Weather Forecast Office

Portland, OR

Saturday, October 19

National Weather Service Winter Outlook 2024-2025

Presenter:
Noah Alviz - Meteorologist

Key Points

1. What is El Niño-Southern Oscillation (ENSO)?

1. ENSO Status: **La Niña Watch**

1. Historical implications of **La Niña** on our weather

1. NWS Climate Prediction Center Outlook

What is El Niño-Southern Oscillation (ENSO)?

El Niño-Southern Oscillation (ENSO)

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What is ENSO?

A recurring climate pattern that involves periodic fluctuations in tropical sea surface temperature and the overlying atmosphere across the equatorial Pacific Ocean.

Modifies the general flow of the atmosphere

Can affect local weather conditions

El Niño-Southern Oscillation (ENSO)

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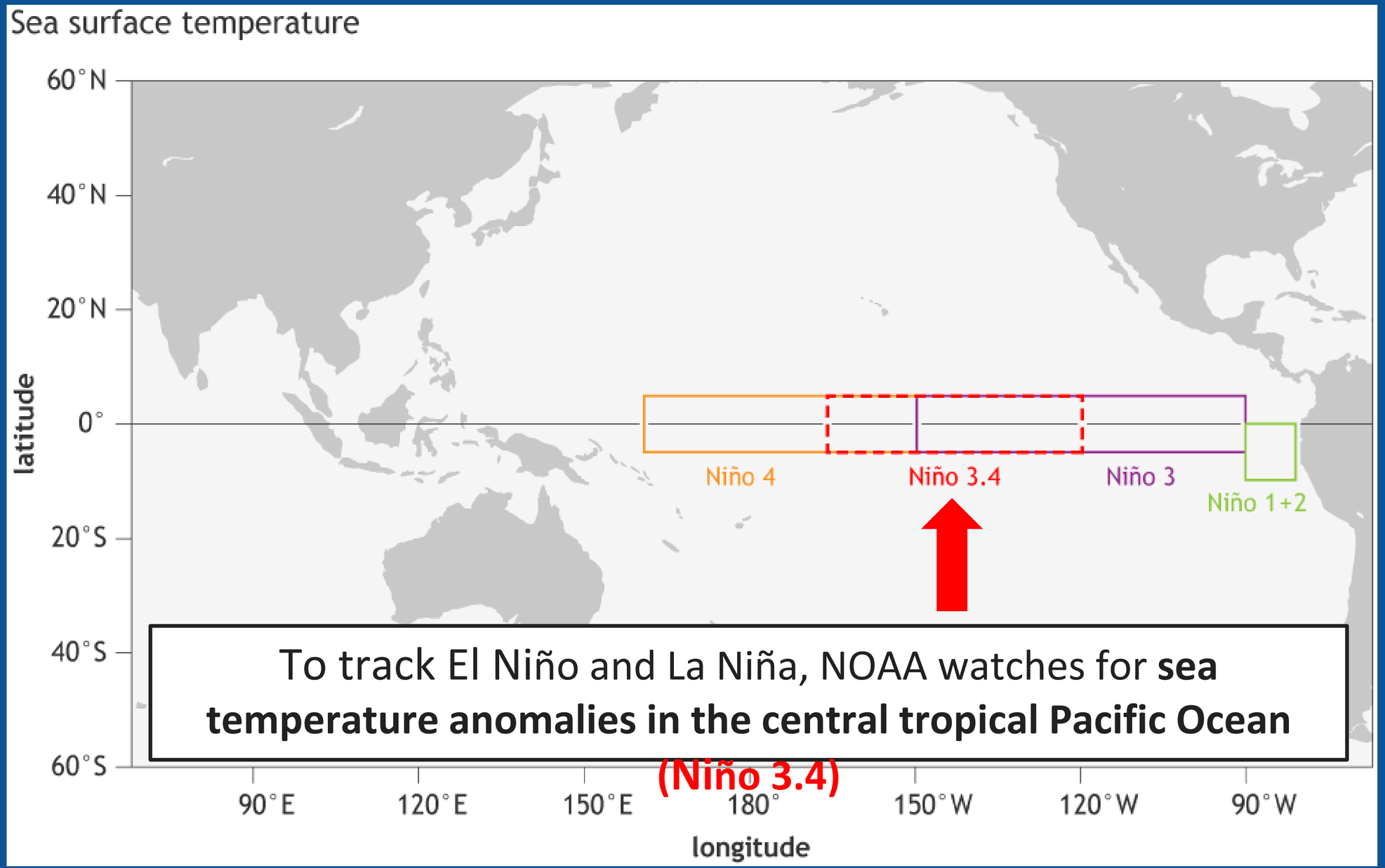


Anomaly is the **difference** between current sea surface temperature and the 30-year average (1991-2020)

Temperature anomalies are taken as a running 3-month seasonal average (Oceanic Niño Index)

El Niño-Southern Oscillation (ENSO)

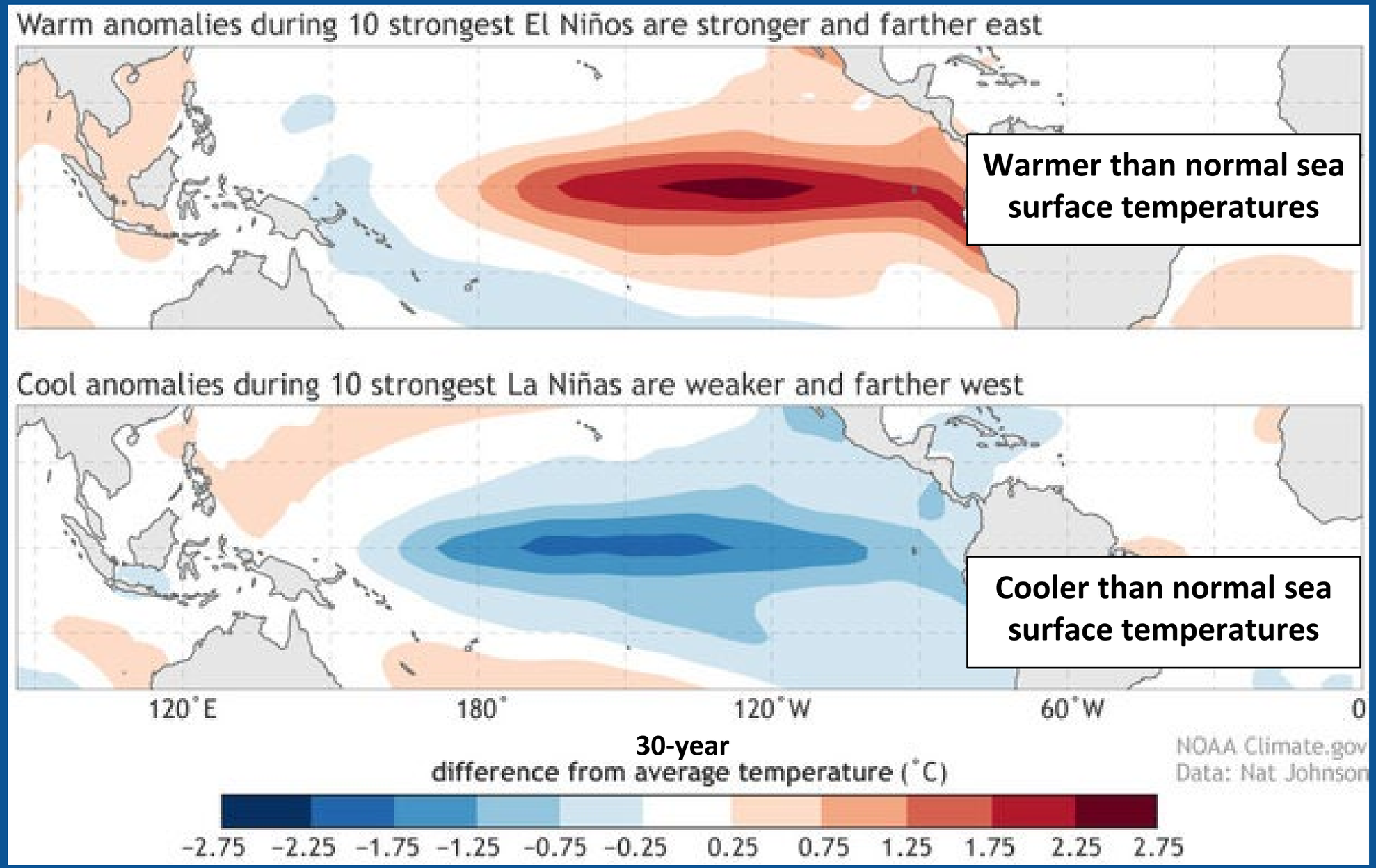
Three ENSO Stages:

When sea surface temperature across the central tropical Pacific Ocean is…

- **Above-normal (+0.5° or higher): El Niño**
- **Below-normal (-0.5° or lower): La Niña**
- **Near-normal: Neutral**

“Normal” is defined as a 30-year average (1991-2020)

El Niño-Southern Oscillation (ENSO)



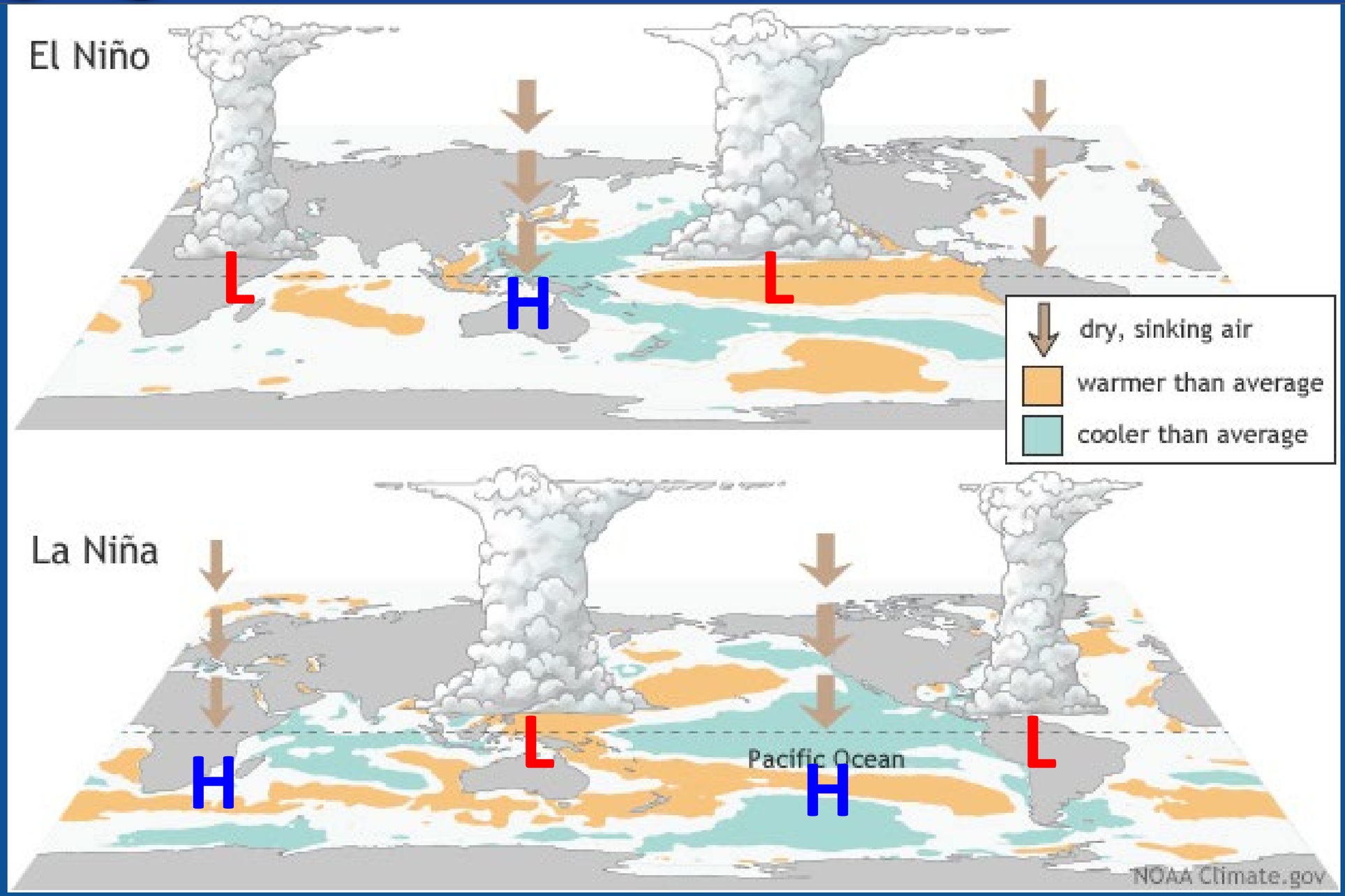
El Niño

Weaker westerly trade winds

La Niña

Stronger westerly trade winds

El Niño-Southern Oscillation (ENSO)



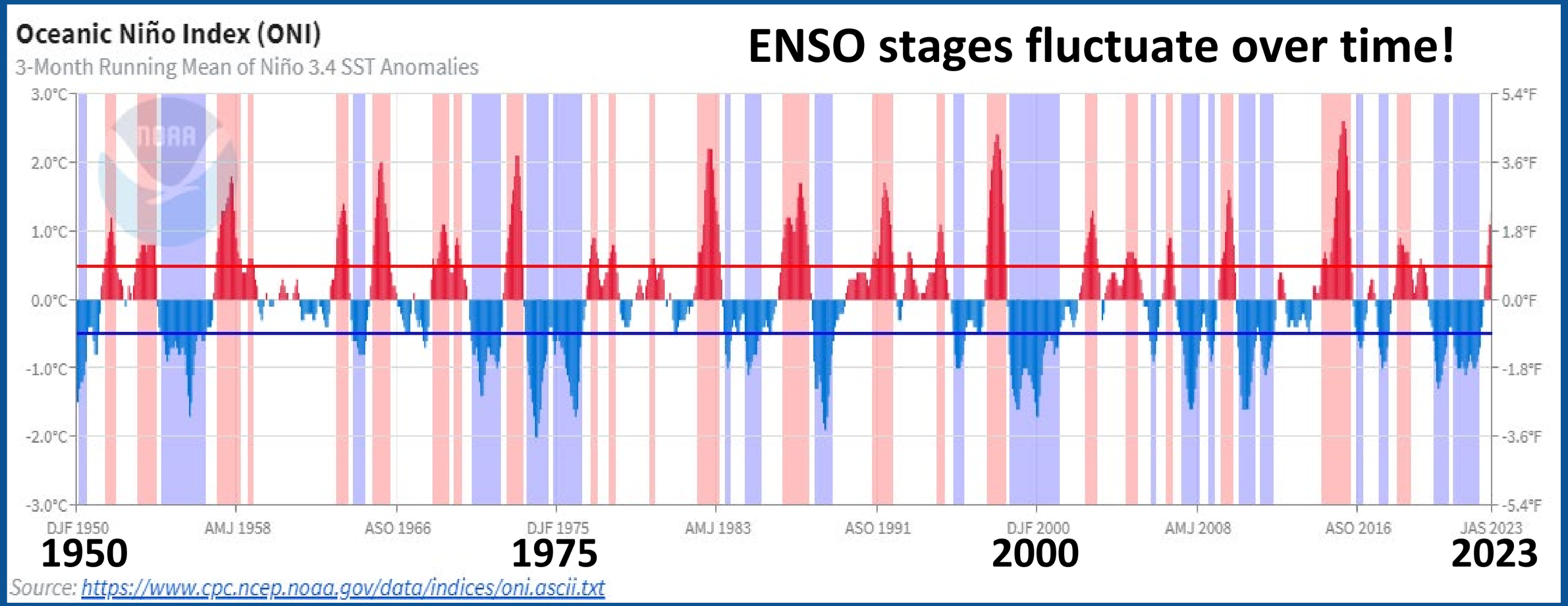
El Niño

Lower pressure over the central equatorial Pacific

La Niña

Higher pressure over the center equatorial Pacific

El Niño-Southern Oscillation (ENSO)



La Niña Categories:

WEAK:	-0.5 to -0.9°C
MODERATE:	-1 to -1.4°C
STRONG:	-1.5 to -1.9°C
VERY STRONG:	≤ -2°C

ENSO Status

ENSO Status: La Niña Watch

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La Niña is favored to emerge Sep-Nov (60% chance), and is expected to persist through Jan-Mar 2025

While the La Niña pattern may be in place, this does **NOT** mean that these conditions are guaranteed to occur.

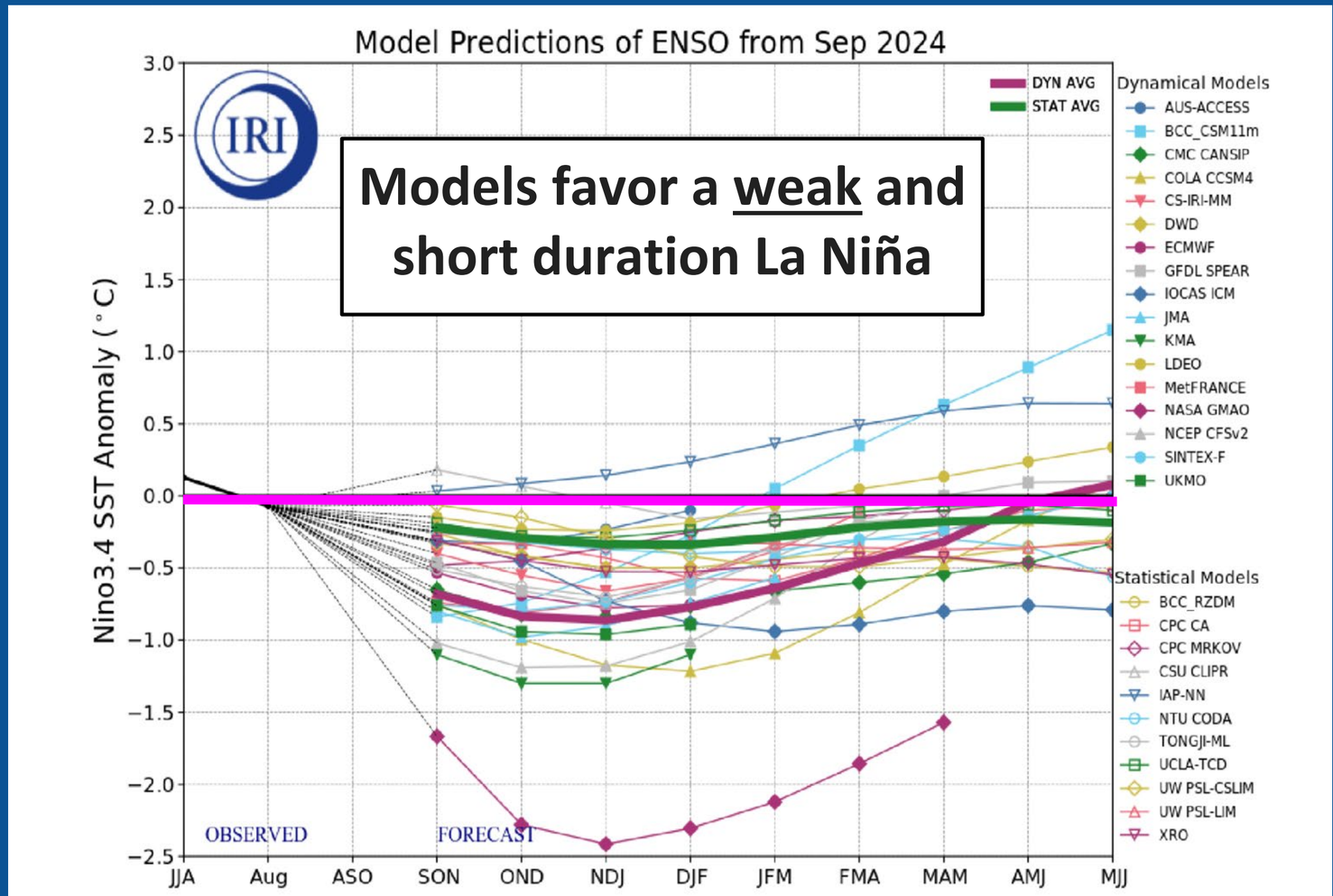

Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 September 2024 by the International Research Institute (IRI) for Climate and Society.

ENSO Status: La Niña Watch

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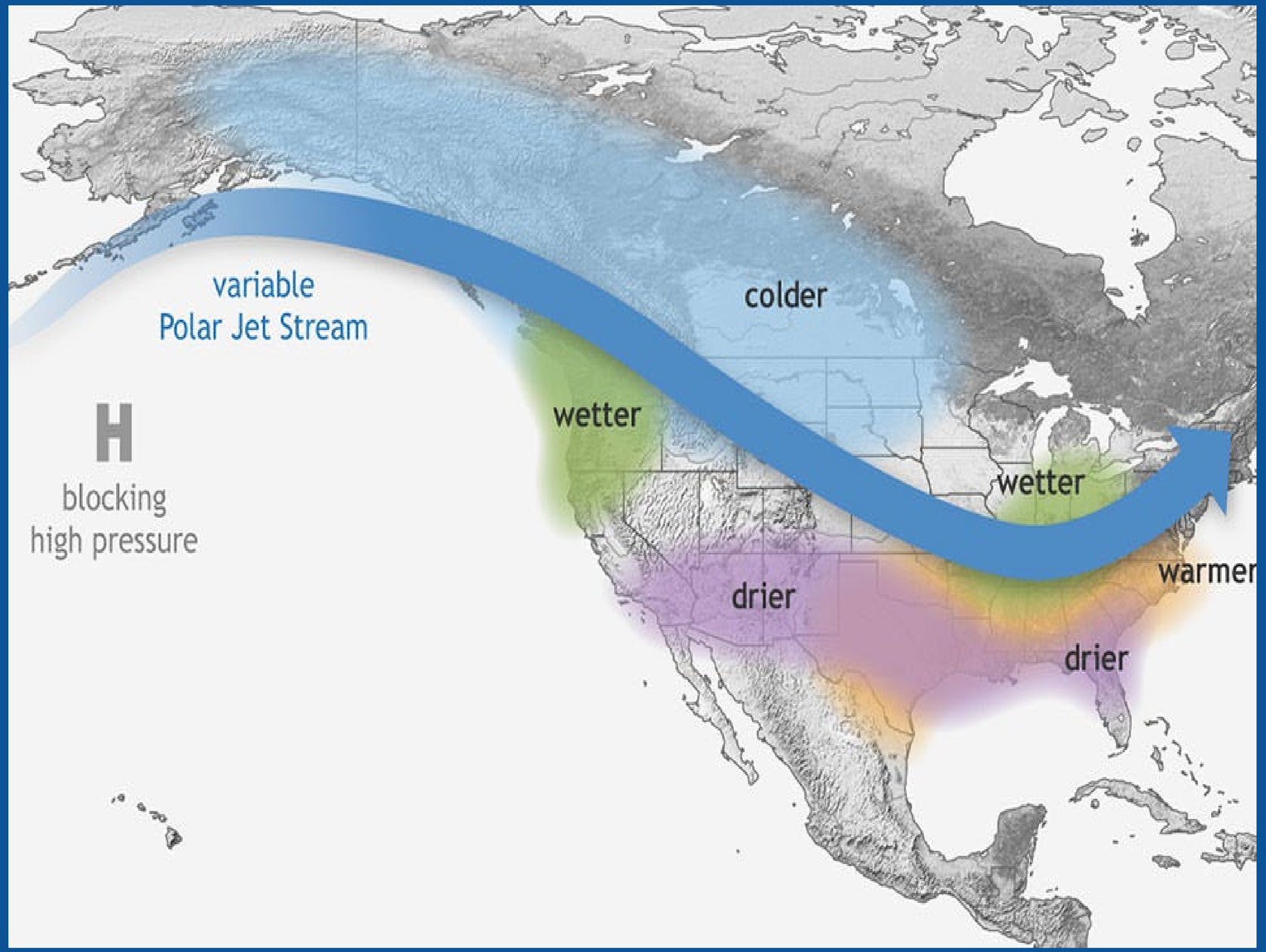


Pacific Jet Stream gets shifted northward

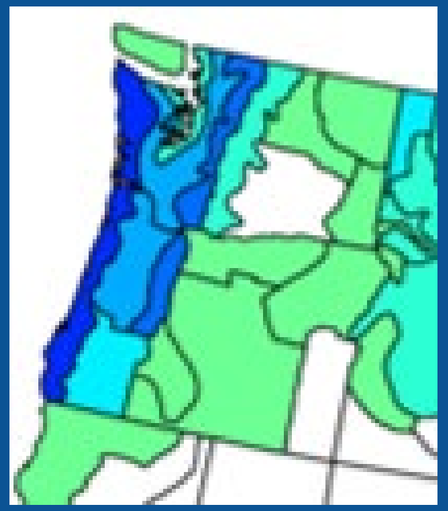
Winter PNW precipitation trend wetter than normal. Temperature trends cooler than normal, mainly late winter.

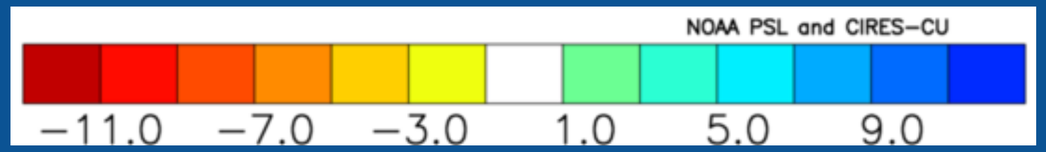
Historical Implications of La Niña on PNW Weather

Historical Implications

Average anomalies (Nov-Feb) among STRONG La Niña years…

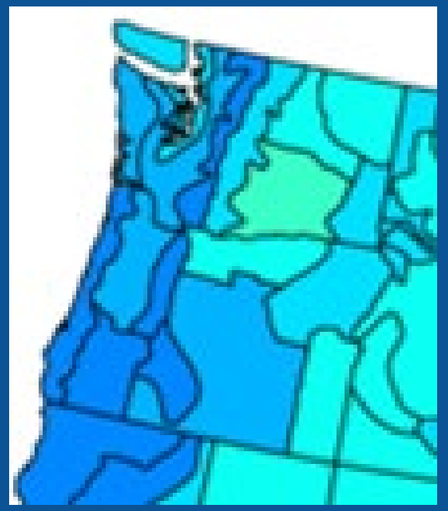
Precipitation:

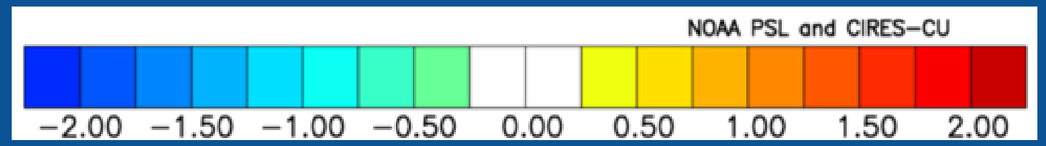




Wetter than normal

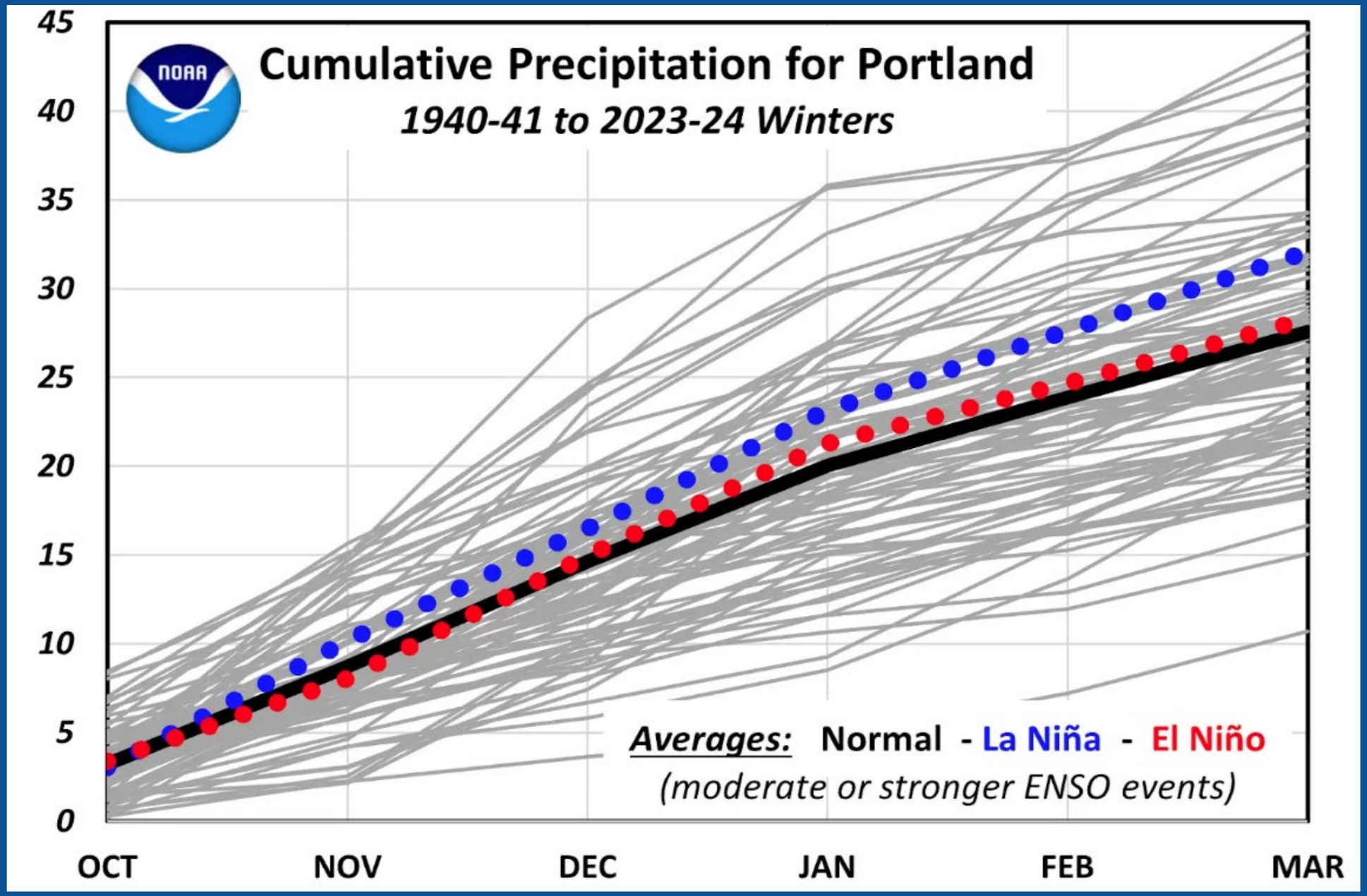
Temperature:



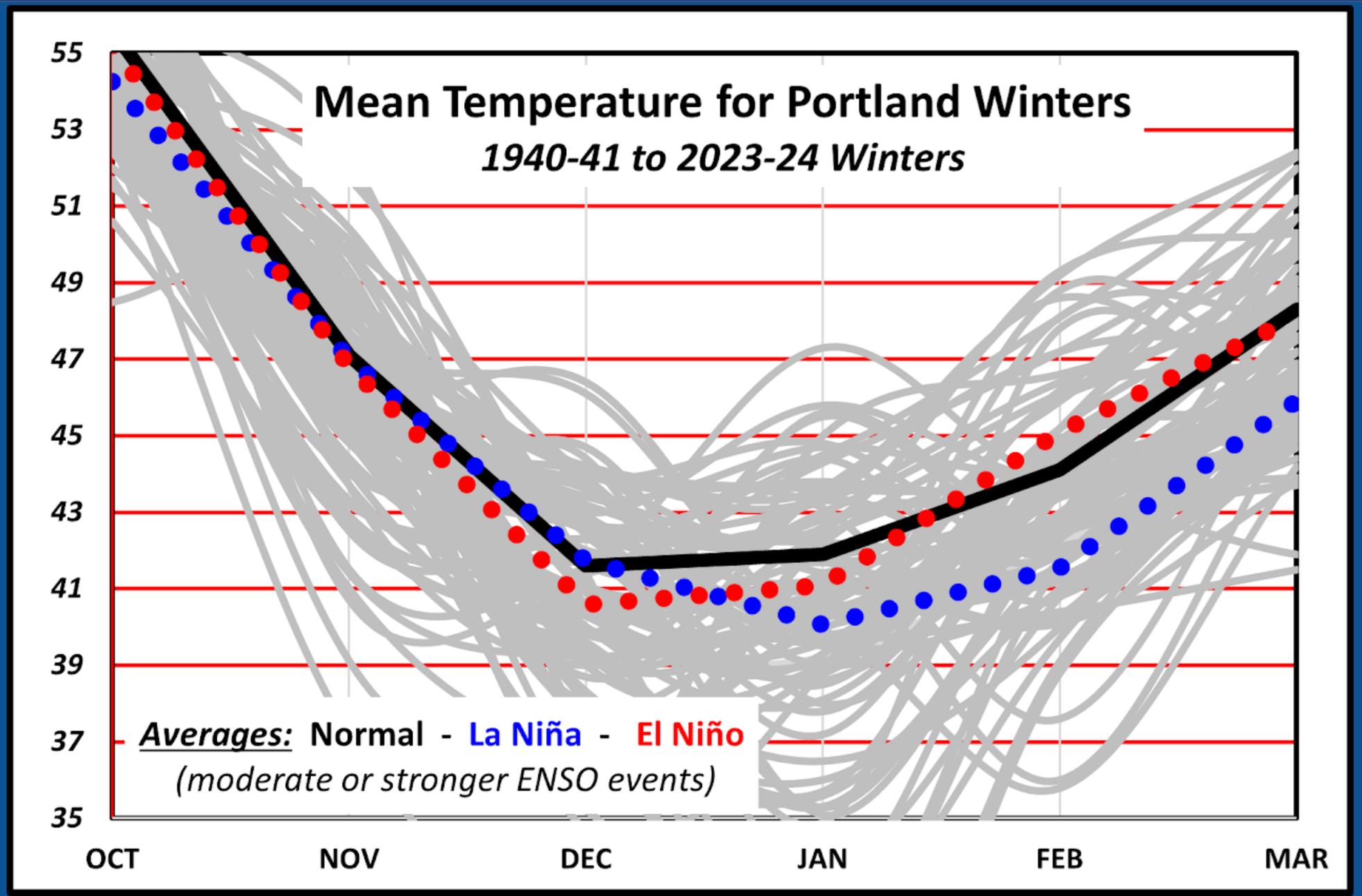


Cooler than normal

Historical Implications



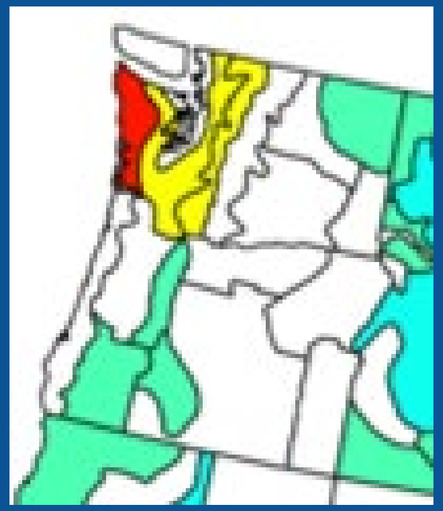
Historical Implications

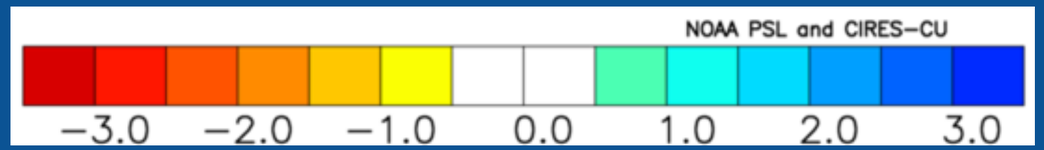


Historical Implications

Average anomalies (Nov-Feb) among WEAK La Niña years…

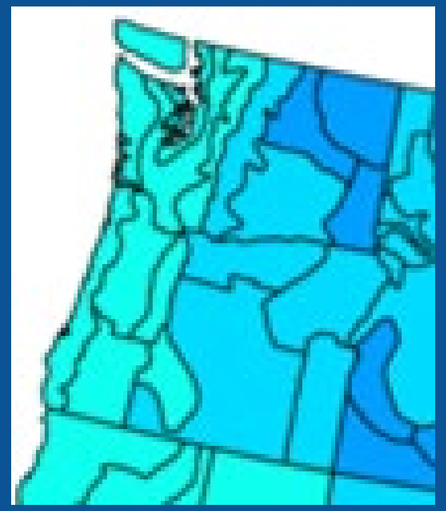
Precipitation:

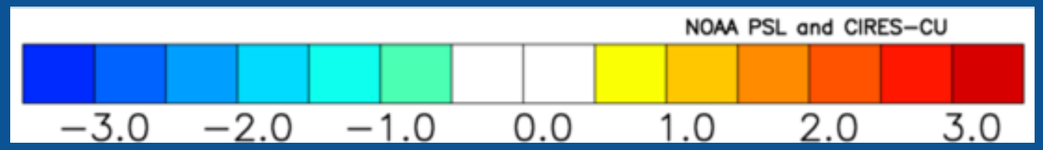




No strong signal

Temperature:





Cooler than normal

Historical Implications

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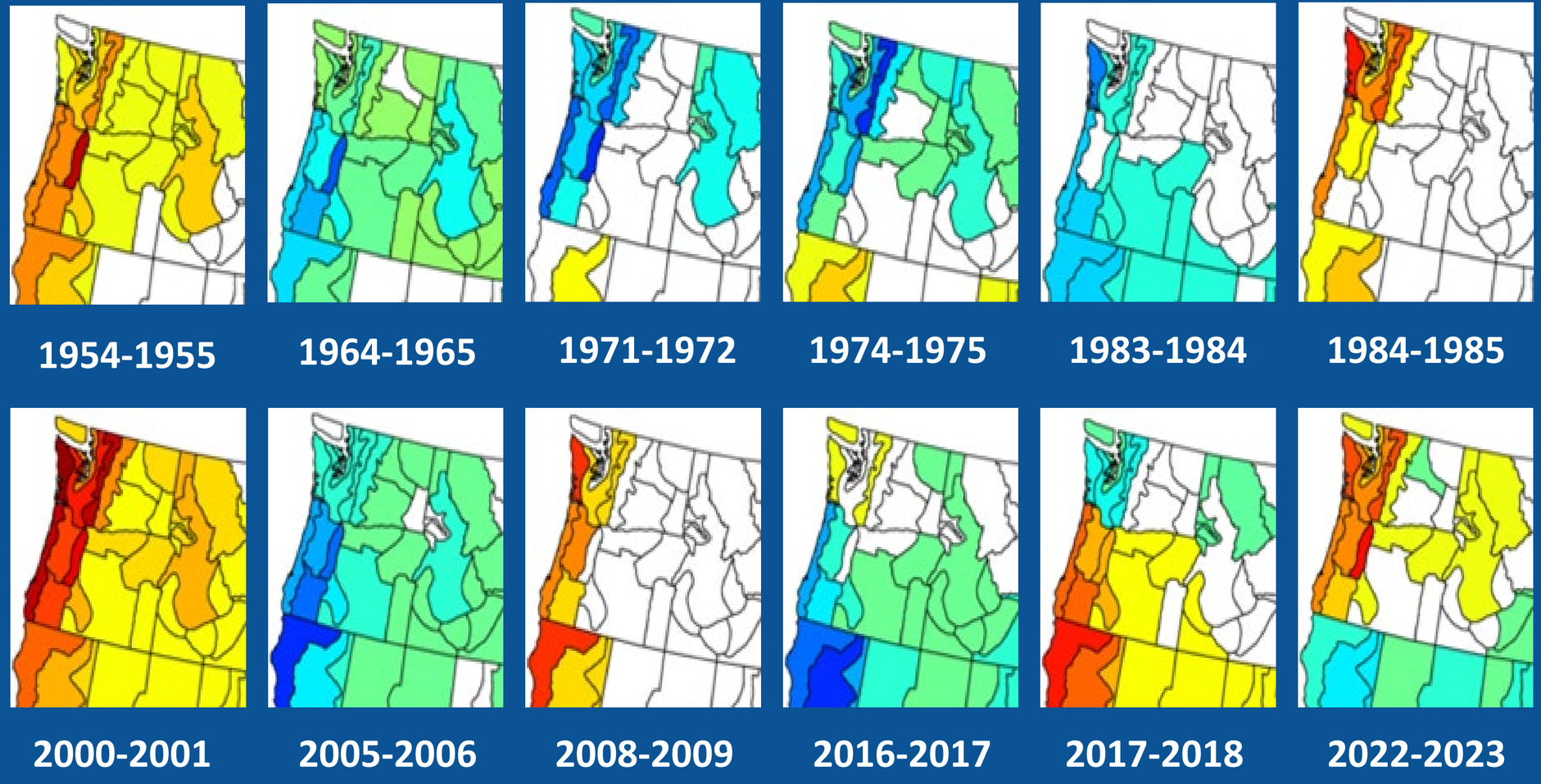
Historical WEAK La Niña Years: Precipitation

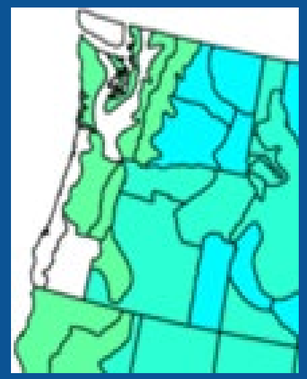


It's a mixed bag!

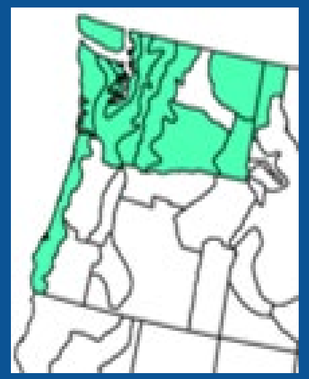
Some years are wetter than normal and some are drier than normal

Historical Implications

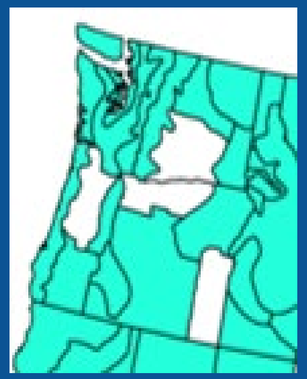
Historical WEAK La Niña Years: Temperature



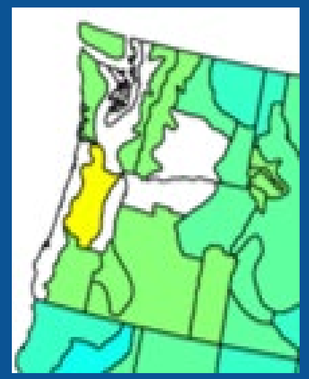
1954-1955



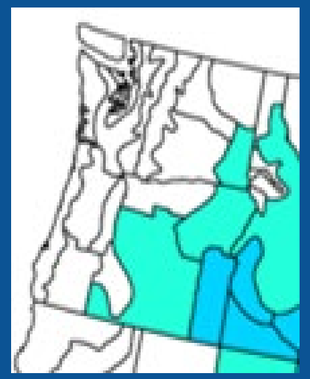
1964-1965



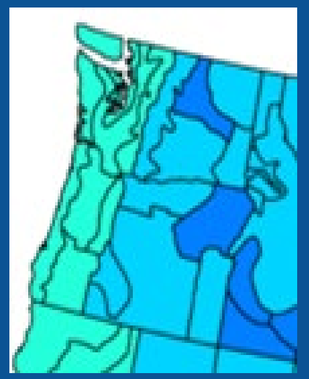
1971-1972



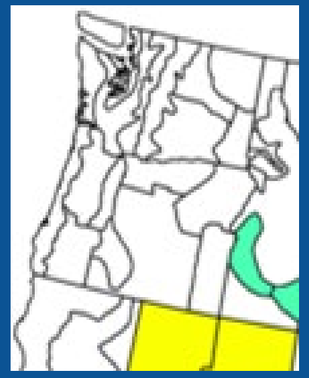
1974-1975



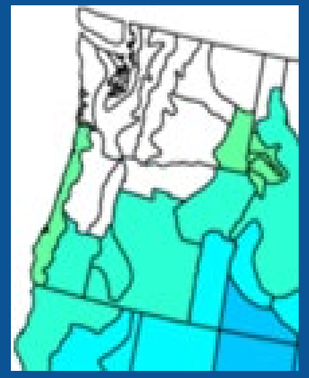
1983-1984



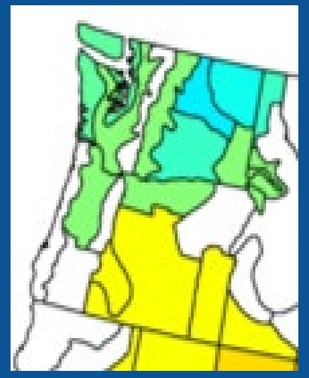
1984-1985



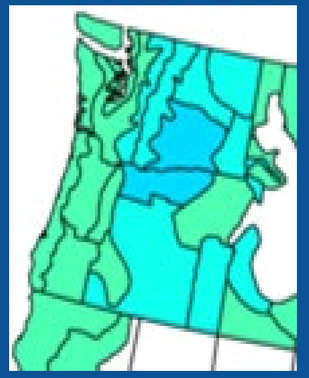
2000-2001



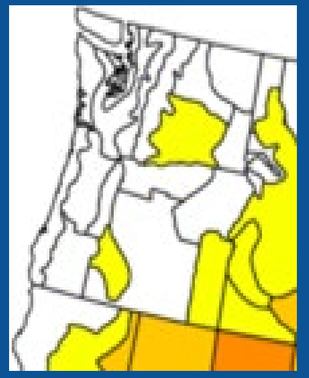
2005-2006



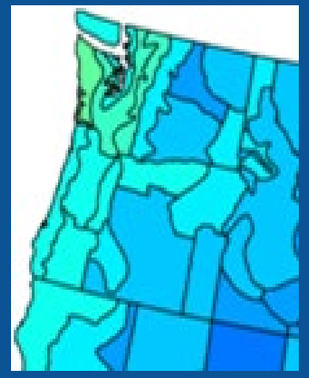
2008-2009



2016-2017



2017-2018



2022-2023

Warmer than normal

Cooler than normal

Trends cooler than normal

However, there are still some years where temperatures were near normal!

La Niña and Cascade Snow (Oct-Mar)

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La Niña — Lower Slopes Snow Data

Oct-Mar		Cougar WA	Detroit OR	Oak-ridge	Hood River
M	1955-56	M	56	58	57
M	1970-71	29	68	38	34
S	1973-74	6	2	13	63
S	1975-76	23	6	6	24
S	1988-89	12	10	1	23
M	1995-96	5	6	5	45
S	1998-99	22	14	8	6
S	1999-00	13	10	2	11
S	2007-08	40	53	17	6
S	2010-11	23	10	11	17
M	2011-12	28	29	14	18
M	2020-21	14	21	T	M
M	2021-22	28	21	16	M

M= moderate, S=strong, VS= very strong La Nina event

Moderate	21	34	26	38
MOD to STG	20	24	16	27
Strong	20	15	8	21
STG to VSTG	20	15	8	21
Very Strong	-	-	-	-
ALL Events	20	24	16	27

Climatic Averages — Lower Slopes				
Winter Snow	Cougar	Detroit	Oakrdg	HoodR
	16	15	11	33

La Niña Characteristics and Tidbits

Lower-slopes see a 25-45% increase over average snowfall. But, 20% drop in Hood River Valley (likely less offshore flow).

at Detroit…	at Oakridge…
1970-71 : 2nd snowiest	1955-56 : 3rd snowiest
1955-56 : 3rd snowiest	1970-71 : 7th snowiest
2007-08 : 4th snowiest	

La Niña — Mid Slope Snow Data

Oct-Mar		Carson FH	Marion Fks FH	Belknap Sprgs	Toketee Falls
M	1955-56	M	223	M	75
M	1970-71	M	180	188	102
S	1973-74	M	122	95	44
S	1975-76	M	131	68	66
S	1988-89	127	122	76	74
M	1995-96	71	102	74	41
S	1998-99	68	120	92	16
S	1999-00	75	97	56	3
S	2007-08	139	265	200	112
S	2010-11	48	131	84	37
M	2011-12	M	136	73	31
M	2020-21	61	46	35	2
M	2021-22	59	79	80	27

M= moderate, S=strong, VS= very strong La Nina event

Moderate	64	128	90	46
MOD to STG	81	135	93	48
Strong	92	141	96	50
STG to VSTG	92	141	96	50
Very Strong	-	-	-	-
ALL Events	81	135	93	48

Climatic Averages — Mid Slopes				
Winter Snow	Carson	Marion	Belkn	Toke
	61	97	66	33

La Niña Characteristics and Tidbits

Mid-slopes of Cascades see a 35-45% increase over average snowfall, slightly decreasing as move far south.

at Marion Forks…	at Belknap Sprgs…
2007-08 : 3rd snowiest	2007-08 : 2nd snowiest
1955-56 : 4th snowiest	1970-71 : 3rd snowiest
1970-71 : 7th snowiest	

La Niña — Upper Slope Snow Data

Oct-Mar		Rainier NPS	Gov't Camp	Santiam Jctn	Crater Lake
M	1955-56	948	386	M	611
M	1970-71	905	388	M	610
S	1973-74	868	387	M	551
S	1975-76	768	384	M	471
S	1988-89	673	299	284	499
M	1995-96	321	176	214	444
S	1998-99	858	274	484	584
S	1999-00	642	186	309	429
S	2007-08	671	359	349	480
S	2010-11	644	266	312	547
M	2011-12	628	251	224	320
M	2020-21	630	268	98	295
M	2021-22	536	M	112	279

M= moderate, S=strong, VS= very strong La Nina event

Moderate	661	294	162	426
MOD to STG	699	302	265	471
Strong	732	308	347	509
STG to VSTG	732	308	347	509
Very Strong	-	-	-	-
ALL Events	699	302	265	471

Climatic Averages — Upper Slopes				
Winter Snow	Rainier	Govt C.	Sant Jct	Crtr Lk
	493	227	182	413

La Niña Characteristics and Tidbits

Upper slopes of Cascades see a 35-45% increase over average snowfall, with that increase decreasing as move south (~15% at Crater Lake).

At Mt Rainer, #2-5 snowiest winters are…

(2) 1955-56, (3) 1970-71, (4) 1973-74, (5) 1998-99

Govt Camp *: (1) 1970-71, (2) 1973-74, (3) 1955-56 (4) 1975-76, (7) 2007-08*

La Niña and Cascade Snow (Oct-Mar)

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For MODERATE to STRONG La Niñas:

Lower Slopes (Cougar WA, Detroit OR, Oakridge OR)	Mid Slopes (Marion Forks, Belknap Springs, Toketee Falls)	Upper Slopes (Rainier NP, Gov't Camp, Santiam Jct, Crater Lake)
• 25-45% increase in average snowfall • 20% drop in the Hood River Valley (likely less offshore flow)	• 35-45% increase in average snowfall, slightly decreasing as you move far south	• 35-45% increase over average snowfall, slightly decreasing as you move south (~15% at Crater Lake)

NWS Climate Prediction Center Outlooks

Outlooks…What do they represent?

The Climate Prediction Center outlooks represent the probability of temperature/precipitation being above, below, or near normal.

Doesn't show magnitude of how much above or below normal either

Winter Outlook

November-December-January (NDJ)

Winter Outlook - NDJ Precipitation

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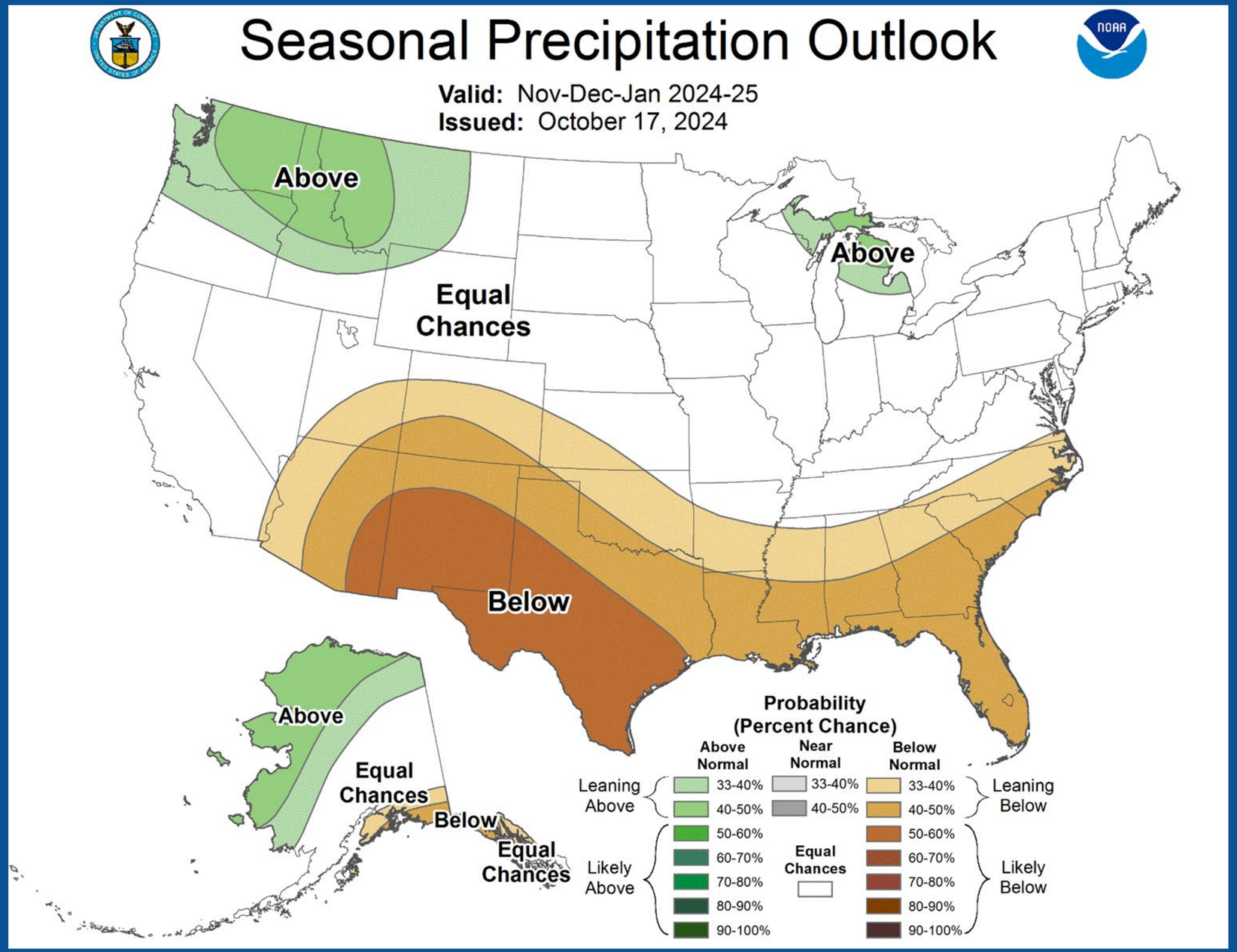
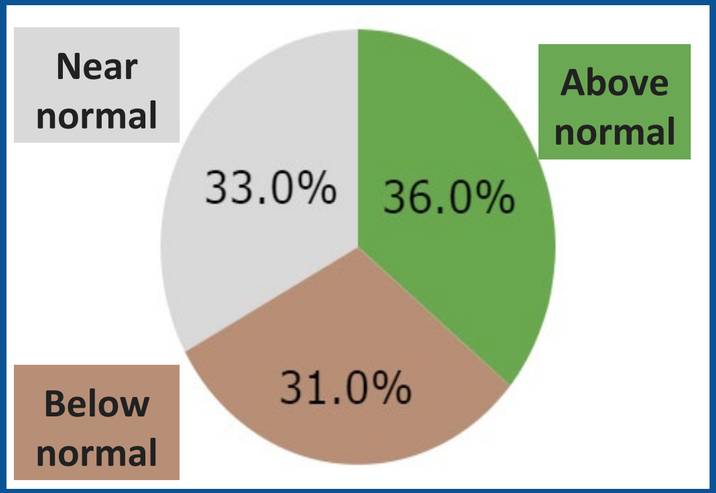


% Chance for Portland, OR



For the NDJ season:

69% chance for near or above normal

64% chance for near or below normal

Winter Outlook - NDJ Temperature

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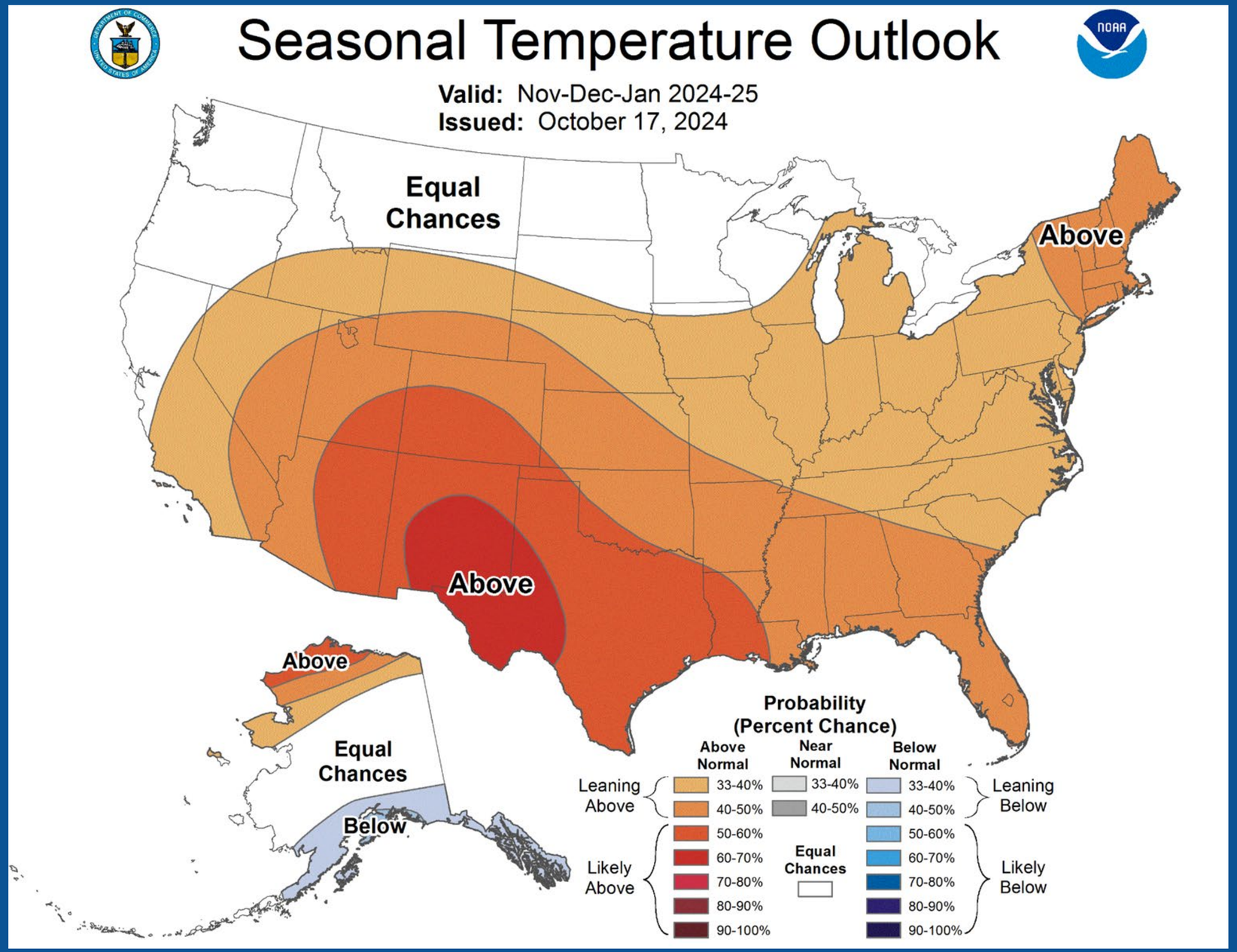
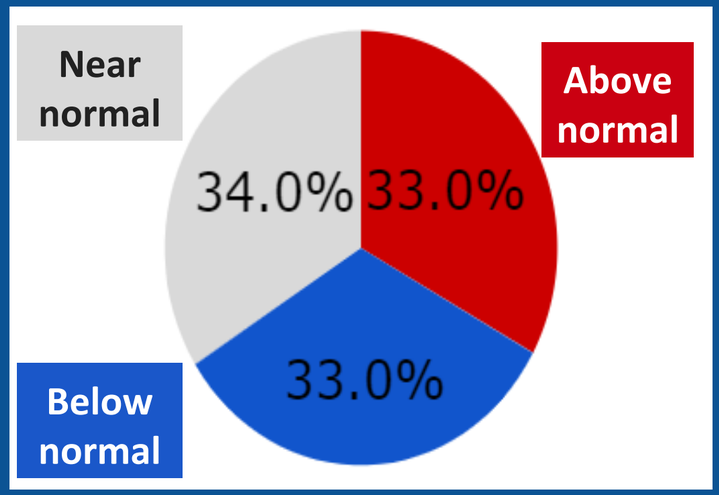


% Chance for Portland, OR



For the NDJ season:

67% chance for near or below normal

67% chance for near or below normal

Winter Outlook

December-January-February (DJF)

Winter Outlook - DJF Precipitation

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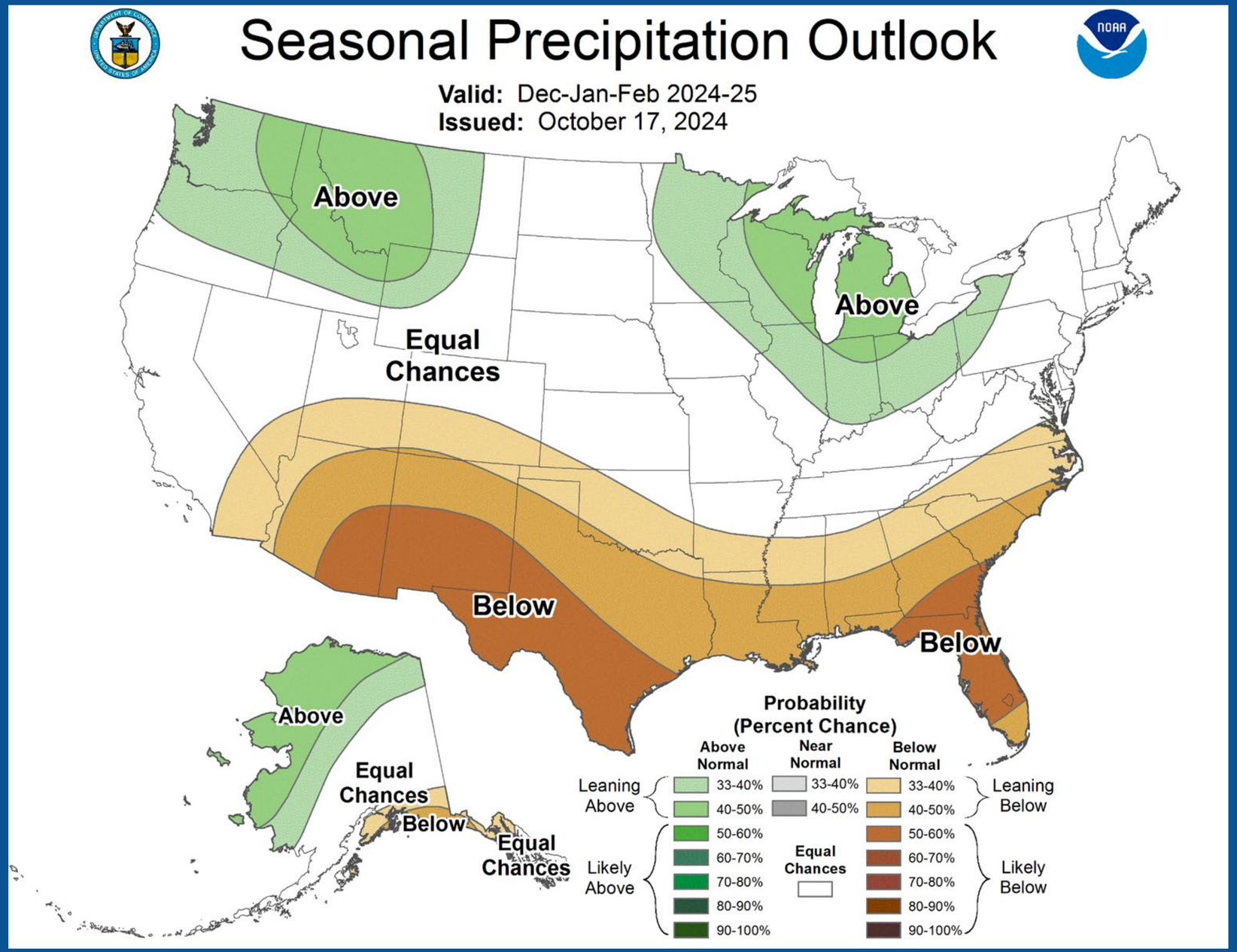
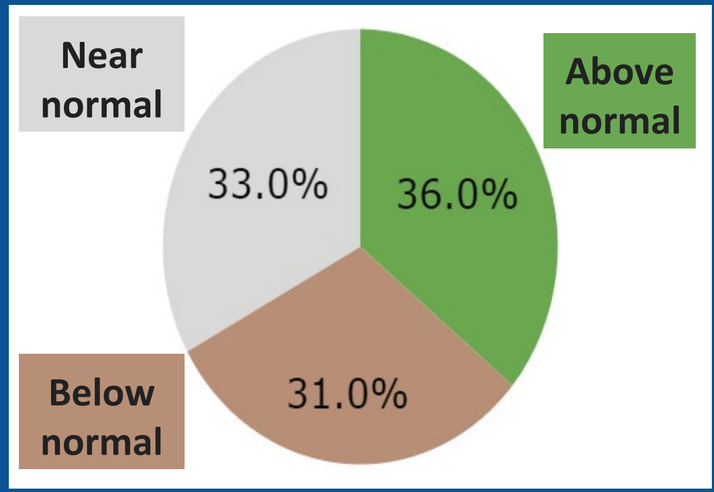


% Chance for Portland, OR



For the DJF season:

69% chance for near or above normal

64% chance for near or below normal

Winter Outlook - DJF Temperature

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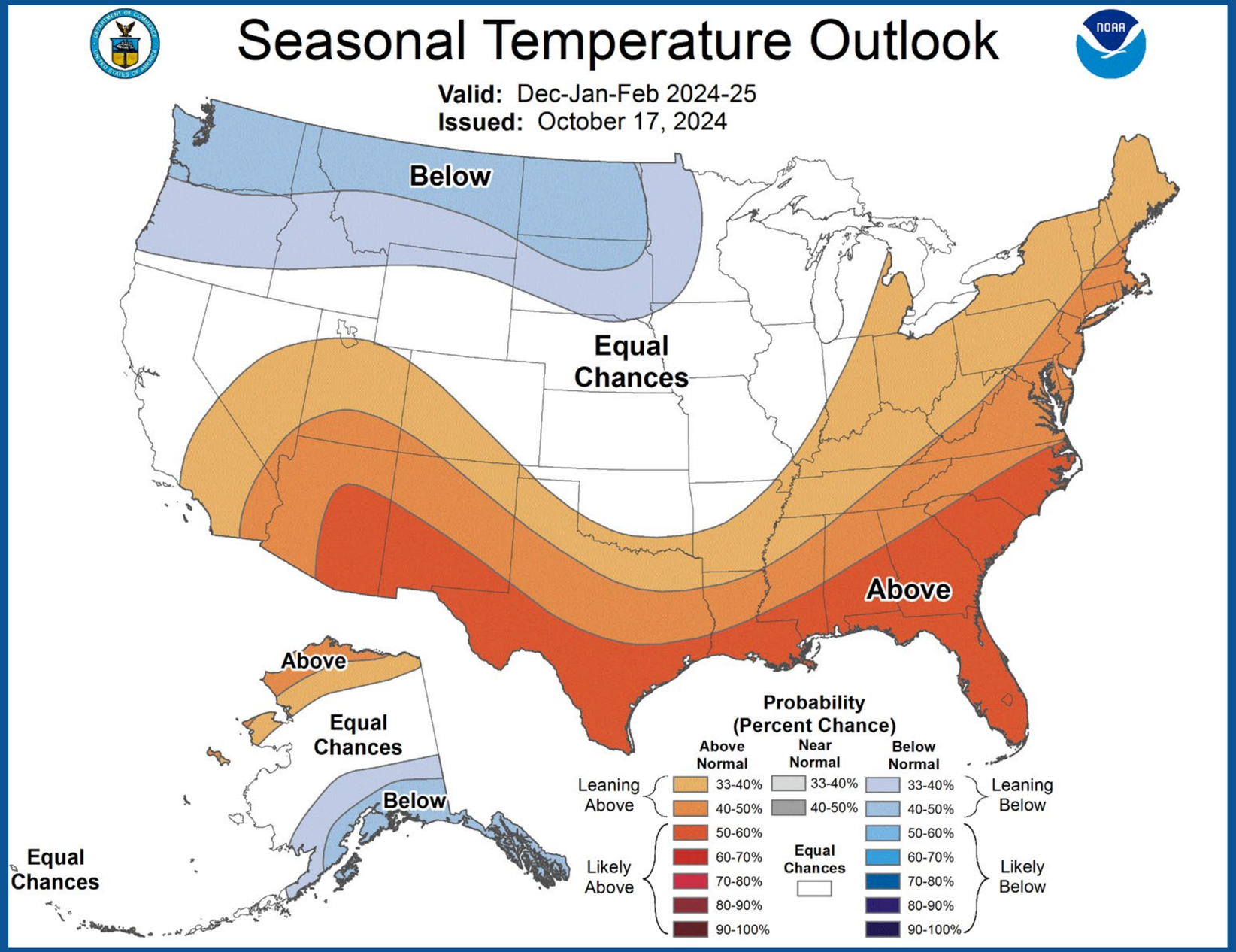
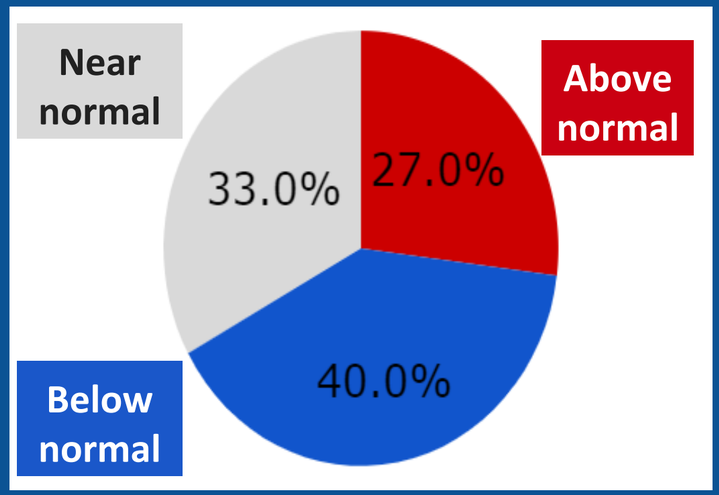


% Chance for Portland, OR



For the DJF season:

73% chance for near or below normal

60% chance for near or above normal

Climate predictions can have skill in predicting seasonal totals and averages.

However, most impacts are associated with short-duration storm systems that cannot be predicted more than 1-2 weeks out.

ALWAYS stay prepared for impactful winter weather, whether you're at home or on the road!

Have Multiple Ways to Stay Informed

- NWS website (weather.gov/portland)
- NOAA Weather Radio
- Media (TV, Radio & Text)
- WEA (Wireless Emergency Alert)
- Weather Apps
- Social Media
- OR-Alert (Oregon only)
- Friends and family

Staying in Touch

Email: w-pqr.webmaster@noaa.gov

Phone: (503) 261-9246 - public line

Facebook: US National Weather Service Portland Oregon

X (formerly Twitter): @NWSPortland