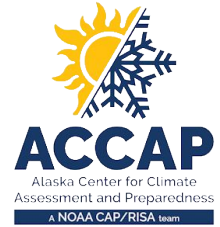
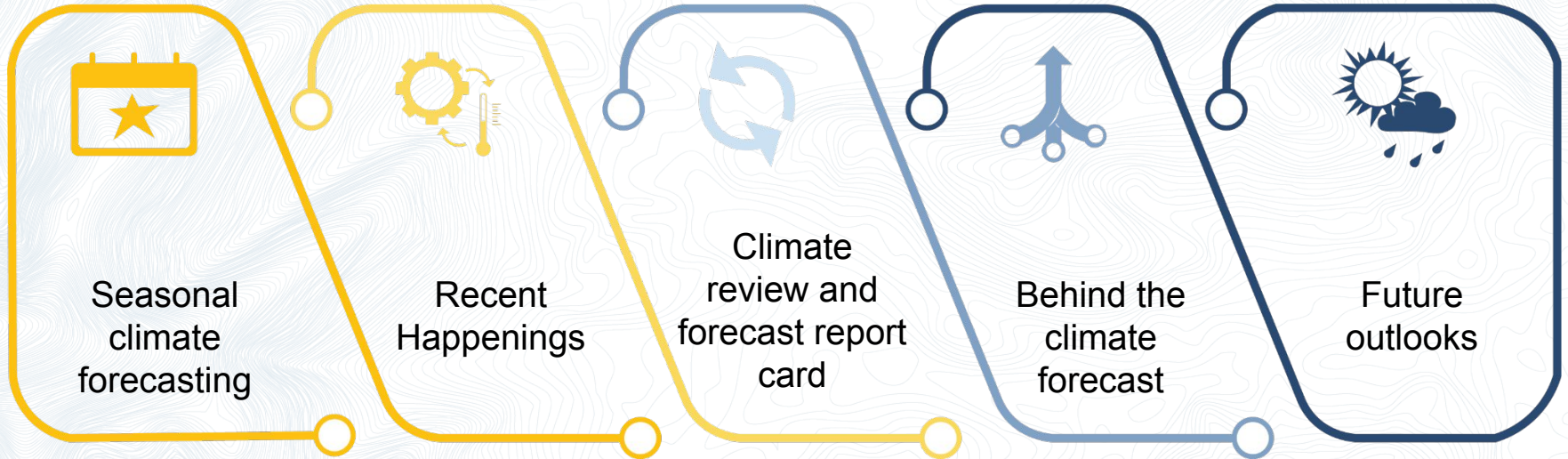




Alaska climate outlook briefing December 2025

Rick Thoman
ACCAP Climate Specialist
December 19, 2025





Seasonal
climate
forecasting

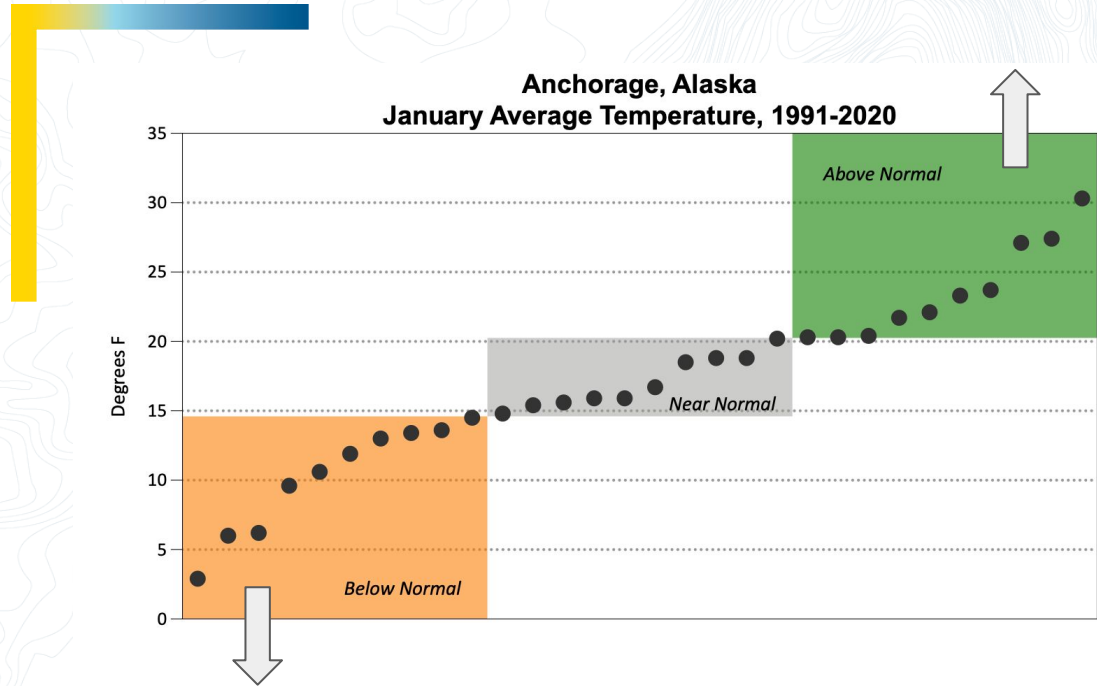


NOAA Center for Weather and Climate Prediction

Climate Prediction Center (CPC) ➤
primary NOAA/NWS forecast responsibility
for two weeks to a year in the future

The basics

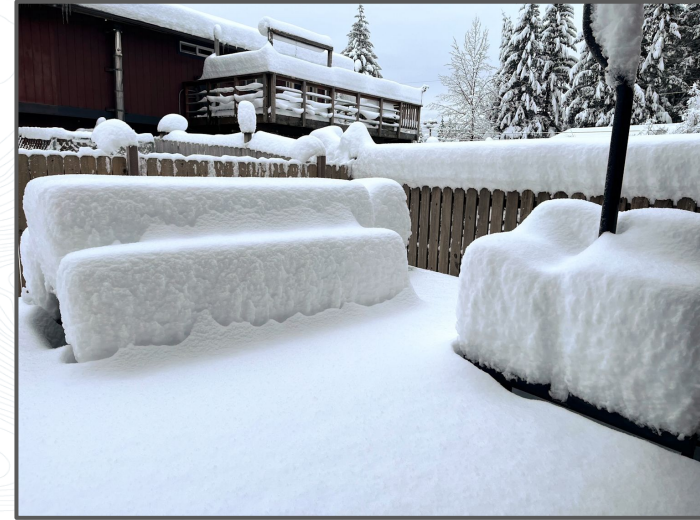
- Relation to long-term normal (1991-2020)
- 3 categories
- Probabilistic
- Temperature
 - Centered on average
- Precipitation
 - Centered on median > can significantly differ from “normal”
- Normals temperature and precip ranges for selected Alaska places at ACCAP climate graphics





Recent Happenings

- **Mat-Su and Anchorage:** repeated freezing rain Dec 1-4
- **Mat-Su:** Long duration wind storm Dec 6-9
 - 100 mph Palmer Airport
 - 73 mph Wasilla Airport
- **Anchorage area:** Damaging northeast winds Dec 14-15
- **Juneau:** Cold (8° below normal) and snowy (3 times normal) first half of December



Juneau Snow

Dec 16, 2025

Photo credit: Rosemarie
Alexander-Isett / Juneau Independent



Climate Review

- What happened?
- How did climate outlooks perform?



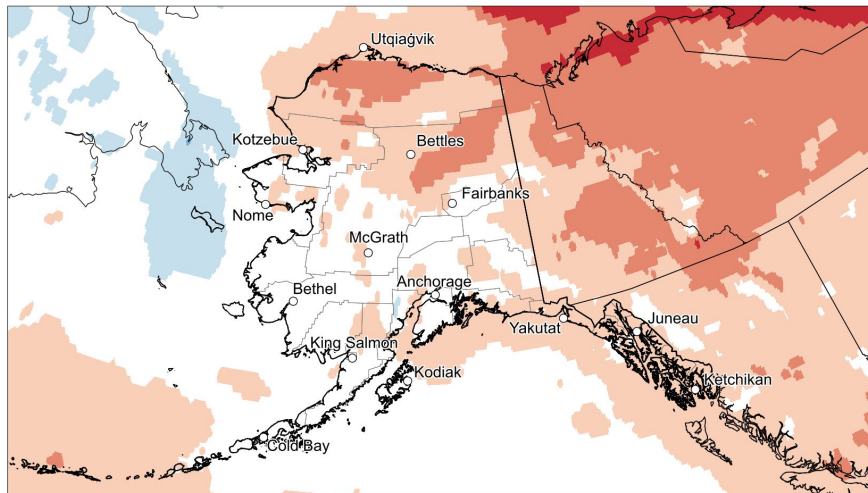
Settlers Bay Lodge
south of Wasilla

December 7, 2025

Photo credit: Bill Roth/ADN

Model- based regional analysis > Average temperatures

Temperature Classification for Nov 2025



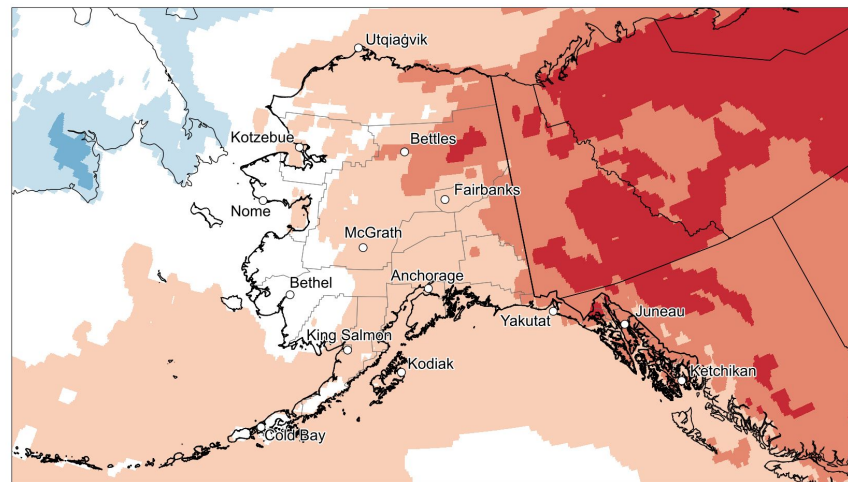
Source: ERA5 Reanalysis

Map by: Brian Brettschneider

Record **Much Below** **Below** **Near Normal** **Above** **Much Above** **Record**

Compared to 1991-2020 Base Period (Records Since 1950)

Temperature Classification for Sep-Nov 2025



Source: ERA5 Reanalysis

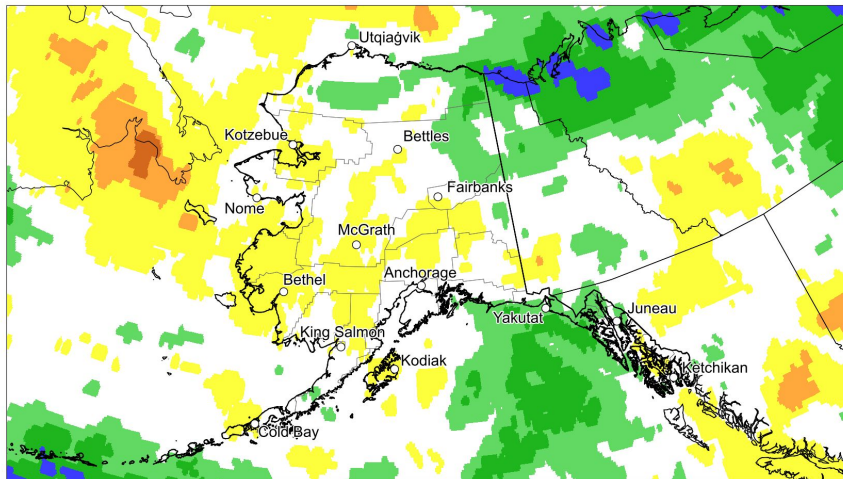
Map by: Brian Brettschneider

Record **Much Below** **Below** **Near Normal** **Above** **Much Above** **Record**

Compared to 1991-2020 Base Period (Records Since 1950)

Model- based regional analysis > Total precipitation

Precipitation Classification for Nov 2025



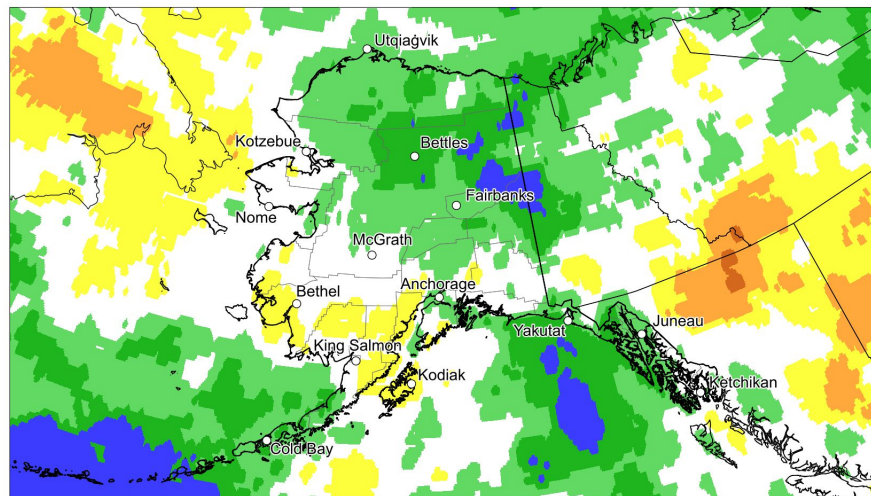
Source: ERA5 Reanalysis

Map by: Brian Brettschneider



Compared to 1991-2020 Base Period (Records Since 1950)

Precipitation Classification for Sep-Nov 2025



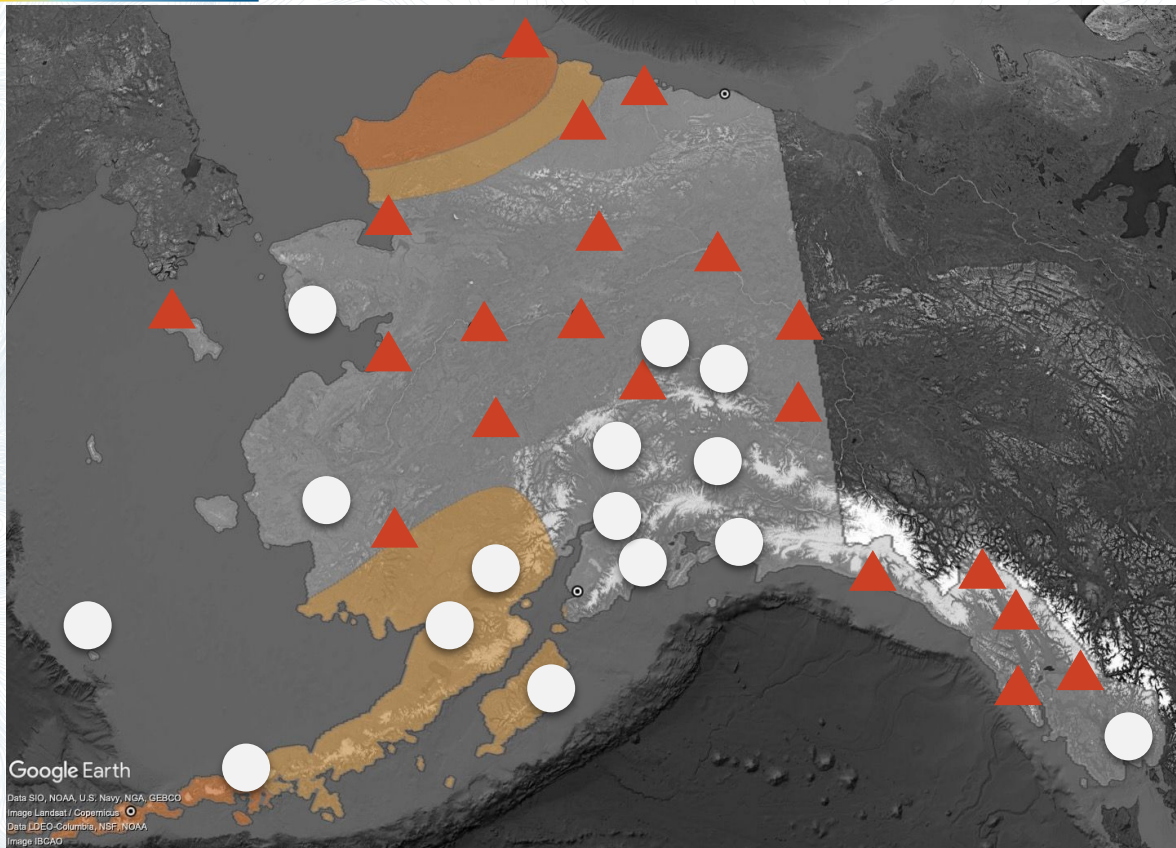
Source: ERA5 Reanalysis

Map by: Brian Brettschneider



Compared to 1991-2020 Base Period (Records Since 1950)

November 2025 temperature > CPC outlook and observed



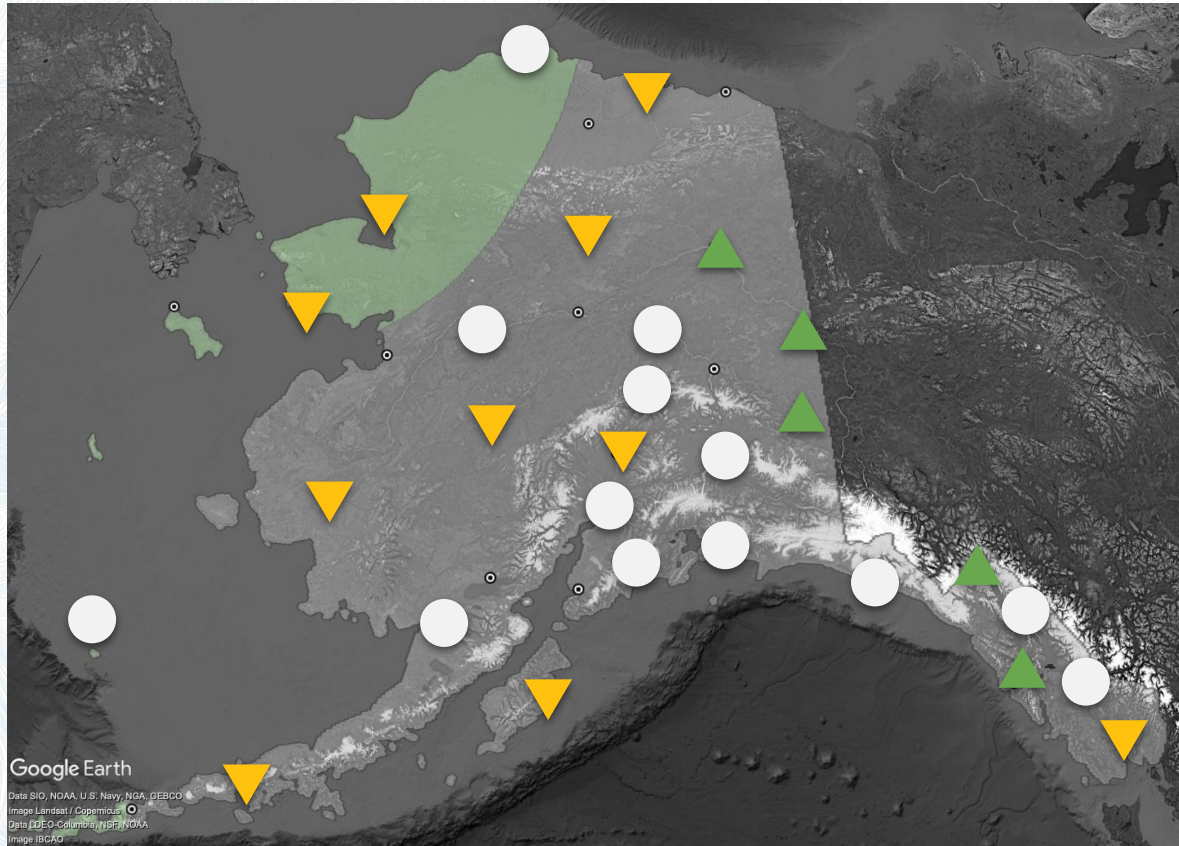
Non-EC skill
score: -20

Percent
correct: 20%

Mid-month
outlook

- ▲ Above normal
- Near normal
- ▼ Below normal

November 2025 precipitation > CPC outlook and observed



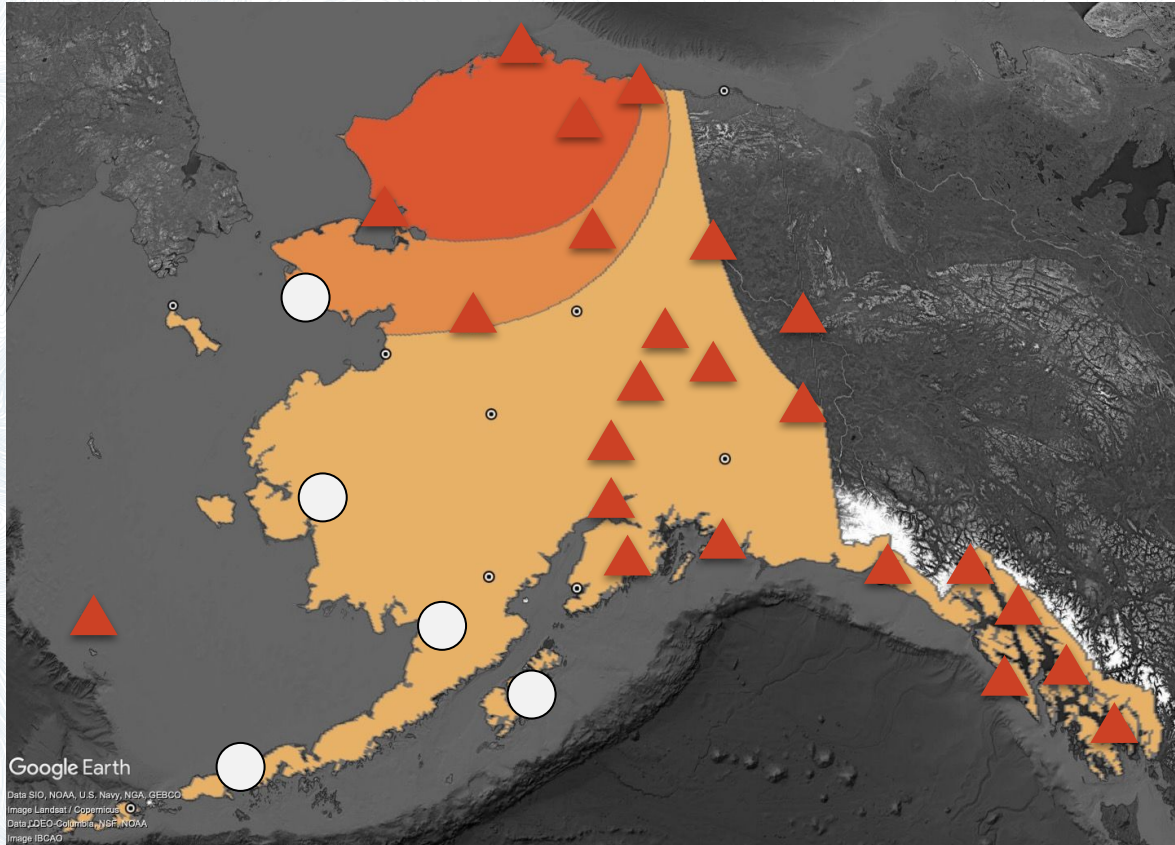
Non-EC skill
score: -50

Percent
correct: 0%

Mid-month
outlook

- ▲ Above normal
- Near normal
- ▼ Below normal

September-November 2025 temperature > CPC outlook & observed

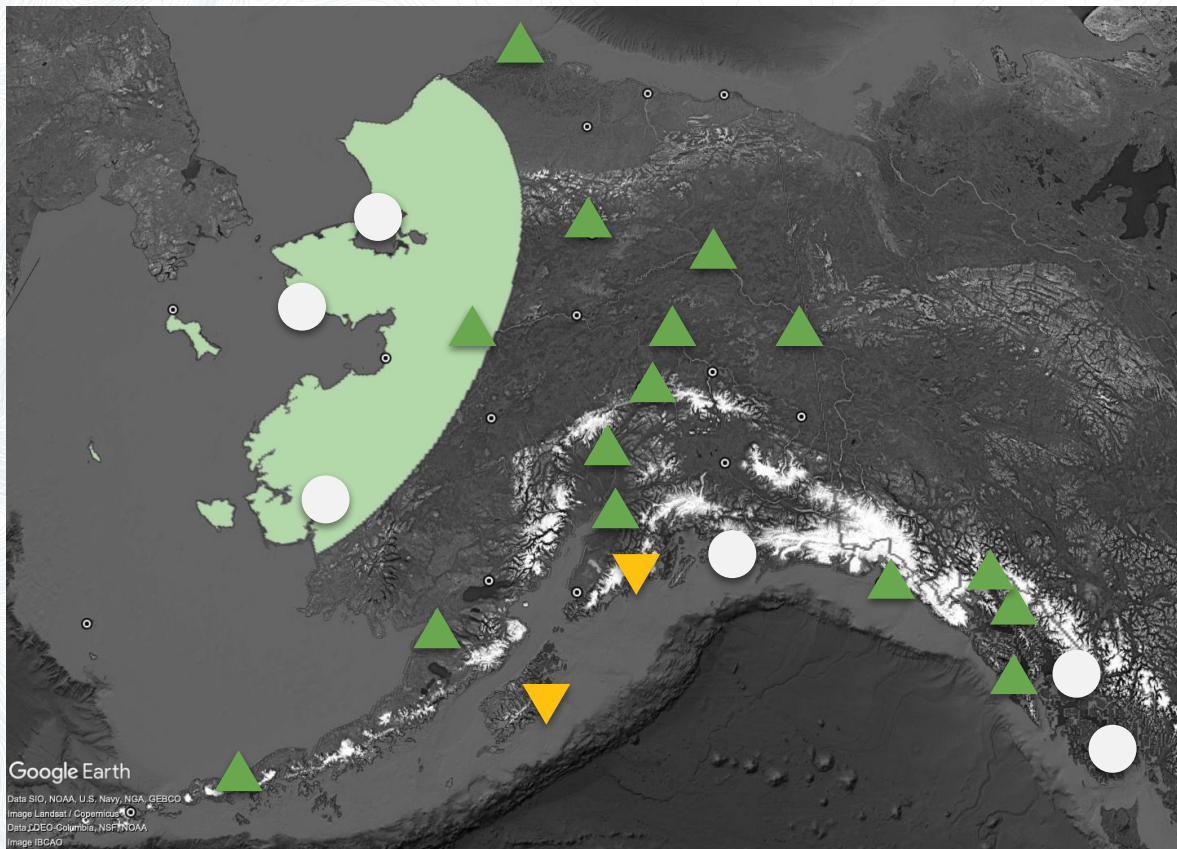


Non-EC skill
score: +72

Percent
correct: 81%

- ▲ Above normal
- Near normal
- ▼ Below normal

September-November 2025 precipitation > CPC outlook & observed

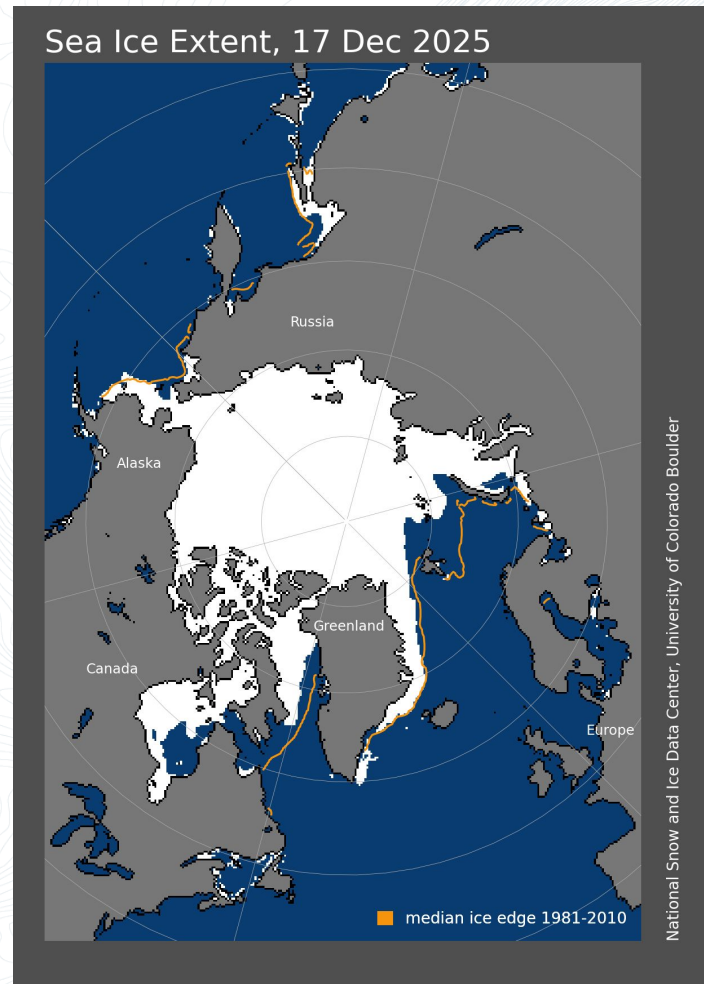
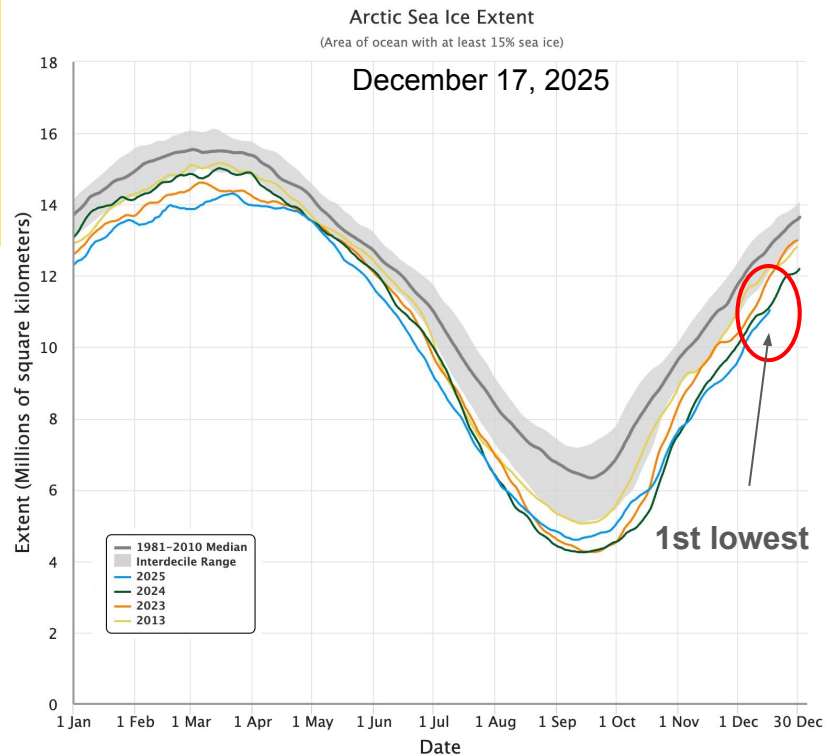


Non-EC skill
score: -13

Percent
correct: 25%

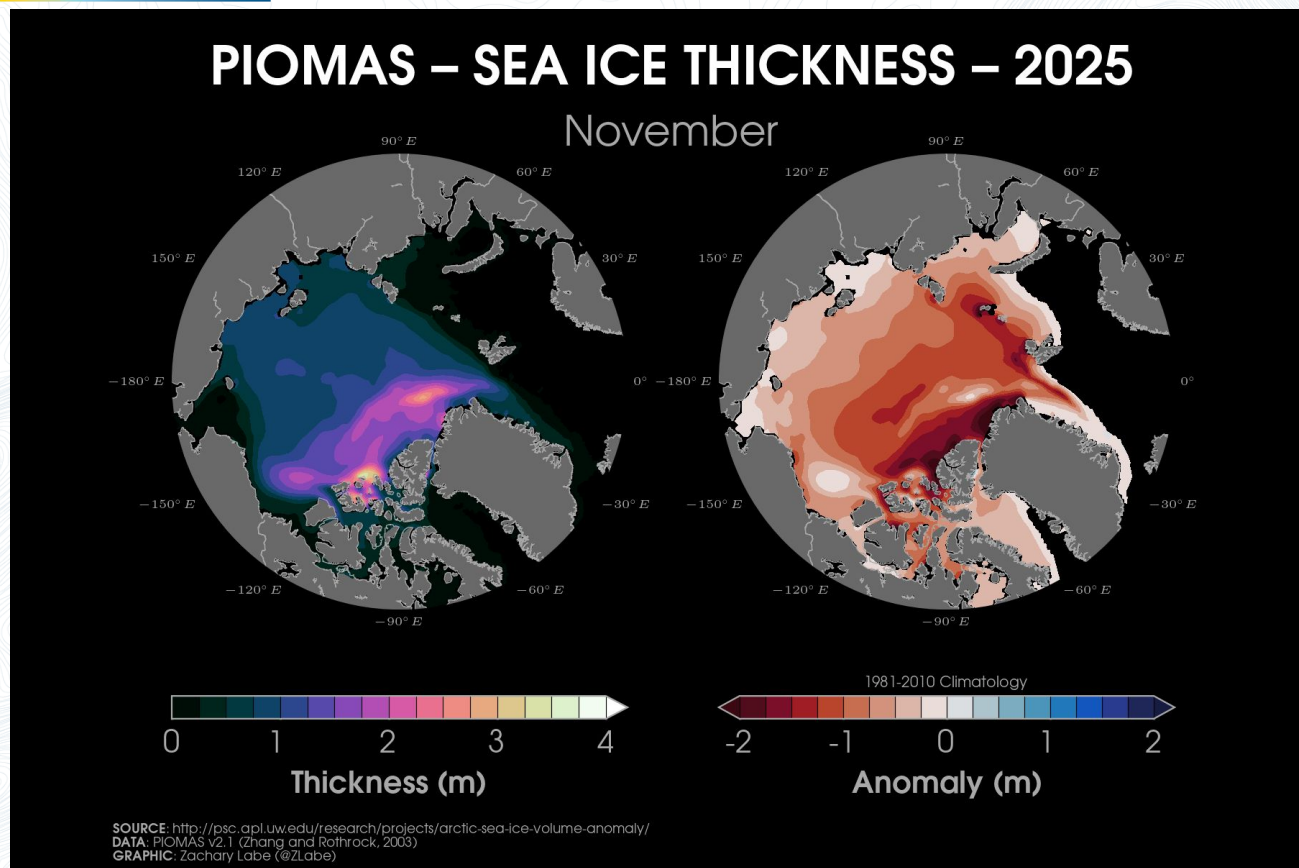
- ▲ Above normal
- Near normal
- ▼ Below normal

Arctic wide sea ice



Arctic sea ice thickness

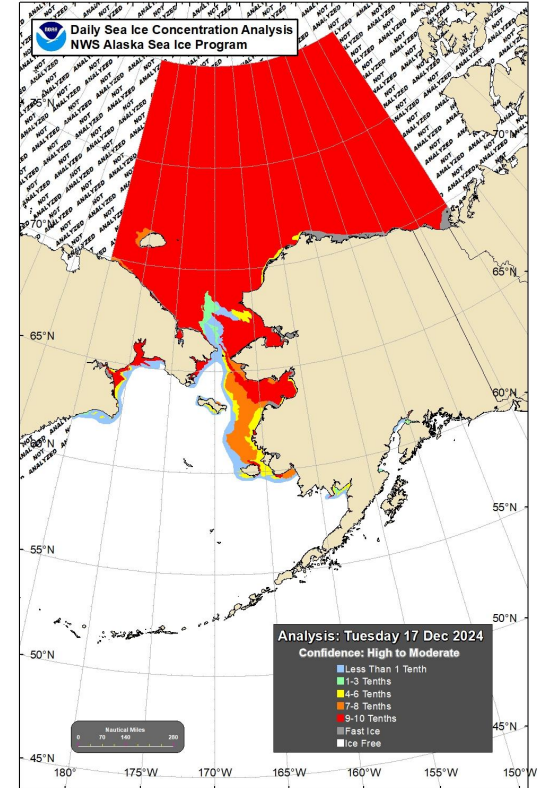
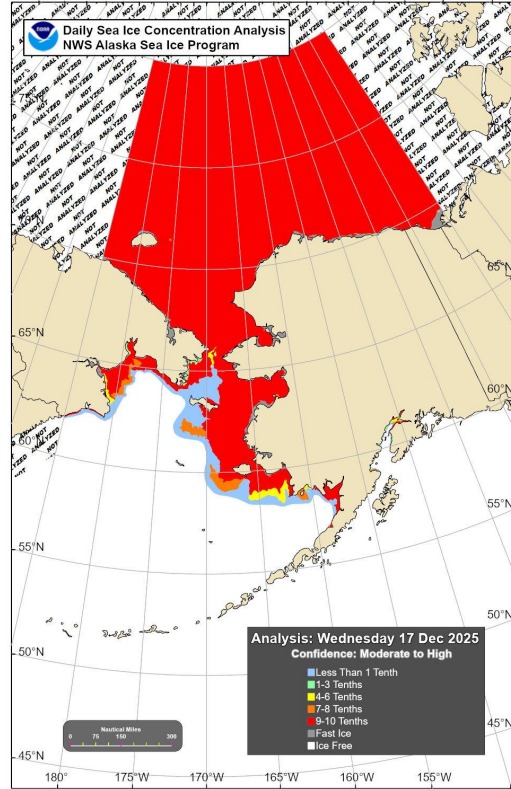
Sources:
Data from U.
Wa./PIOMAS data
Graphics by Z. Labe



December 17, 2025

December 17, 2024

Mid-December sea ice comparison

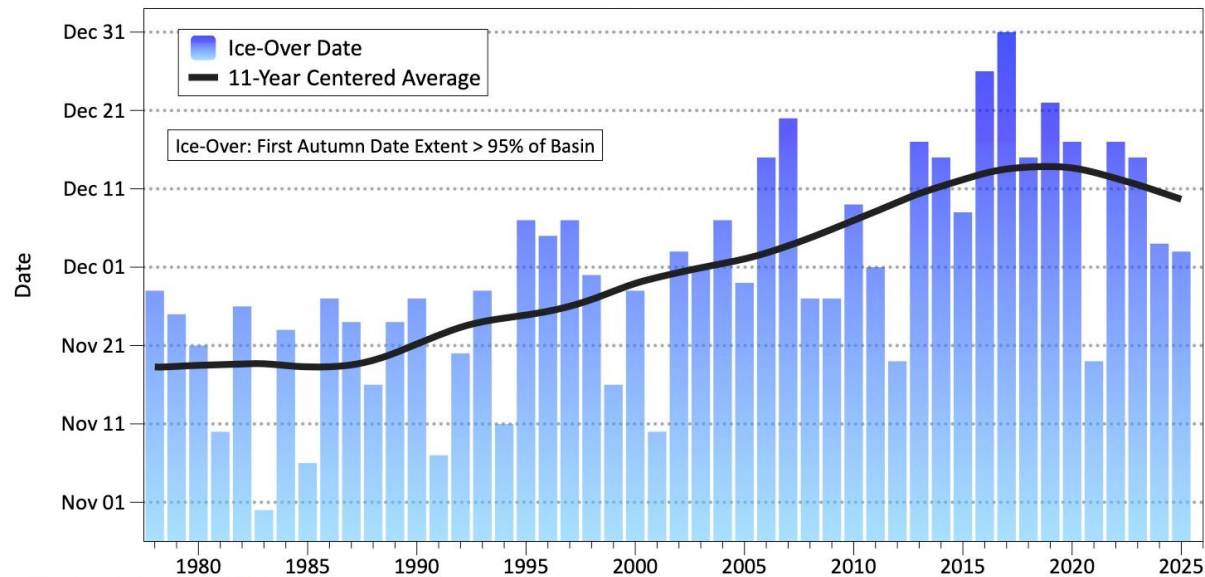


Source: National Weather Service
Alaska Region Sea Ice Program

End of the open water season

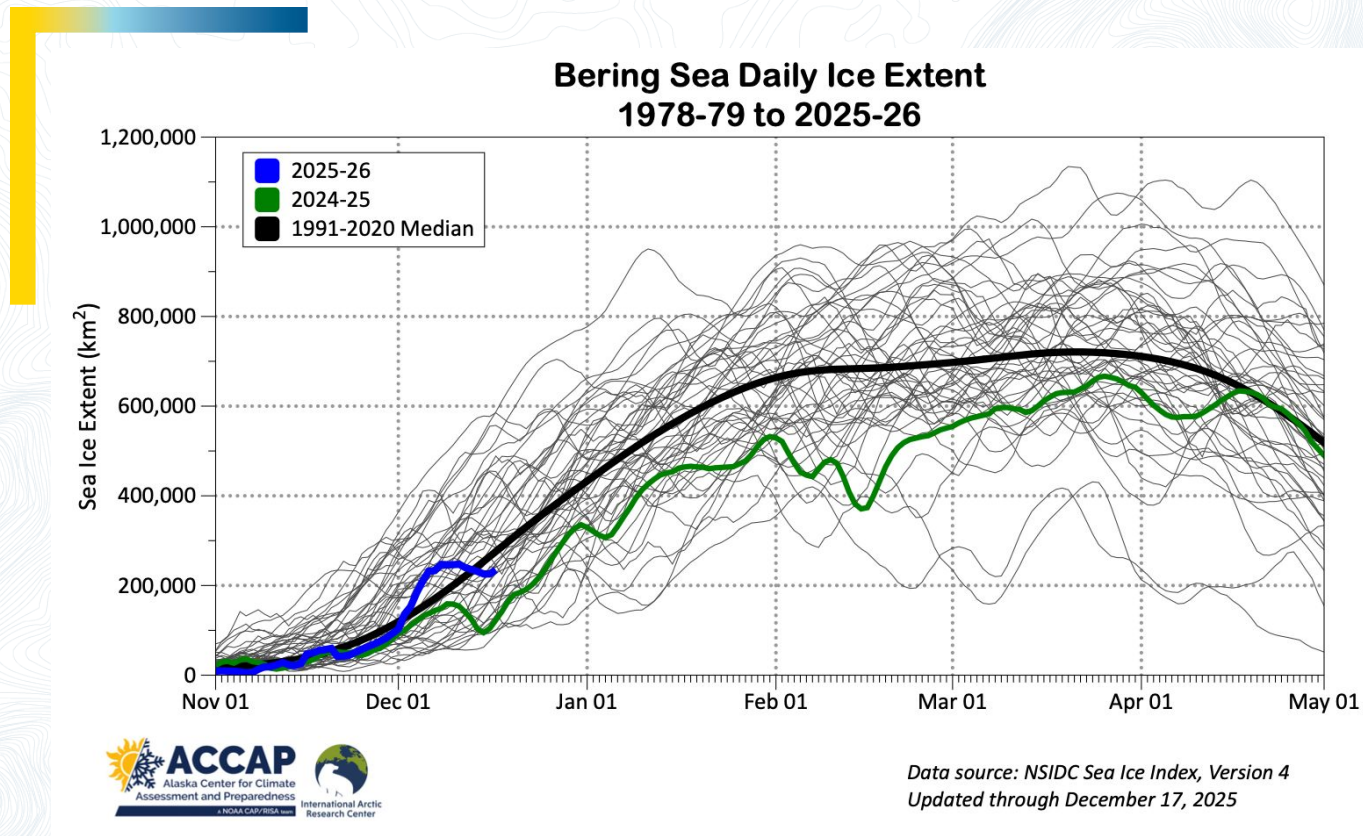
Sources:
Data NSIDC Sea Ice Index,
Version 4.

Chukchi Sea Autumn Ice-Over Date 1978-2025

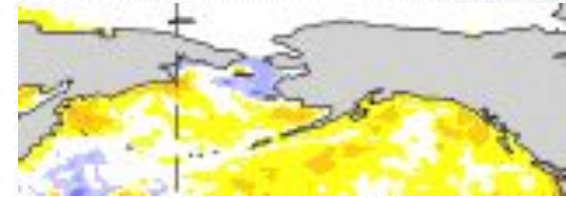
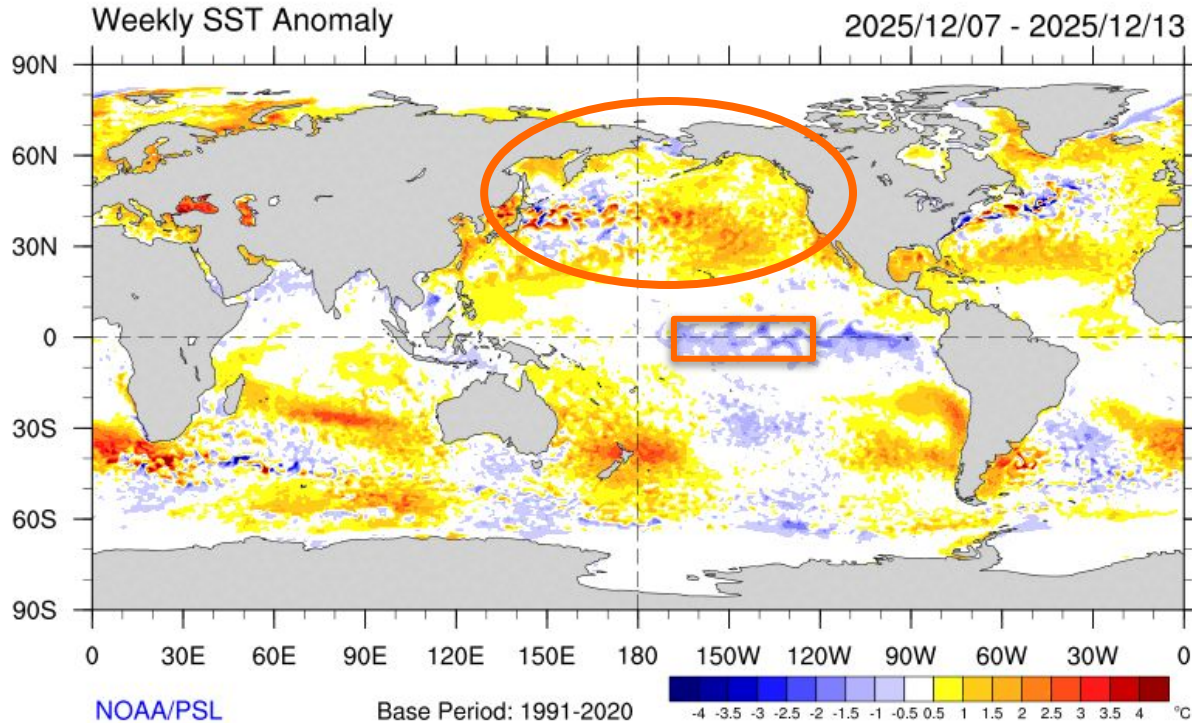


Sea ice extent through the season

Sources:
Data NSIDC Sea Ice Index,
Version 4.



Global sea surface temperature departure from normal



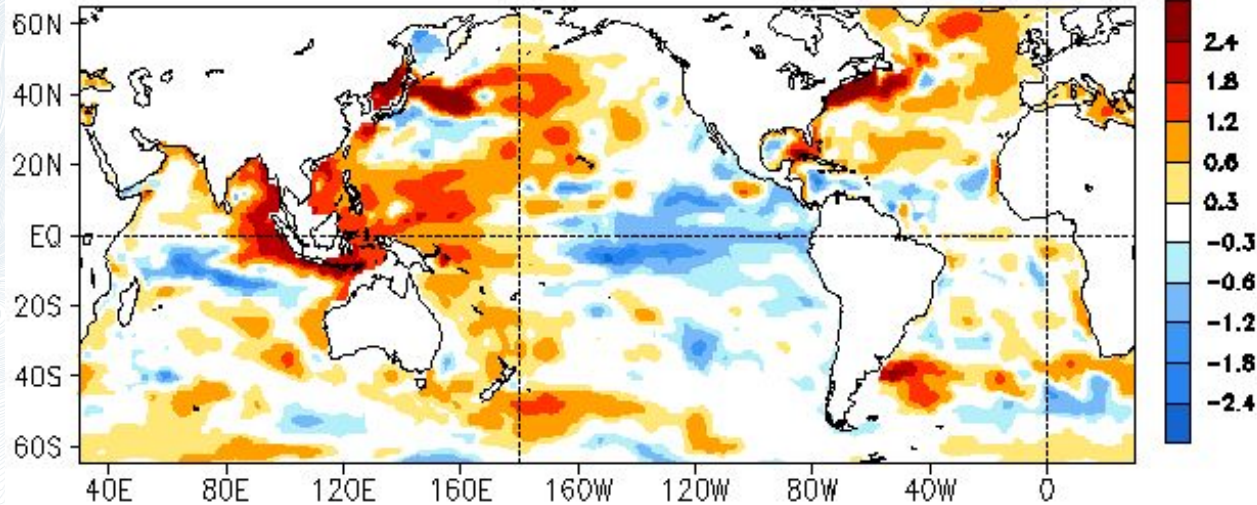
ONI for **Sep-Nov**: -0.6

PDO for **Nov 2025**: -1.0

Sources: ONI from CPC
PDO Index from WCS

Upper ocean heat departure from average

NOV 2025 Heat Content Anomaly (°C)
(GODAS, Clima. 91-20)



Little change near Alaska

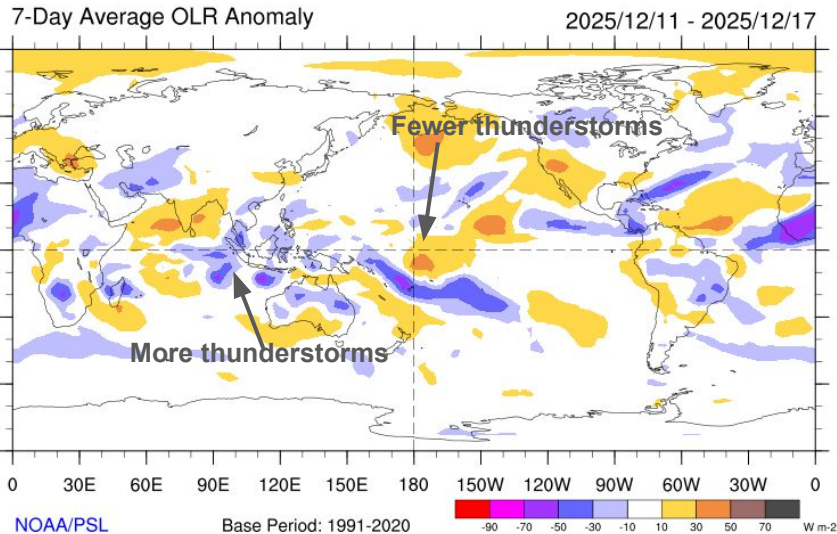
Upper 300 meters of the ocean

Source: NOAA/CPC

Tropical Pacific atmosphere

Sep-Nov Oceanic Niño Index: -0.6

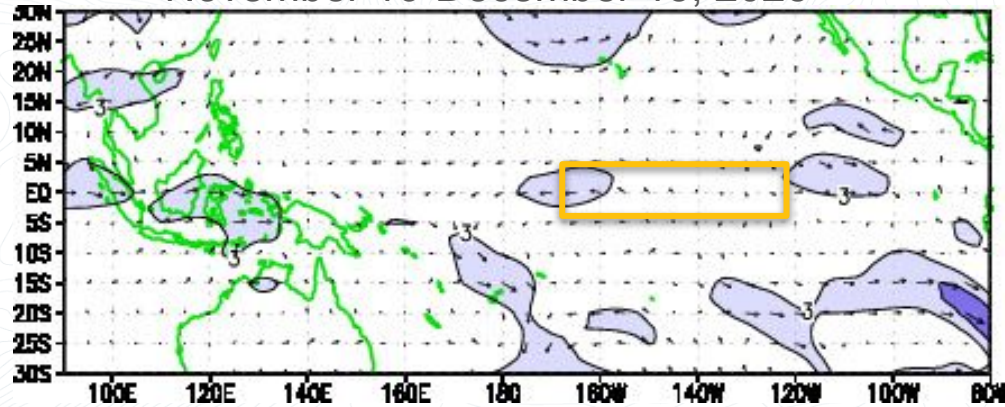
Deep tropical convection
Via “outgoing longwave radiation”



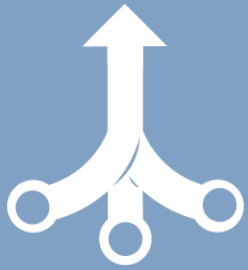
Trade winds close to normal
Niño Region 3.4



Trade winds
850 mb wind difference from average
November 16-December 15, 2025



Behind the
climate
forecast



El Niño/La Niña (ENSO) > expert
evaluation

Statistical models > using the past

- Temperature and Precipitation

Dynamical models > All physics, all
the time

- Sea surface temperatures
- Sea Ice
- Temperature and Precipitation

CPC Niño 3.4 forecasts > experts

November 2025

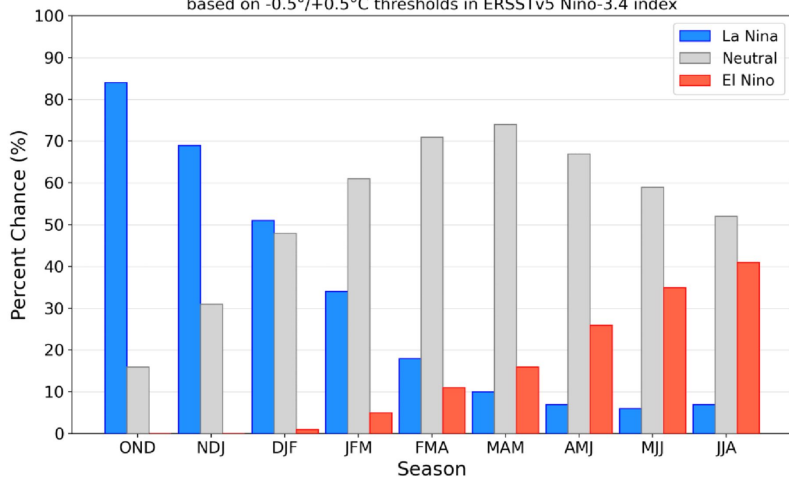
December 2025

ENSO Alert System Status:

La Niña Advisory

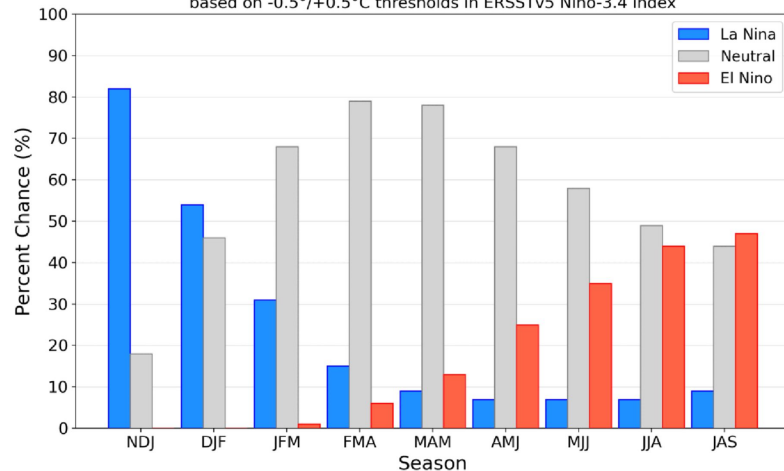
Official NOAA CPC ENSO Probabilities (issued November 2025)

based on $-0.5^{\circ}/+0.5^{\circ}\text{C}$ thresholds in ERSSTv5 Niño-3.4 index



Official NOAA CPC ENSO Probabilities (issued December 2025)

based on $-0.5^{\circ}/+0.5^{\circ}\text{C}$ thresholds in ERSSTv5 Niño-3.4 index



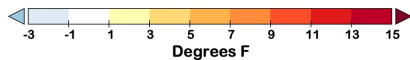
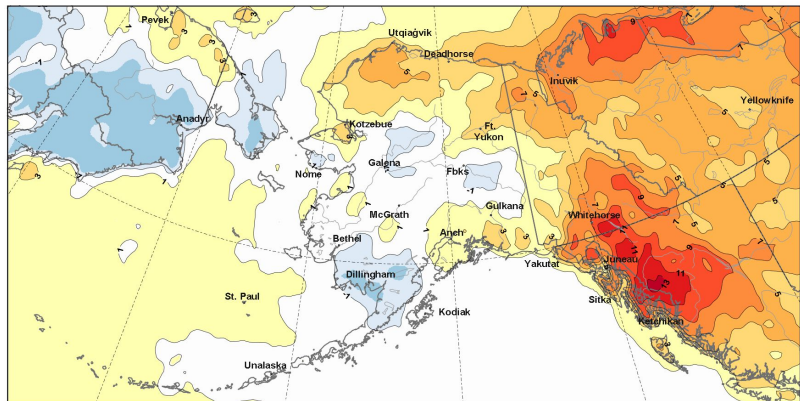
**Statistical
guidance** ➤
using the past
to predict the
future

- Long term trends
- Optimum climate normals: Alaska trends the past 15 years
- What happened in past La Niñas

January half century trends

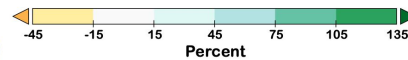
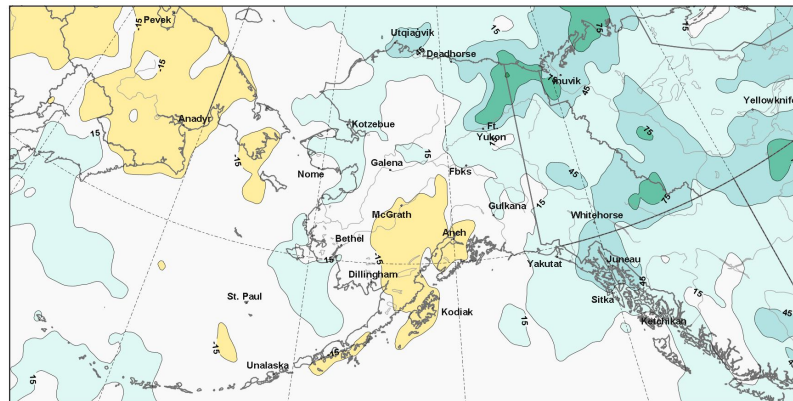
Temperatures

Change in January average temperature
1976-2025



Precipitation

Percent change in January average precipitation
1976-2025

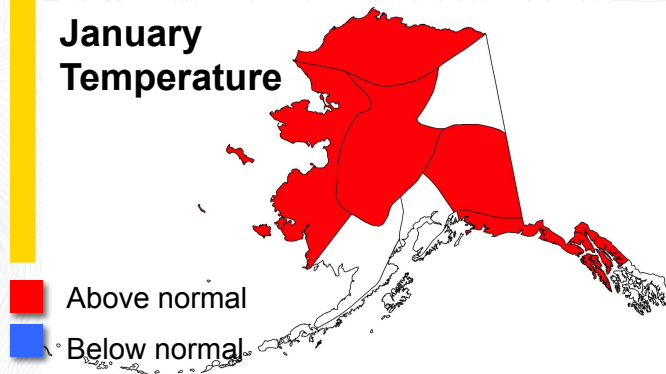


Change in the average
over 50 years

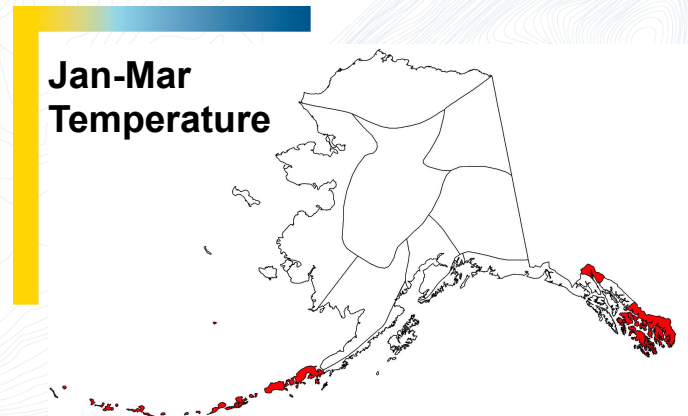
2011 to 2025 trends

Past 15 years compared to 1991-2020

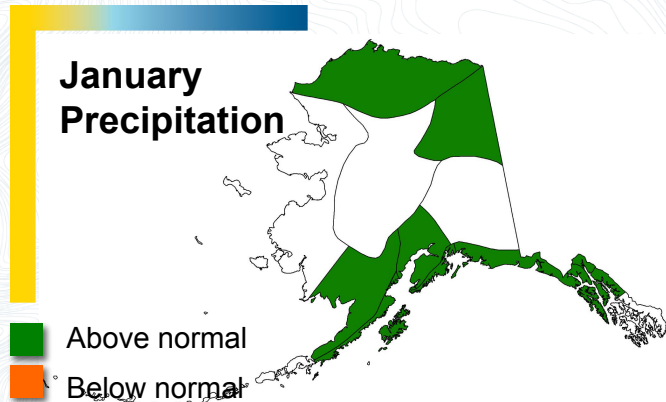
January Temperature



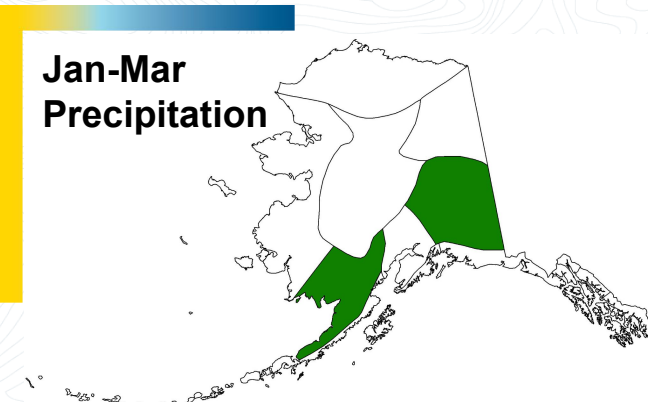
Jan-Mar Temperature



January Precipitation



Jan-Mar Precipitation



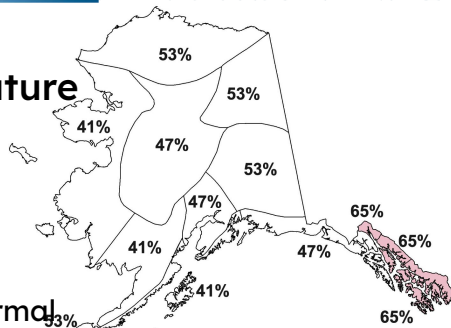
17 La Niña since 1976

1983, 1984, 1988, 1995, 1998, 1999, 2000, 2005, 2007, 2009, 2010, 2011, 2016, 2017, 2020, 2021, 2022 (these are the start years)

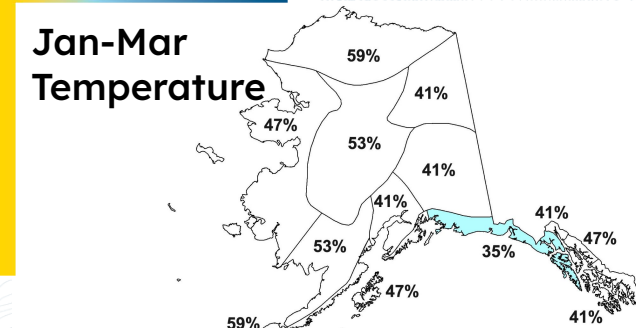
Percent years above average

January Temperature

Above normal
Below normal

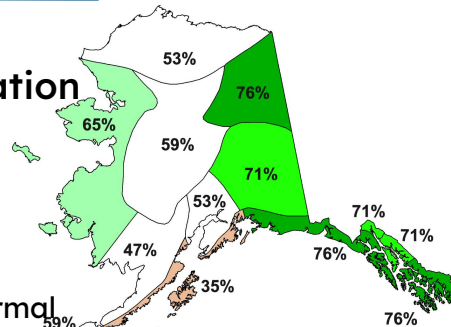


Jan-Mar Temperature

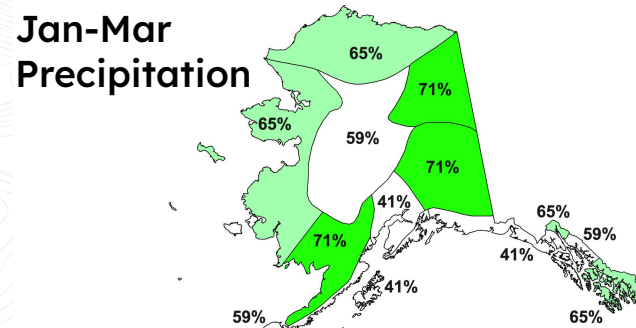


January Precipitation

Above normal
Below normal



Jan-Mar Precipitation



Dynamic model forecasts

Current suite of Dynamic Climate Models

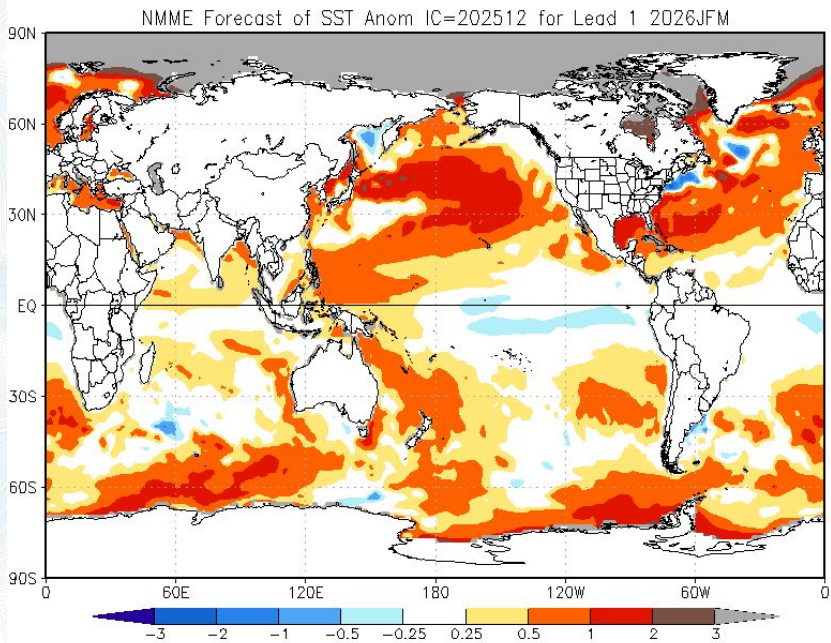
- CPC Experimental Sea Ice Ensemble
- World Climate Service Multi-Model Ensemble
- North American Multi-Model Ensemble (NMME)

What's being forecasted

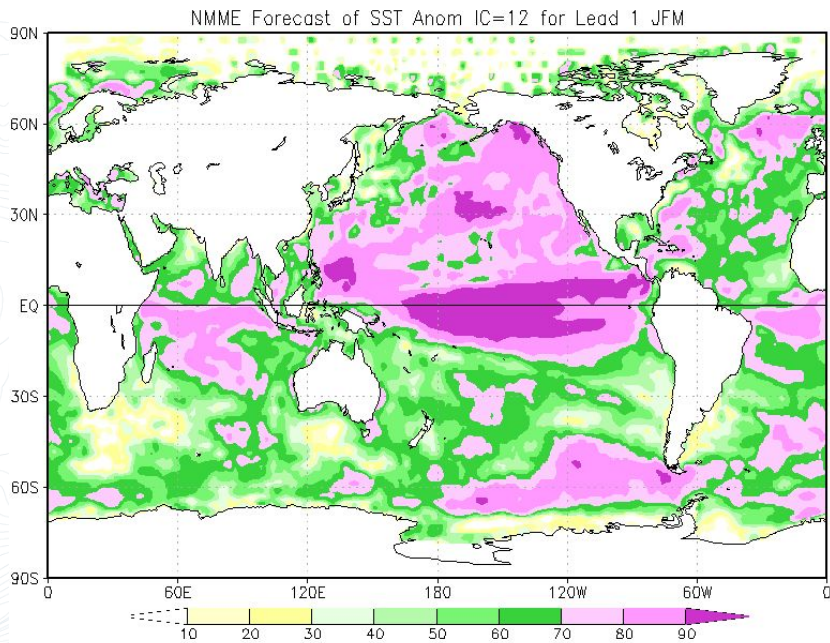
- Sea surface temperatures relative to normal
- Sea ice forecast
- Temperature and precip relative to normal

January-March 2026 sea surface temperature ➤ NMME

Forecast
departure from normal

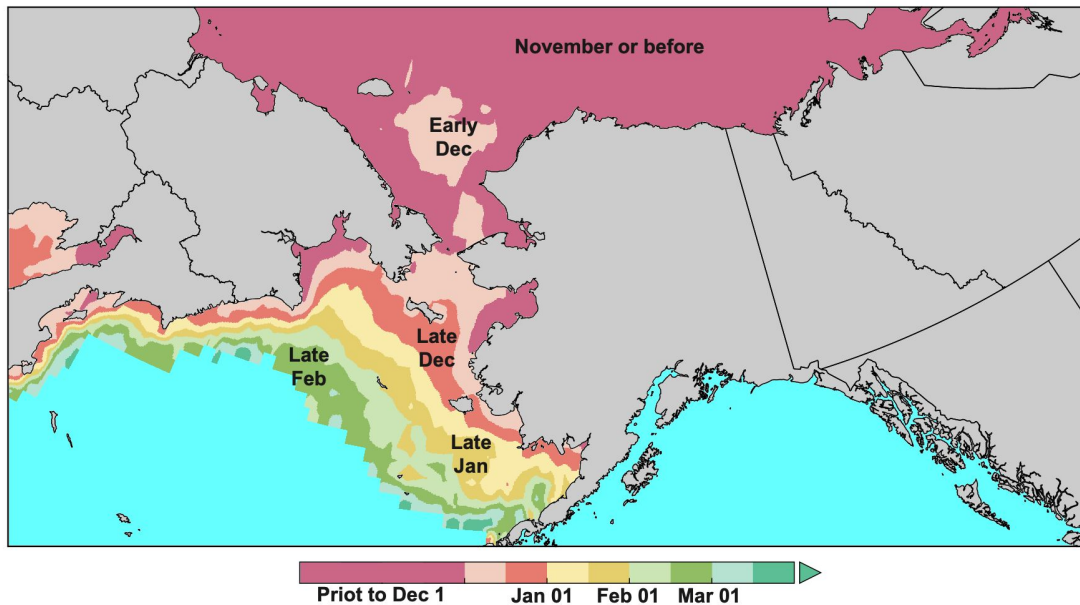


Skill
of the forecast



Experimental sea ice forecast > CPC

First sea ice concentration 15 percent or higher
Fall/Winter 2025-26



Forecast made in late November
Data: NOAA/CPC Exp. Sea Ice Outlook

The 20-models
average of first date
with ice concentration
15 percent or higher
From data though late November

January 2026 calibrated probability forecast ➤ NMME

Forecast from →

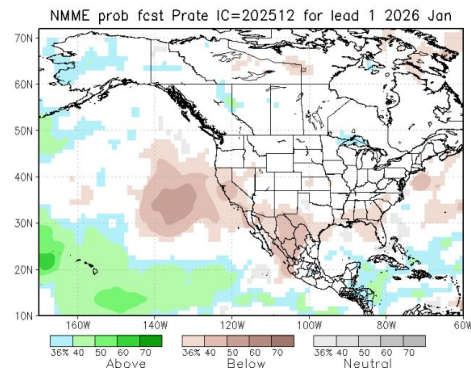
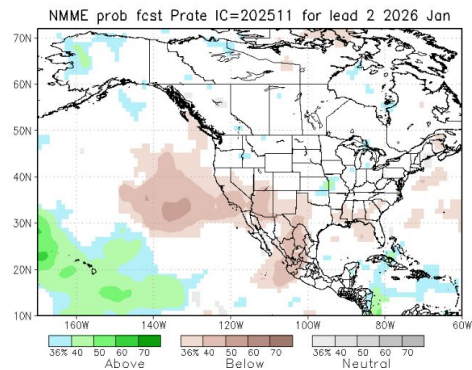
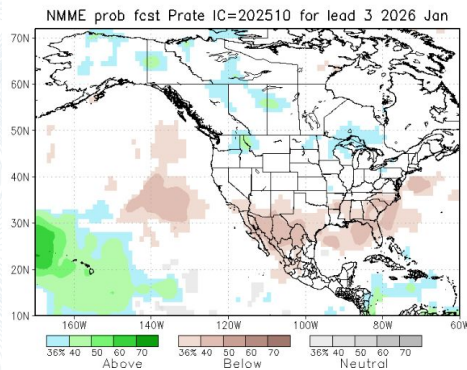
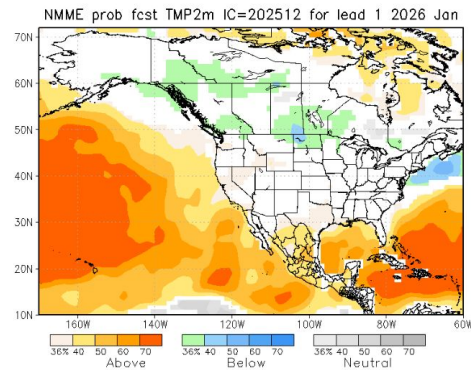
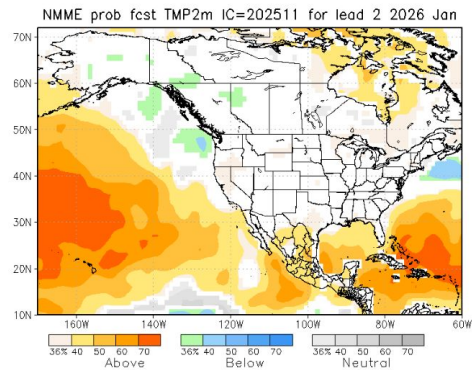
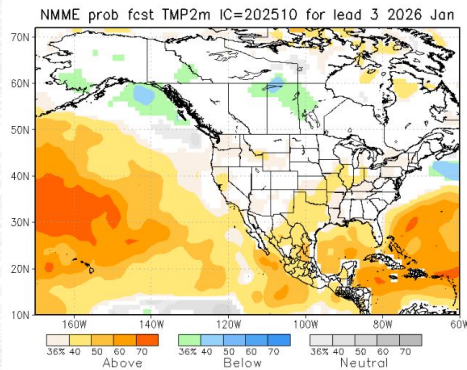
October

November

December

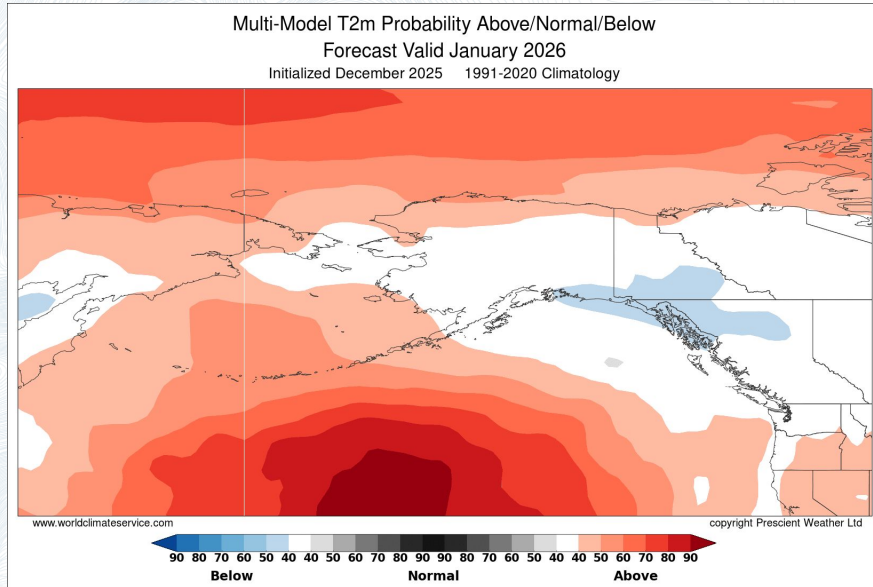
Temperature

Precipitation

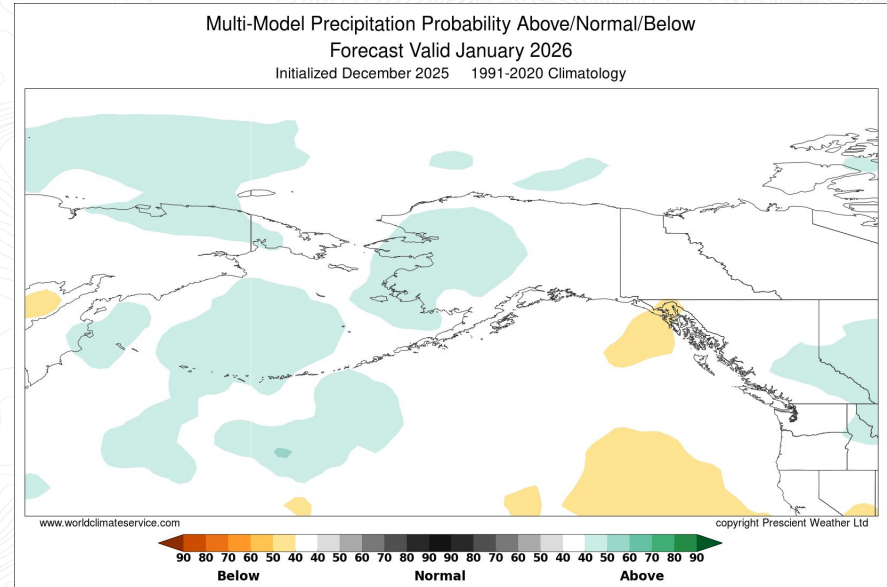


January 2026 outlooks ➤ World Climate Service

Temperature



Precipitation



Bias Corrected, Skill Weighted CFS + ECMWF

January-March 2026 calibrated probability forecast ➤ NMME

Forecast from →

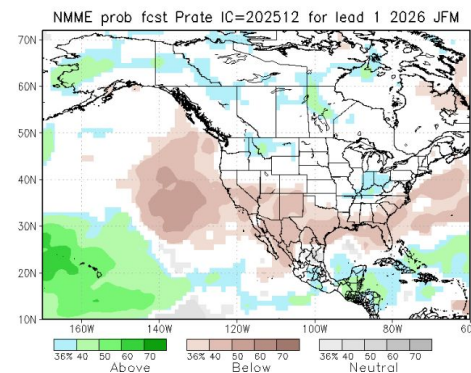
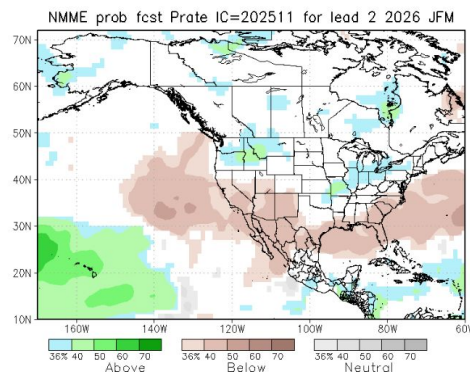
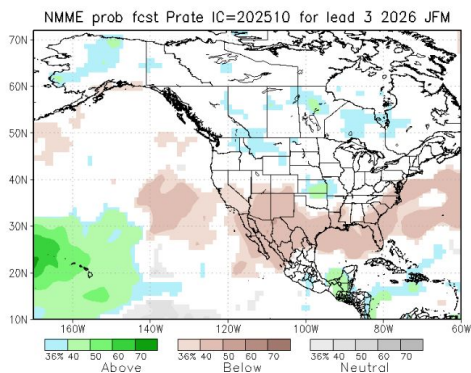
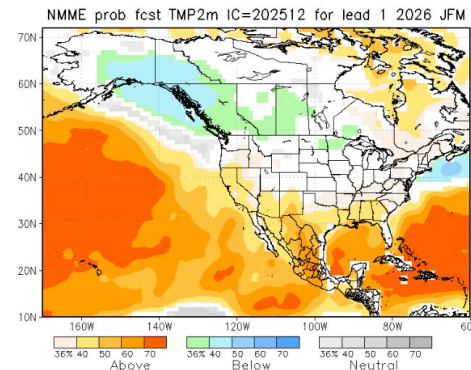
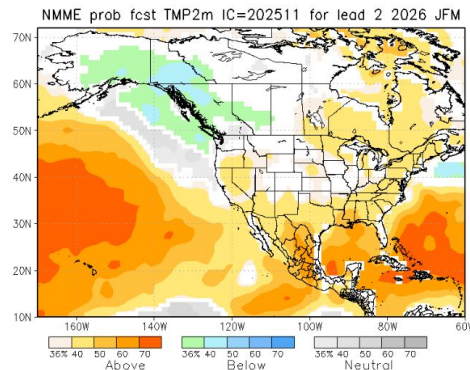
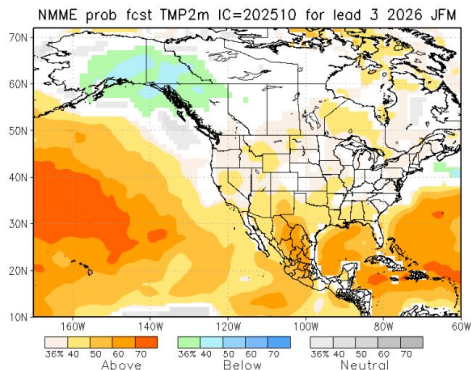
October

November

December

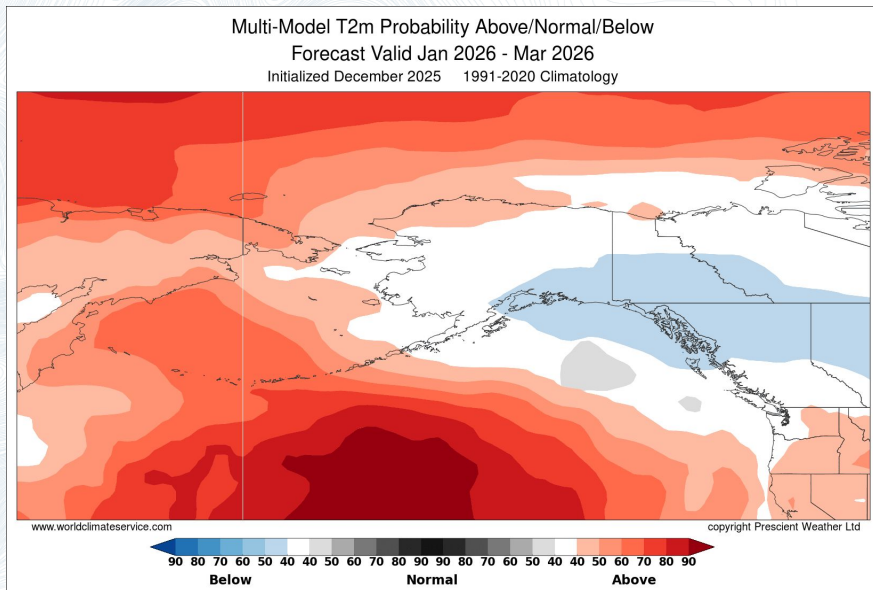
Temperature

Precipitation

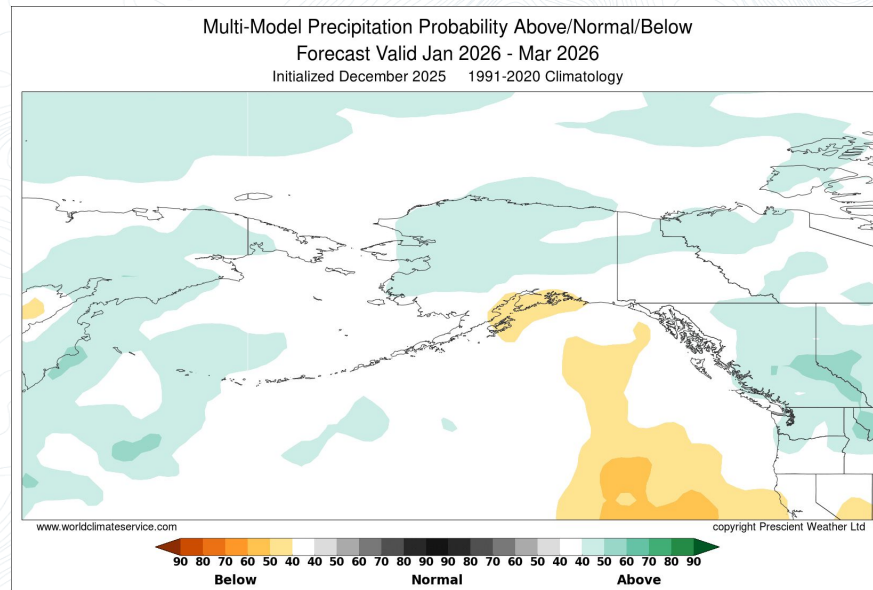


January-March 2026 outlooks > World Climate Service

Temperature

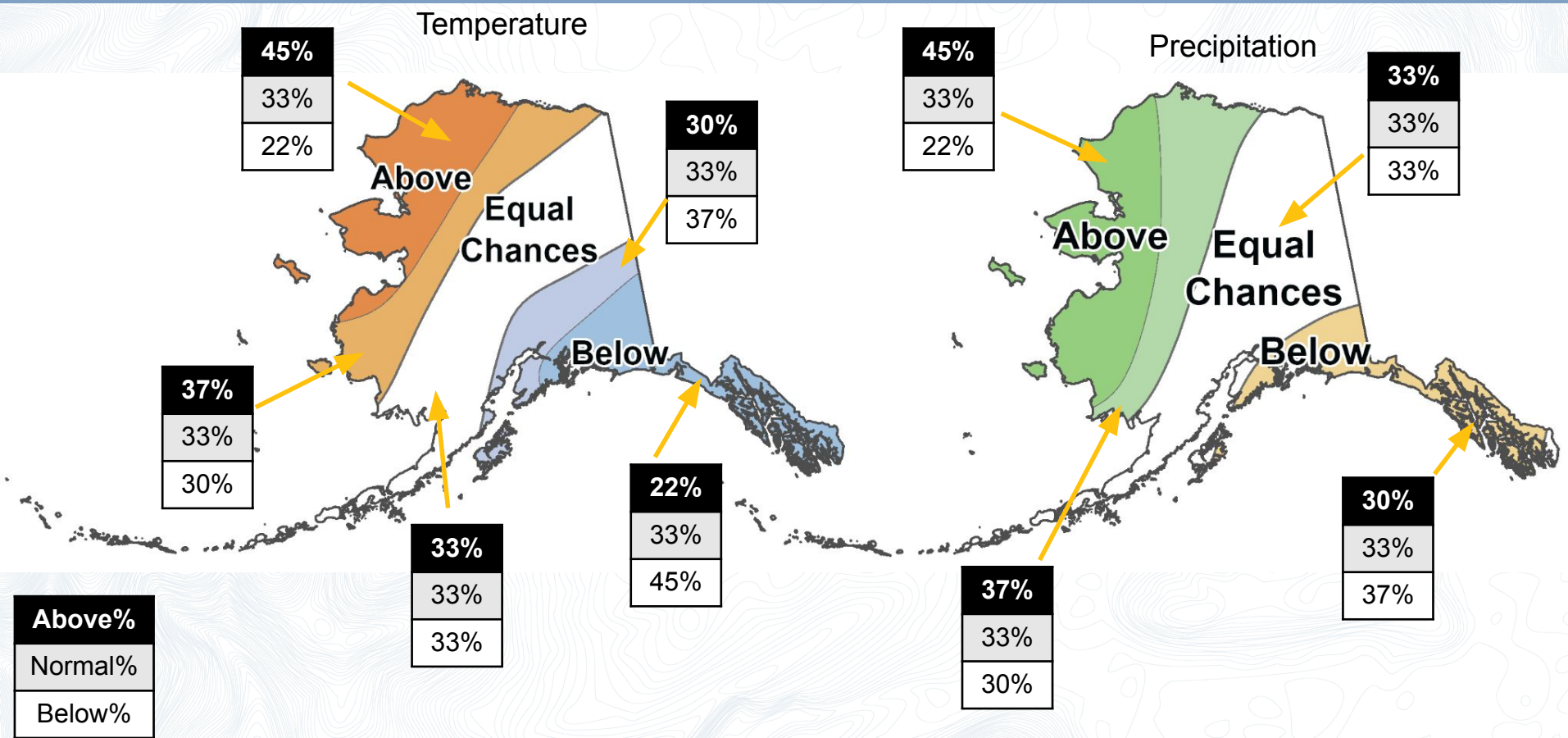


Precipitation



Bias Corrected, Skill Weighted CFS + ECMWF

January-March 2026 outlooks from **November**



Future
outlook



And the answer is...

CPC January 2026 outlooks

Temperature

Precipitation

33%
33%
33%

Equal Chances

30%
33%
37%

12%
33%
55%

Below

37%
33%
30%

22%
33%
45%

45%
33%
22%

Above

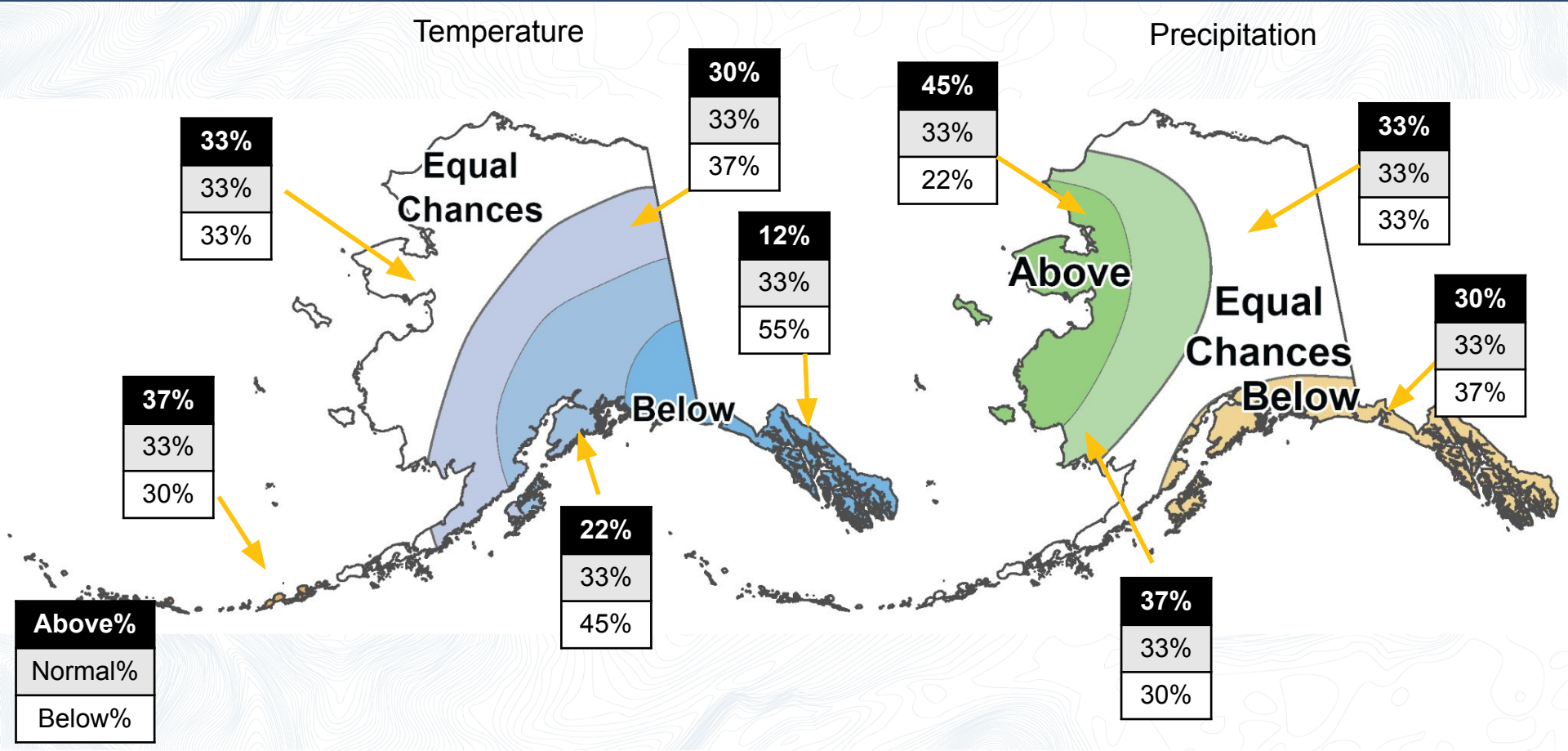
Equal Chances
Below

33%
33%
33%

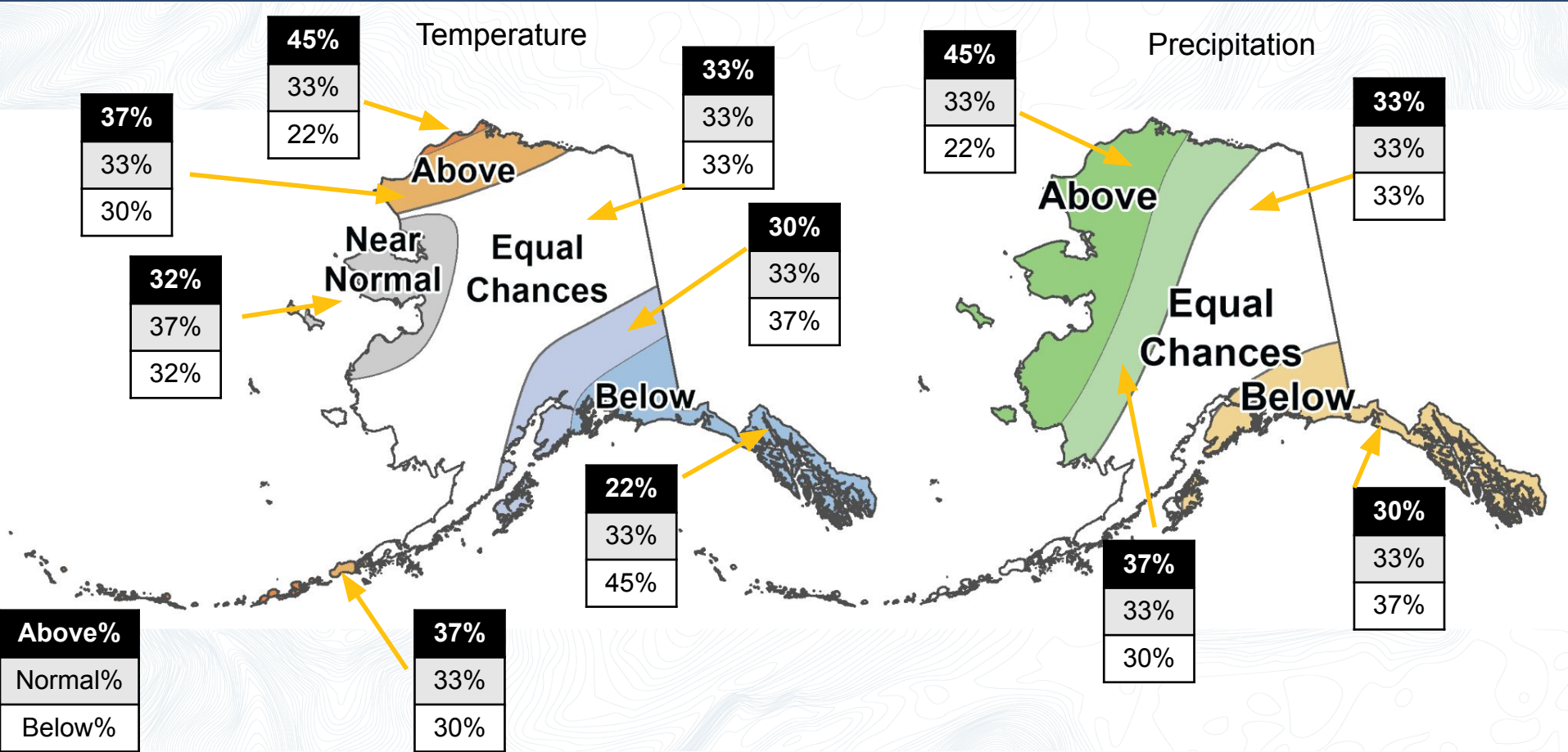
30%
33%
37%

37%
33%
30%

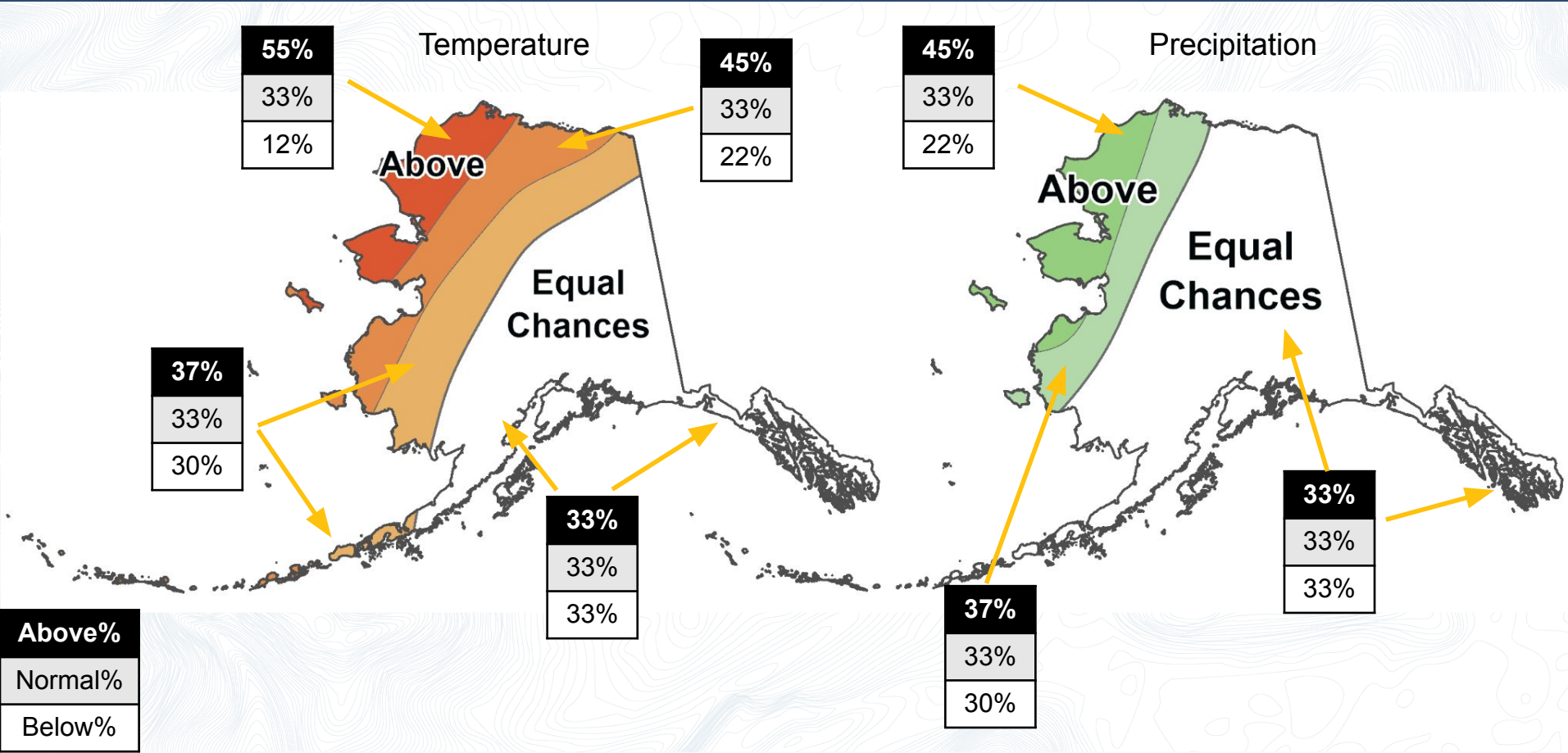
Above%
Normal%
Below%



CPC January-March 2026 outlooks



CPC Spring 2026 outlook



Upcoming ACCAP webinars

Upcoming ACCAP webinars accap.uaf.edu/events

- January 16 ▶ NWS Monthly Climate Outlook Briefing
- January 21 ▶ A Practical and Scientific Guide to Using Windy.com in Alaska
- January 27 ▶ Arctic Report Card Review

For more info email Ed Plumb ewplumb@alaska.edu



A NOAA CAP/RISA team



ACCAP is housed at the International Arctic
Research Center on the University of Alaska
Fairbanks Troth Yeddha' Campus