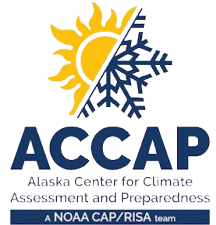




Alaska climate outlook briefing September 2025

Rick Thoman
ACCAP Climate Specialist
September 19, 2025





Seasonal
climate
forecasting



Recent
Happenings



Climate
review and
forecast report
card



Behind the
climate
forecast



Future
outlooks

Seasonal
climate
forecasting

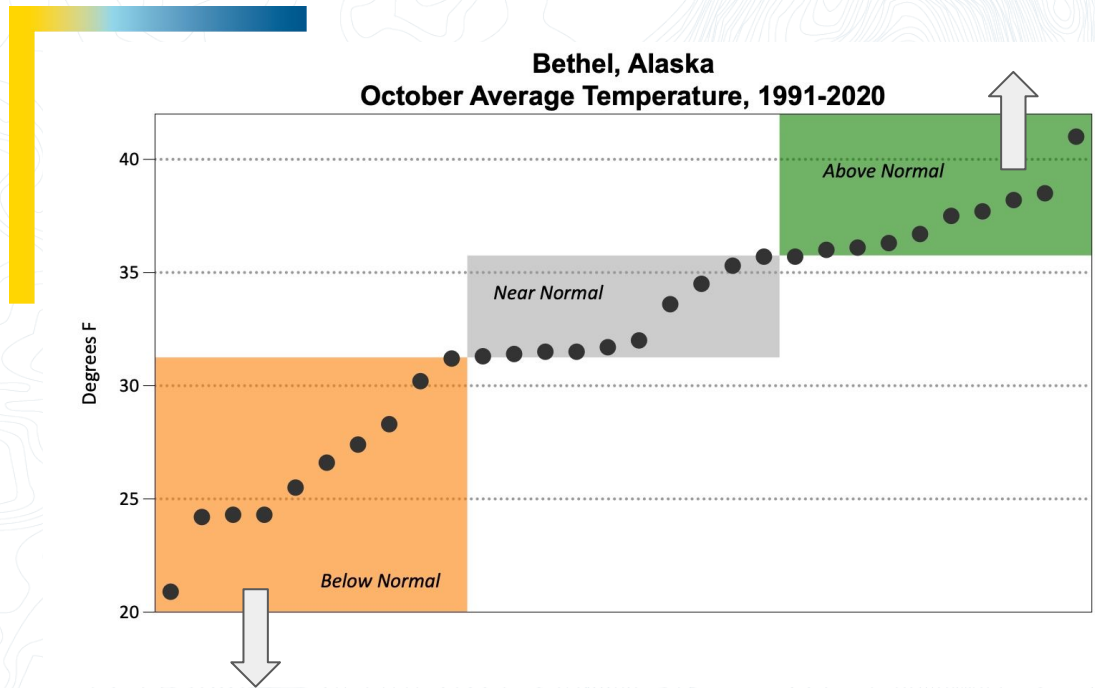


NOAA Center for Weather and Climate Prediction

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

- Late August Koyukuk and Kobuk river valleys
 - State disaster declaration at Allakaket
 - Dalton Highway and Wiseman Road closures
- Late August Susitna valley
 - Talkeetna River highest crest since 2012
- Mid-september Southeast Alaska storminess
 - Ketchikan 7.66 inches rain Sep 15, 4th highest daily total
 - Damaging winds Sitka and Juneau



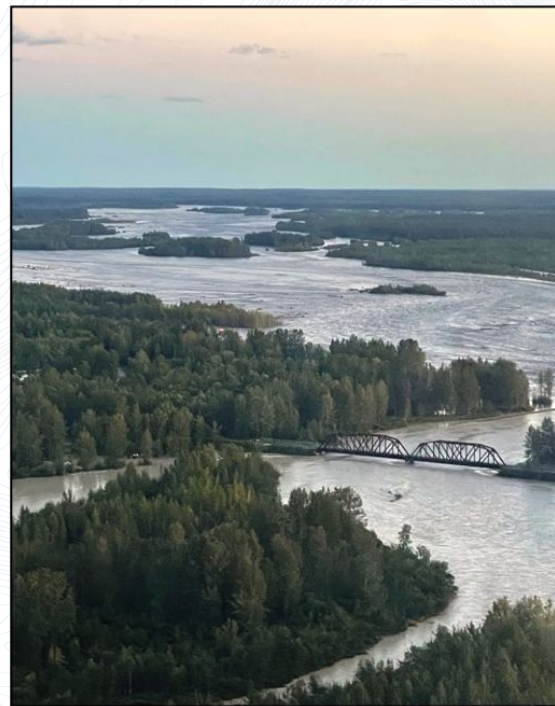
Allakaket flooding
August 2025

Photo credit: AP RiverForecast Center



Climate Review

- What happened?
- How did climate outlooks perform?

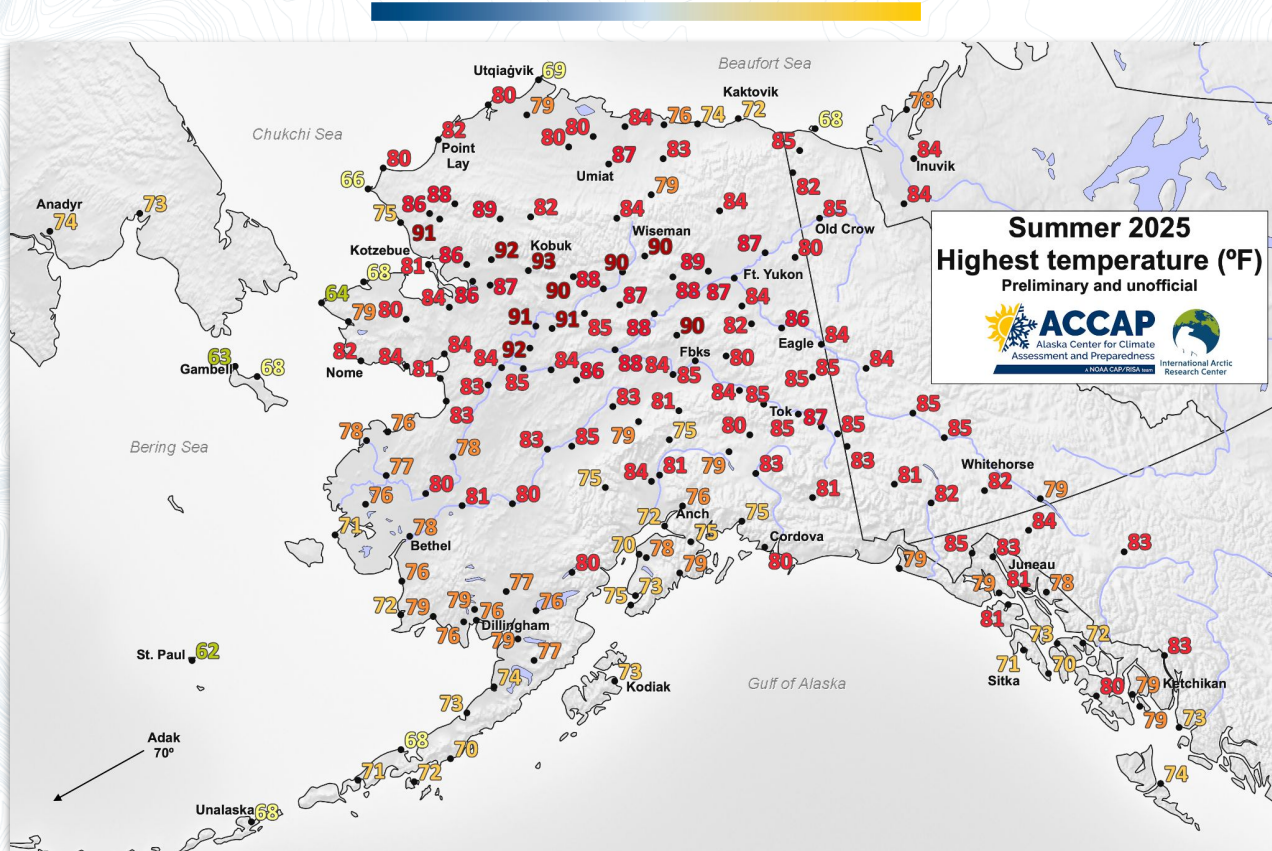


Flooding on the Talkeetna River

August 29, 2025

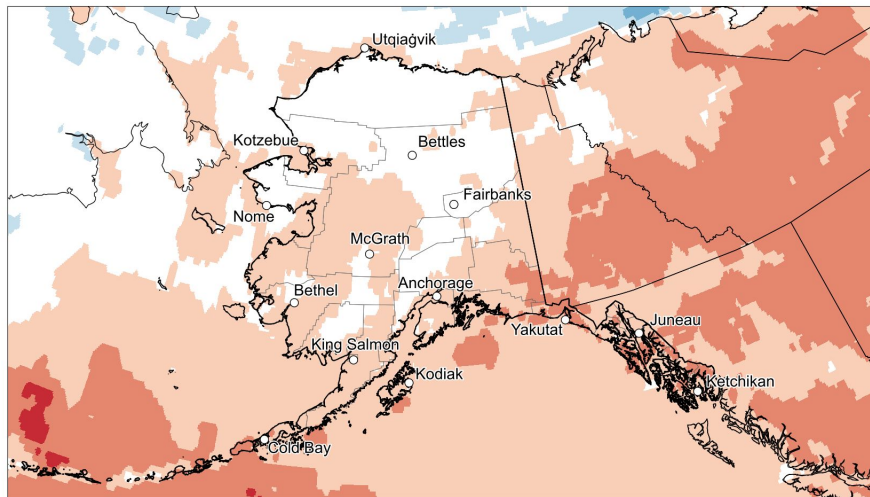
Photo courtesy K. Writer

Summer 2025 highest temperatures



Model- based regional analysis ➤ Average temperatures

Temperature Classification for Aug 2025



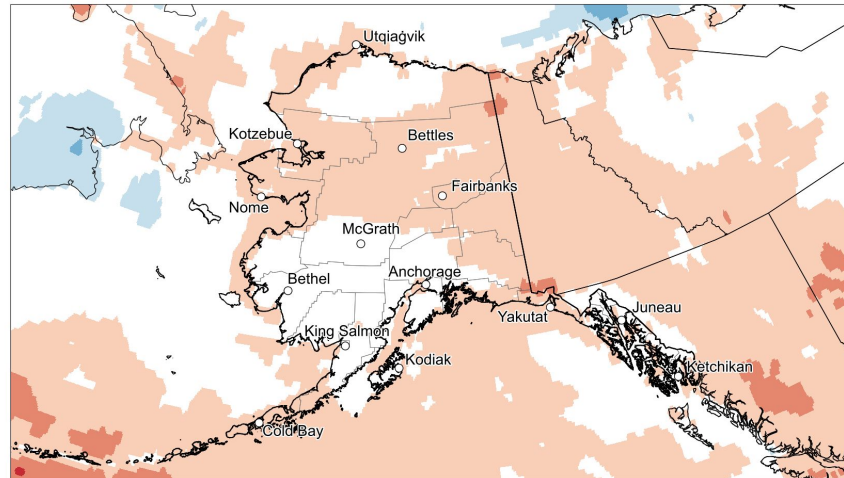
Source: ERA5 Reanalysis

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 Jun-Aug 2025



Source: ERA5 Reanalysis

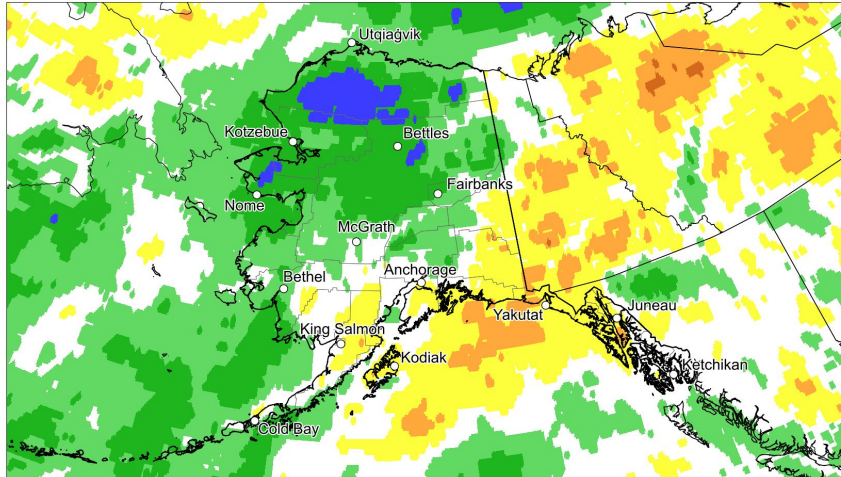
Map by: Brian Brettschneider

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 Aug 2025



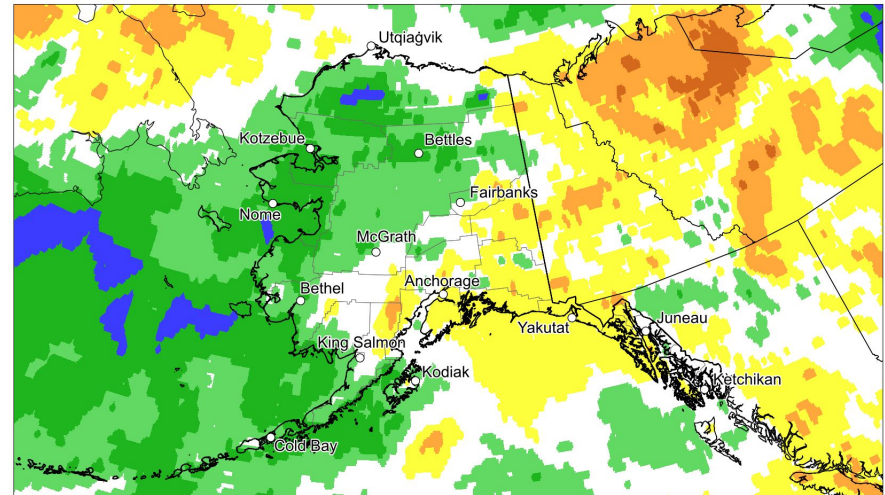
Source: ERA5 Reanalysis

Map by: Brian Brettschneider

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

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

Precipitation Classification for Jun-Aug 2025



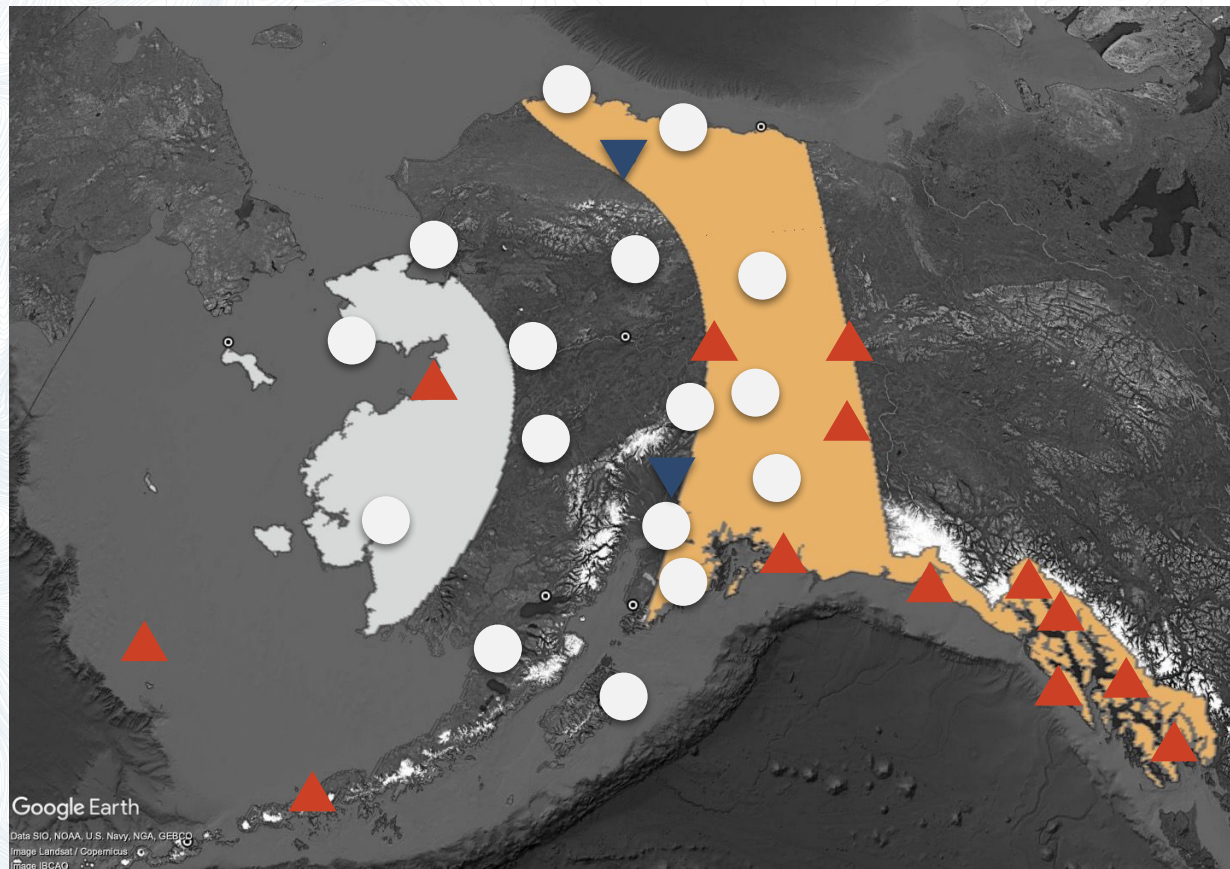
Source: ERA5 Reanalysis

Map by: Brian Brettschneider

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

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

August 2025 temperature ➤ CPC outlook and observed



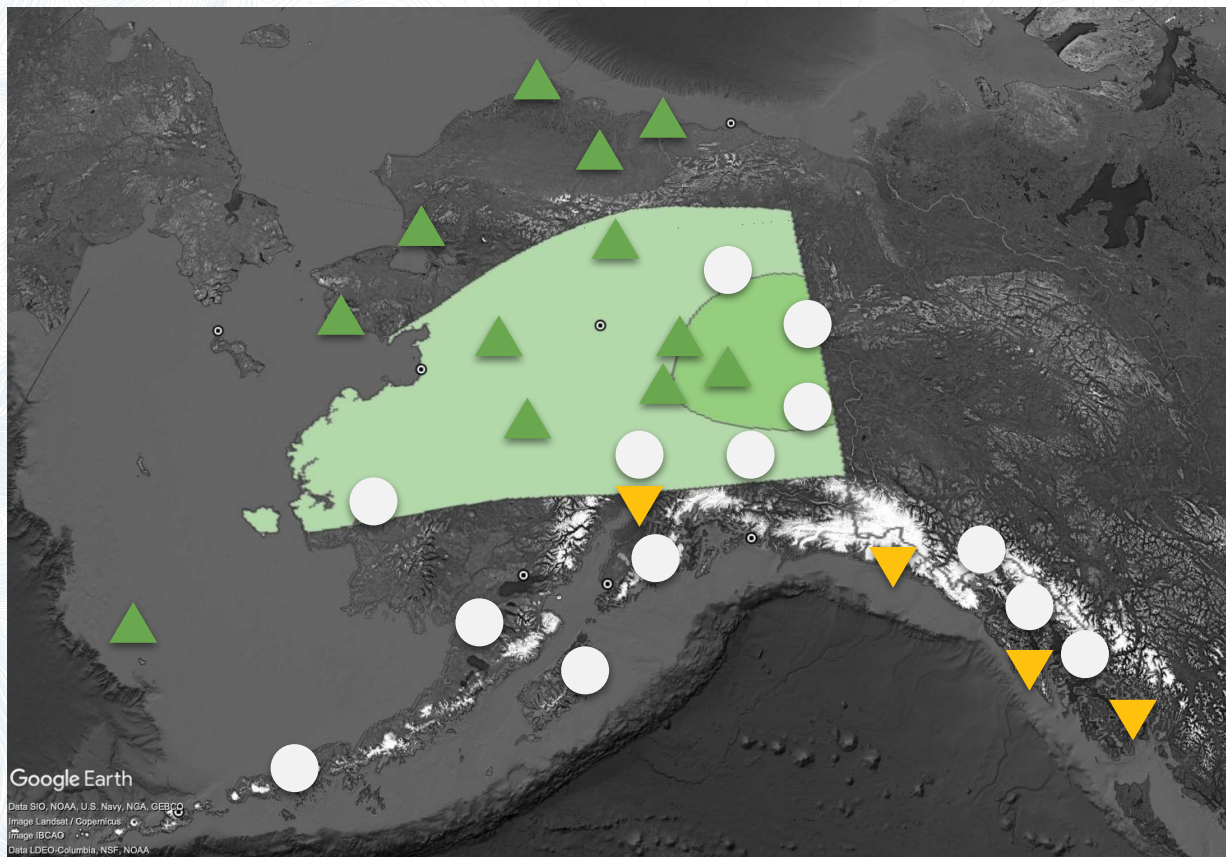
Non-EC skill
score: +40

Percent
correct: 60%

Mid-month
outlook

- ▲ Above normal
- Near normal
- ▼ Below normal

August 2025 precipitation ➤ CPC outlook and observed



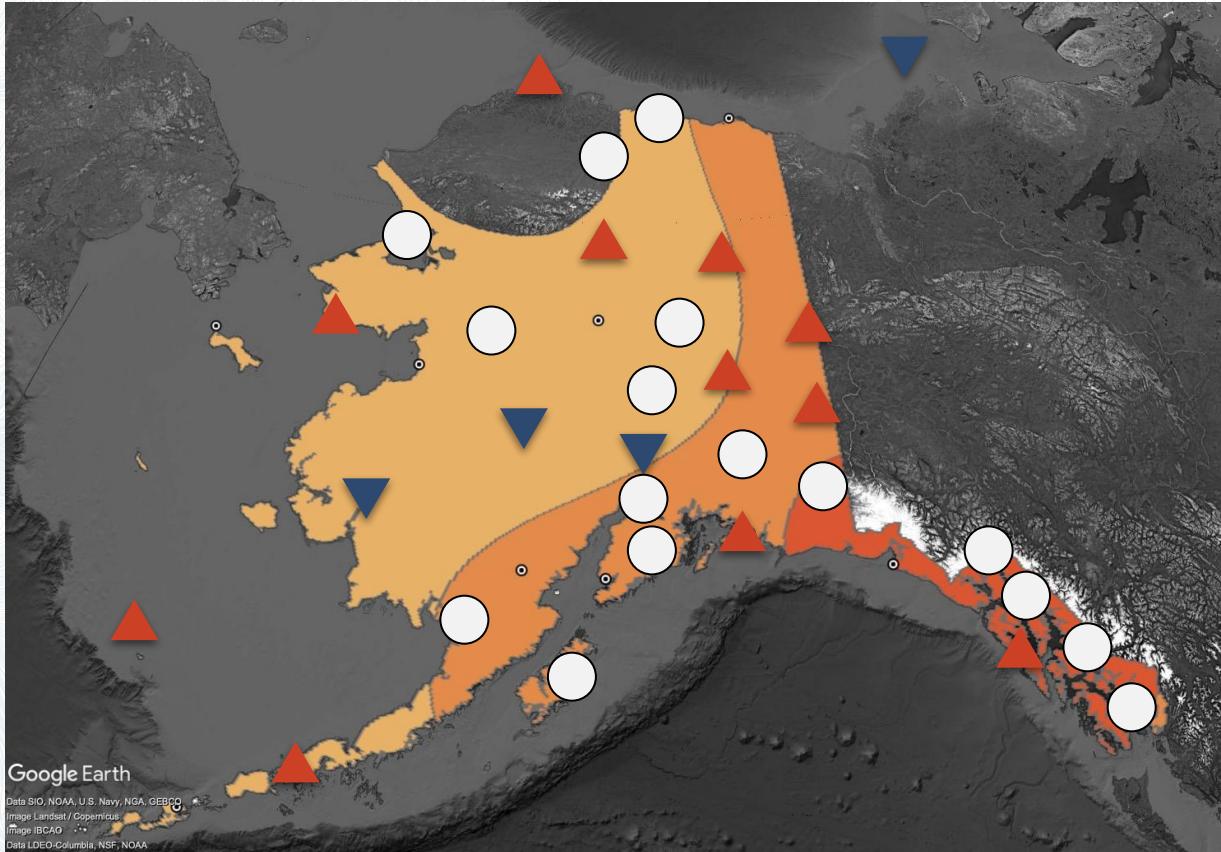
Non-EC skill
score: +25

Percent
correct: 50%

Mid-month
outlook

- ▲ Above normal
- Near normal
- ▼ Below normal

June-August 2025 temperature ➤ CPC outlook & observed

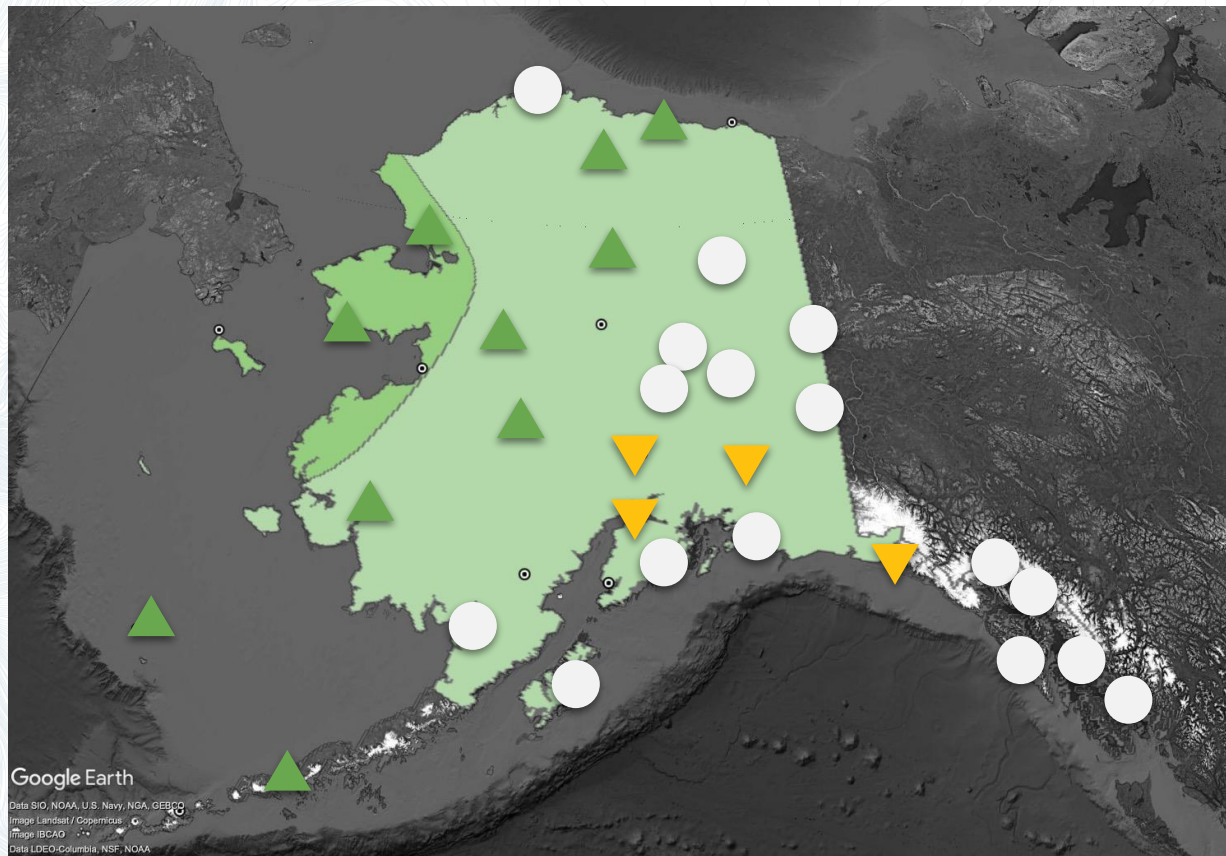


Non-EC skill
score: +07

Percent
correct: 37%

- ▲ Above normal
- Near normal
- ▼ Below normal

June-August 2025 precipitation ➤ CPC outlook & observed

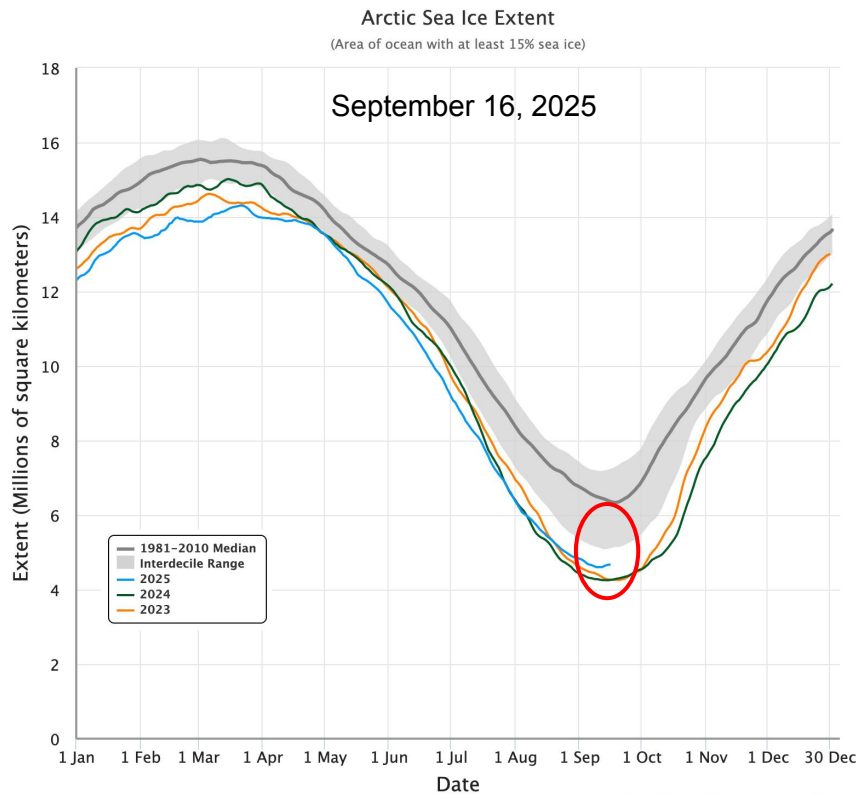


Non-EC skill
score: +11

Percent
correct: 41%

- ▲ Above normal
- Near normal
- ▼ Below normal

Arctic wide sea ice



National Snow and Ice Data Center, Boulder, CO

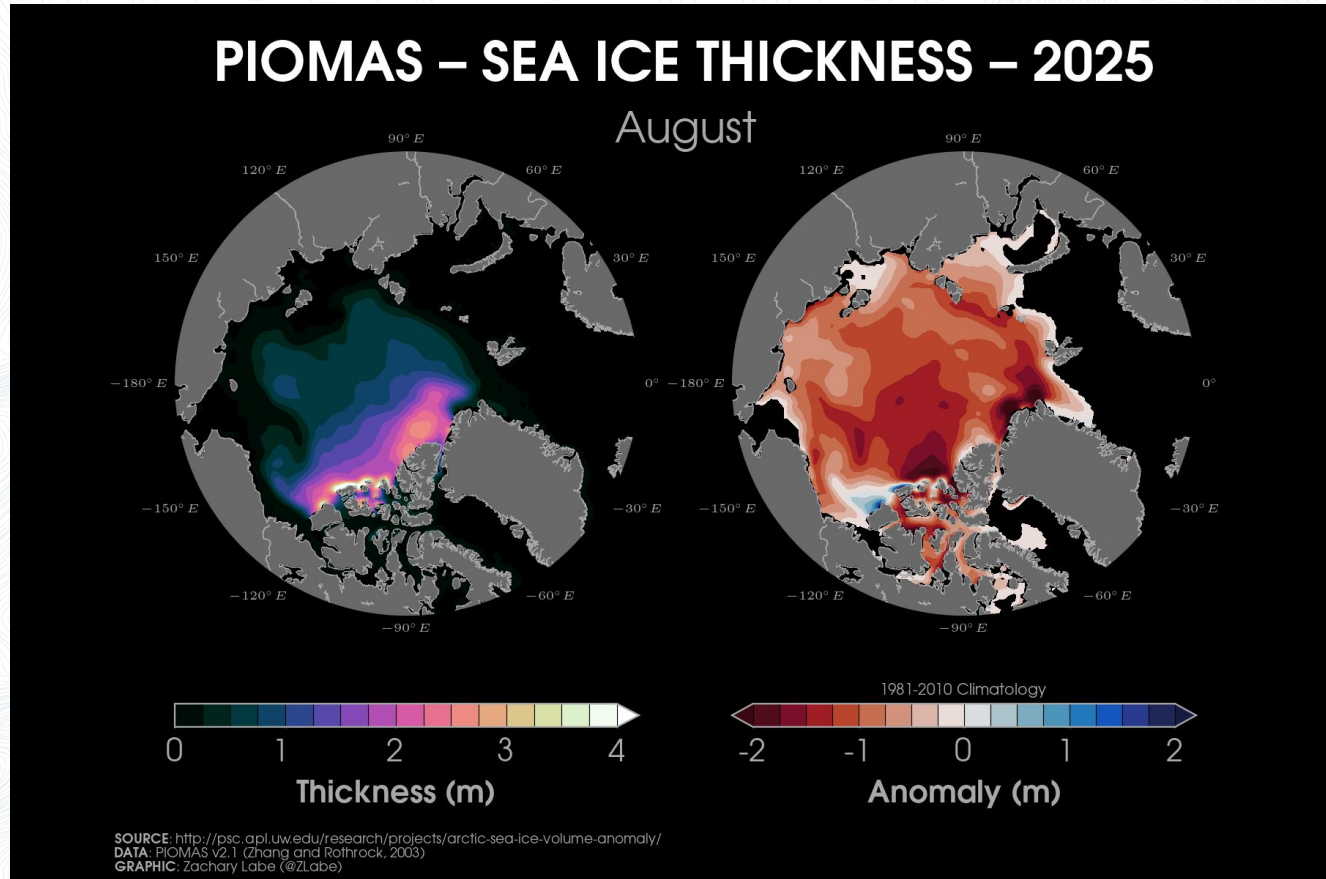
Sea Ice Extent, 16 Sep 2025



National Snow and Ice Data Center, University of Colorado Boulder

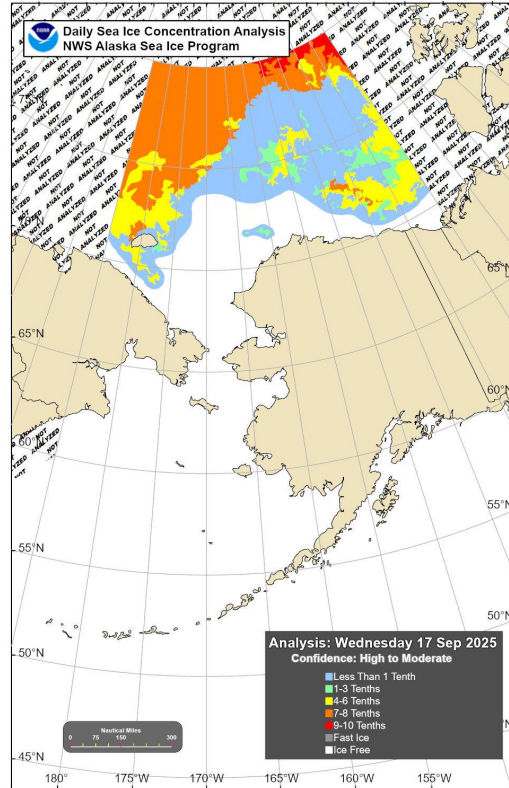
Arctic sea ice thickness

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

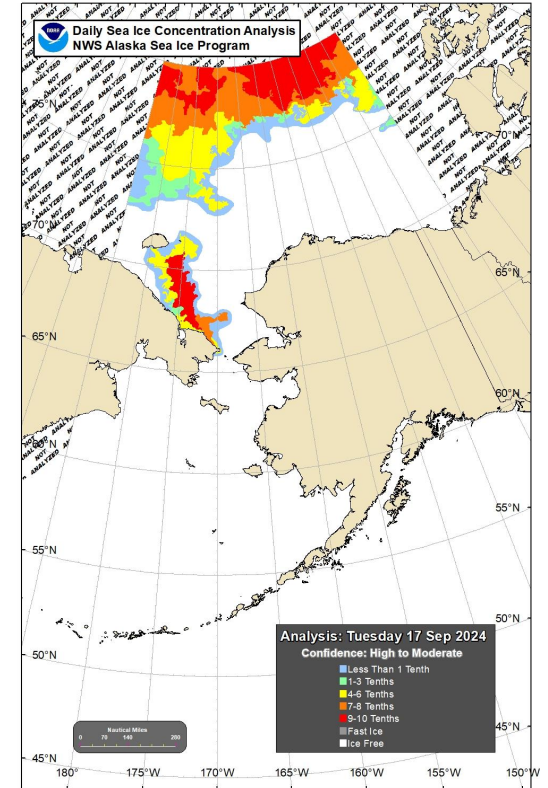


Mid-September sea ice comparison

September 17, 2025



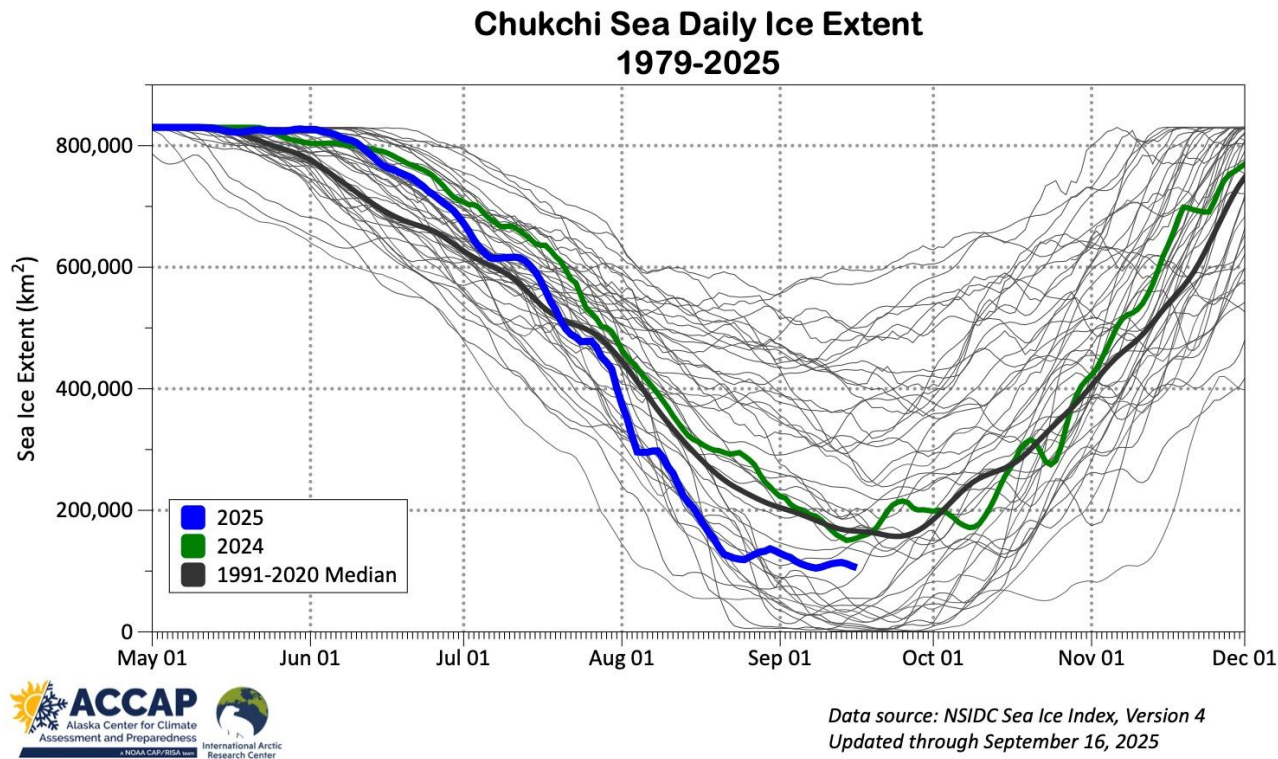
September 17, 2024



Source: National Weather Service
Alaska Region Sea Ice Program

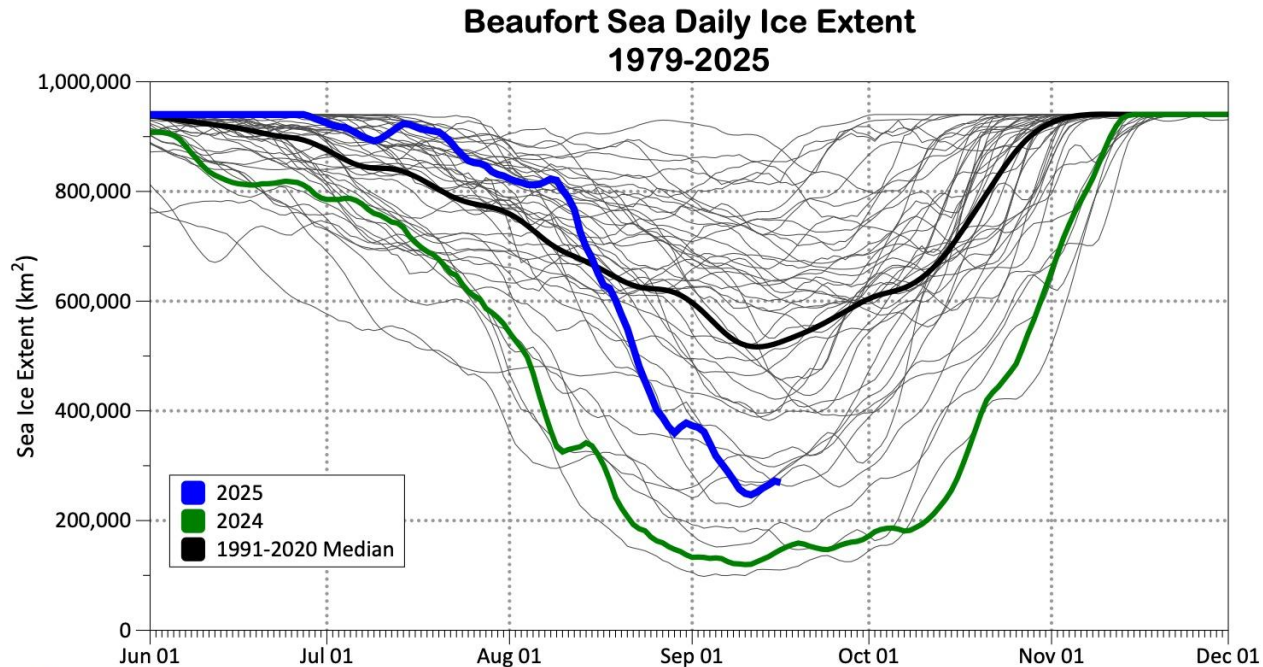
Sea ice extent through the season

Sources:
Data NSIDC Sea Ice Index,
Version 4.

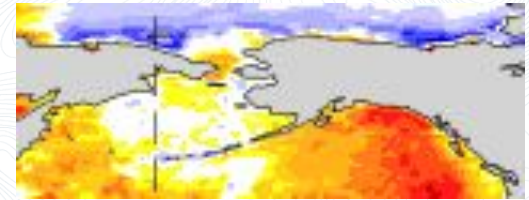
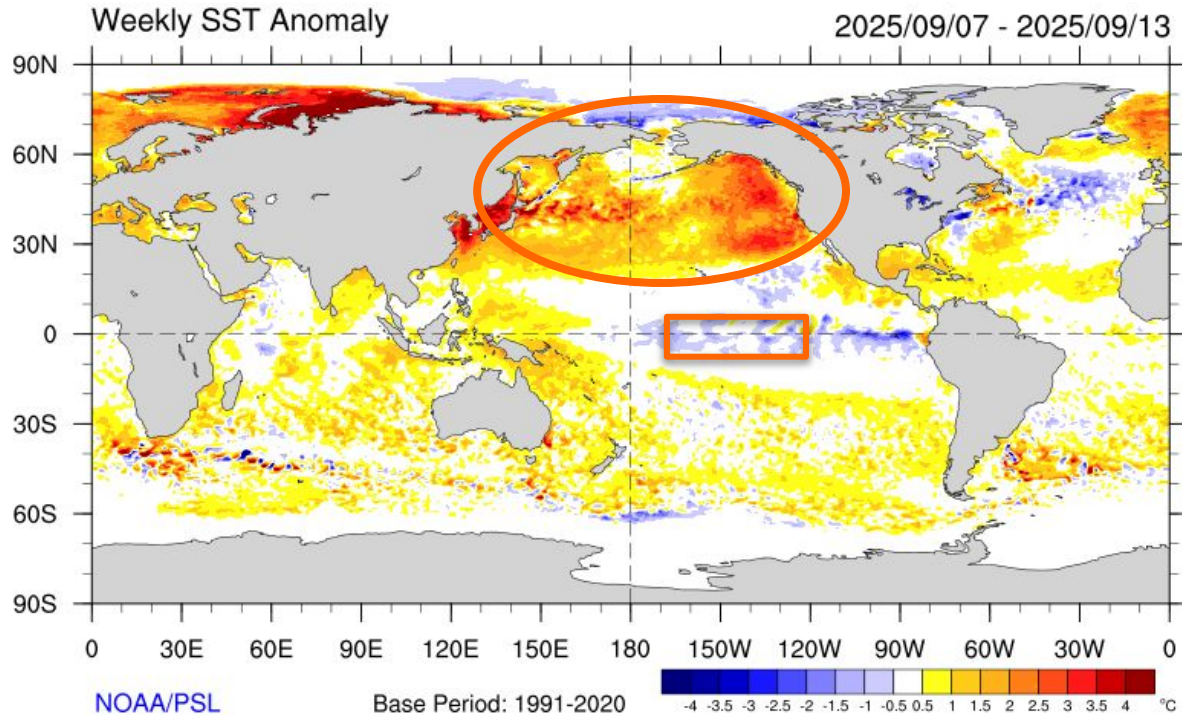


Sea ice extent through the season

Sources:
Data NSIDC Sea Ice Index,
Version 4.



Global sea surface temperature departure from normal

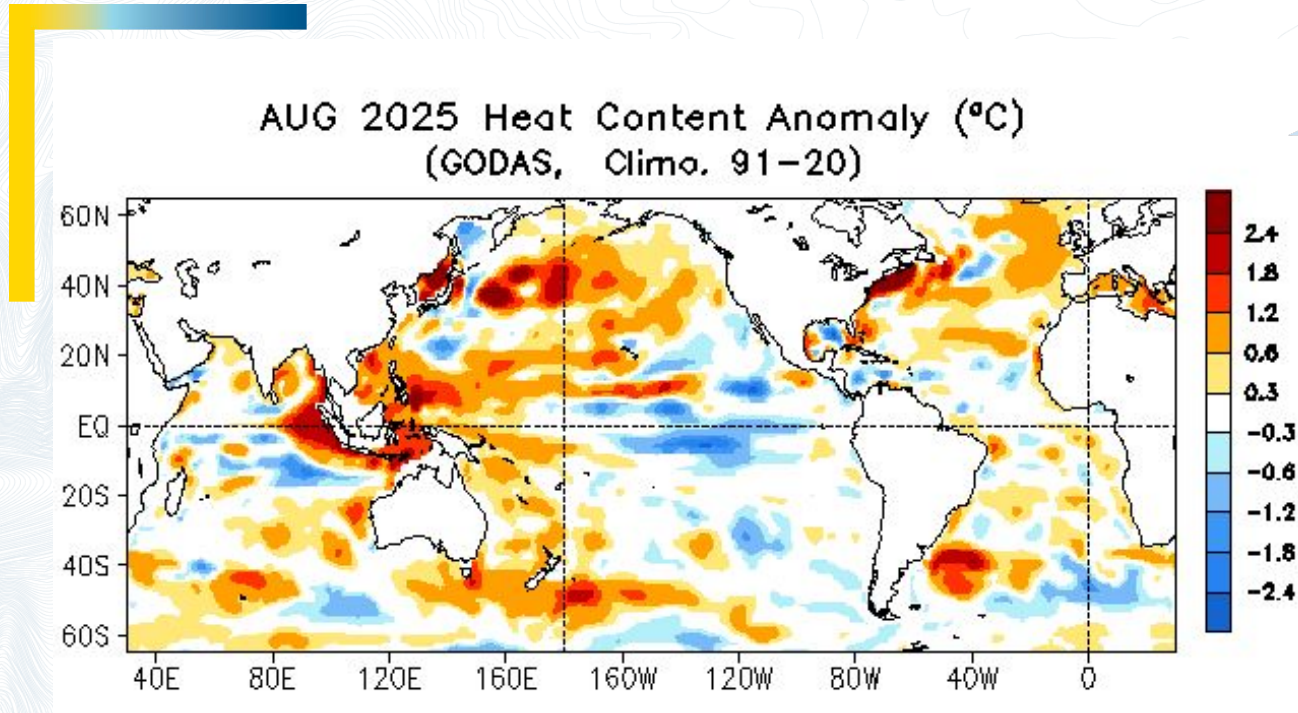


ONI for **Jun-Aug**: -0.2

PDO for **Aug 2025**: -1.5

Sources: ONI from CPC
PDO Index from WCS

Upper ocean heat departure from average



Little change near
Alaska

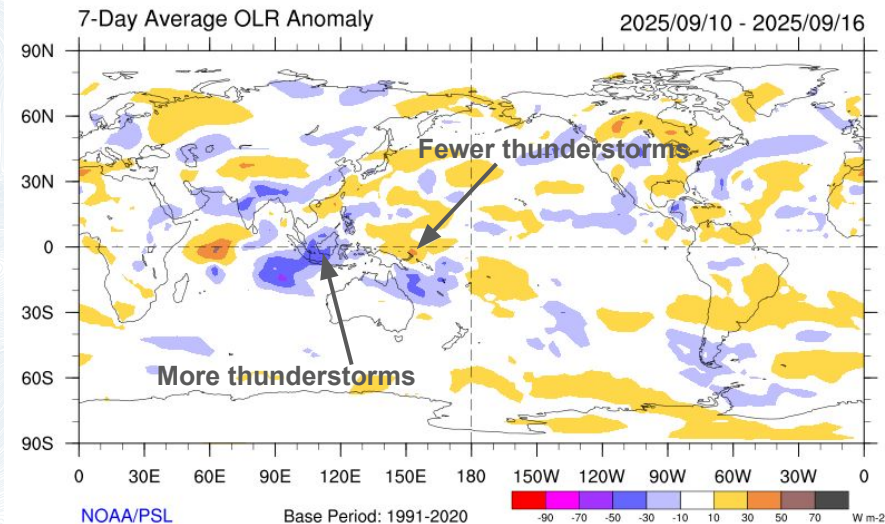
Source: NOAA/CPC

Upper 300 meters of the ocean

Tropical Pacific atmosphere

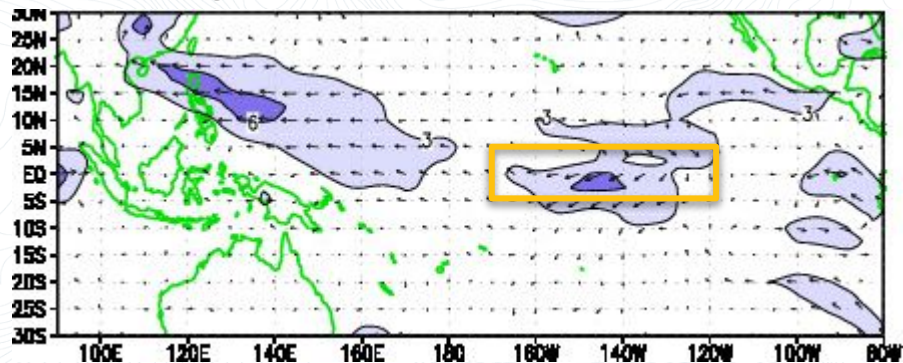
Jun-Aug Oceanic
Niño Index: -0.2

Deep tropical convection
Via “outgoing longwave radiation”

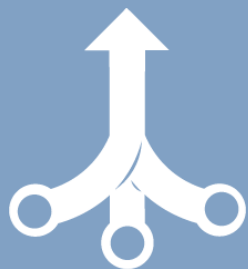


Enhanced trade winds
Niño Region 3.4

Trade winds
850 mb wind difference from average
August 17-September 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

August 2025

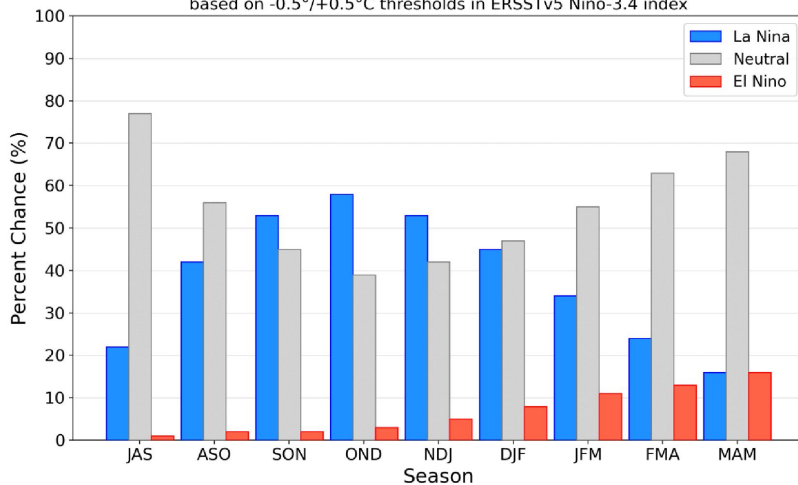
September 2025

ENSO Alert System Status:

La Niña Watch

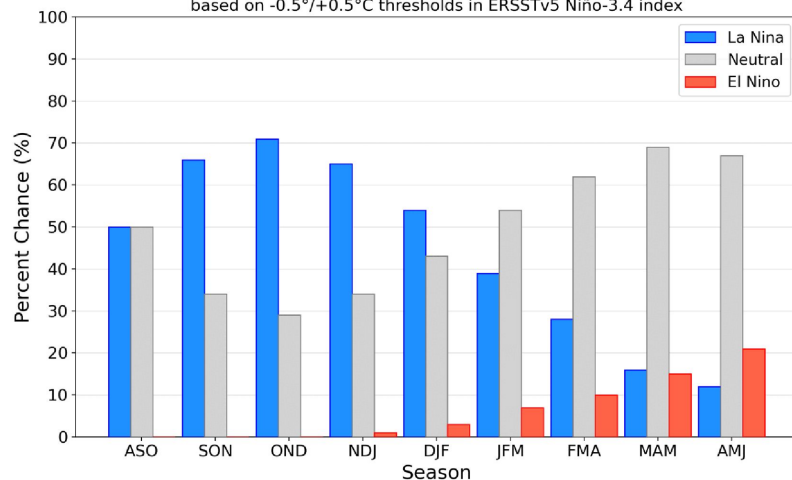
Official NOAA CPC ENSO Probabilities (issued August 2025)

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



Official NOAA CPC ENSO Probabilities (issued September 2025)

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



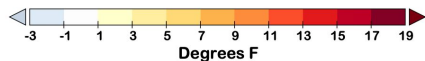
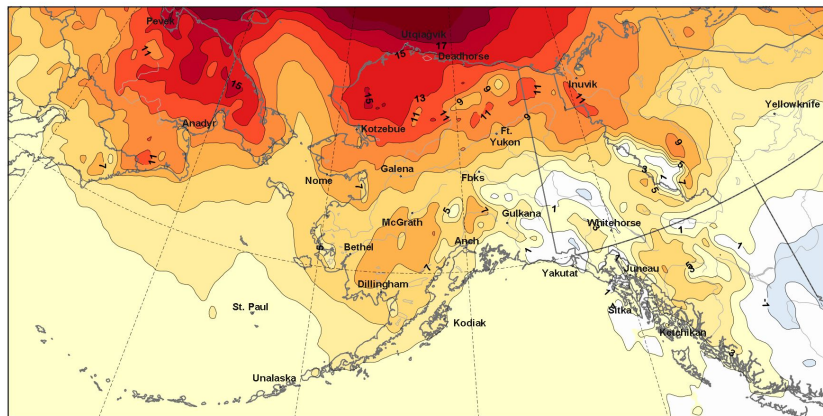
**Statistical
guidance** ➤
using the past
to predict the
future

- Long term trends
- Optimum climate normals: Alaska trends the past 15 years

October half century trends

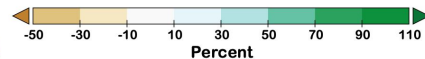
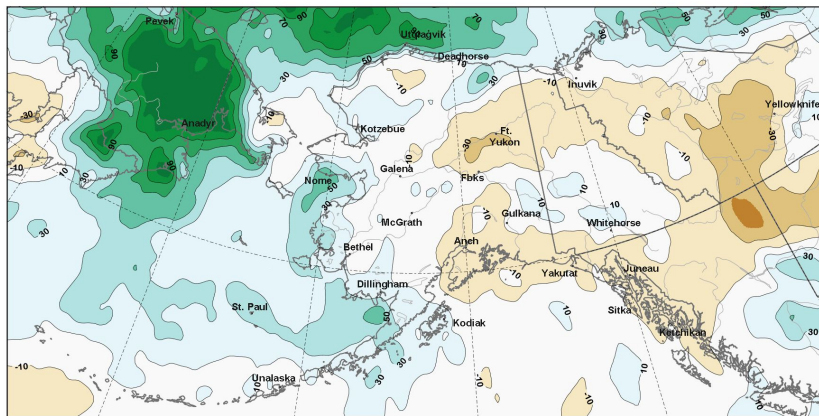
Temperatures

Total Change in October Average Temperature
1975-2024



Precipitation

Percent Change in October Precipitation
1975-2024



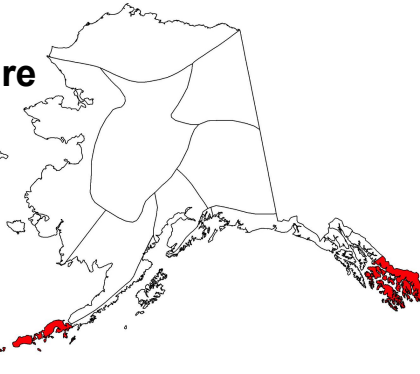
Change in the average
over 50 years

2010 to 2024 trends

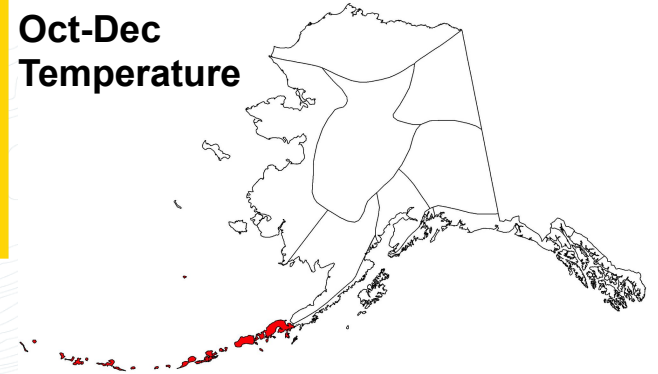
Past 15 years compared
to 1991-2020

**October
Temperature**

 Above normal
 Below normal

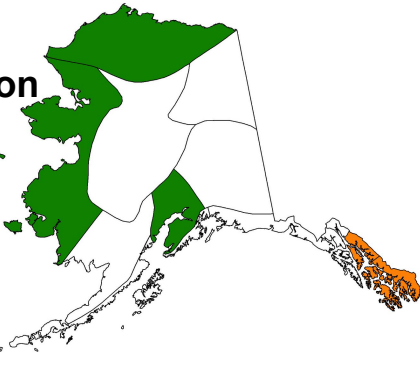


**Oct-Dec
Temperature**

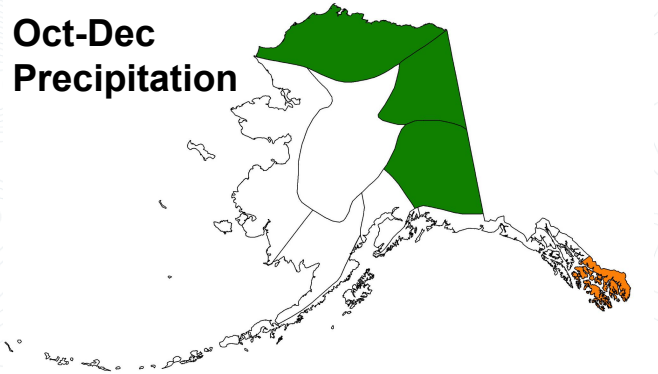


**October
Precipitation**

 Above normal
 Below normal



**Oct-Dec
Precipitation**



Dynamic model forecasts

Current suite of Dynamic Climate Models

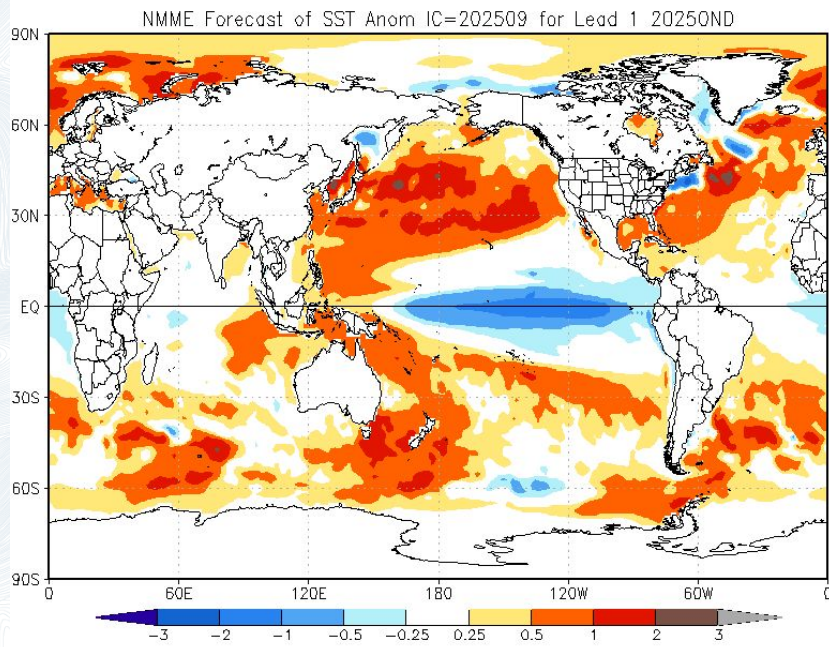
- CPC Experimental Sea Ice Ensemble
- World Climate Service Multi-Model Ensemble
- North American Multi-Model Ensemble (NMME)

What's being forecasted

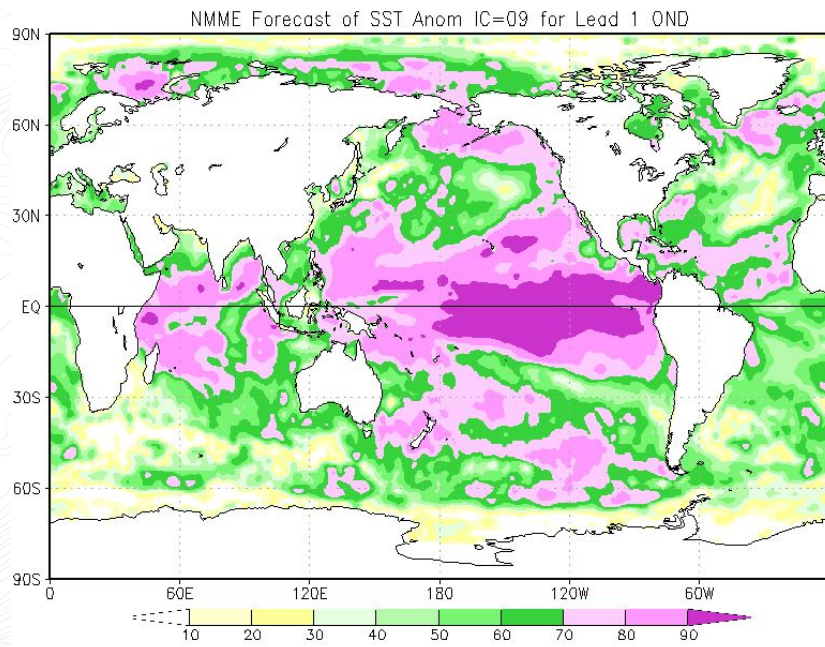
- Sea surface temperatures relative to normal
- Sea ice forecast
- Temperature and precip relative to normal

October-December 2025 sea surface temperature ➤ NMME

Forecast
departure from normal



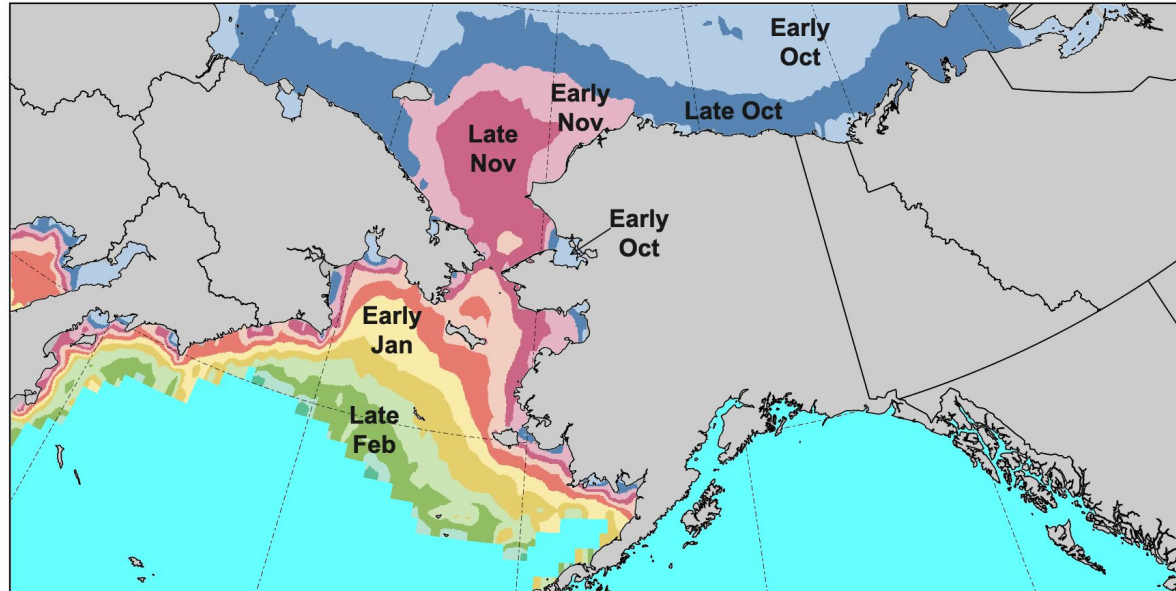
Skill
of the forecast



Experimental sea ice forecast ➤ CPC

Date of first sea ice concentration 15 percent or higher

Autumn/Winter 2025-26



Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01

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

The 20-models
average of first date
with open water
From data though late August

October 2025 calibrated probability forecast ➤ NMME

Forecast from →



Temperature

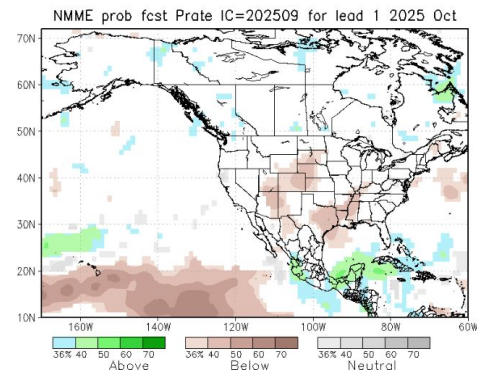
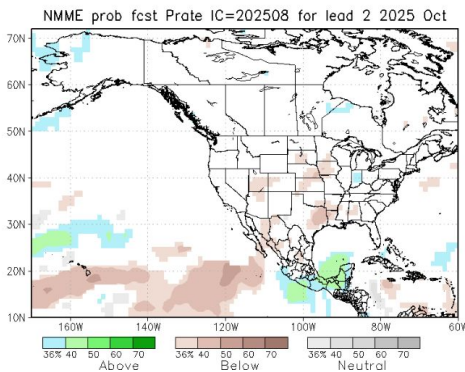
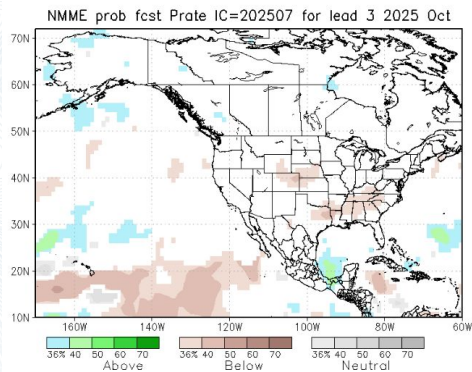
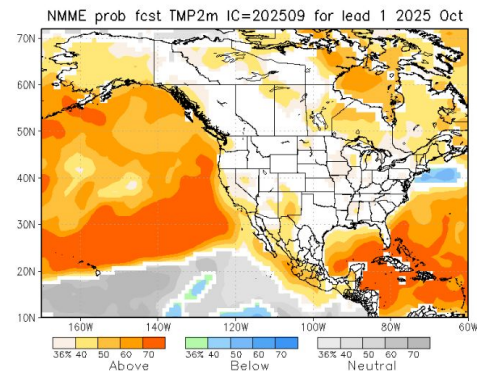
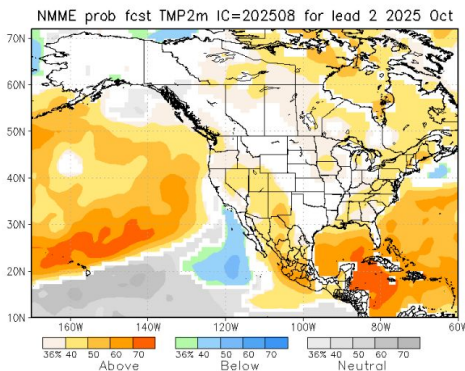
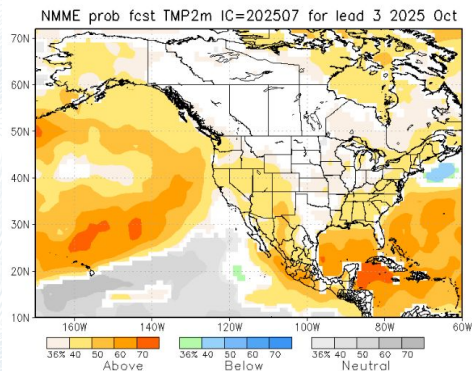


Precipitation

July

August

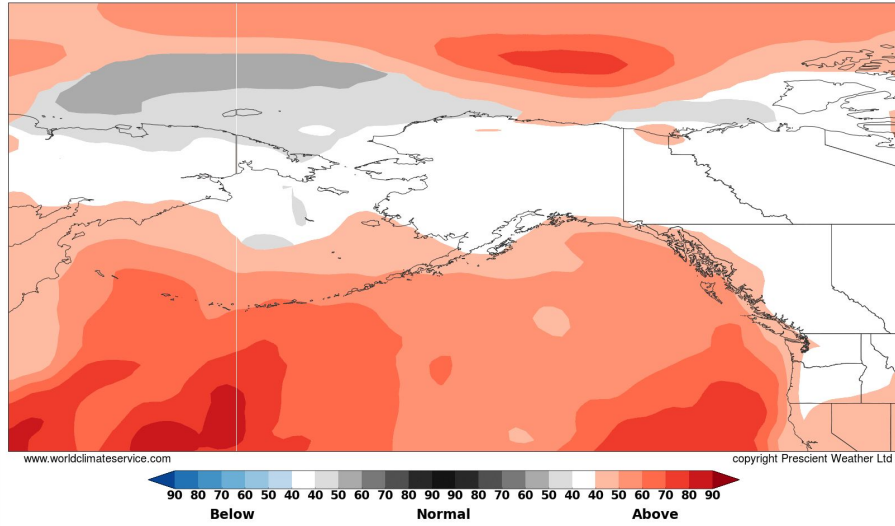
September



October 2025 outlooks ➤ World Climate Service

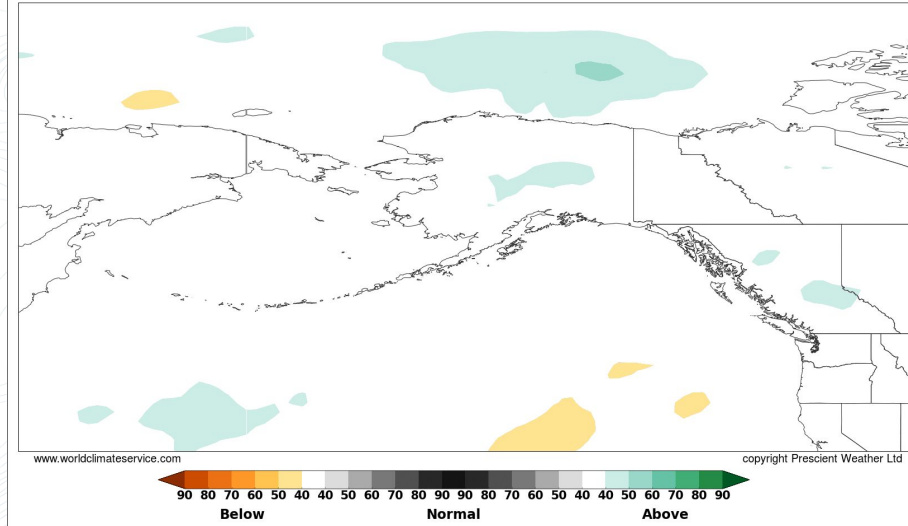
Temperature

Multi-Model T2m Probability Above/Normal/Below
Forecast Valid October 2025
Initialized September 2025 1991-2020 Climatology



Precipitation

Multi-Model Precipitation Probability Above/Normal/Below
Forecast Valid October 2025
Initialized September 2025 1991-2020 Climatology



Bias Corrected, Skill Weighted CFS + ECMWF

October-December 2025 calibrated probability forecast ➤ NMME

Forecast from →



Temperature

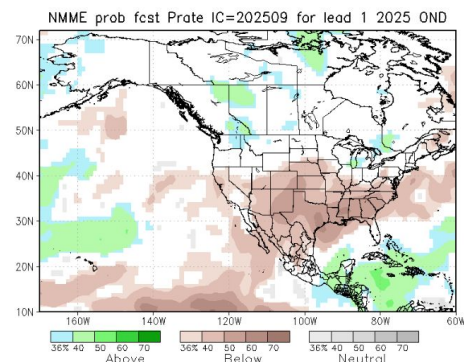
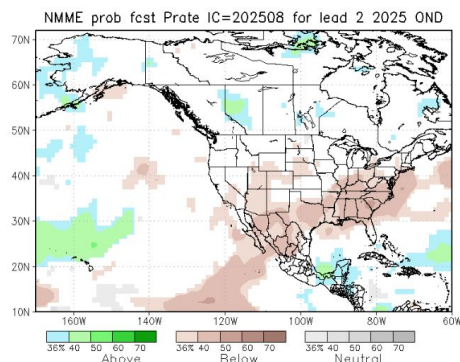
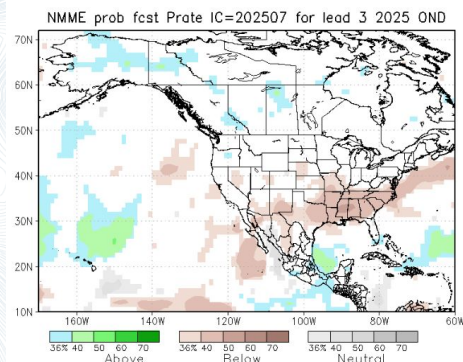
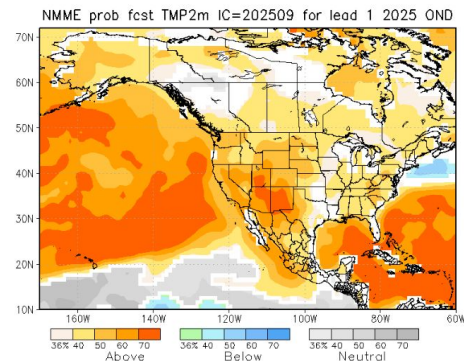
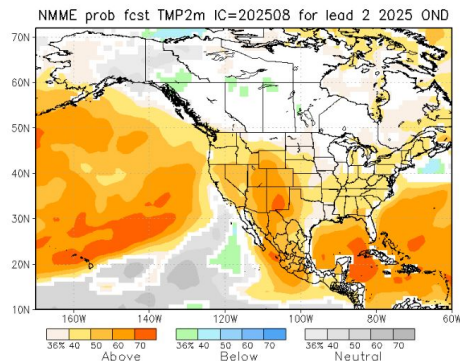
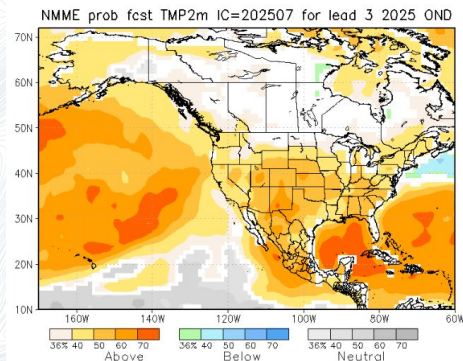


Precipitation

July

August

September

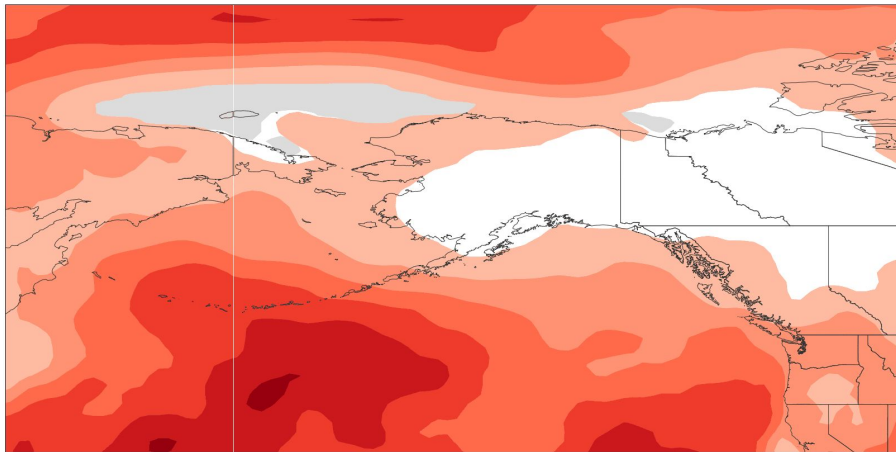


October-December 2025 outlooks ➤ World Climate Service

Temperature



Multi-Model T2m Probability Above/Normal/Below
Forecast Valid Oct 2025 - Dec 2025
Initialized September 2025 1991-2020 Climatology



www.worldclimateservice.com

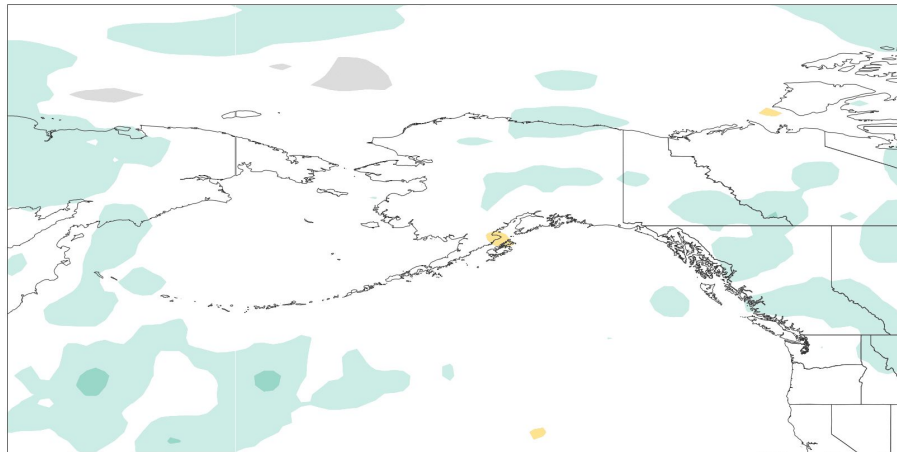
copyright Prescient Weather Ltd



Precipitation



Multi-Model Precipitation Probability Above/Normal/Below
Forecast Valid Oct 2025 - Dec 2025
Initialized September 2025 1991-2020 Climatology



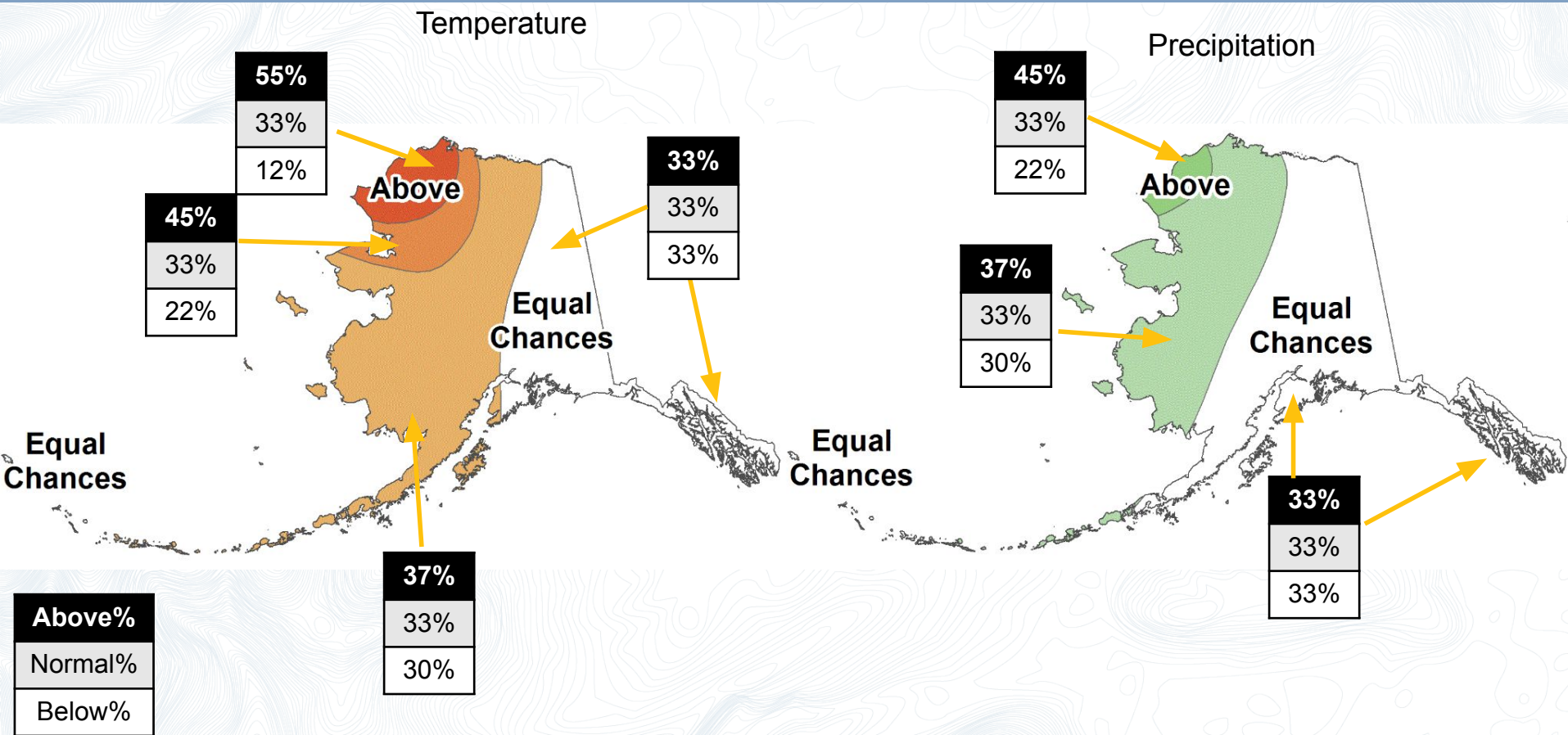
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Bias Corrected, Skill Weighted CFS + ECMWF

October-December 2025 outlooks from **August**

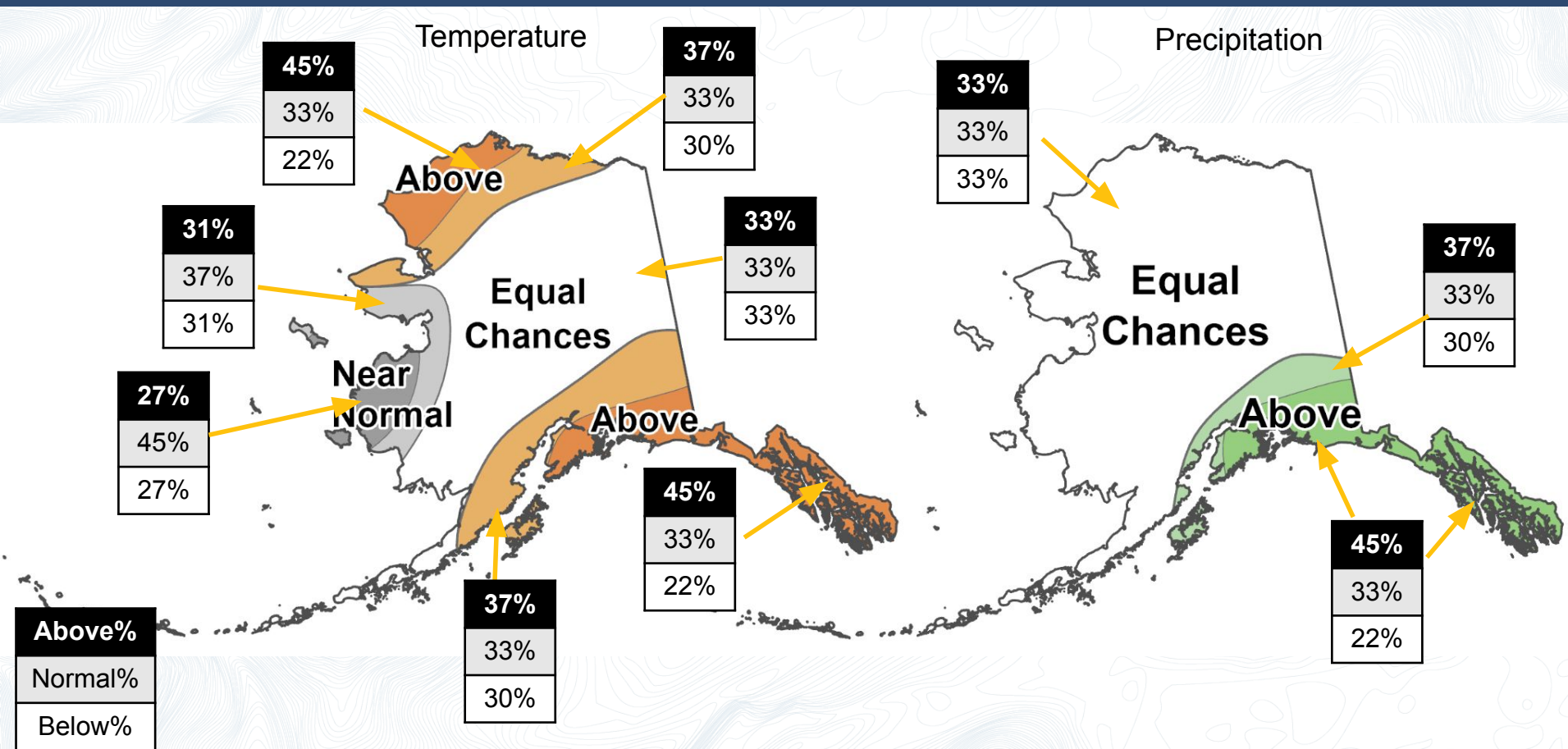


Future
outlook

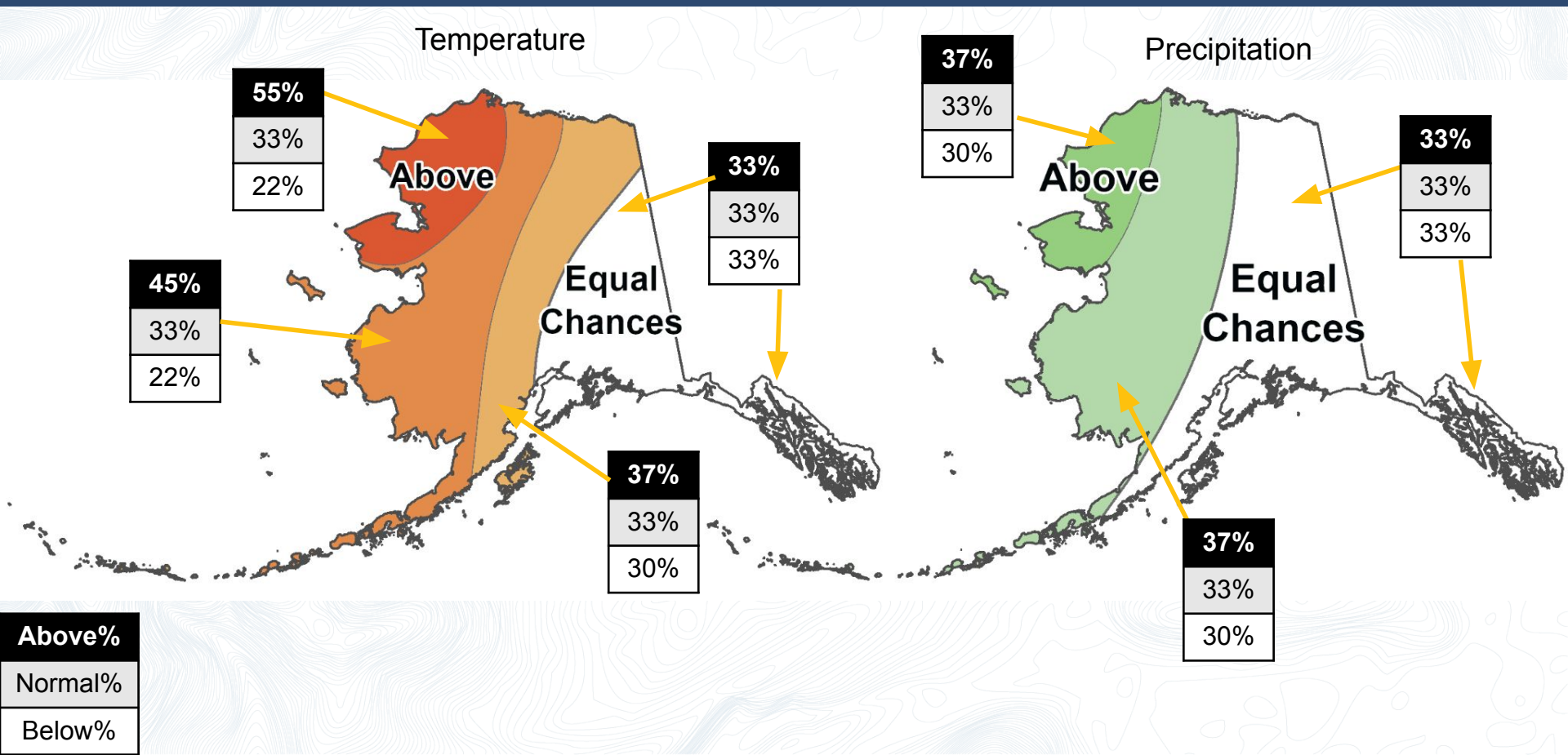


And the answer is...

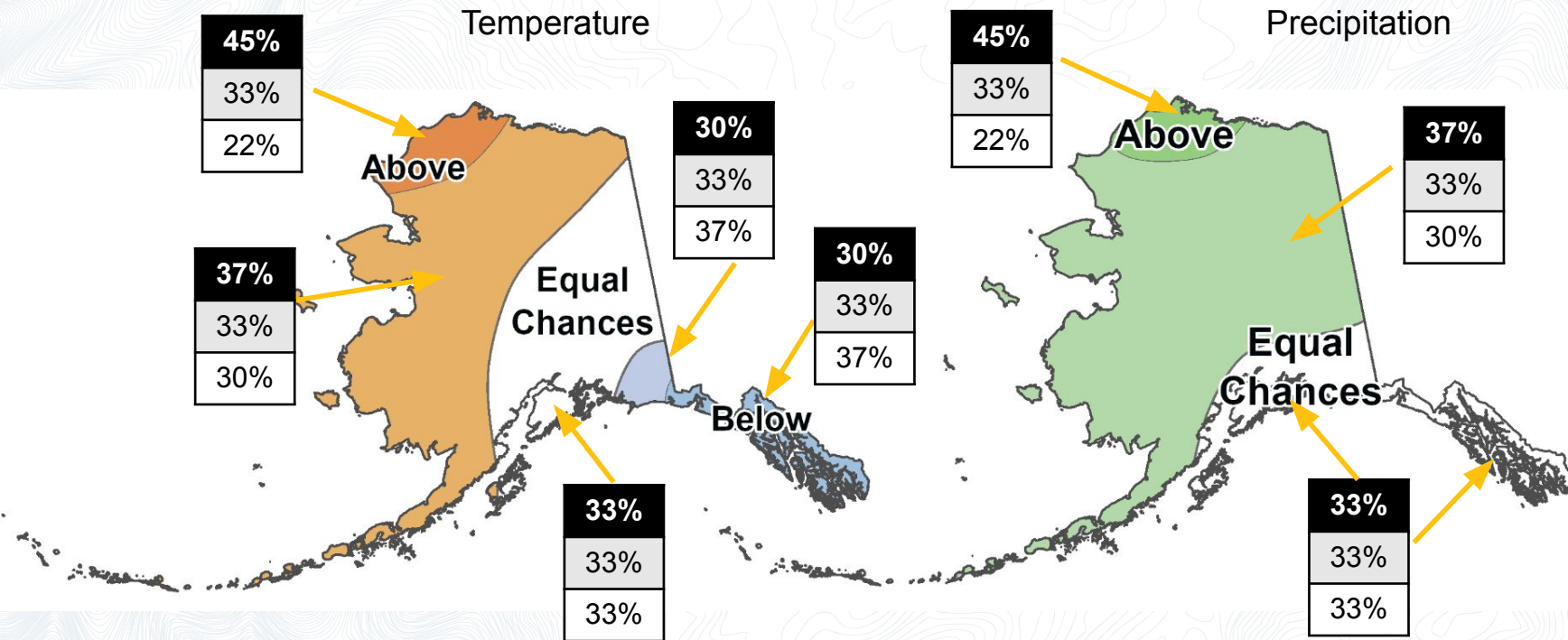
CPC October 2025 outlooks



CPC October-December 2025 outlooks



CPC Winter 2025-26 outlook



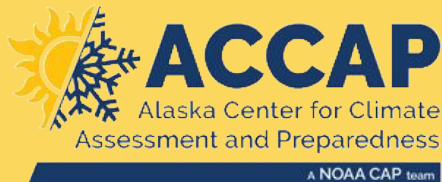
Above%
Normal%
Below%

Upcoming ACCAP webinars

Upcoming ACCAP webinars accap.uaf.edu/events

- October 8 ▶ Powering Alaska's digital atlas: L. Jones/Alaska DGGs
- October 17 ▶ NWS Monthly Climate Outlook Briefing

Email Rick Thoman rthoman@alaska.edu



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