2025-26 Willamette Valley Winter Weather Predictions

By: Tanis

2024-25 Scorecard

Predictions	Actual/Projected	Oct	Dec
Water Year Rain: PDX" 39.9"+ (Dec: 39.7"+) EUG: 44.2"+	PDX: 35.83" EUG: 39.6"	✗	✗
Average Temperature Departure: At least 0.6°F below average	0.56°F Above Average (PDX) -0.18°F Below Average (EUG)	✗	✗
Lowest Winter Temperature: <20°F	24°F (PDX), 20°F (EUG) Teens recorded in HIO, CVO, SPB	1/2	1/2
Peak Wind Gust: 53 mph+ (equivalent for EUG is 50 mph+) Alt: Big event that misses PDX but hits PNW	52 MPH twice (PDX) 51 MPH (EUG) N. Coast big storms (70 mph+) Dec 26th, Feb 24th plus Puget Sound Bomb Cyclone	✓	✓
Most Active Time: Jan 1st to Feb 15th (October) or Feb 29th (December)	Feb 2nd to Feb 14th	✓	✓
April 1st Snow Depth: 115%+ of normal	It's Complicated	1/2	1/2
Valley Snowfall: 6" or more	Portland: 3 in. Eugene: 1 in. All Valley Average (Population Weighted): 2.99"	✗	✗

Methodology

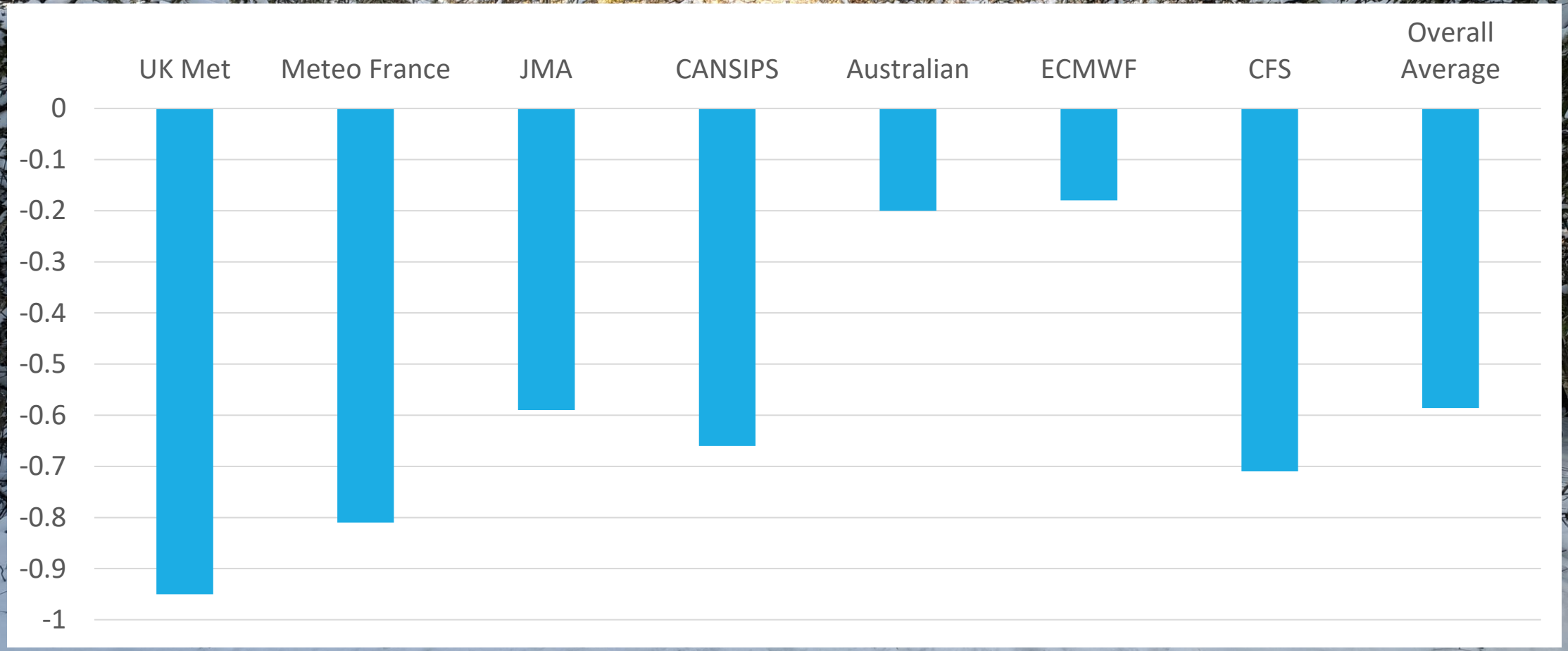
- Adjusted analog year approach using:
  - ENSO via the Oceanic Nino Index (ONI) and confirmed using the Southern Oscillation Index (SOI).
  - Pacific ~~and Atlantic Multidecadal Oscillation~~ (PDO ~~and AMO~~).
  - Quasi-Biannual Index (QBO)
  - Sunspot Count.
  - Analogs are not weighted equally. Analogs closer to this year's conditions have a higher weighting. Adjustments to analog years made using statistical analysis (since 1940):
  - If there is a statistically likely/unlikely chance (90%) of something occurring, analogs will be adjusted unless there is a clear trend in the analog years showing the opposite.
  - General trends based on the previous season when appropriate.
- All forecasts will cover what has happened in 1 out of 3 winters at the Portland Airport.

Adjustments to Past Data

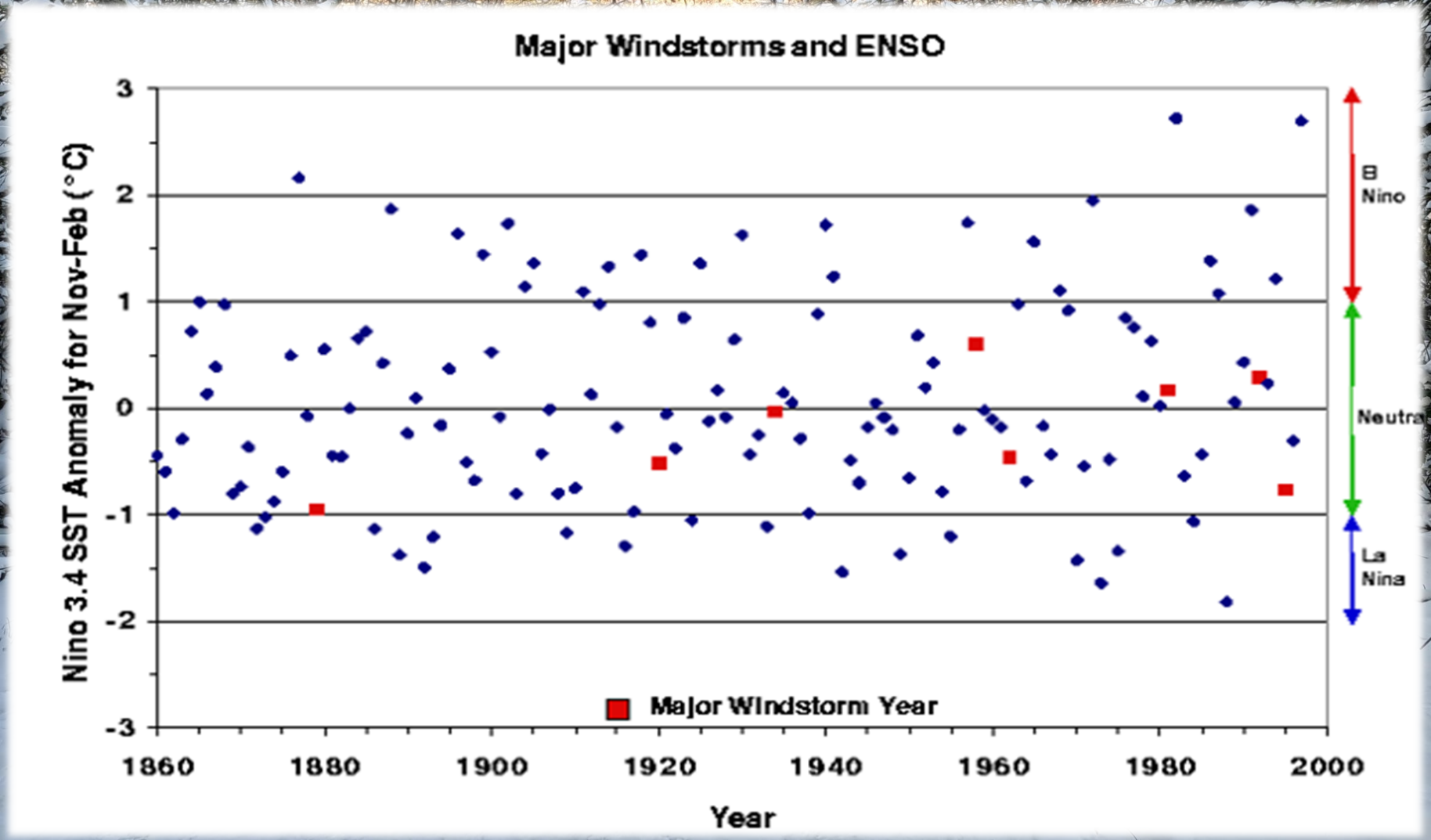
- Snow before the 1970s has been adjusted to a 4.3-inch average per winter on analogs. Further adjustments are made if necessary for marginal setups.
- Temperature departures adjusted to averages at the time they occurred.
- Since Downtown Portland was used for analogs before 1940, precipitation has been converted to a PDX equivalent (83.8% of what downtown gets).


Data and Oscillations

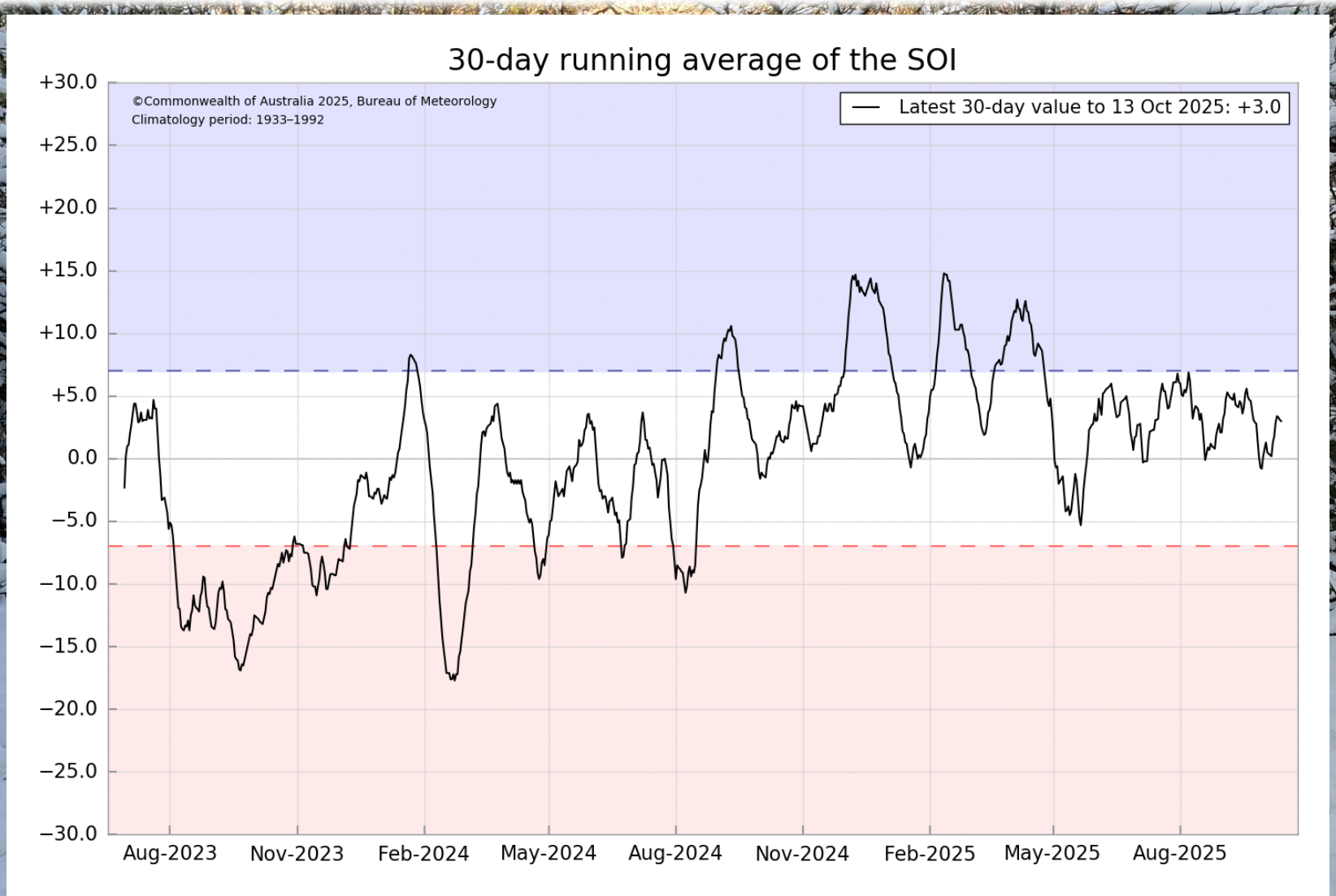
ENSO 3.4 NDJ


UK Met
Meteo France
JMA
CANSIPS
Australian
ECMWF
CFS
Overall Average
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
-0.9
-1

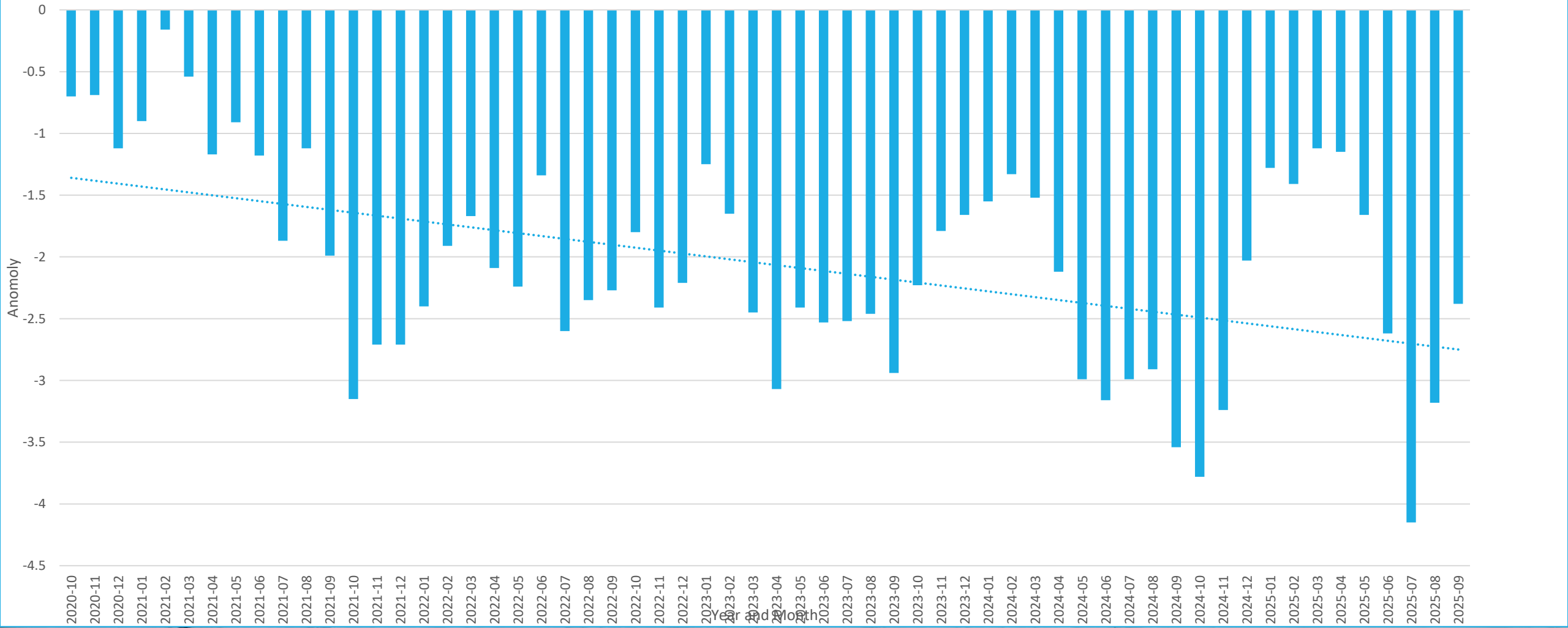
Major Windstorms and ENSO



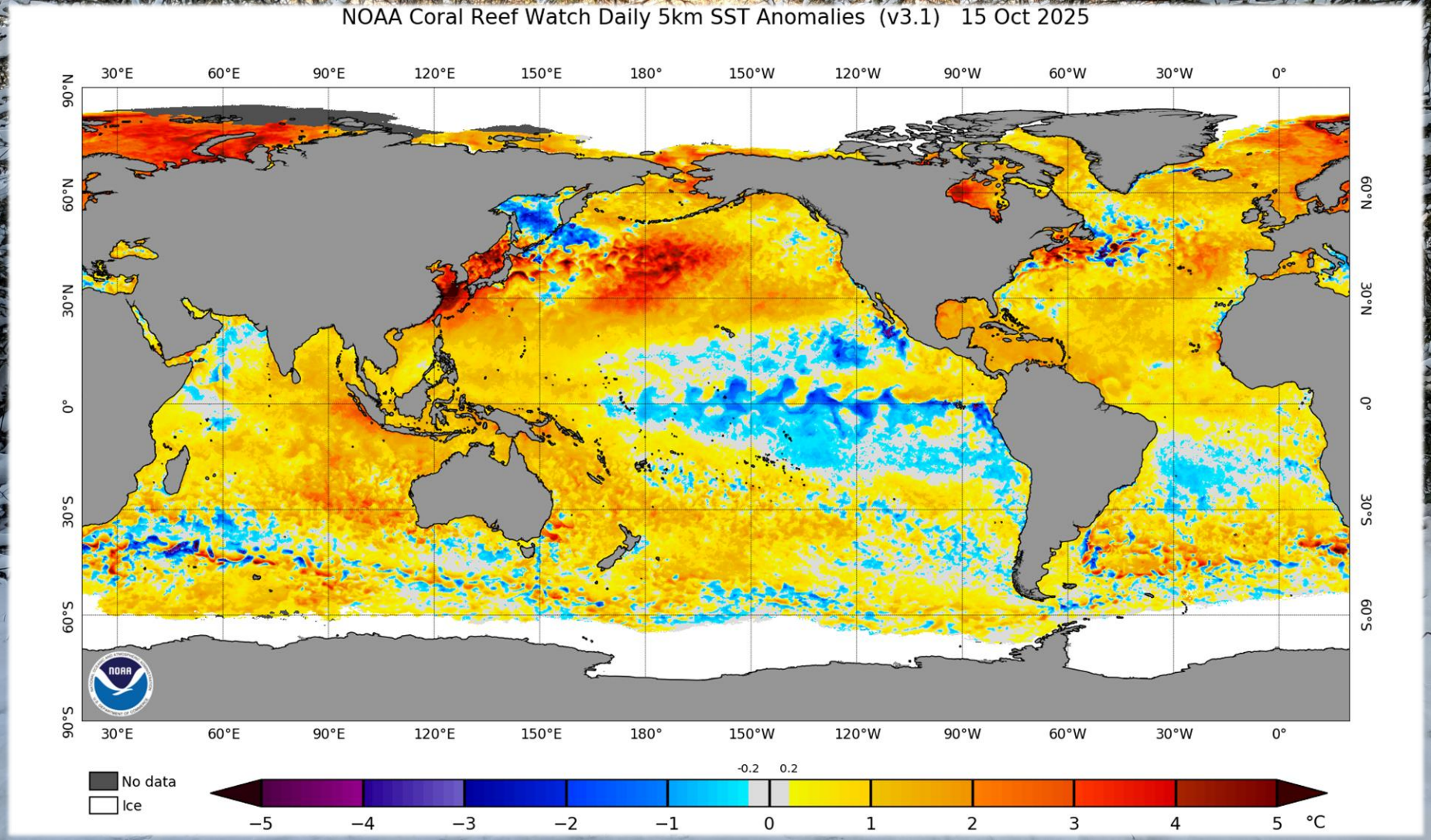
Southern Oscillation Index: Last 2.5 Years



PDO: Firmly Negative



Return of “the Blob?”



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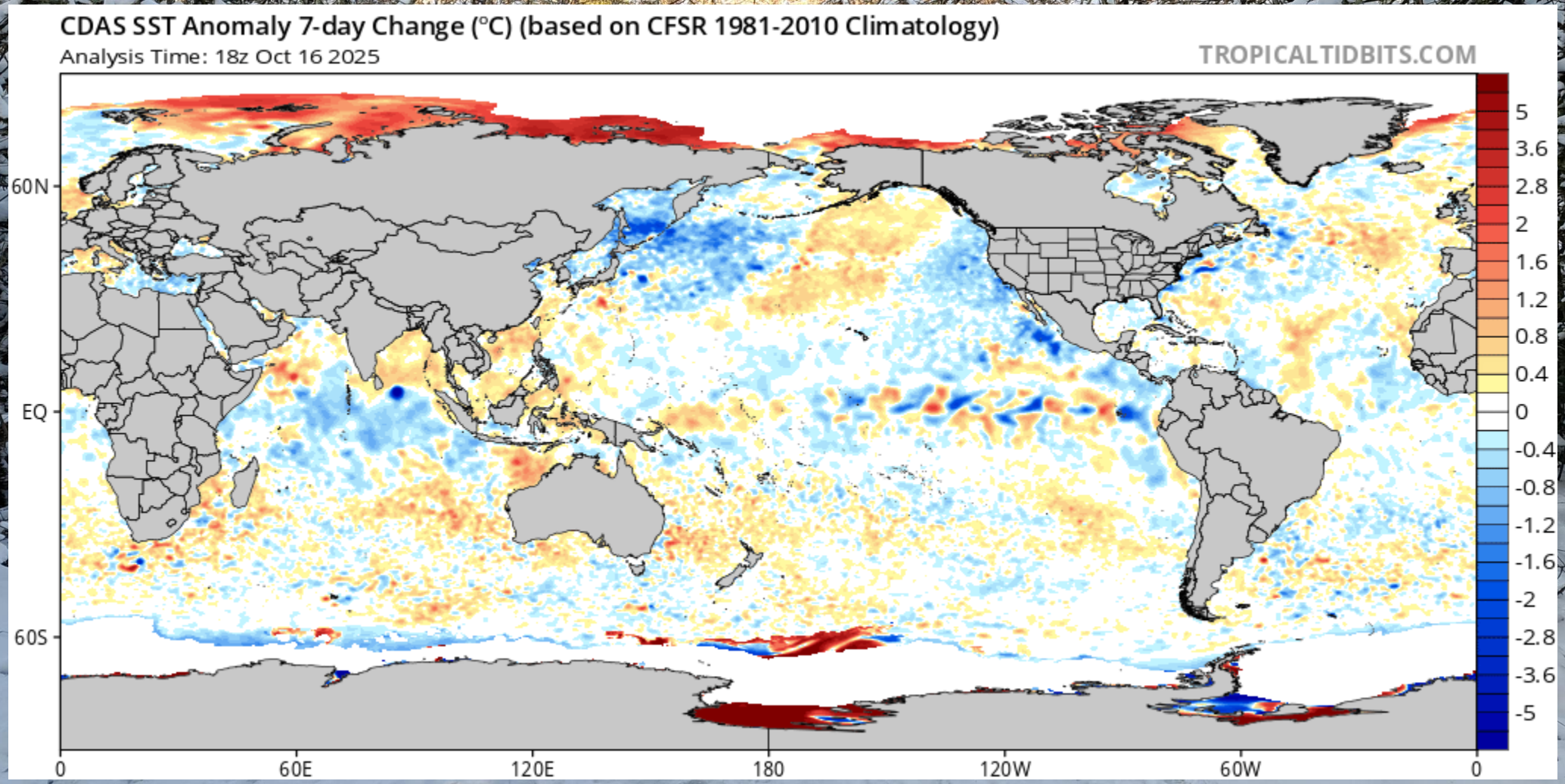
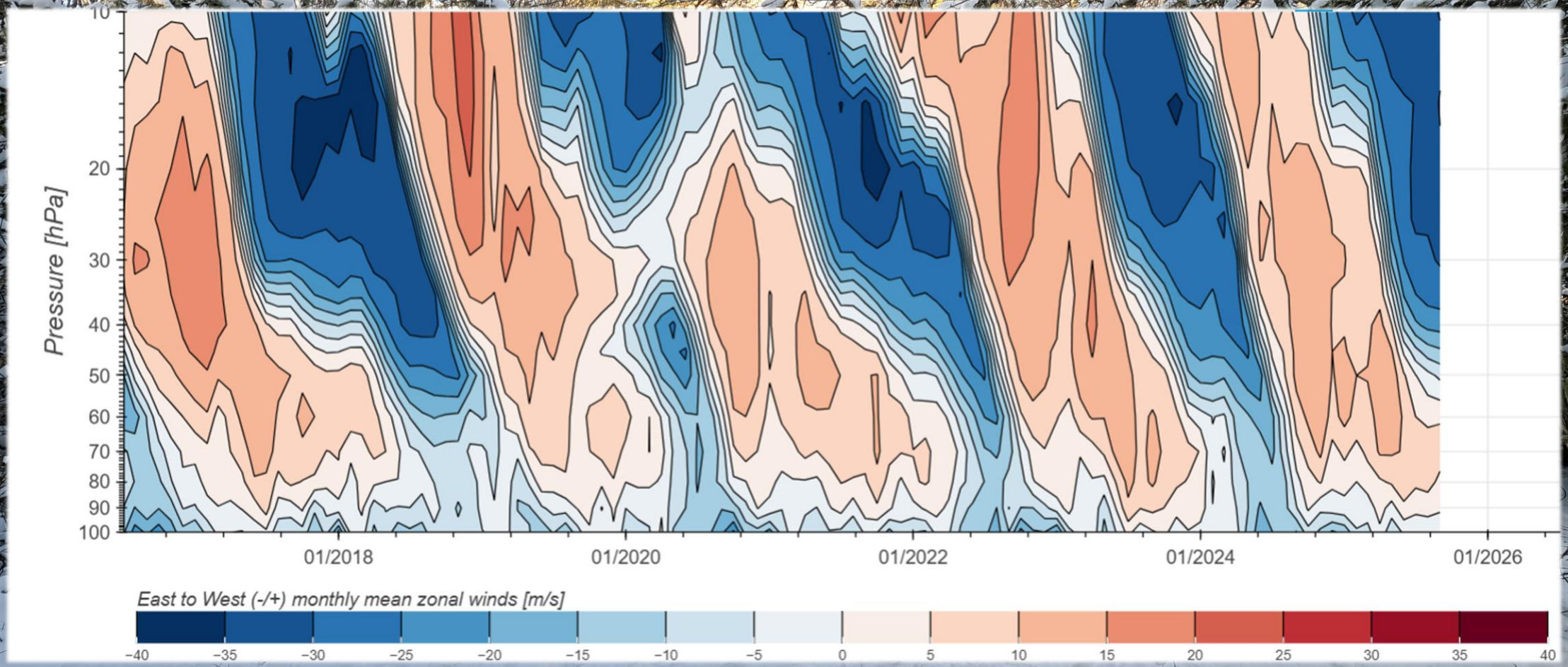
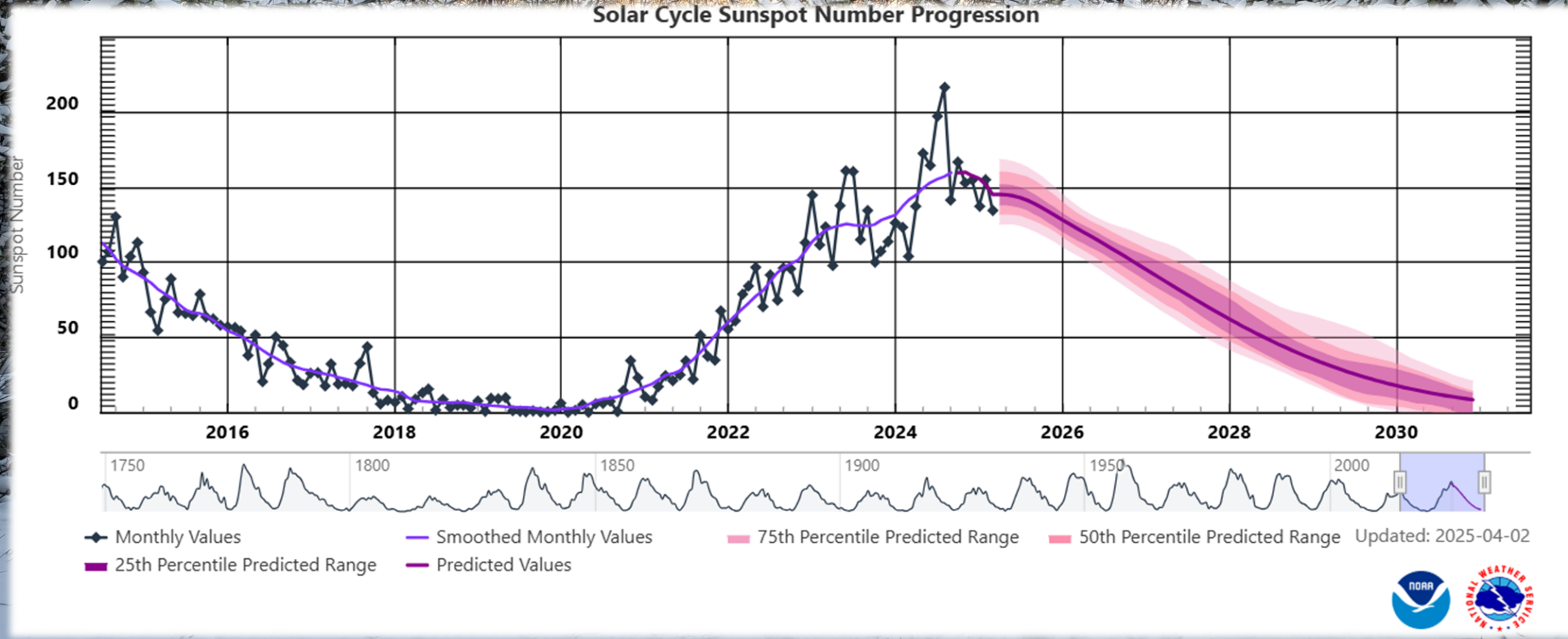


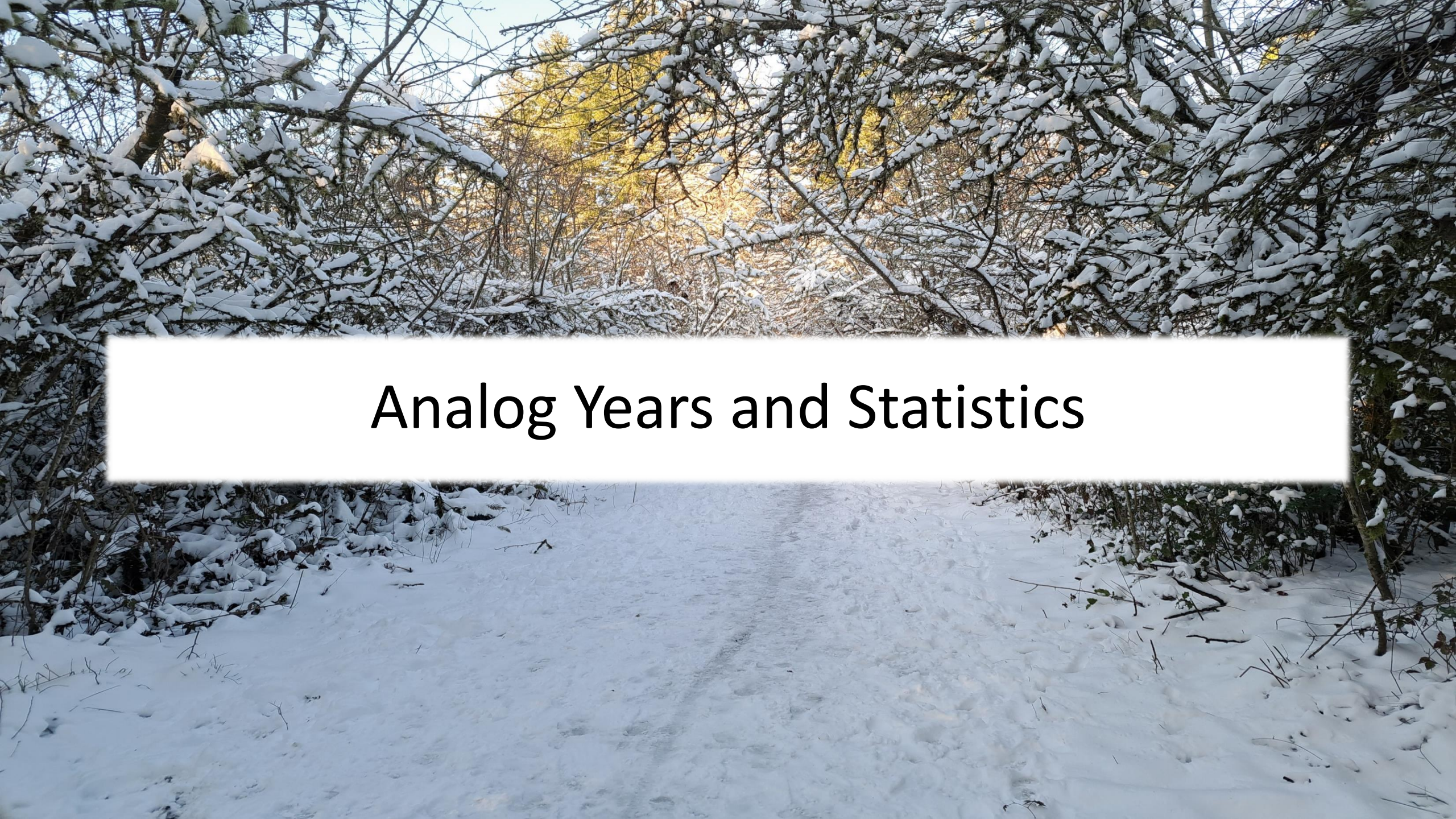
QBO Values: Easterly Phase



Data from Karlsruhe Institute of Technology

Sunspot Count





Analog Years and Statistics

Analog Years

- 1874-75
- 1875-76
- 1880-81
- 1882-83
- 1890-91
- 1893-94
- 1894-95
- 1898-99
- 1910-11
- 1917-18
- 1921-22
- 1922-23
- 1949-50
- 1950-51
- 1956-57
- 1962-63
- 1967-68
- 1971-72
- 1981-82
- 2000-01
- 2008-09
- 2011-12
- 2012-13
- 2013-14
- 2017-18
- 2021-22
- 2022-23

Top Analog Year Comparison: The Oldest 2

	1893-94	1922-23	2024-25
La Nina Strength	Weak	Super Cold Neutral	Super Cold Neutral/Weak
PDO	Negative with blip	Negative with blip	Negative
Sunspot progression	60%	90%	60%

Top Analog Year Comparisons: The other top 5

	1967-68	2013-14	2017-18	2025-26
La Nina Strength	Super Cold Neutral/Weak	Cold Neutral	Weak/Moderate	Super Cold Neutral/Weak
PDO	Negative with Blip	Deteriorating Negative (MHW)	Negative	Negative
QBO	Easterly	Flipping to Westerly	Easterly	Easterly
Sunspot progression	45%	45%	90%	60%

Top Analog Year Extreme Events The 2 oldest years

1893-94

- Short cold snap in early January, with 1.2” of snow.
  - Another 2.9” later in the month in a more marginal setup.
- 5” of marginal snow in early to mid February, followed by a late-season cold snap the 18th-23rd, with another 5”.
  - Subfreezing high on the 20th, but lows stayed in the 20s, with one exception. Likely east wind event.

1921-22

- November 1921 Ice storm of the Century in the East Metro/Gorge.
  - 6” of ice in spots.
  - 54” of snow reported in the Gorge.
  - More details in November’s meeting.
- December Arctic blast: 2 sub-30°F highs at PDX, 3 in EUG, but lows stayed in the 20s.
  - Likely east wind event with cloud cover.
  - 4.1” of snow at PDX, 1.3” at EUG, some may have been sleet.
- Mid-January cold snap with 2 subfreezing highs, but only 1” of snow at downtown PDX.
  - Eugene had 3.3” in more marginal setups later.
- Late February dry and breezy cold snap

Top Analog Year Extreme Events Other Top 5

1967-68

- Mid December cold snap with 4.8” of snow at PDX
  - No subfreezing highs.
  - PDX focused
- Late January cold snap with 2-12” of snow and a subfreezing high.
- 70°F on 2/28/68
- 60% of average peak snow depth.

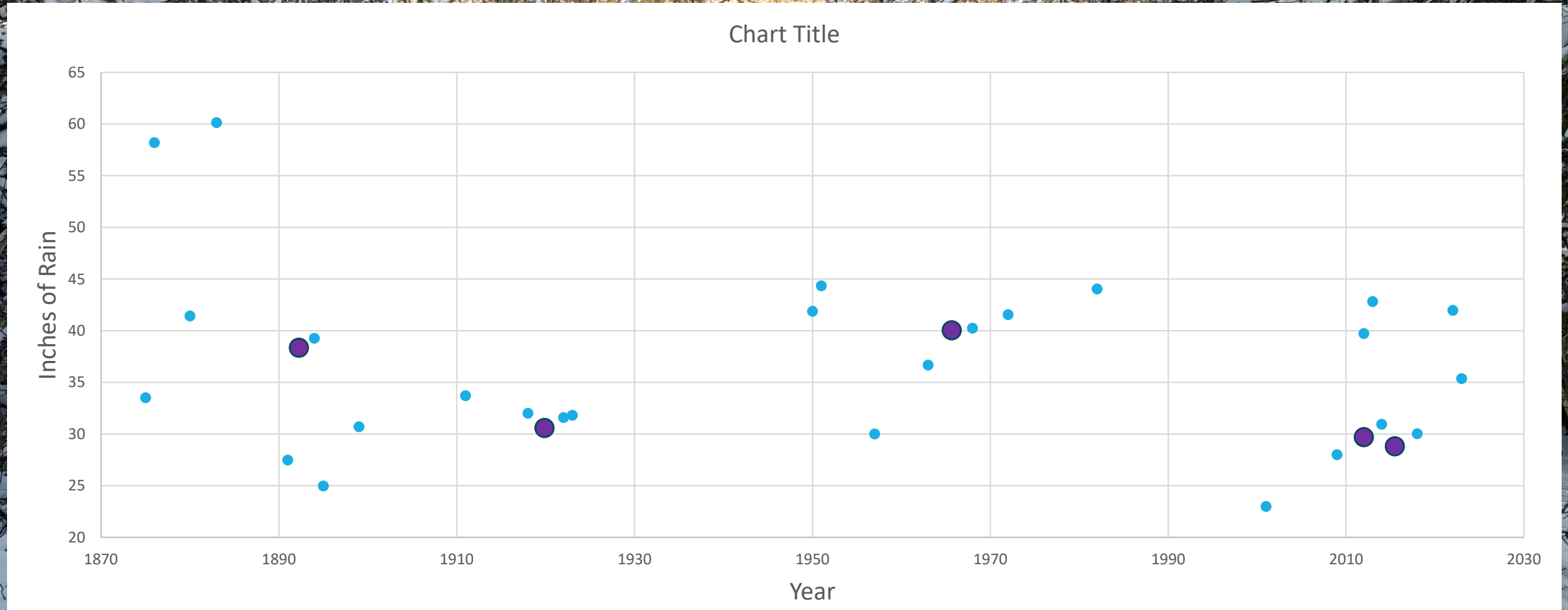
2013-14

- Major Arctic Blast and S. Valley Snowstorm in December, with -10F temperature in EUG.
- 2nd arctic blast in February, with more widespread snow/ice.
- Nothing in between
- Slow cascade snow start

2017-18

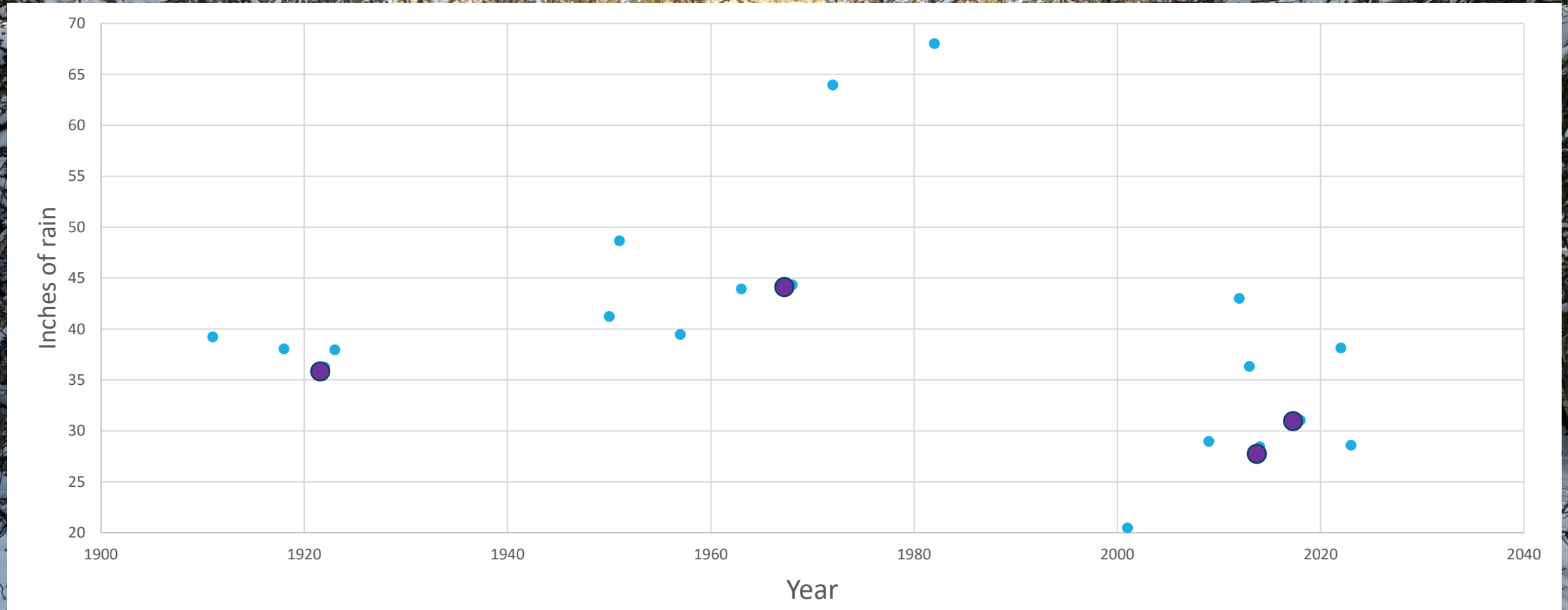
- White Christmas and cold snap.
- 2nd cold snap in February, with more widespread snow.
- Nothing in between
- Slow cascade snow start

Water Year Rainfall PDX



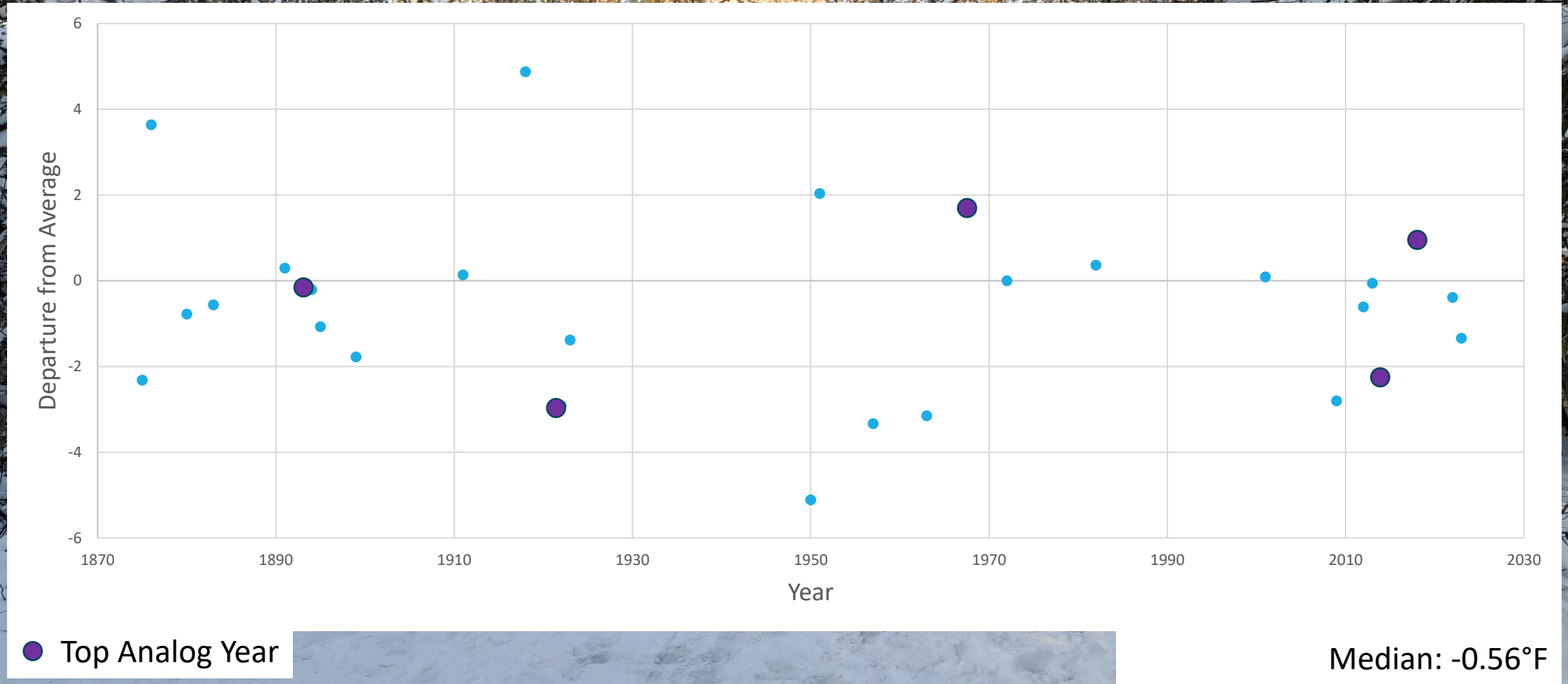
Median: 35.37”
Top Analog Median: 31.6”
Weighted Analog Median:

Water Year Rainfall EUG



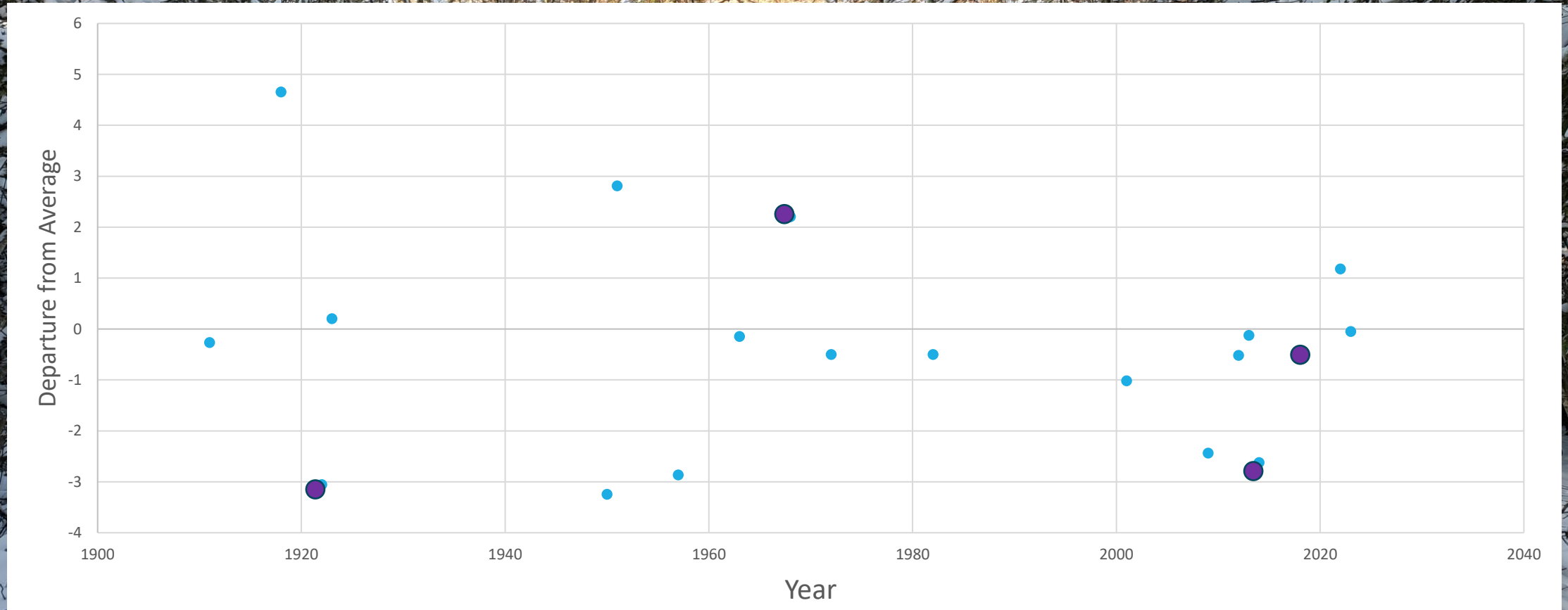
Median: 38.16”
Top Analog Median: 33.65”
Weighted Analog Median:

Temperature Departure From Average (Trend Adjusted) PDX



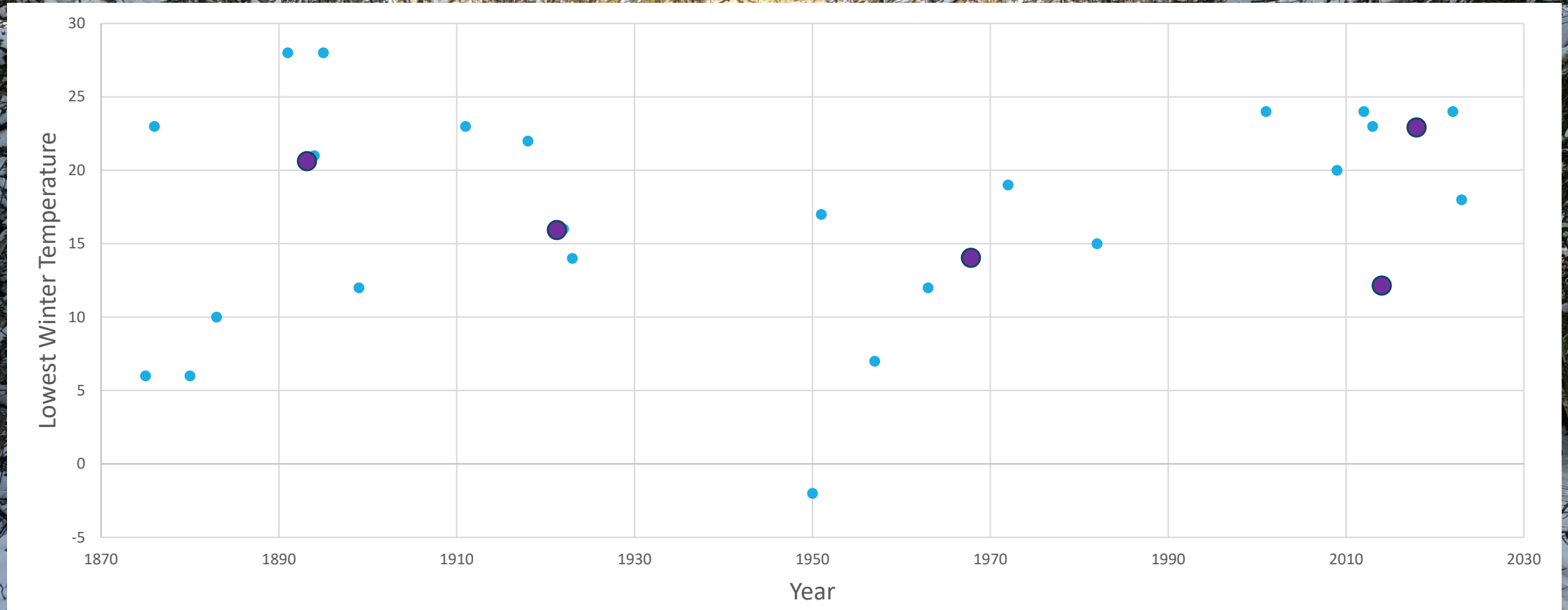
Median: -0.56°F
Top Analog Median: -0.2°F
Weighted analog median: -

Temperature Departure From Average (Trend Adjusted) EUG



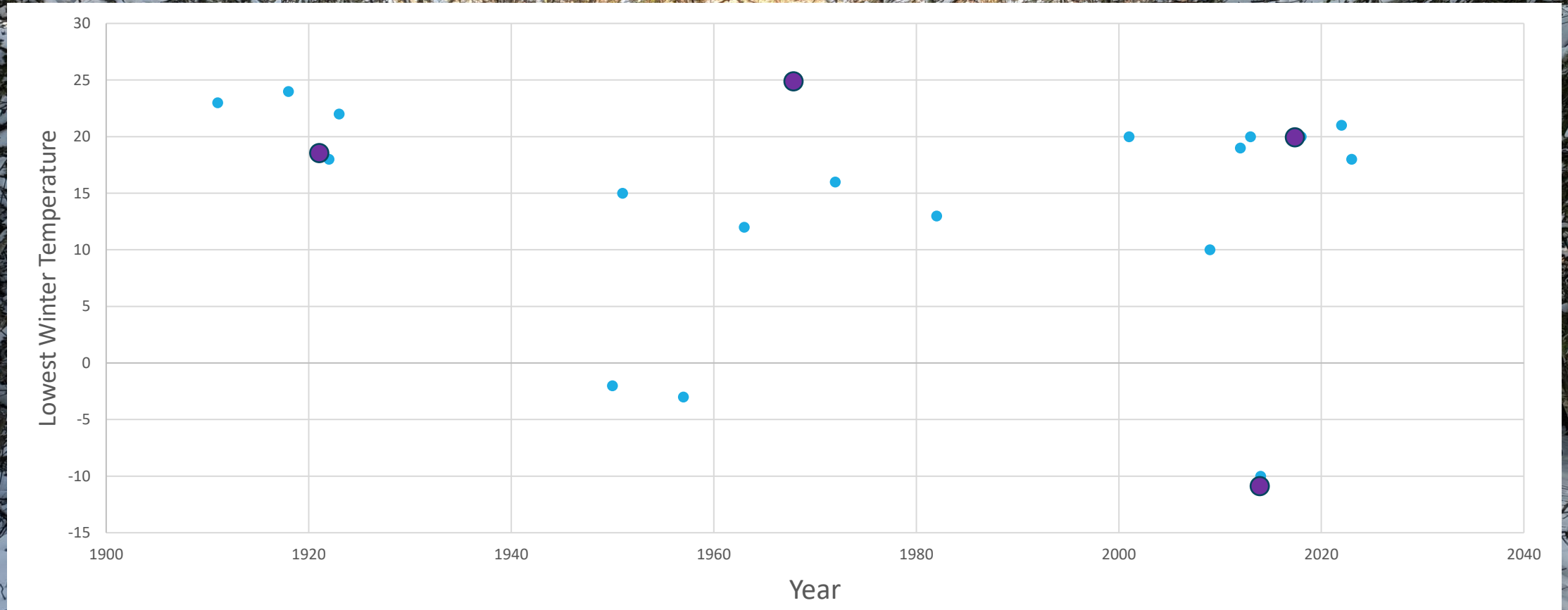
Median: -0.35°F
Top Analog Median: -1.5°F
Weighted Analog Median: -

Lowest Winter Temperature (Trend Adjusted) PDX



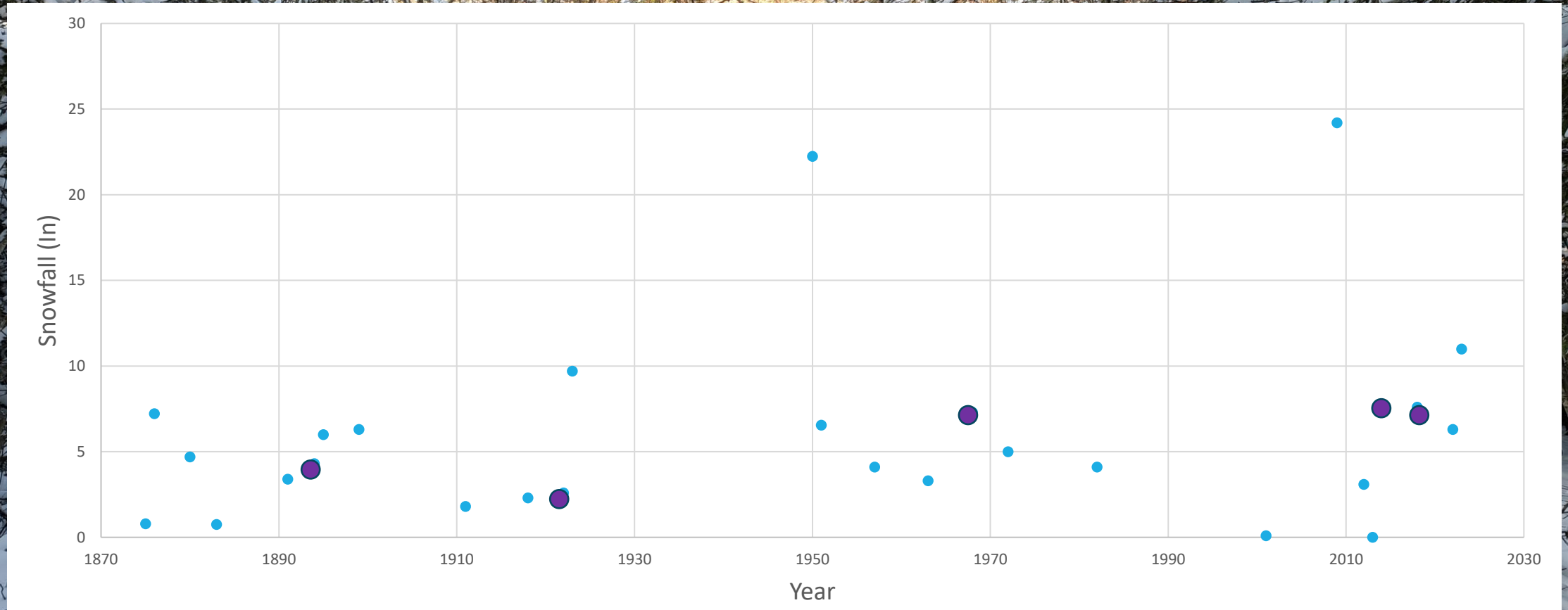
Median: 18°F
Top Analog Median: 16°F
Weighted Analog Median:

Lowest Winter Temperature (Trend Adjusted) EUG



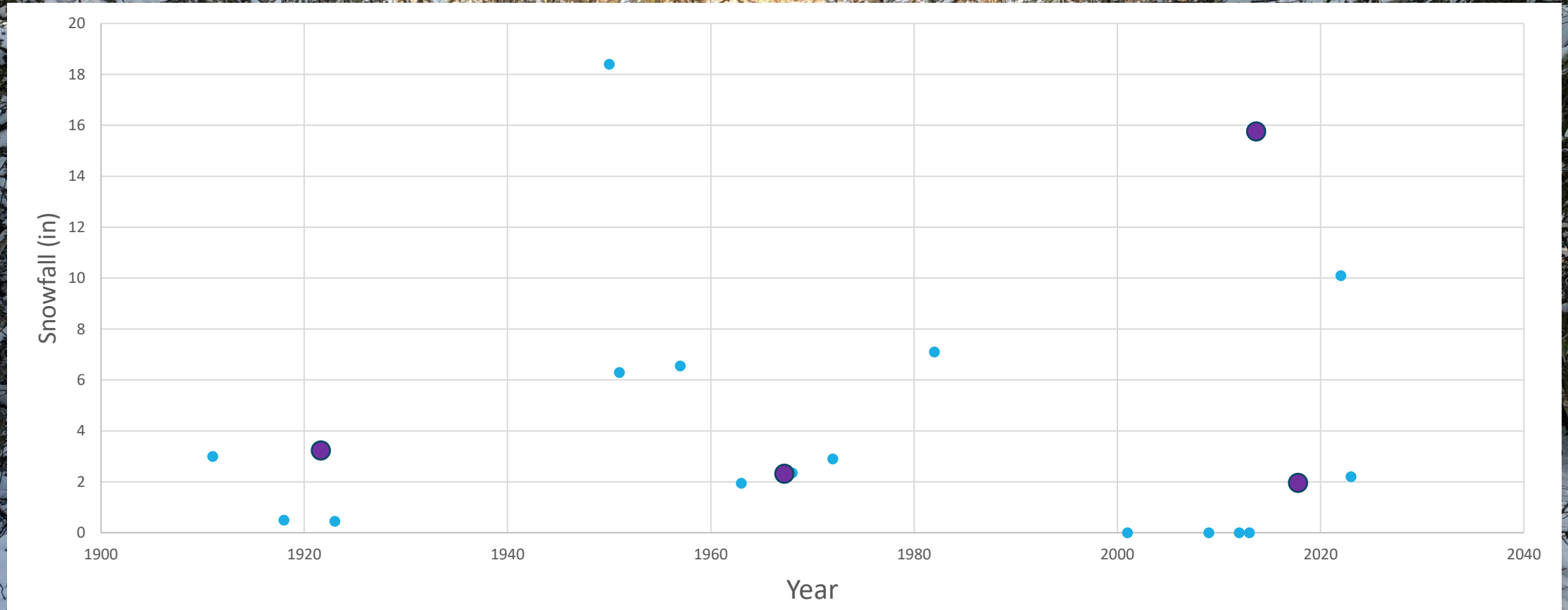
Median: 18°F
Top Analog Median: 19°F
Weighted Analog Median:

Adjusted Snowfall PDX



Median: 4.7”
Top Analog Median: 7.3”
Weighted Analog Median:

Adjusted Snowfall EUG



Median: 3.0”
Top Analog Median: 3.3”
Weighted Analog Median:

Historically Significant Trends:

- 10 consecutive winters have had measurable snowfall. (record high)
  - Chance of an 11th occurring (unadjusted): 2.7%
    - Analog Years disagree with this, so leaning with analogs.
- Only 3 winters (1941-42, 1973-74, 1976-77) have produced a temperature under 20°F with less than 1.5 inches of snow (all with 0).
- 5 winters in a row where the total days with snow on the ground have been above the median (1.5 days). (record high)
  - Chance of a 6^{th} occurring: 1.5%
- There has been no deep Arctic blast (-12C at 850mb level over Salem) for 11 winters (record high).
  - Chance of 12^{th} occurring: 4.7%

Correlations with Past Seasons

- 2nd Year Ninas almost always have a drier winter season.
  - Questionable status of last year's ENSO status brings this into question.
  - Occurred 13/14 times (93% frequency) at PDX, and 12/14 times (86% frequency) at EUG.
  - Last winter: 14.06" (94% of average)


The Predictions

The Basics

- Rain: Near Average
  - PDX: **30-38” (33” Best Estimate)**
  - S. Valley: **33-42” (37” Best Estimate)**
- Temperature Departure: Near to tilting below: **Up to 2.5°F below average.**
  - Low confidence
- Windstorm(s): A decent storm: **50-60 mph**
- Lowest Temperature: **Below 20°F**
  - Best estimate: **16°F**
- Most likely to be Active: Double Peak possible: December and February.
  - At least one of these will be less than 1 week

Snowfall

- Mountain Snow Depth on April 1st: 80-120% of normal
- Valley Snowfall: 1-3 decent storms: net total of **2-8”**
  - PDX Best Estimate: 6”
  - S. Valley Best Estimate: 4”
  - Chance of No Snow Winter: 20%


Thank You.