 2020
Jul 2020
Jan 2021
Jul 2021
Jan 2022
Jul 2022
Year
Drought Category
D0
D1
D2
D3
D4


Pacific Northwest
Missouri
California
Great Basin
Upper Colorado
Lower Colorado
Rio Grande
Arkansas-White-Red
Texas-Gulf
100
75
50
25
0
% in Category
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Year
Drought Category
D0
D1
D2
D3
D4


US Drought Monitor
% of Weeks in Class D0–D4
Jan 4, 2000 – Sept 13, 2022
0 10 20 30 40 50 60 70 80 90


US Drought Monitor
% of Weeks in Class D1–D4
Jan 4, 2000 – Sept 13, 2022
0 10 20 30 40 50 60 70 80 90


US Drought Monitor
% of Weeks in Class D2–D4
Jan 4, 2000 – Sept 13, 2022
0 10 20 30 40 50 60 70 80 90


US Drought Monitor
% of Weeks in Class D3–D4
Jan 4, 2000 – Sept 13, 2022
0 10 20 30 40 50 60 70 80 90

U.S. Drought Monitor

September 13, 2022

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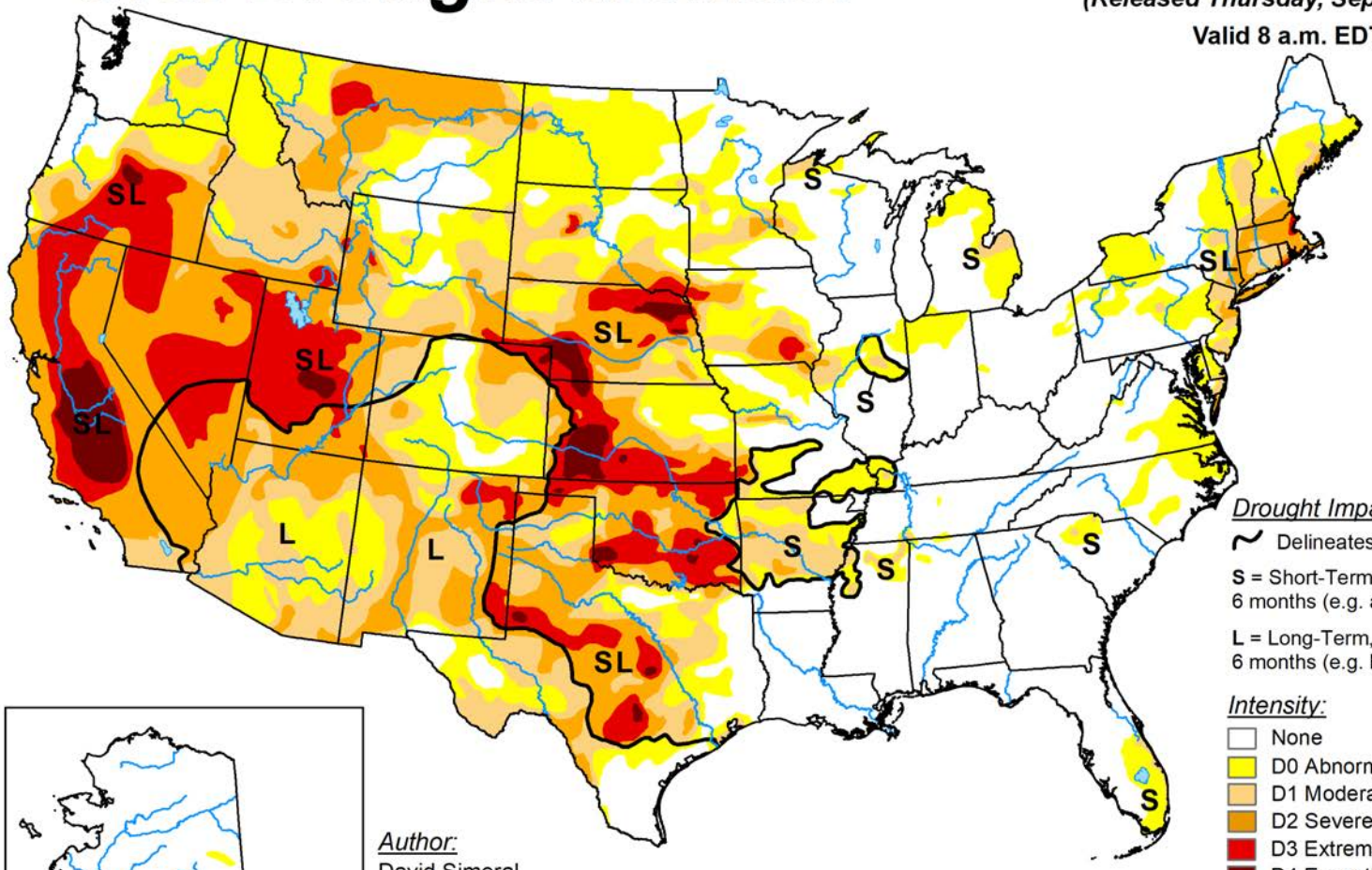

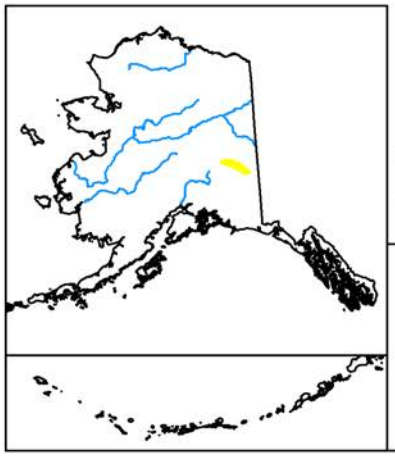

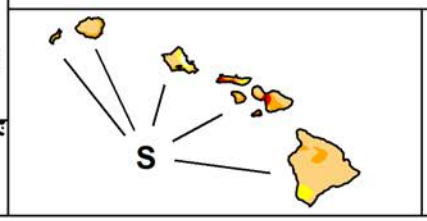

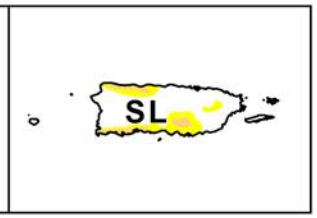

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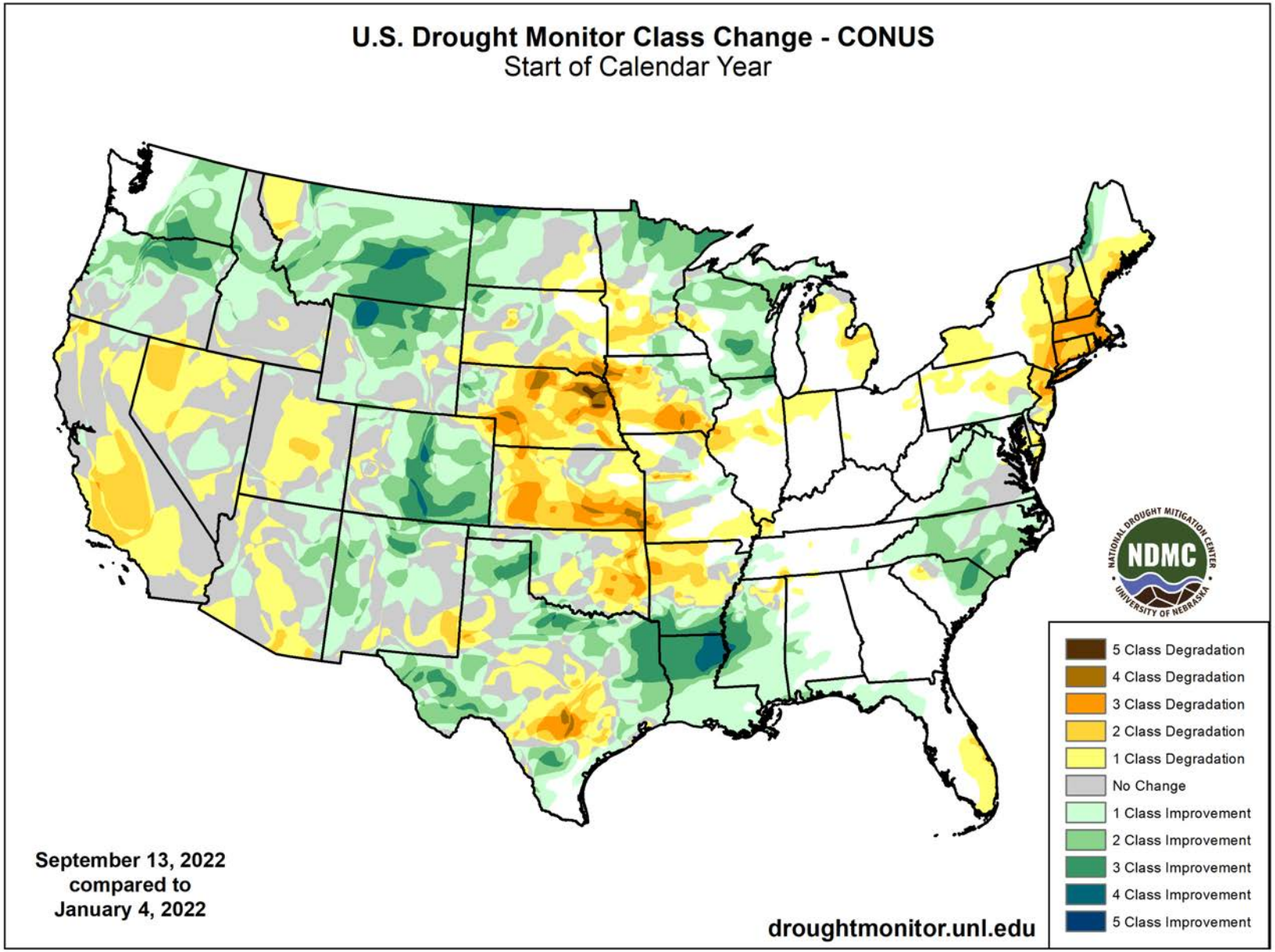
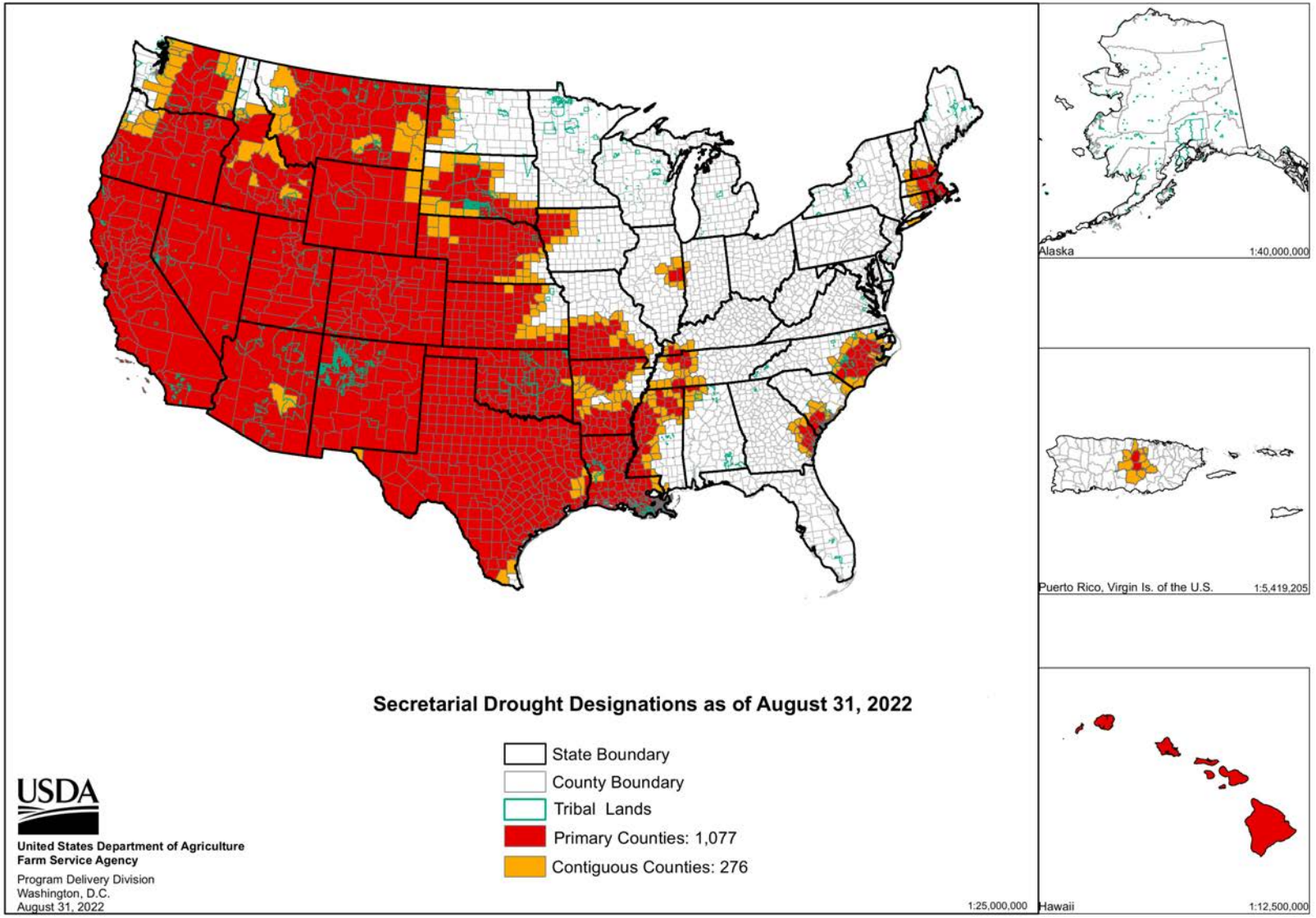
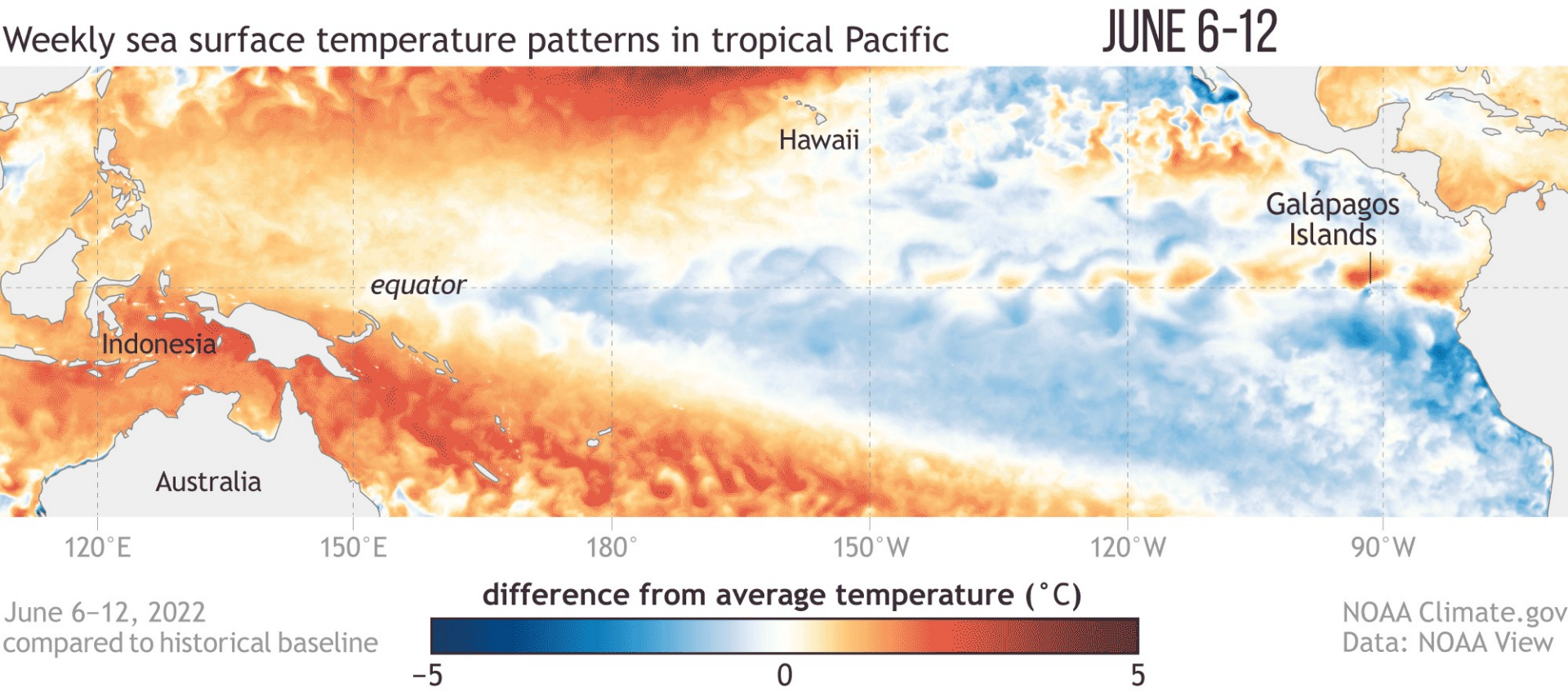
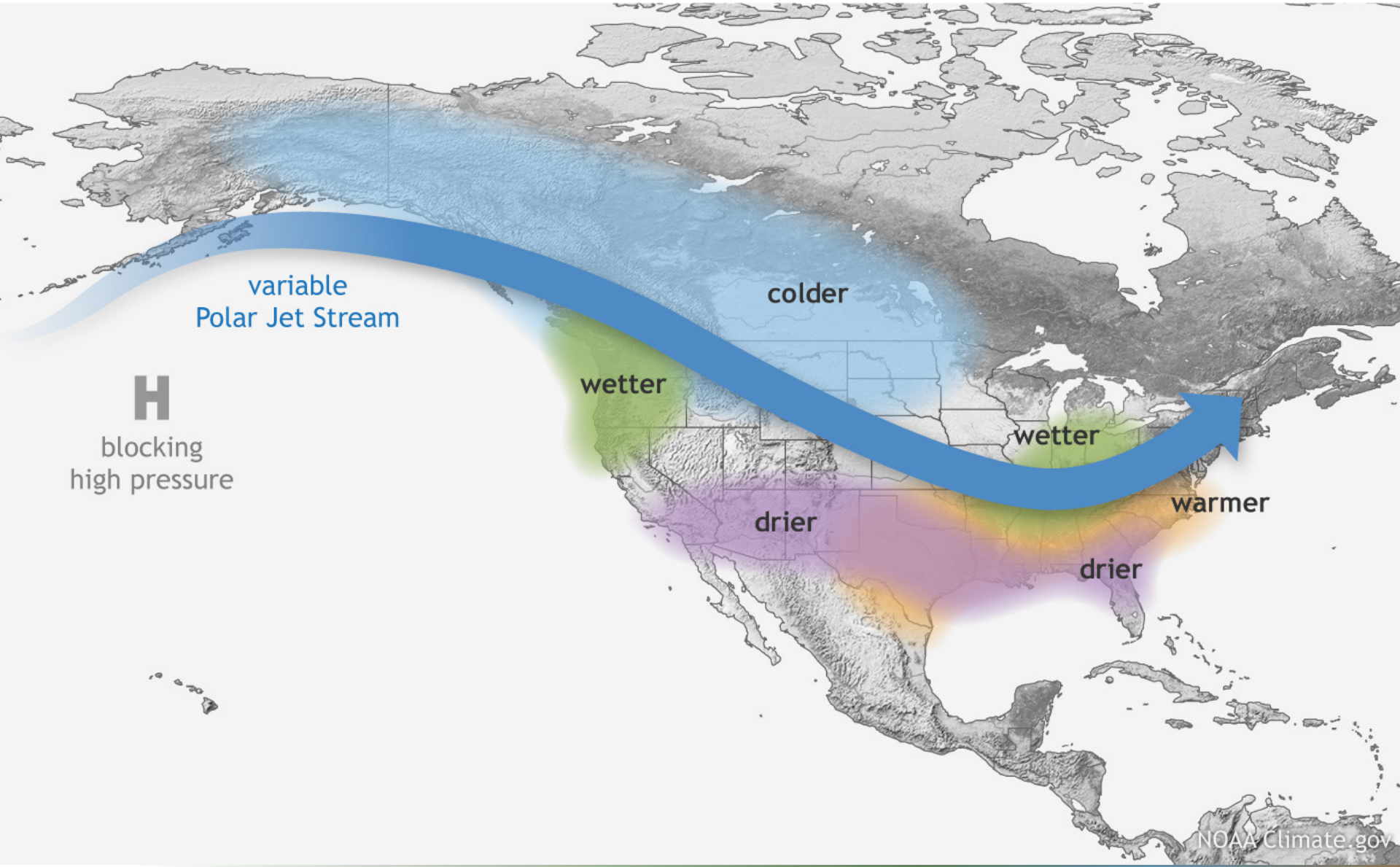

U.S. Drought Monitor Class Change - CONUS
Start of Calendar Year
NDMC
NATIONAL DROUGHT MITIGATION CENTER
UNIVERSITY OF NEBRASKA
5 Class Degradation
4 Class Degradation
3 Class Degradation
2 Class Degradation
1 Class Degradation
No Change
1 Class Improvement
2 Class Improvement
3 Class Improvement
4 Class Improvement
5 Class Improvement
September 13, 2022
compared to
January 4, 2022
droughtmonitor.unl.edu

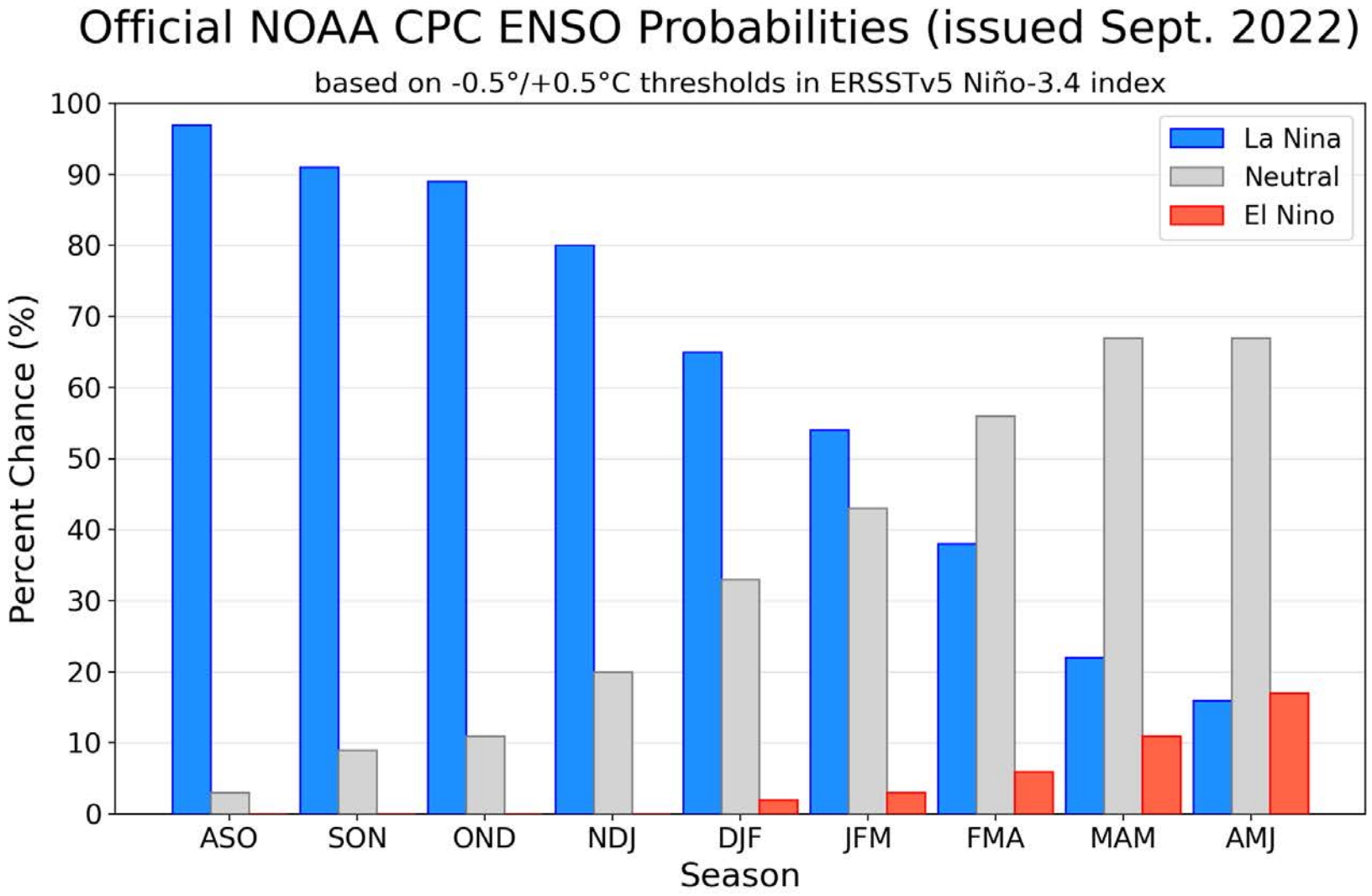
2022 Secretarial Drought Designations - All Drought

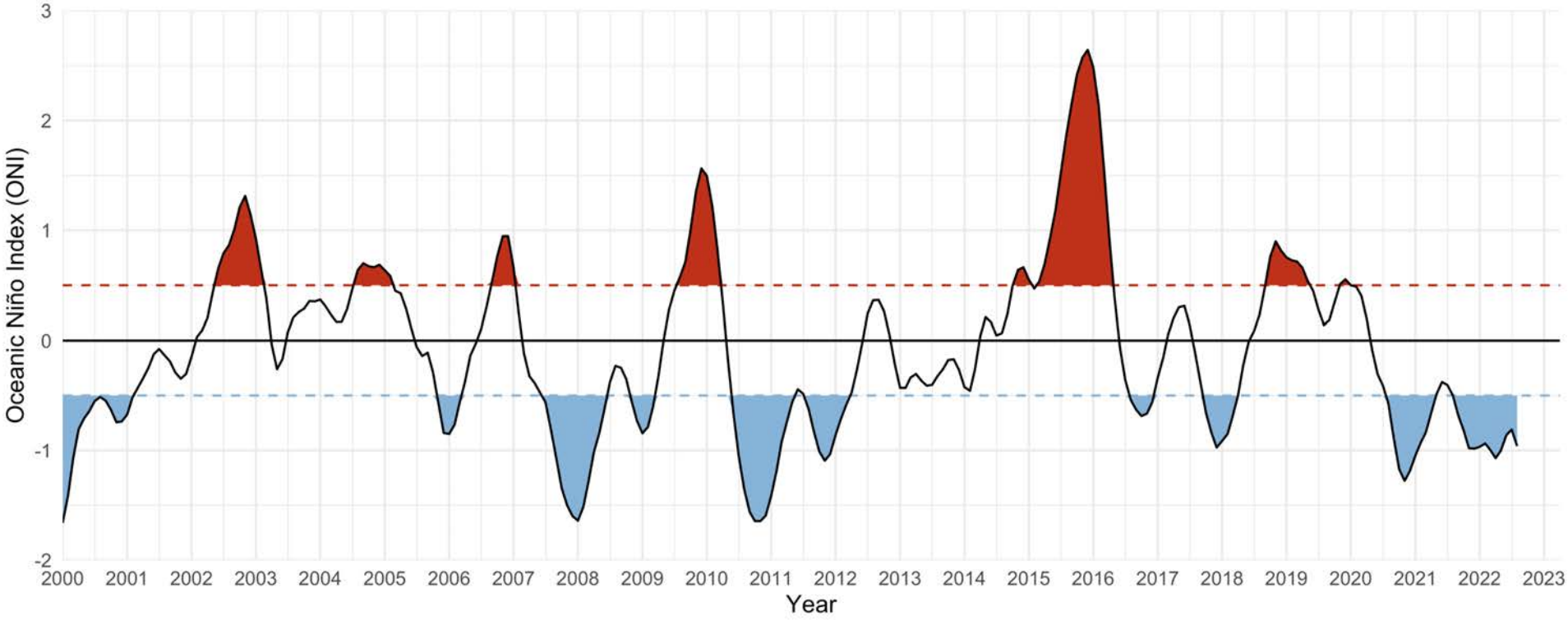


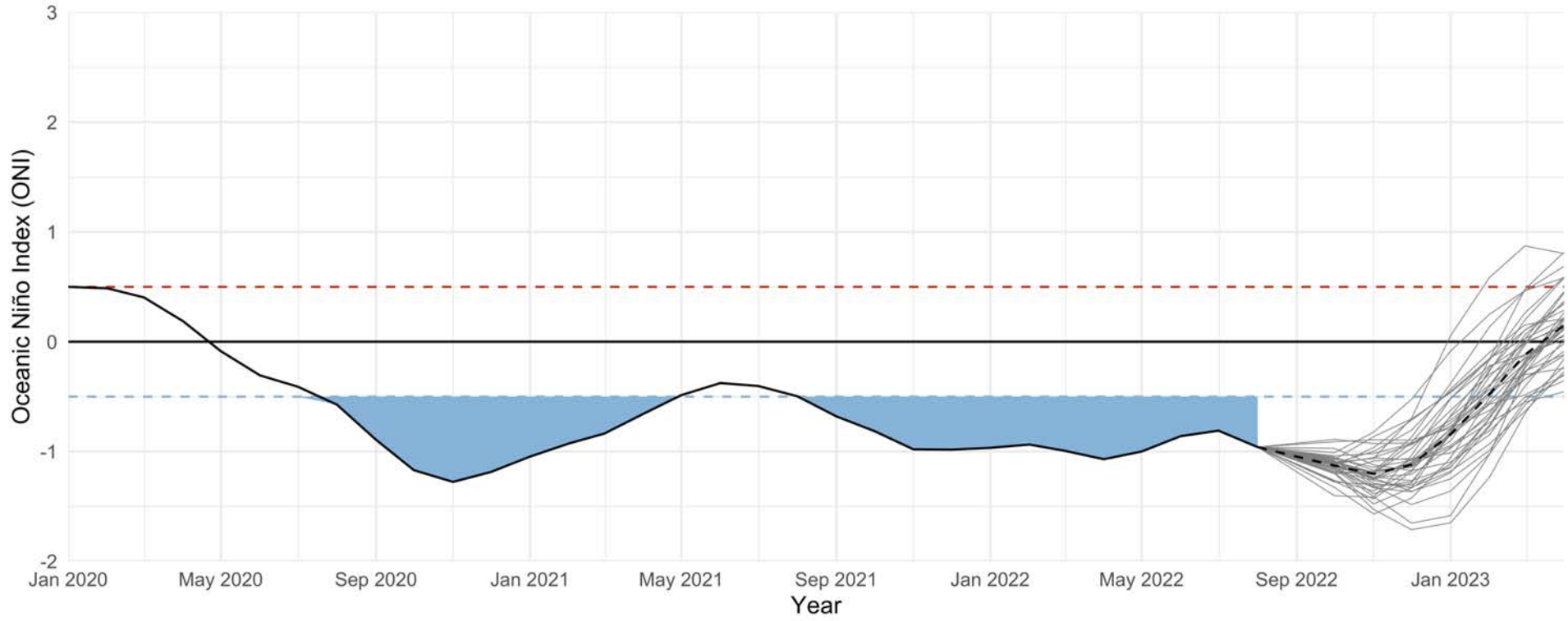

Weekly sea surface temperature patterns in tropical Pacific
JUNE 6-12
Hawaii
Galápagos Islands
equator
Indonesia
Australia
120°E
150°E
180°
150°W
120°W
90°W
June 6–12, 2022
compared to historical baseline
difference from average temperature (°C)
−5
0
5
NOAA Climate.gov
Data: NOAA View

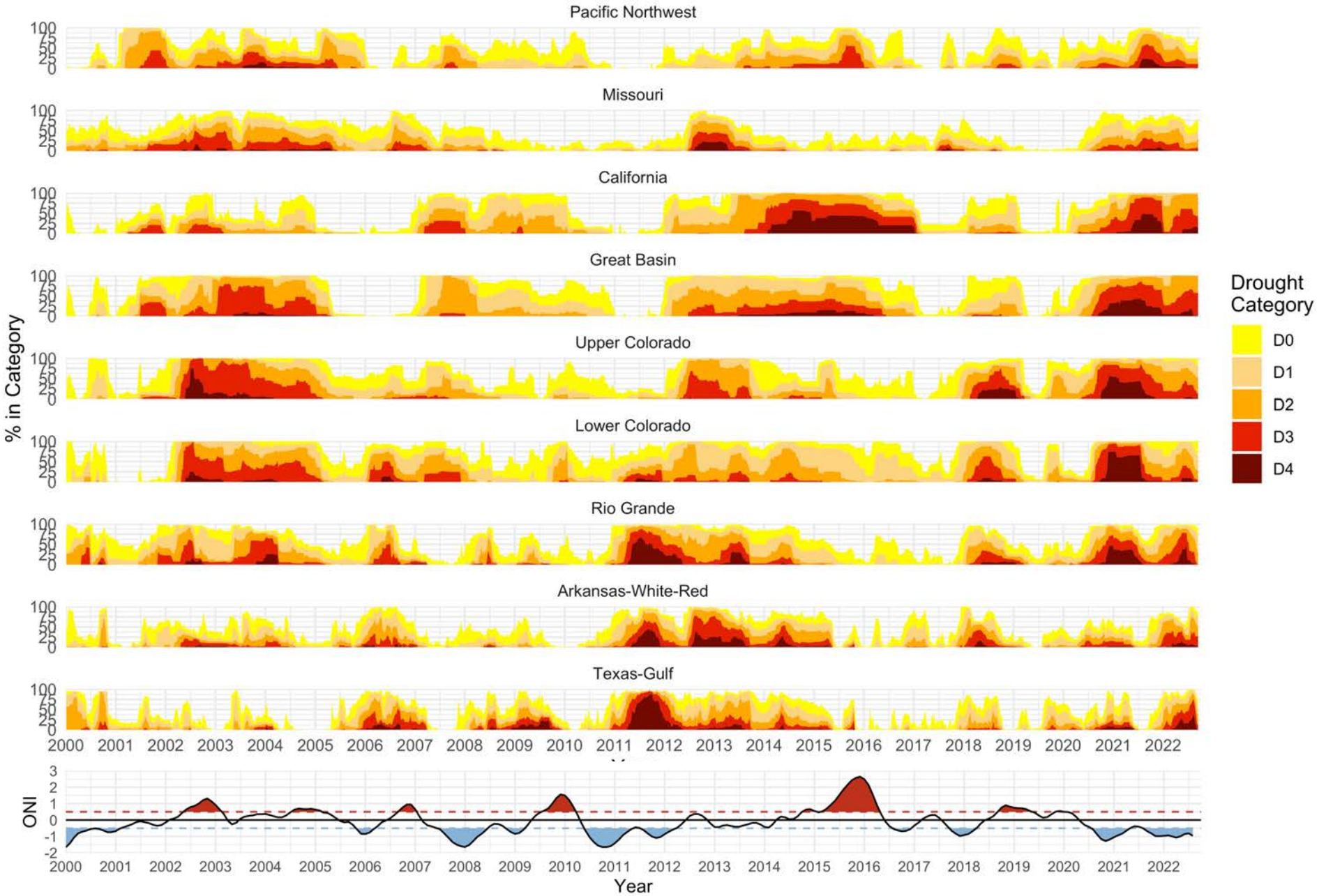
Typical winter La Niña pattern

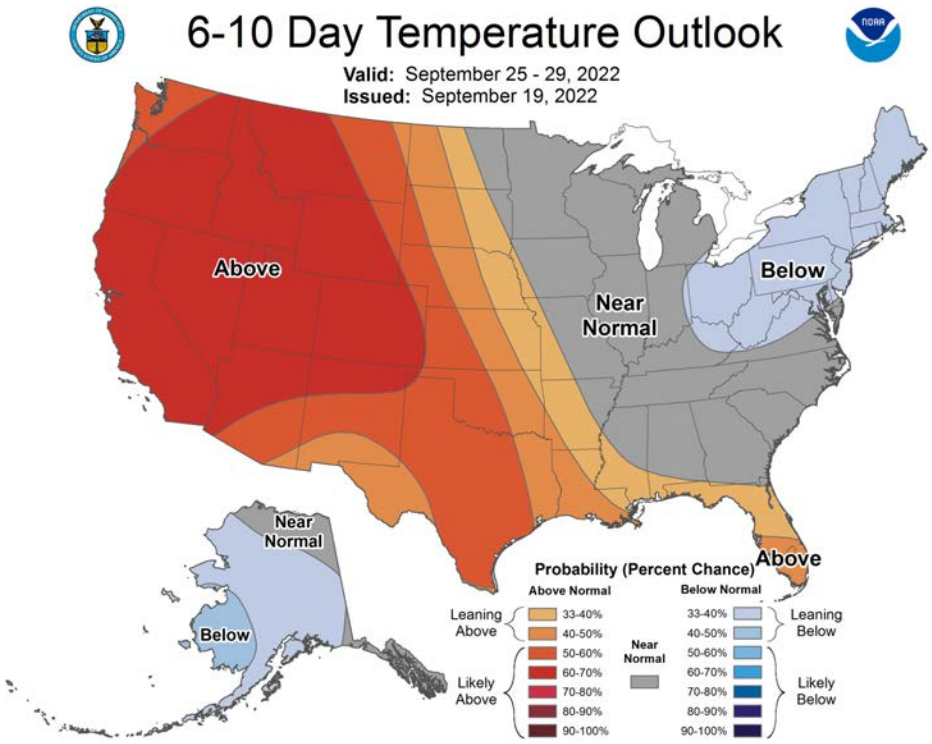


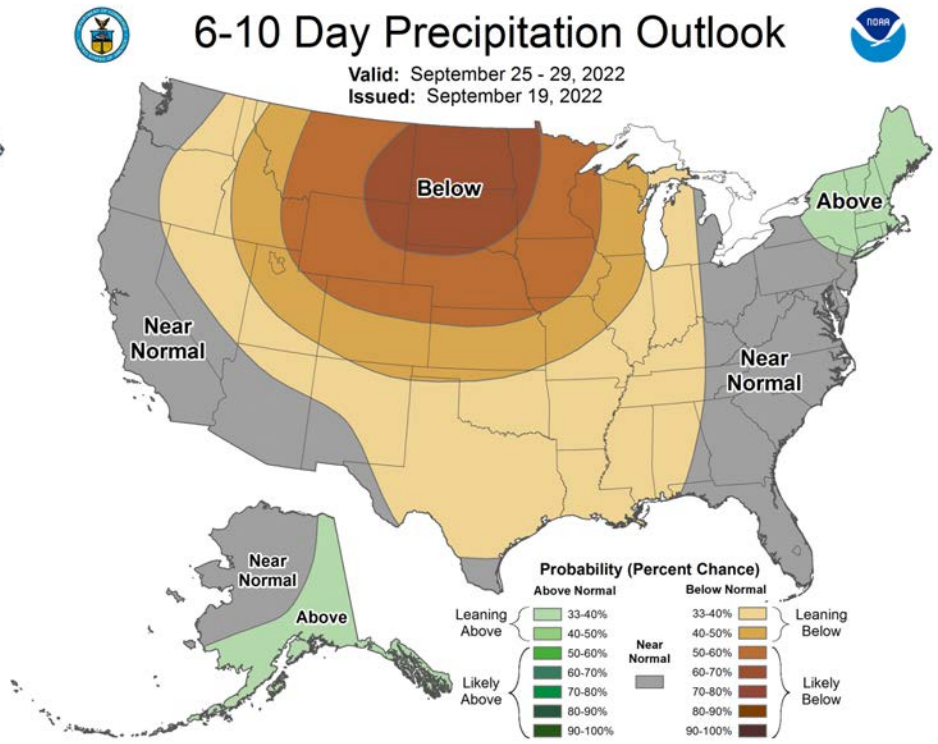

Official NOAA CPC ENSO Probabilities (issued Sept. 2022)
based on -0.5°/+0.5°C thresholds in ERSSTv5 Niño-3.4 index
La Nina
Neutral
El Nino
Percent Chance (%)
0
10
20
30
40
50
60
70
80
90
100
ASO
SON
OND
NDJ
DJF
JFM
FMA
MAM
AMJ
Season

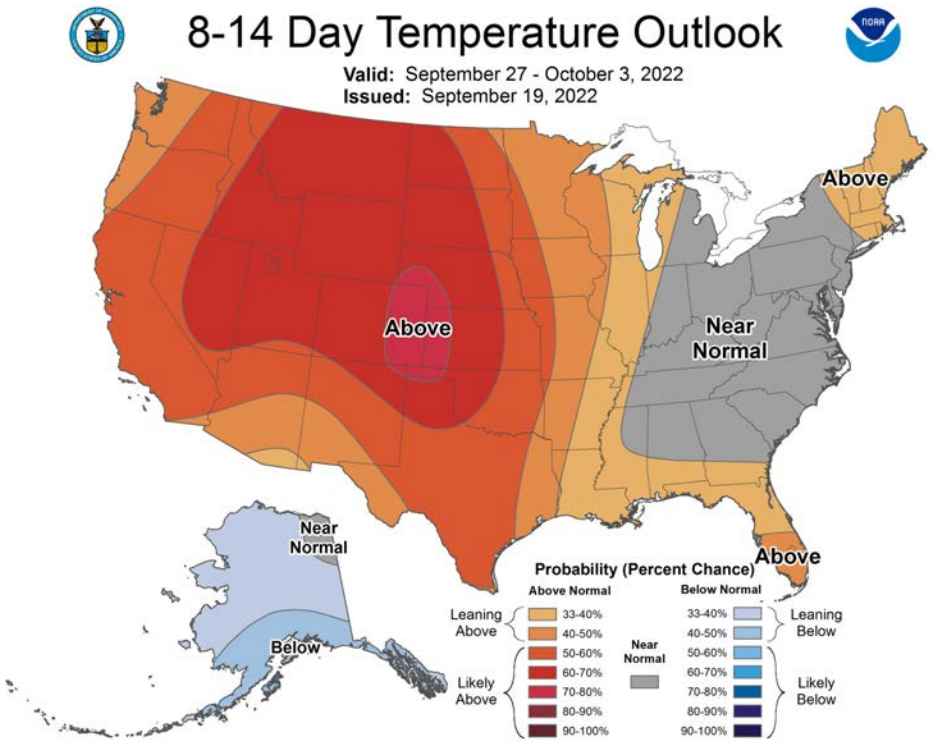

Oceanic Niño Index (ONI)
3
2
1
0
-1
-2
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year

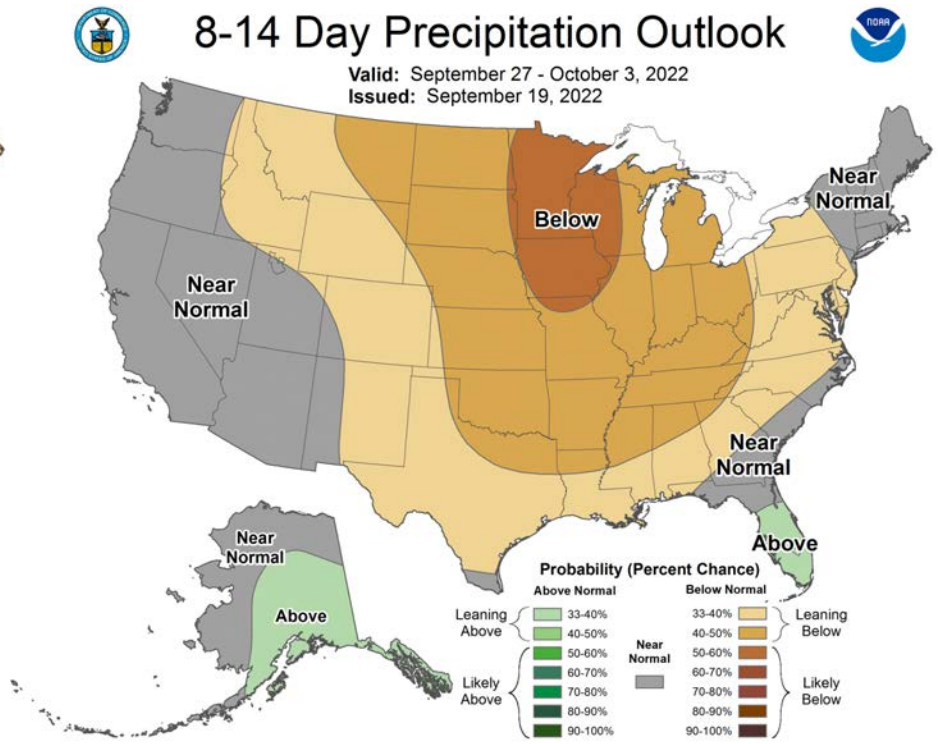

Oceanic Niño Index (ONI)
3
2
1
0
-1
-2
Jan 2020
May 2020
Sep 2020
Jan 2021
May 2021
Sep 2021
Jan 2022
May 2022
Sep 2022
Jan 2023
Year


Pacific Northwest
Missouri
California
Great Basin
Upper Colorado
Lower Colorado
Rio Grande
Arkansas-White-Red
Texas-Gulf
% in Category
Drought Category
D0
D1
D2
D3
D4
ONI
Year


6-10 Day Temperature Outlook
Valid: September 25 - 29, 2022
Issued: September 19, 2022
Above
Near Normal
Below
Near Normal
Below
Above
Probability (Percent Chance)
Above Normal
Below Normal
Leaning Above
Likely Above
Near Normal
Leaning Below
Likely Below
33-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%


6-10 Day Precipitation Outlook
Valid: September 25 - 29, 2022
Issued: September 19, 2022
Below
Above
Near Normal
Near Normal
Near Normal
Above
Probability (Percent Chance)
Above Normal
Below Normal
Leaning Above
Likely Above
Near Normal
Leaning Below
Likely Below
33-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%


8-14 Day Temperature Outlook
Valid: September 27 - October 3, 2022
Issued: September 19, 2022
Above
Near Normal
Above
Above
Near Normal
Below
Probability (Percent Chance)
Above Normal
Below Normal
Leaning Above
Likely Above
Near Normal
Leaning Below
Likely Below
33-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%


8-14 Day Precipitation Outlook
Valid: September 27 - October 3, 2022
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Near Normal
Below
Near Normal
Near Normal
Above
Near Normal
Above
Probability (Percent Chance)
Above Normal
Below Normal
Leaning Above
Likely Above
Near Normal
Leaning Below
Likely Below
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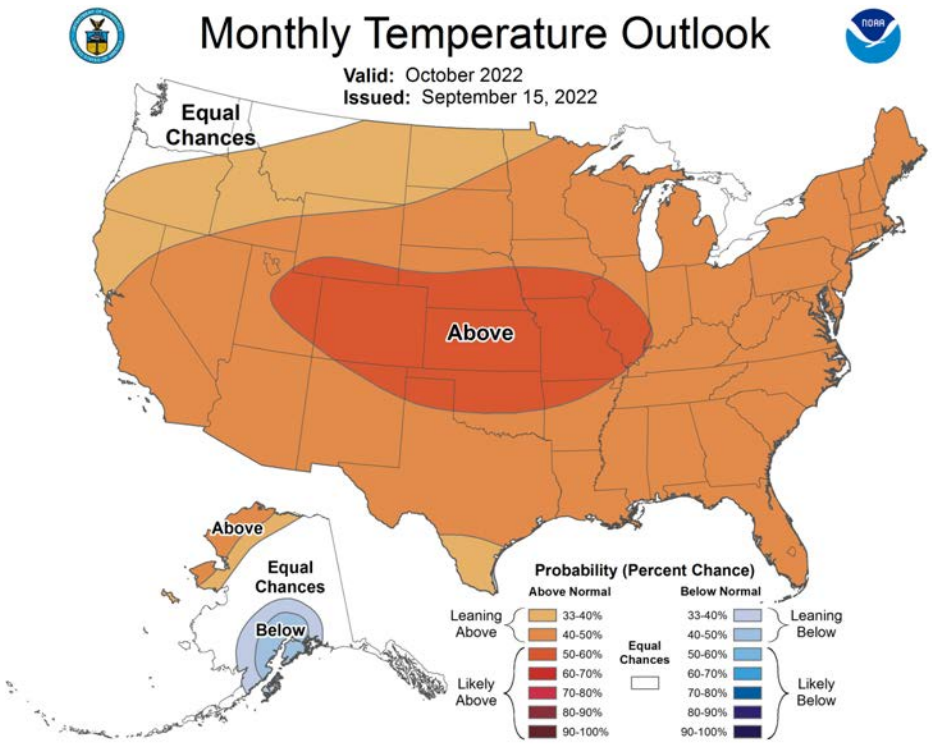
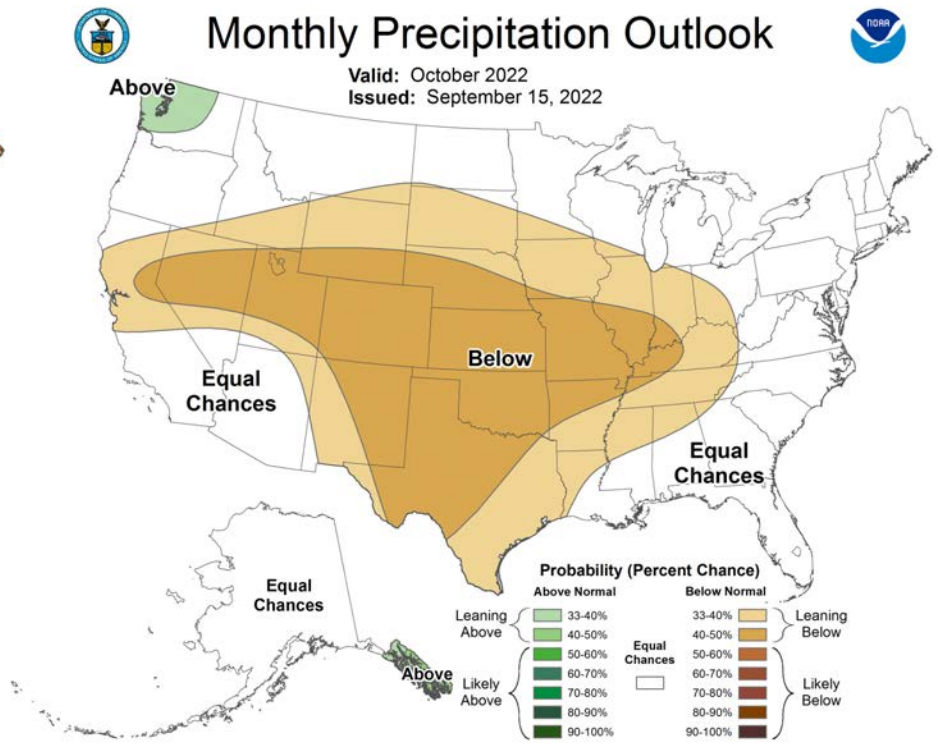
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%


Monthly Temperature Outlook
Valid: October 2022
Issued: September 15, 2022
Equal Chances
Above
Above
Equal Chances
Below
Probability (Percent Chance)
Above Normal
Below Normal
Leaning Above
Likely Above
Equal Chances
Leaning Below
Likely Below
33-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%


Monthly Precipitation Outlook
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Above
Below
Equal Chances
Equal Chances
Equal Chances
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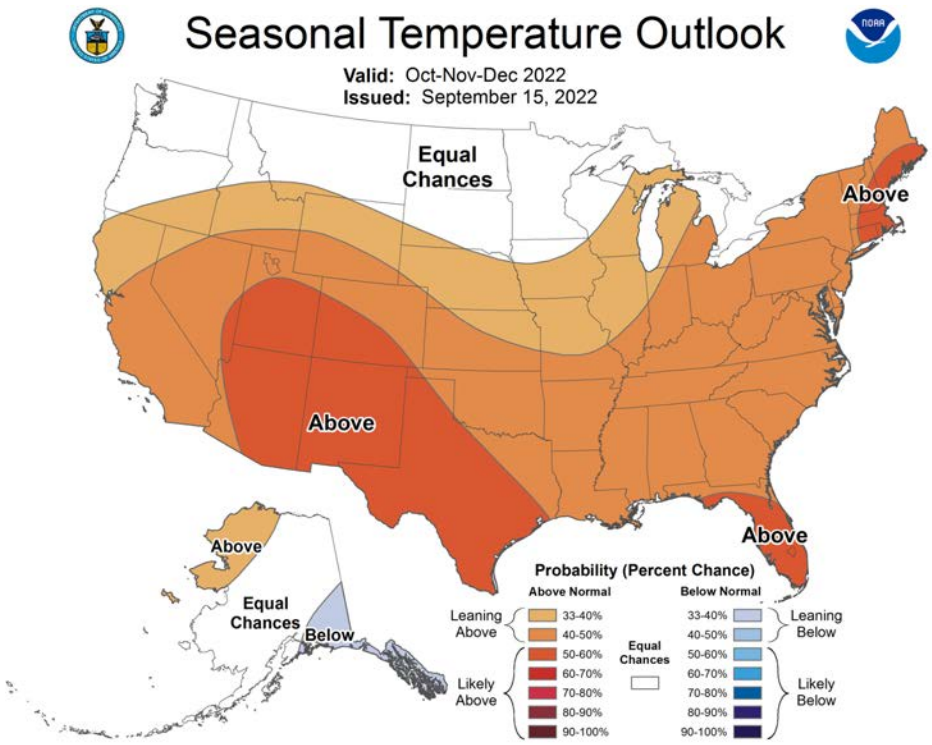
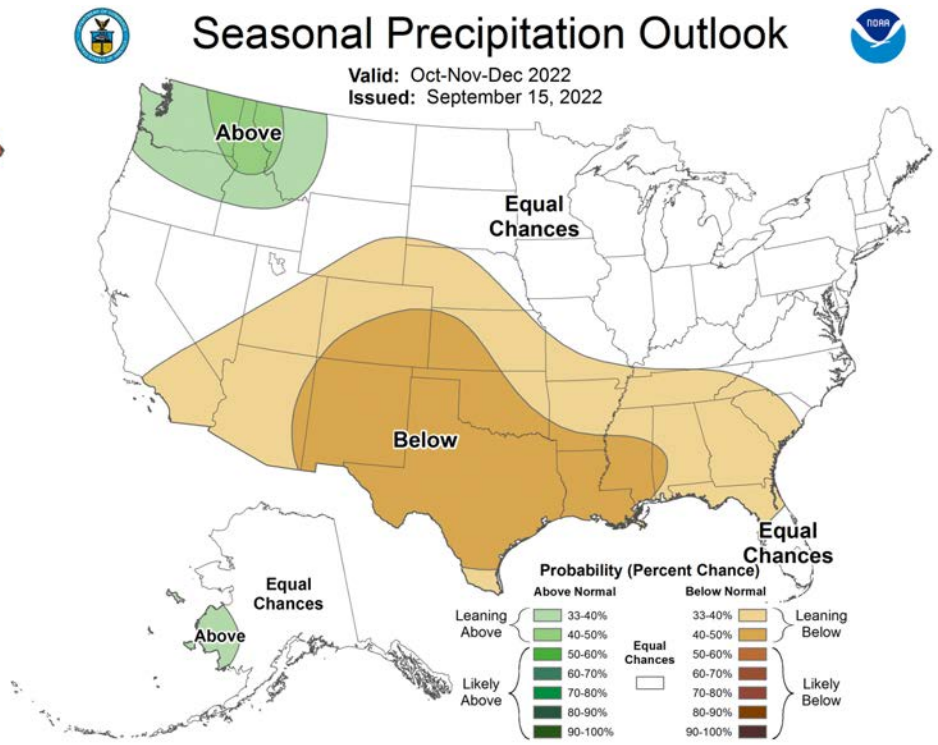

Seasonal Temperature Outlook
Valid: Oct-Nov-Dec 2022
Issued: September 15, 2022
Equal Chances
Above
Above
Above
Equal Chances
Below
Probability (Percent Chance)
Above Normal
Below Normal
Leaning Above
Likely Above
Equal Chances
Leaning Below
Likely Below
33-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%


Seasonal Precipitation Outlook
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Equal Chances
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Equal Chances
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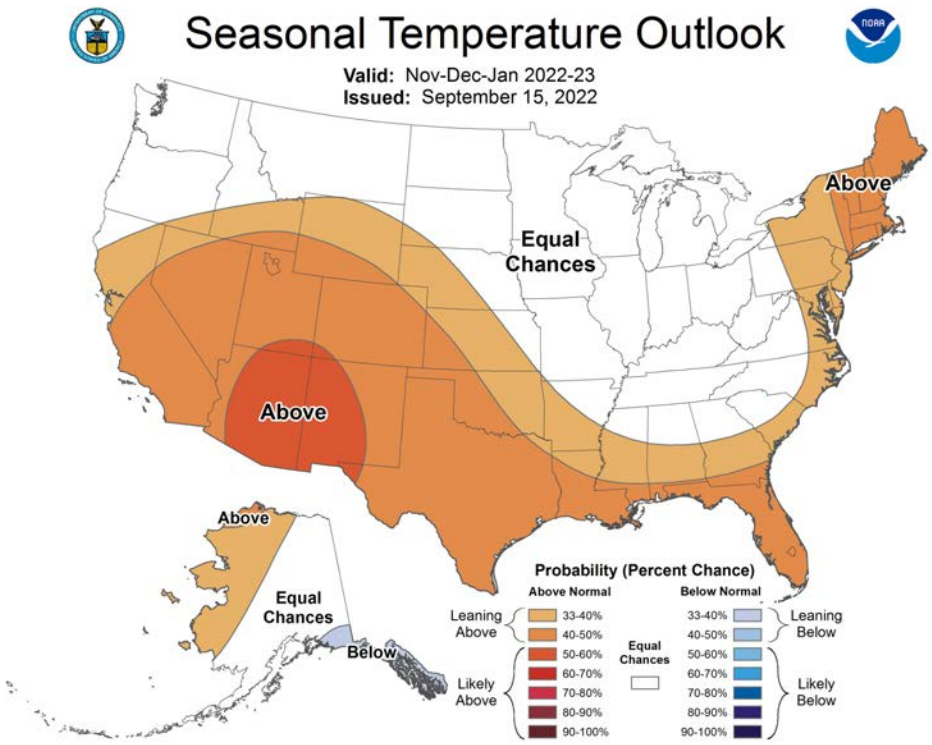
Seasonal Temperature Outlook
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Above
Equal Chances
Above
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Equal Chances
Below
Probability (Percent Chance)
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Likely Above
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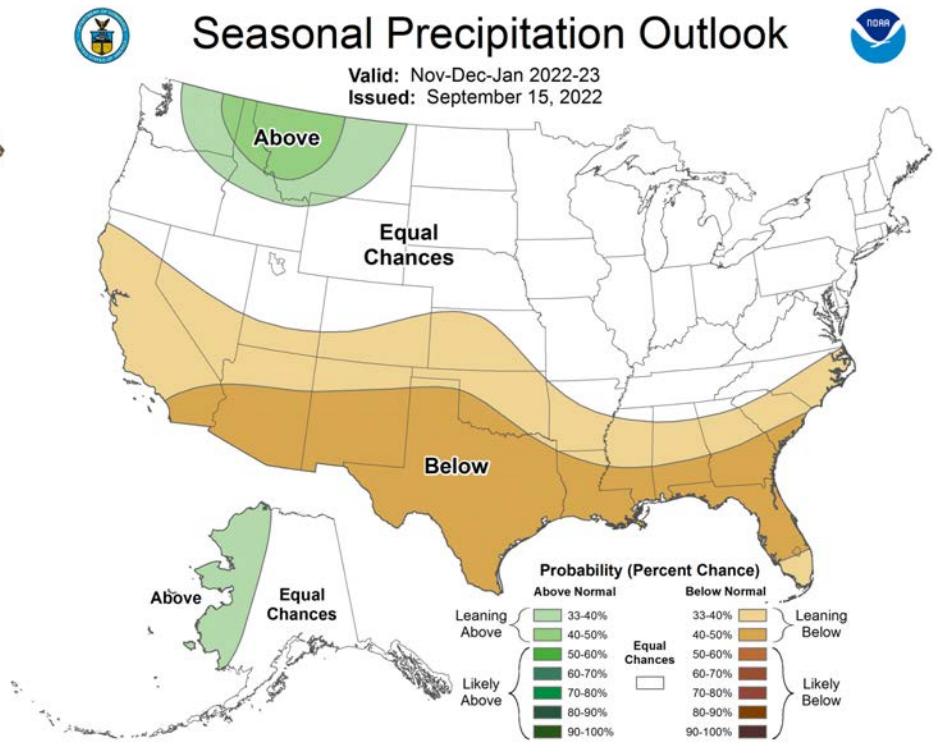
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Likely Below
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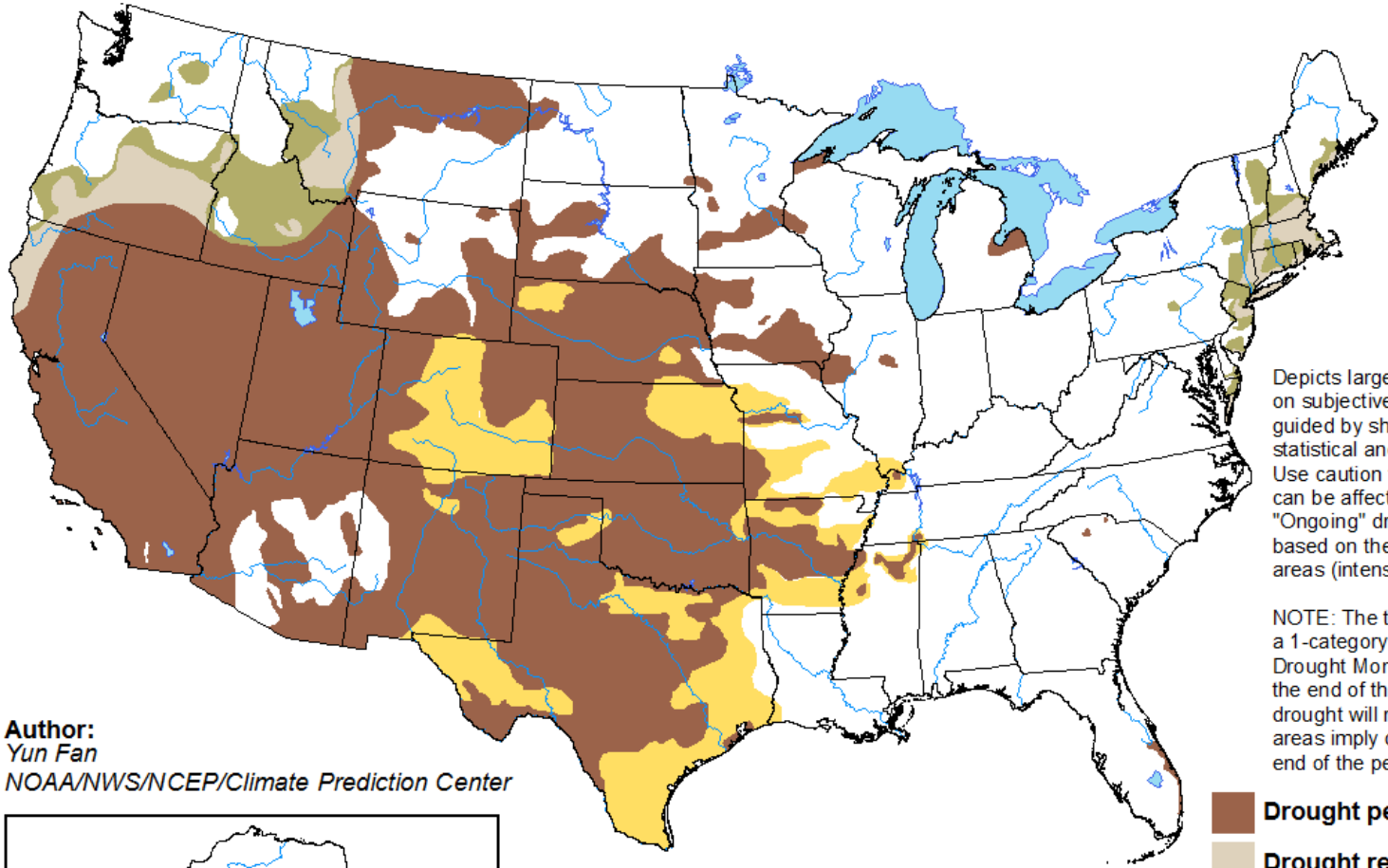
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for September 15 - December 31, 2022
Released September 15



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

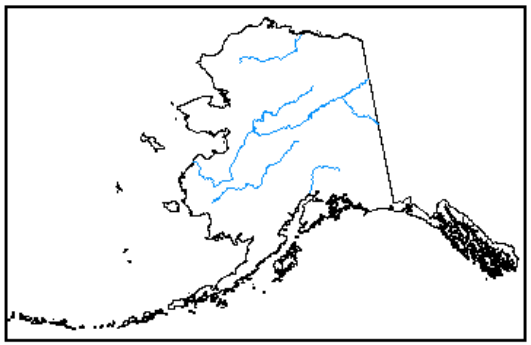
Drought persists

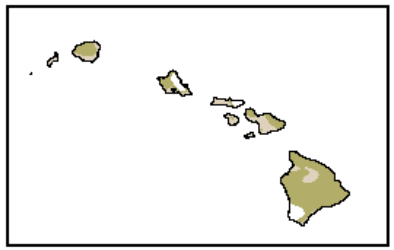
Drought remains but improves

Drought removal likely

Drought development likely

Author:
Yun Fan
NOAA/NWS/NCEP/Climate Prediction Center



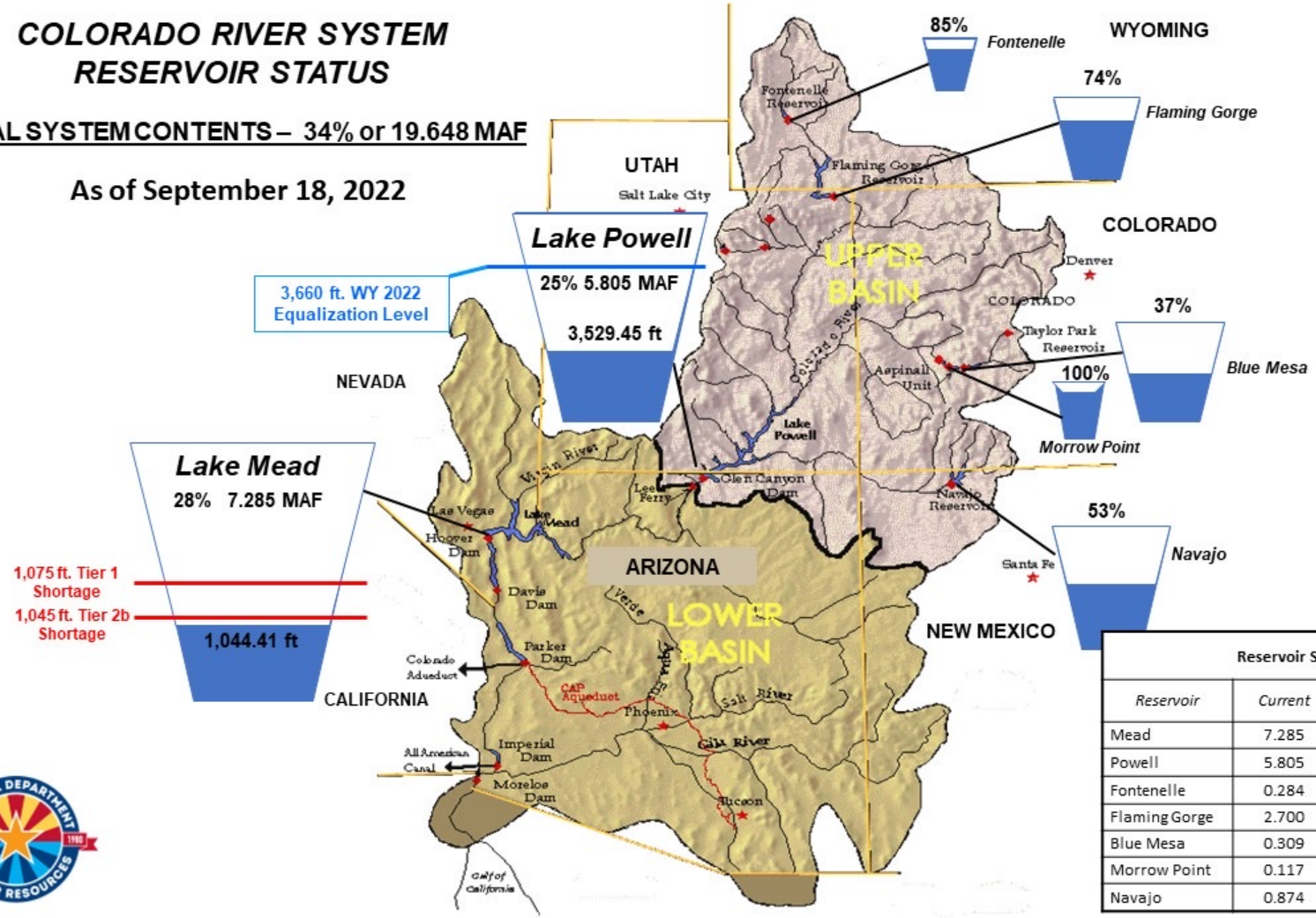


http://go.usa.gov/3eZ73

COLORADO RIVER SYSTEM RESERVOIR STATUS

TOTAL SYSTEM CONTENTS – 34% or 19.648 MAF

As of September 18, 2022



Reservoir Storage (MAF)			
Reservoir	*Current*	*Last Year*	*Maximum*
Mead	7.285	9.011	26.120
Powell	5.805	7.390	24.322
Fontenelle	0.284	0.236	0.334
Flaming Gorge	2.700	2.979	3.671
Blue Mesa	0.309	0.269	0.827
Morrow Point	0.117	0.111	0.117
Navajo	0.874	0.972	1.648

September 2022
Western Drought Summary

- **Drought conditions continue to dominate** the western US, especially in the Great Basin and central Plains.
- Pacific sea surface temperatures continue to be cooler than normal, indicating **La Niña conditions.** La Niña predicted to persist through early winter, with warmer and drier conditions across the southern US.
- **Drought expected to continue or worsen** across southwestern US and southern plains.
- **Historically low reservoir storage** in the Colorado River basin and much of California going into a La Niña winter.


Thank You
Questions?
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