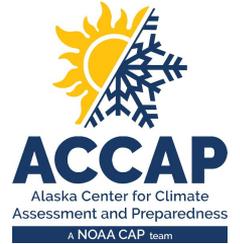
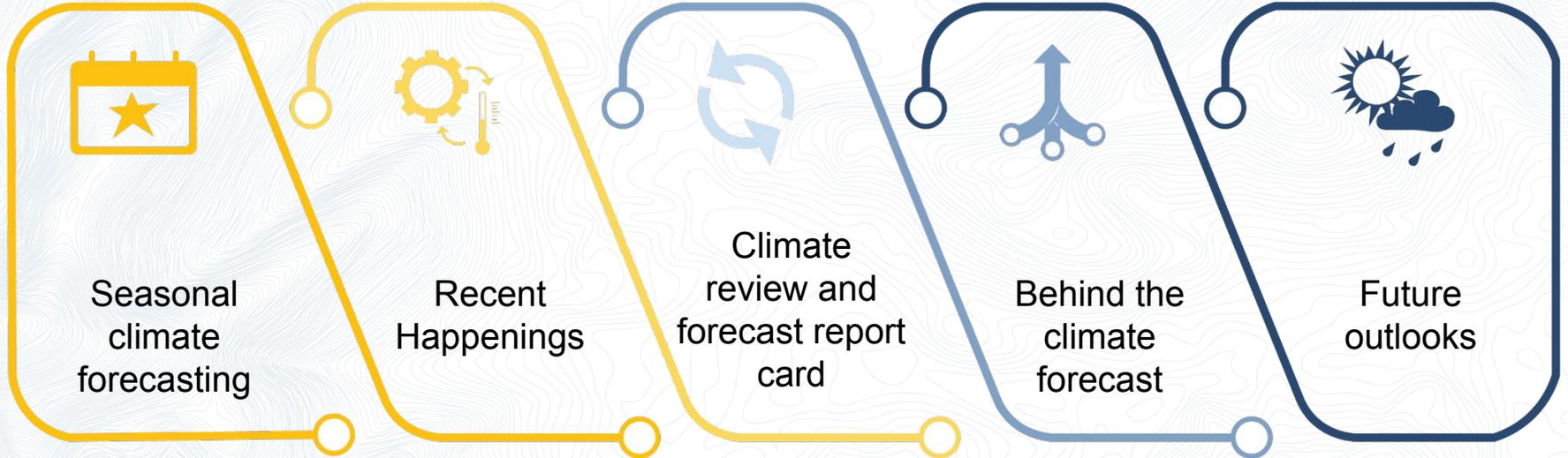




# Alaska climate outlook briefing July 2025

Rick Thoman  
ACCAP Climate Specialist  
July 18, 2025





Seasonal  
climate  
forecasting

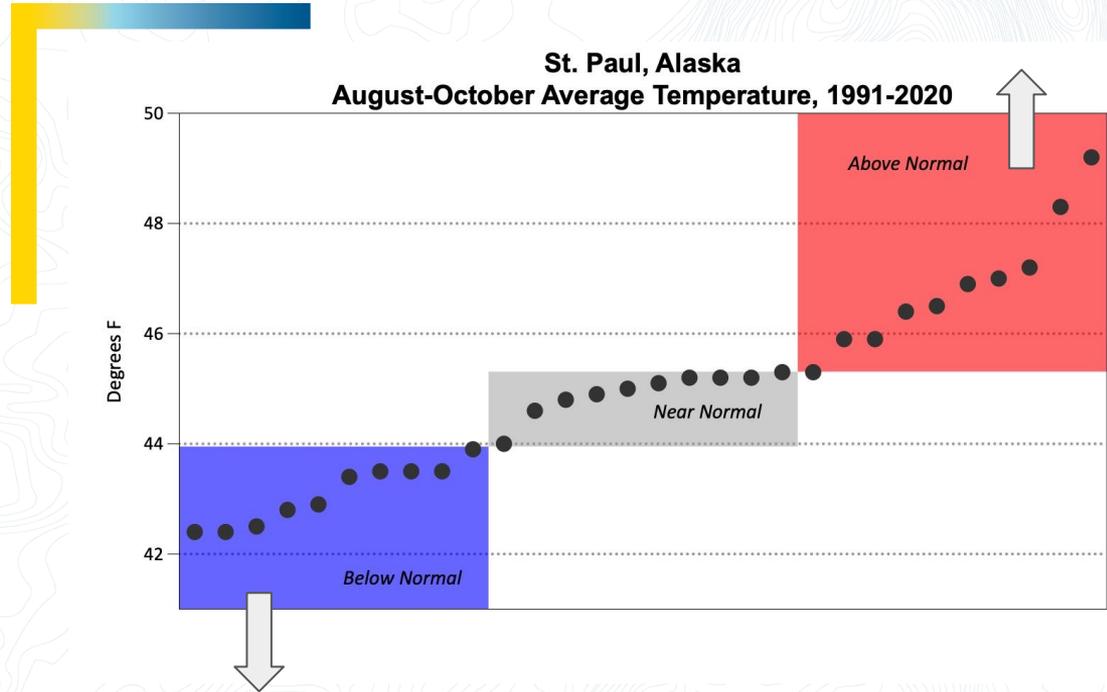


NOAA Center for Weather and Climate Prediction

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

# The basics

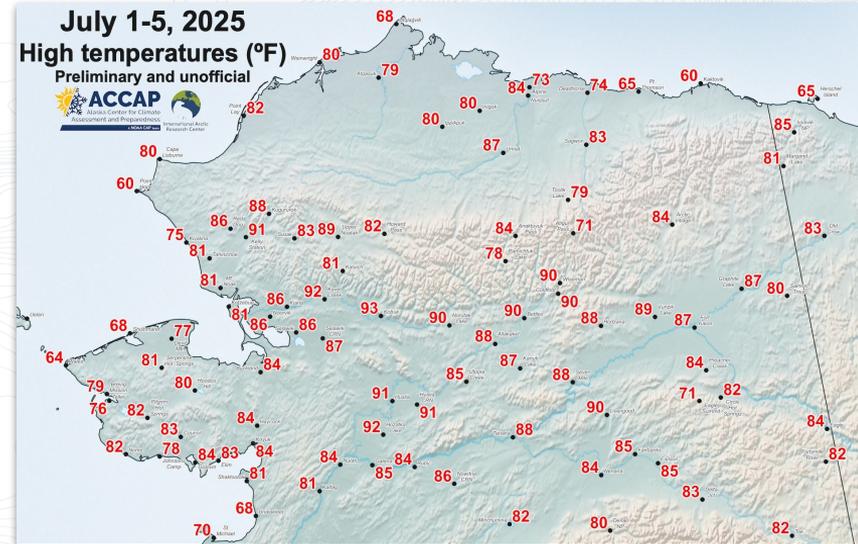
- Relation to long-term normal (1991-2020)
- 3 categories
- Probabilistic
- Temperature
  - Centered on average
- Precipitation
  - Centered on median > can significantly differ from “normal”
- Normals temperature and precip ranges for selected Alaska places at ACCAP climate graphics





# Recent Happenings

- Wildfire
  - Sprung to life mid-June
  - Large fires interior and northwest
  - Primary residences lost in Bear Creek and Saint George Creek fires
- Heatwave in northern Interior and NW Arctic
- Southeast: the little summer that couldn't (so far), fewest warm days to mid-July since 2017



Dalton Highway Mile 315 wash-out  
June 14, 2025  
Photo: Alaska DOT & PF



## **Climate Review**

- What happened?
- How did climate outlooks perform?

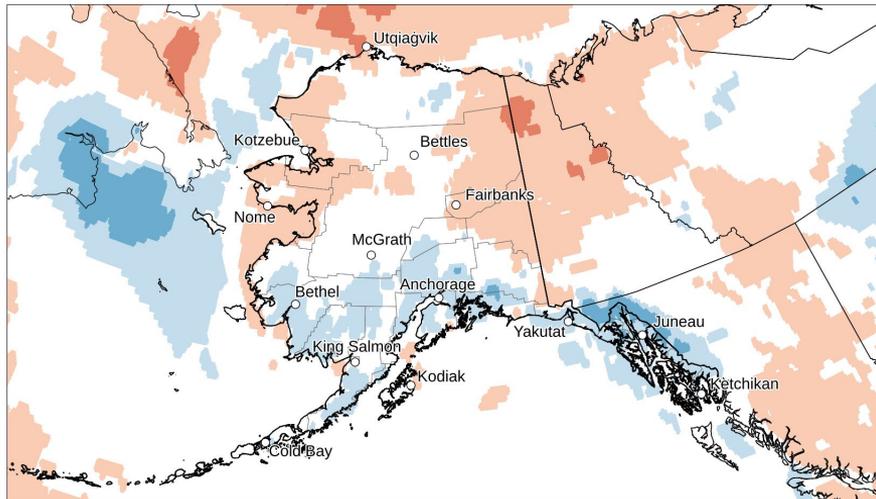


**Nenana Ridge Complex**  
**July 10, 2025**

Photo courtesy [akfireinfo.com](http://akfireinfo.com)

# Model-based regional analysis > Average temperatures

Temperature Classification for Jun 2025



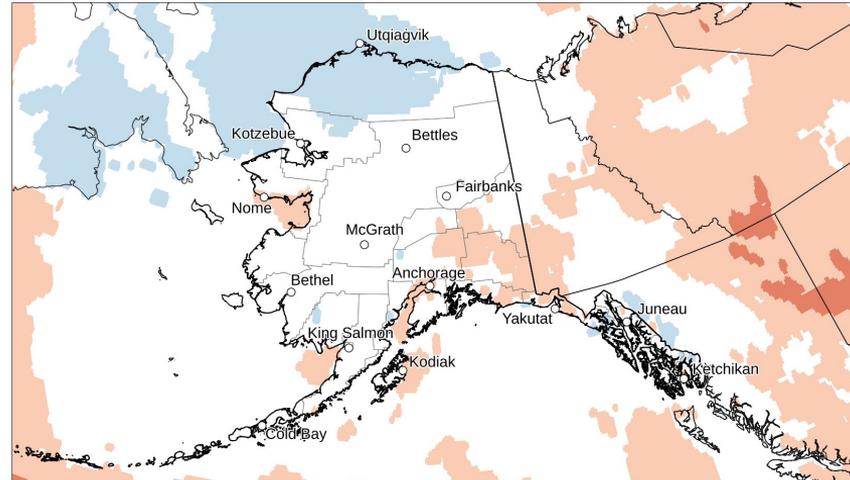
Source: ERA5 Reanalysis

Map by: Brian Brettschneider



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

Temperature Classification for Apr-Jun 2025



Source: ERA5 Reanalysis

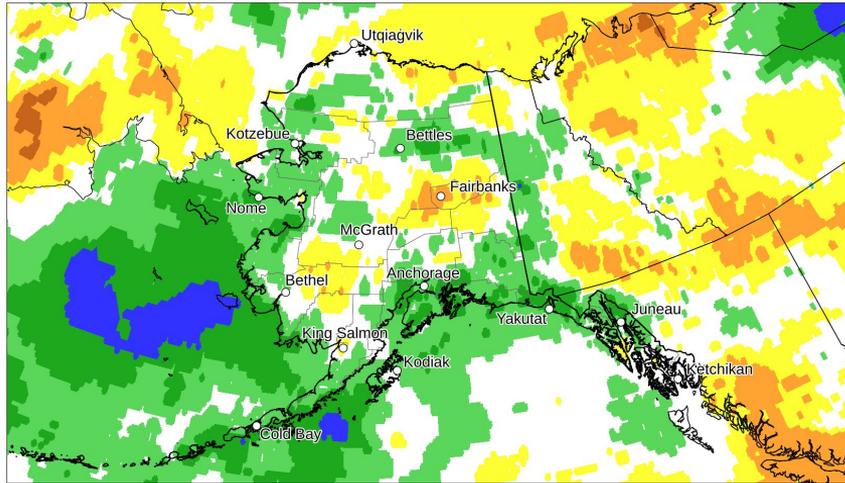
Map by: Brian Brettschneider



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

# Model- based regional analysis > Total precipitation

## Precipitation Classification for Jun 2025



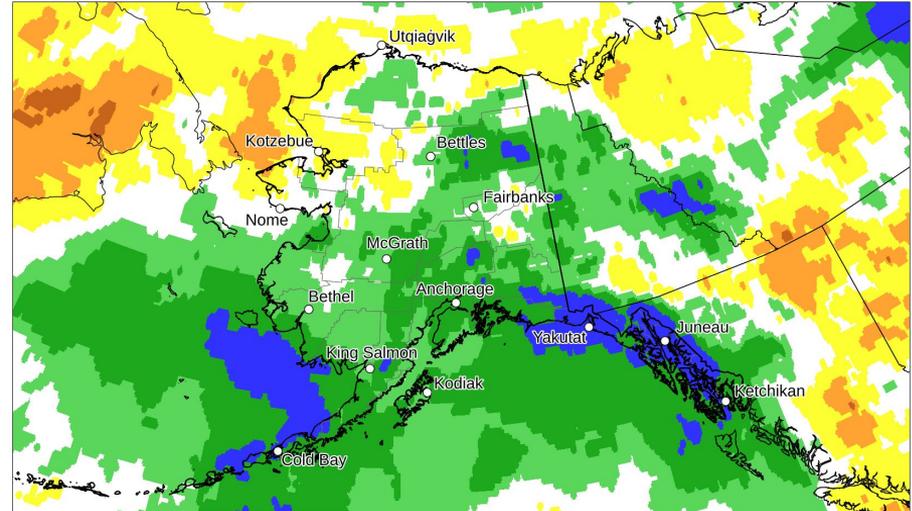
Source: ERA5 Reanalysis

Map by: Brian Brettschneider



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

## Precipitation Classification for Apr-Jun 2025



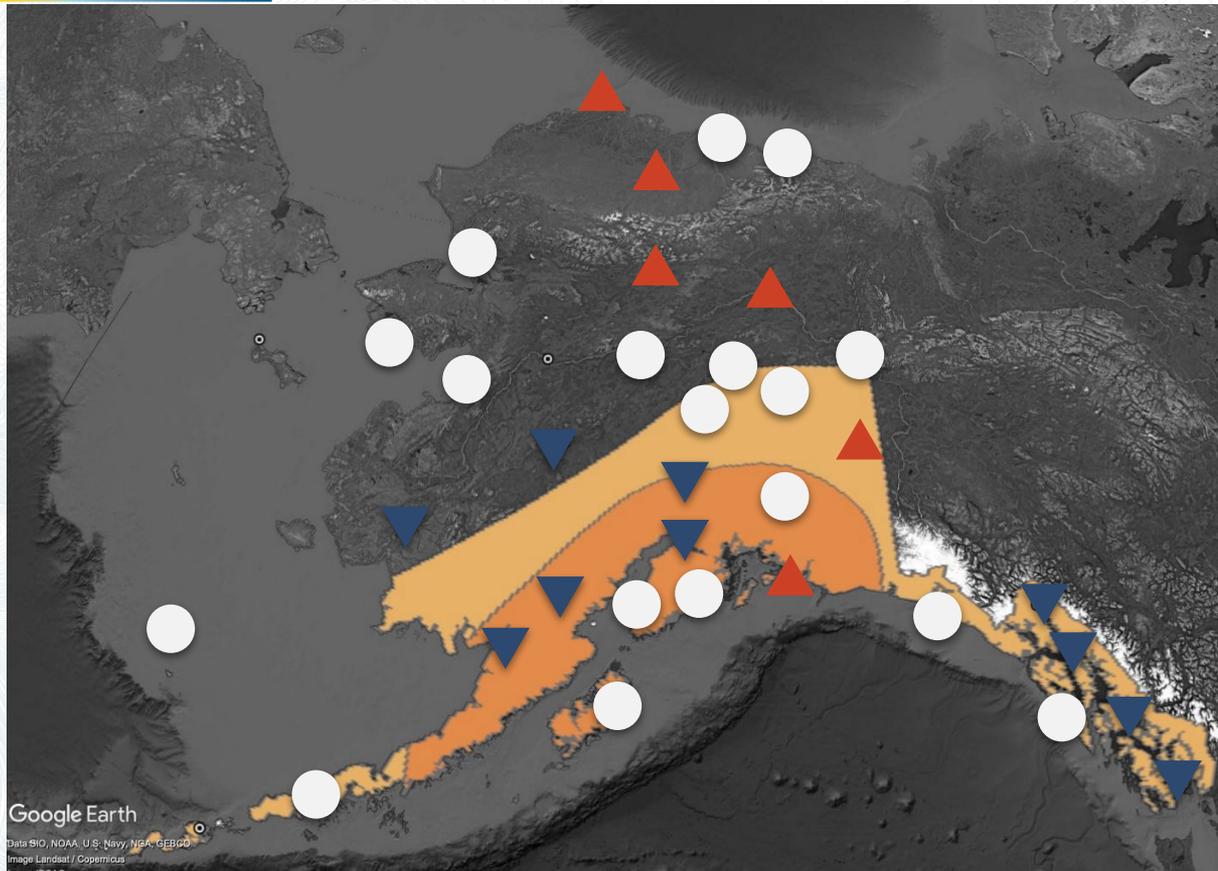
Source: ERA5 Reanalysis

Map by: Brian Brettschneider



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

# June 2025 temperature > CPC outlook and observed



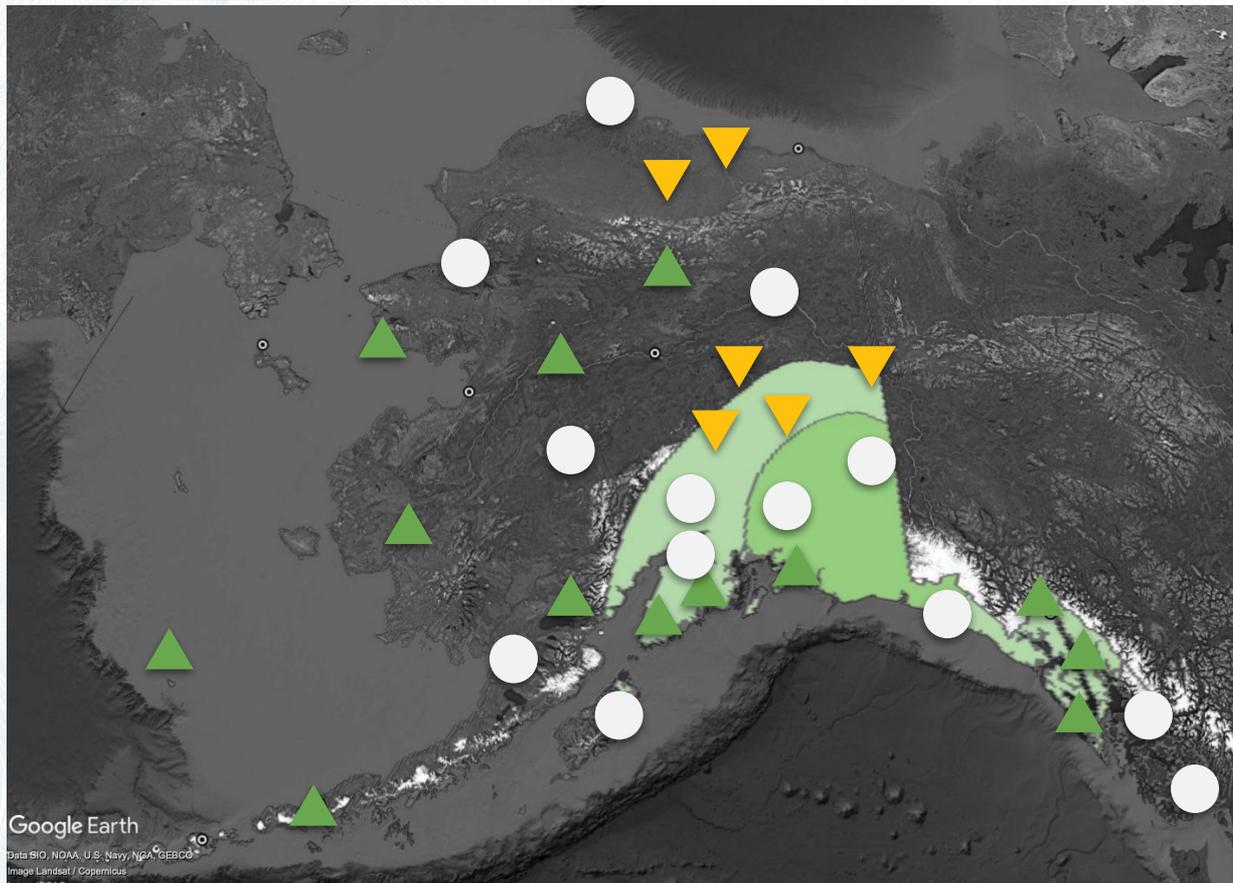
Non-EC skill  
score: -34

Percent  
correct: 11%

Mid-month  
outlook

- ▲ Above normal
- Near normal
- ▼ Below normal

# June 2025 precipitation > CPC outlook and observed



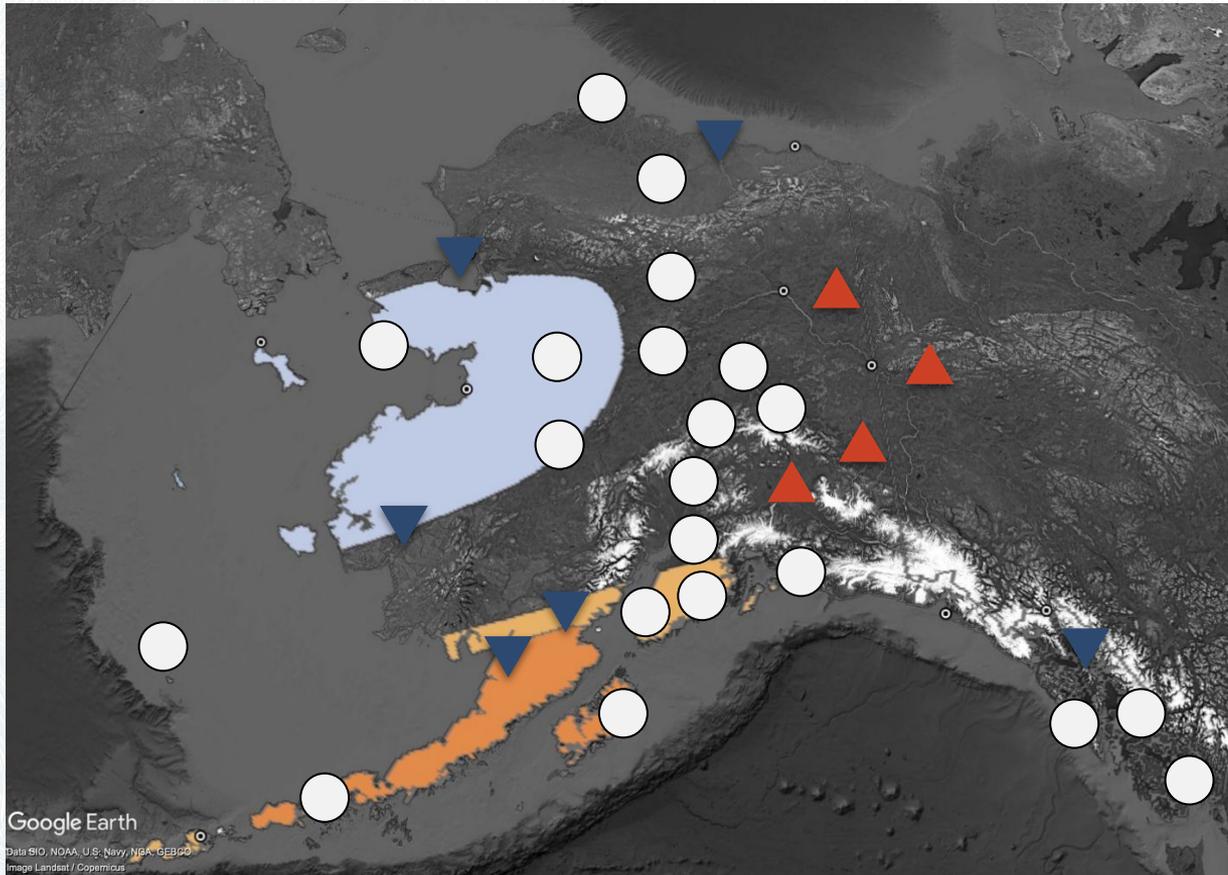
Non-EC skill  
score: +19

Percent  
correct: 46%

Mid-month  
outlook

- ▲ Above normal
- Near normal
- ▼ Below normal

# April-June 2025 temperature > CPC outlook & observed



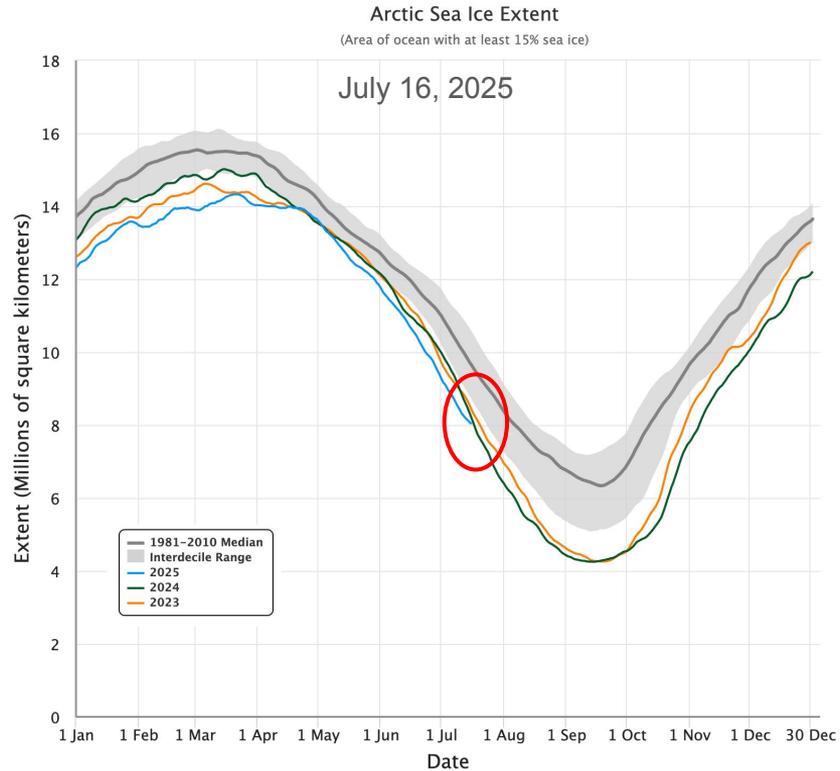
Non-EC skill  
score: -35

Percent  
correct: 10%

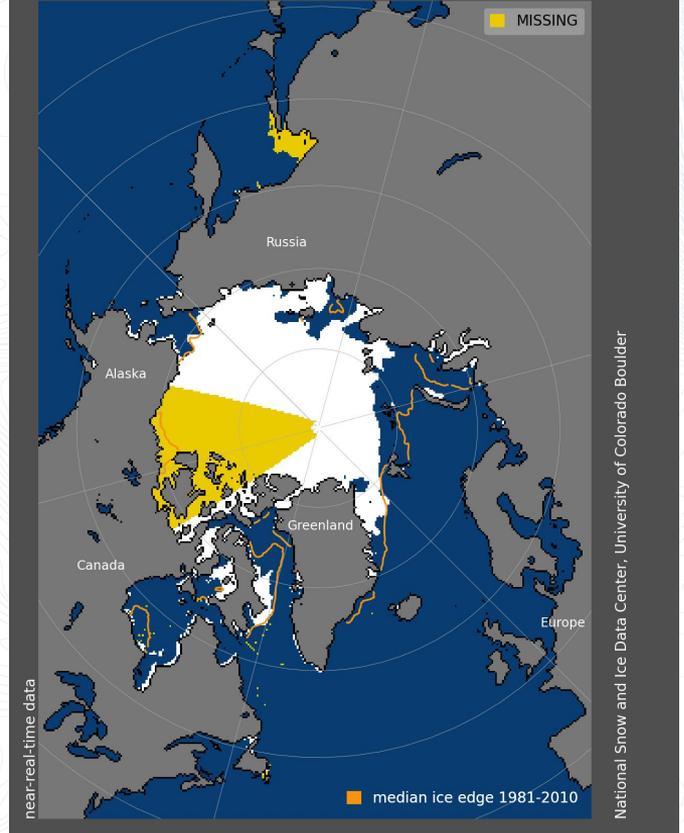
- ▲ Above normal
- Near normal
- ▼ Below normal



# Arctic wide sea ice

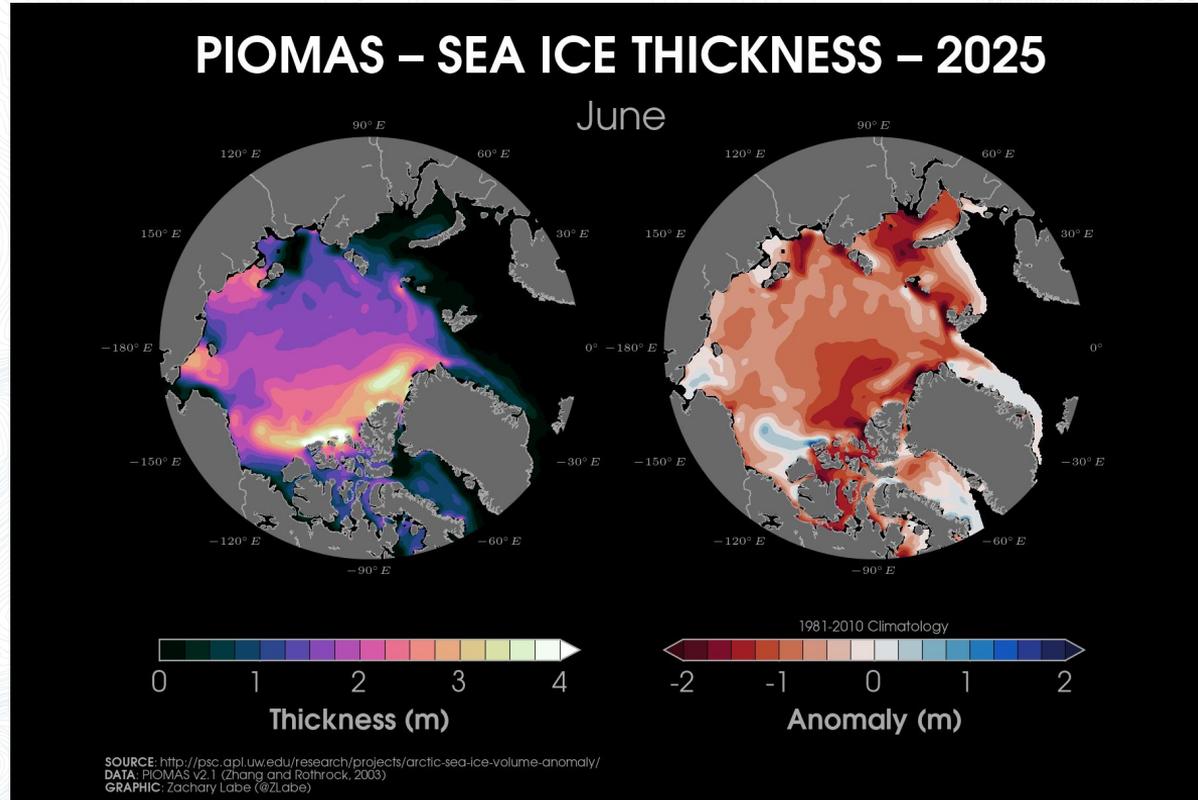


Sea Ice Extent, 16 Jul 2025



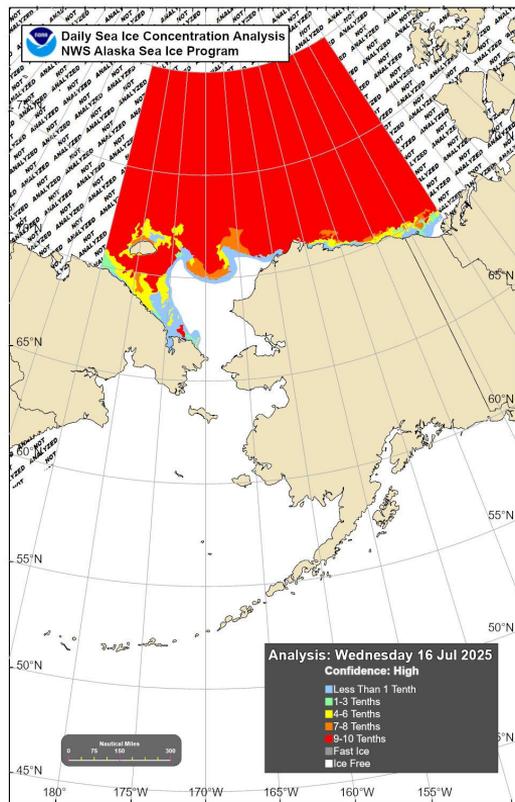
# Arctic sea ice thickness

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

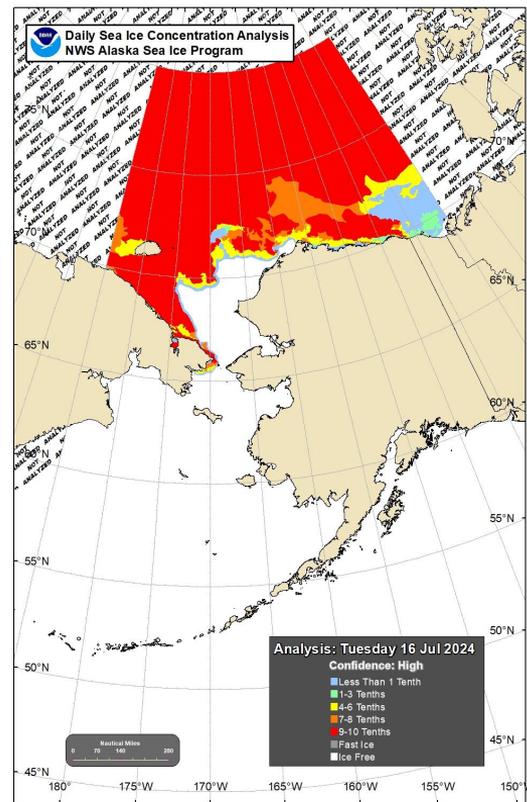


# Mid-July sea ice comparison

July 16, 2025



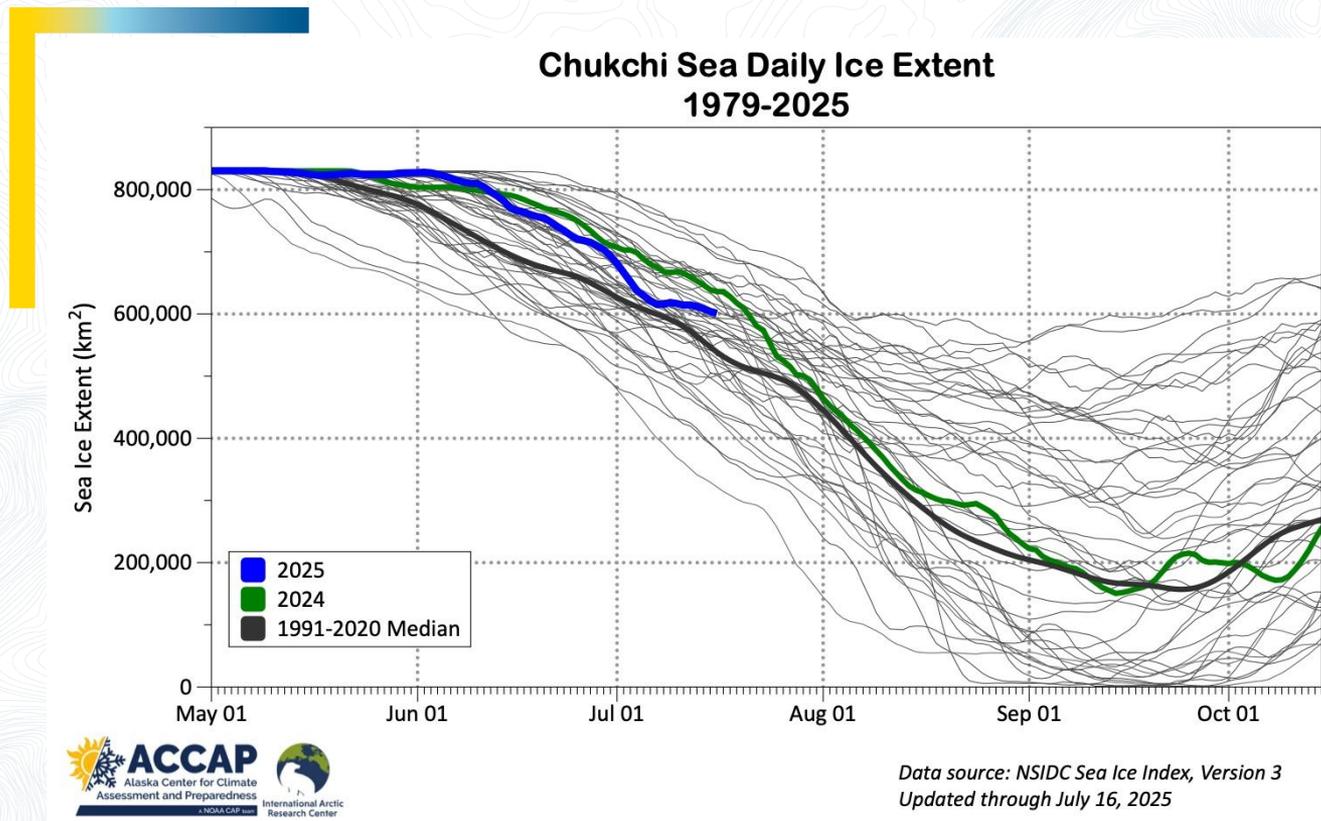
July 16, 2024



Source: National Weather Service  
Alaska Region Sea Ice Program

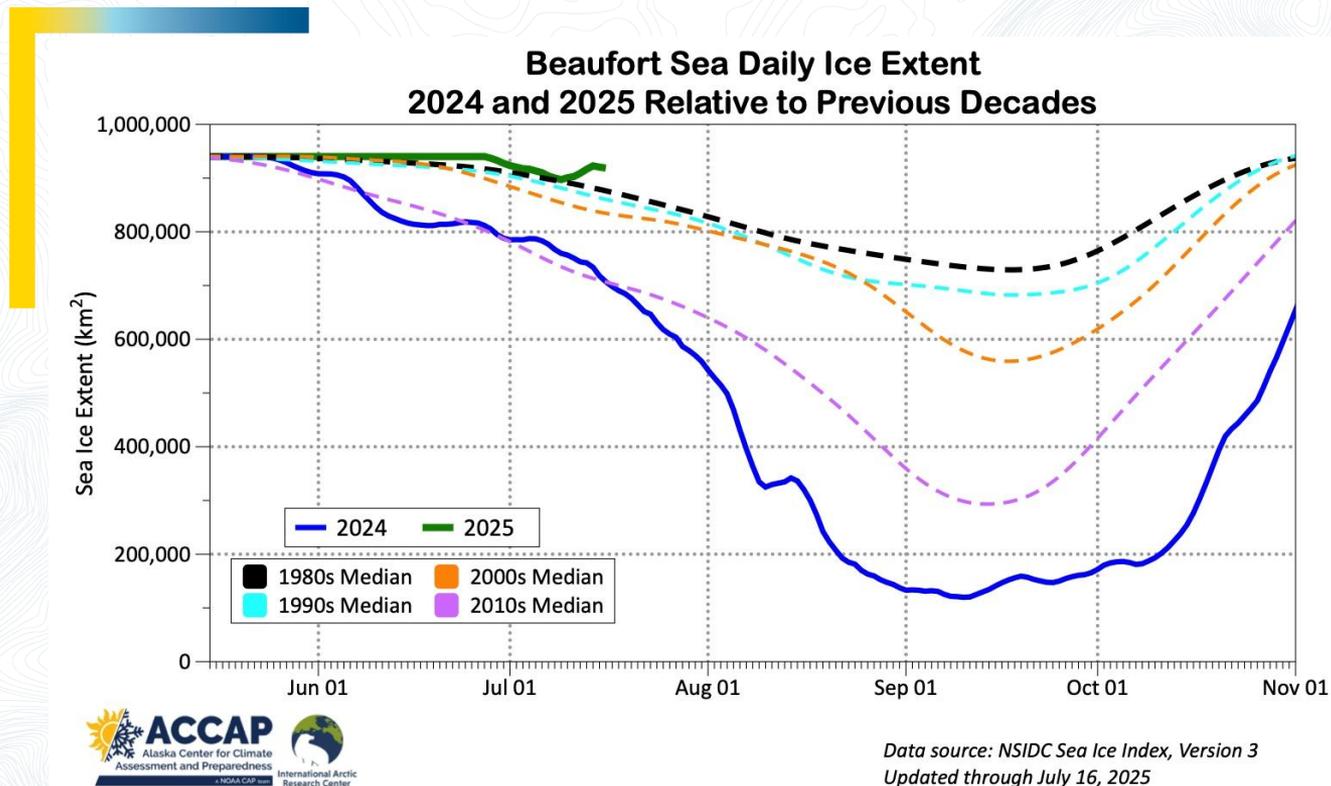
# Sea ice extent through the season

Sources:  
Data NSIDC Sea Ice Index,  
Version 3.

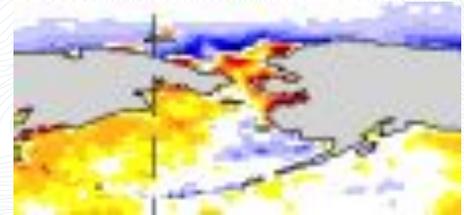
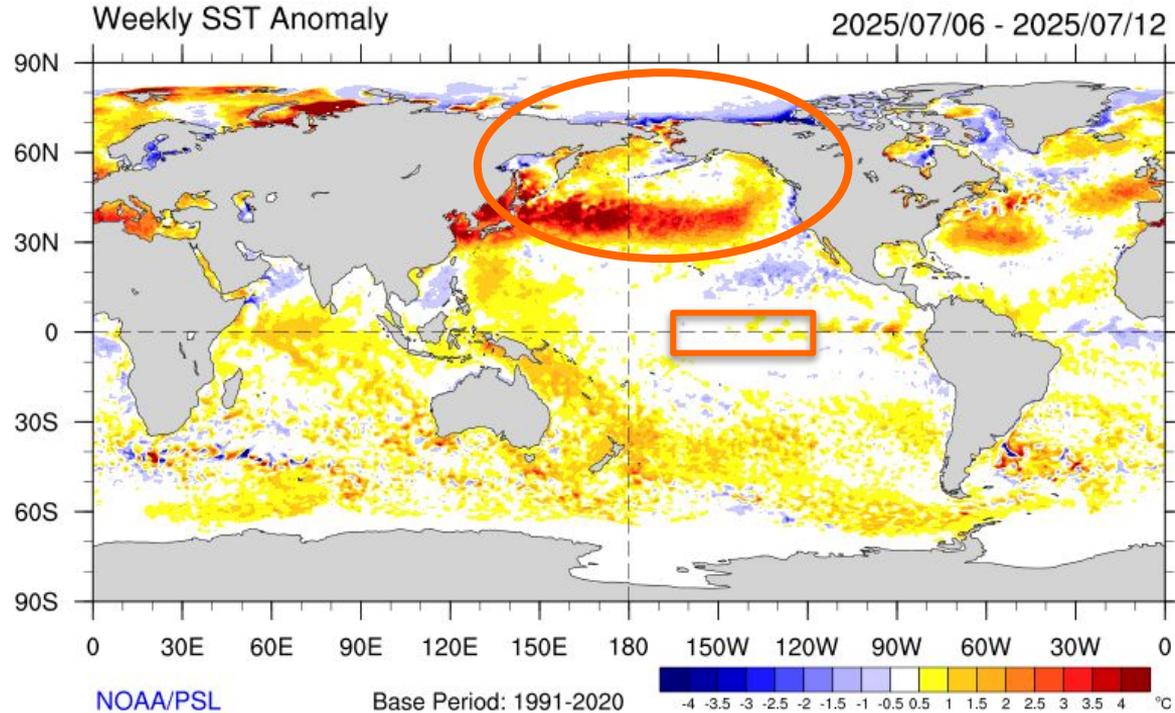


# Sea ice extent through the season

Sources:  
Data NSIDC Sea Ice Index,  
Version 3.



# Global sea surface temperature departure from normal

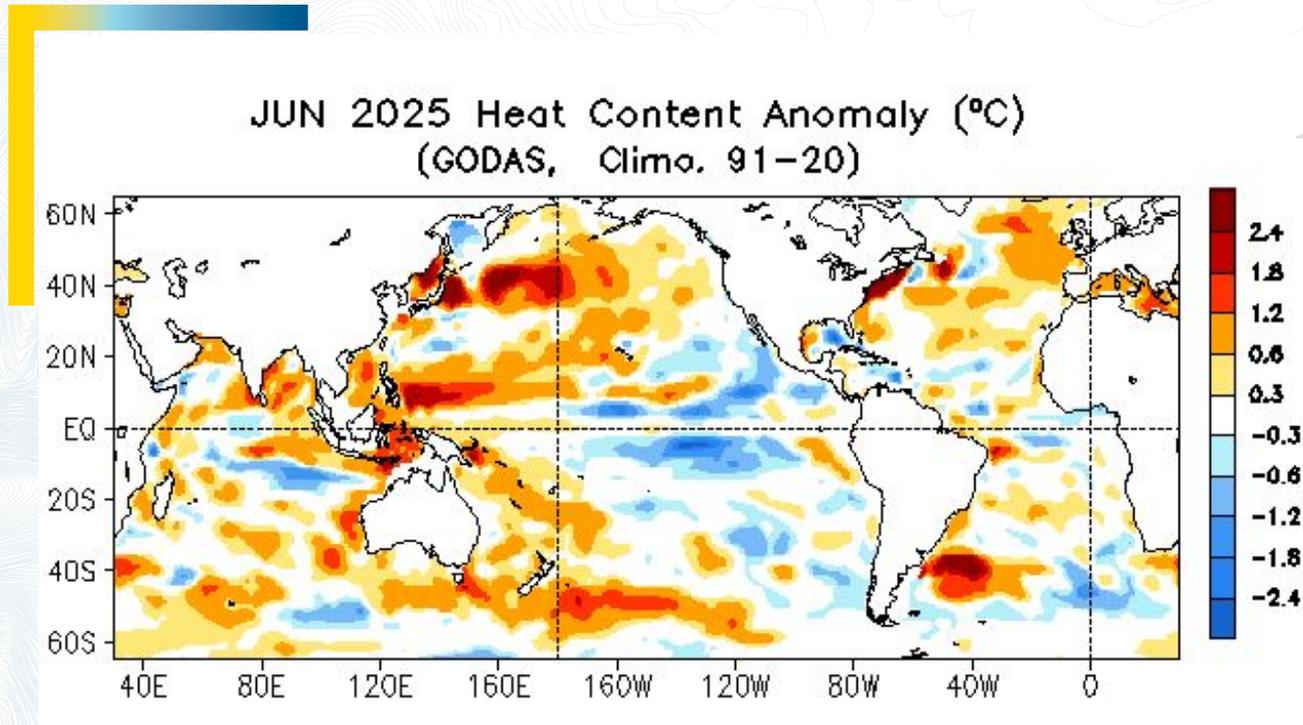


ONI for **Apr-Jun**: -0.1

PDO for **June 2025**: -1.6

Sources: ONI from CPC  
PDO Index from WCS

# Upper ocean heat departure from average



Upper 300 meters of the ocean

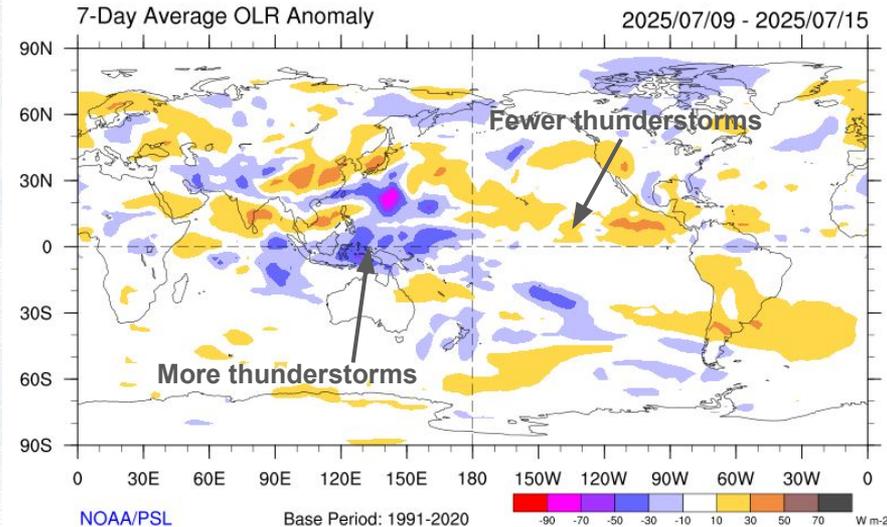
Little change near  
Alaska

Source: NOAA/CPC

# Tropical Pacific atmosphere

April-June Oceanic Niño Index: -0.1

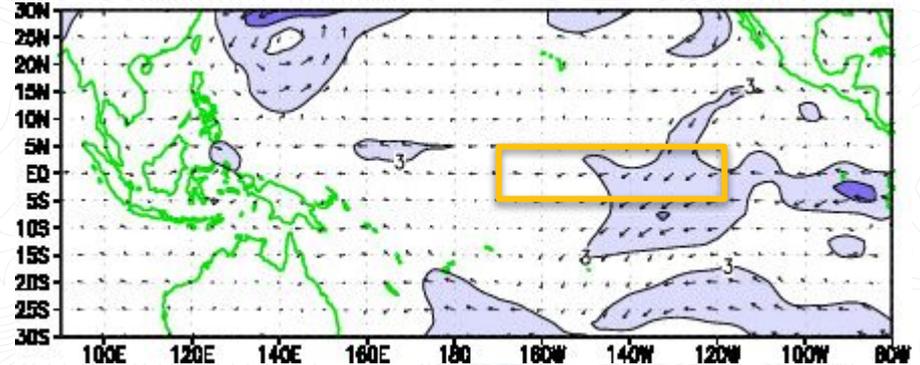
**Deep tropical convection**  
Via “outgoing longwave radiation”



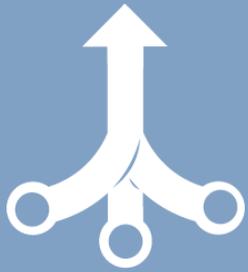
**Slightly enhanced trade winds**  
Niño Region 3.4



Trade winds  
850 mb wind difference from average  
June 15-July 14, 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

June 2025

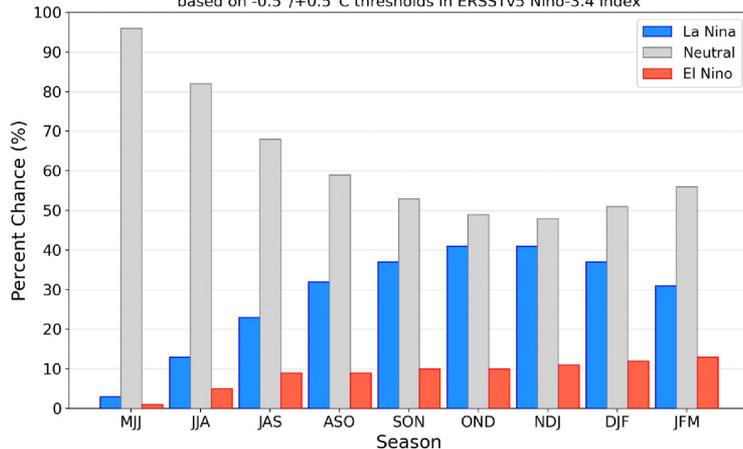
July 2025

ENSO Alert System Status:  
None



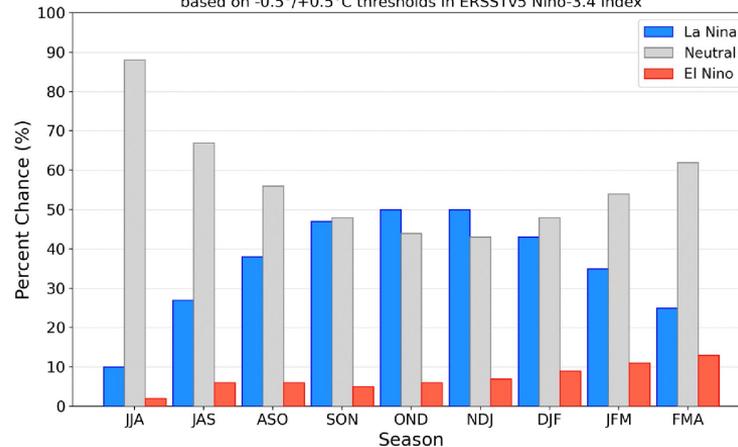
Official NOAA CPC ENSO Probabilities (issued June 2025)

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



Official NOAA CPC ENSO Probabilities (issued July 2025)

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



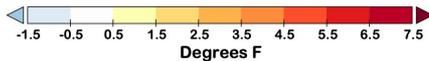
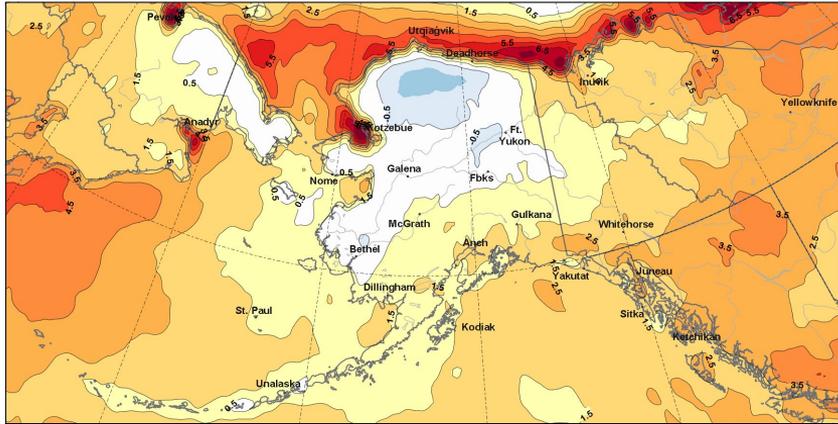
**Statistical  
guidance** ➤  
using the past  
to predict the  
future

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

# August half century trends

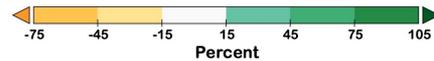
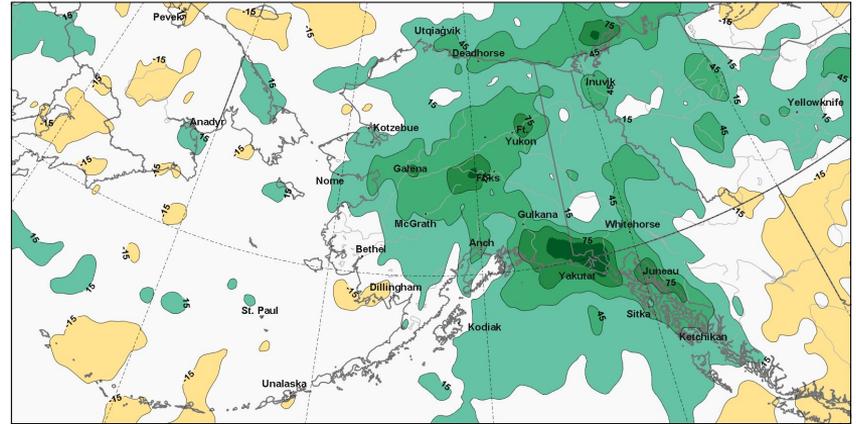
## Temperatures

Total Change in August Average Temperature  
1975-2024



## Precipitation

Total Change in August Total Precipitation  
1975-2024

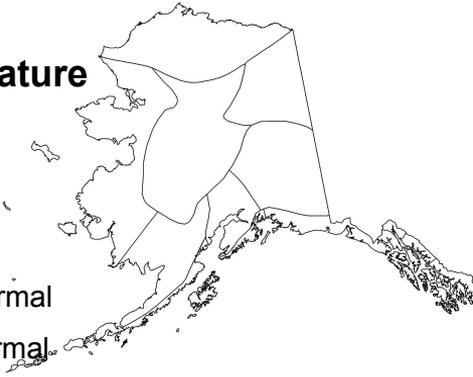
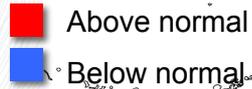


Change in the average  
over 50 years

# 2010 to 2024 trends

Past 15 years compared to 1991-2020

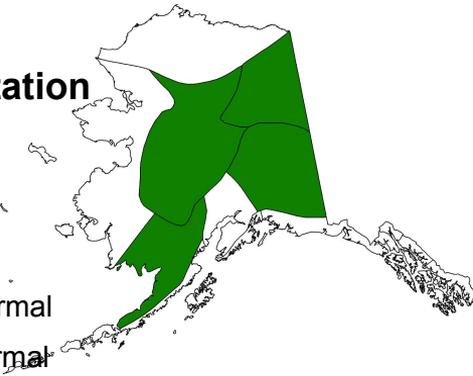
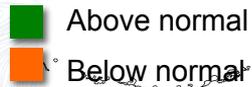
## August Temperature



## August-October Temperature



## August Precipitation



## August-October 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)
  - Lost a model this month

### **What's being forecasted**

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

# August-October 2025 sea surface temperature ➤ NMME

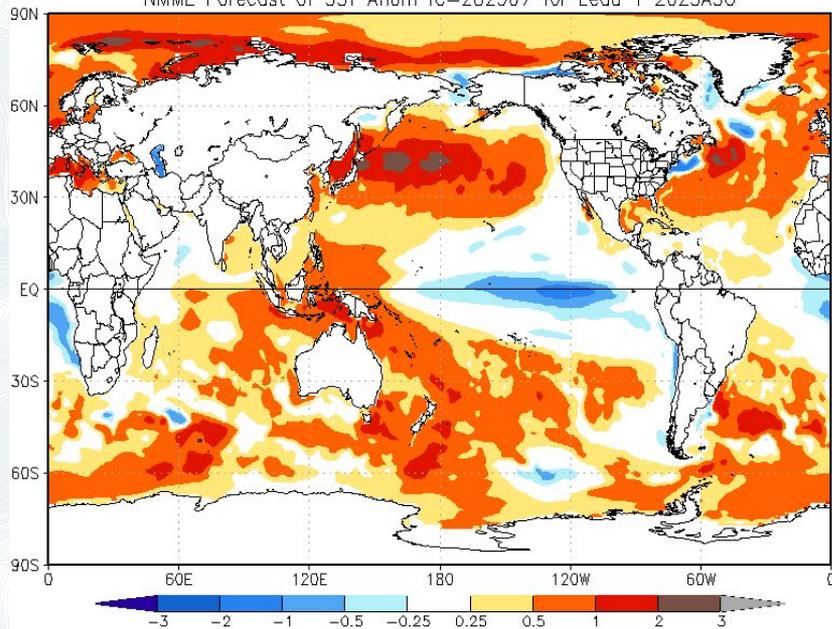
**Forecast**  
departure from normal



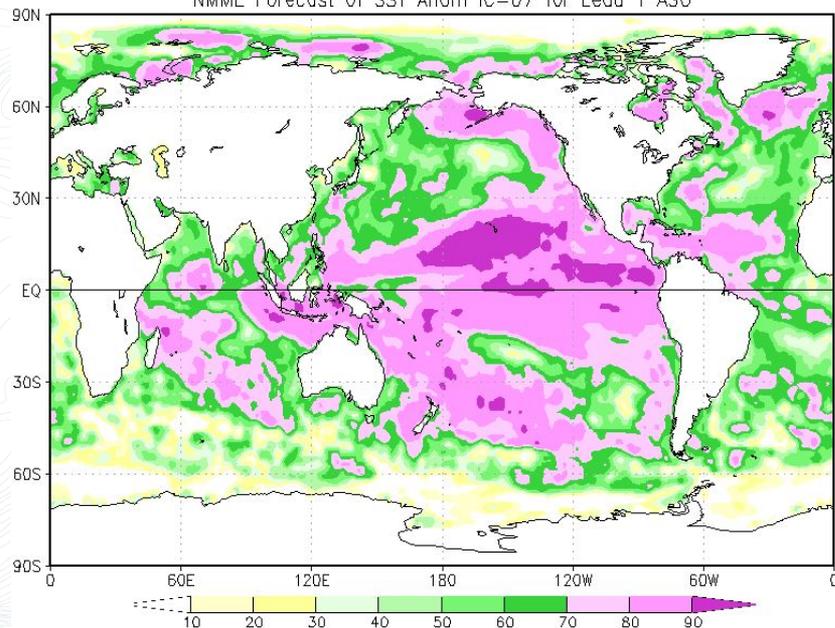
**Skill**  
of the forecast



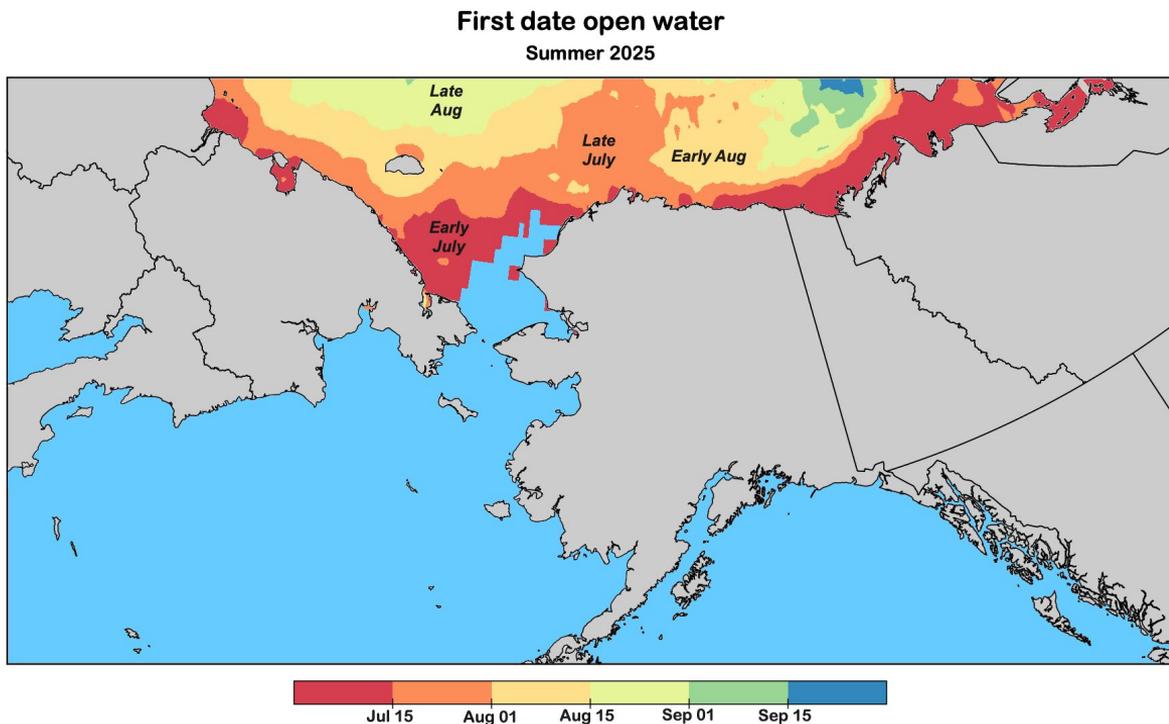
NMME Forecast of SST Anom IC=202507 for Lead 1 2025ASO



NMME Forecast of SST Anom IC=07 for Lead 1 ASO



# Experimental sea ice forecast > CPC



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

# August 2025 calibrated probability forecast ➤ NMME

Forecast from →

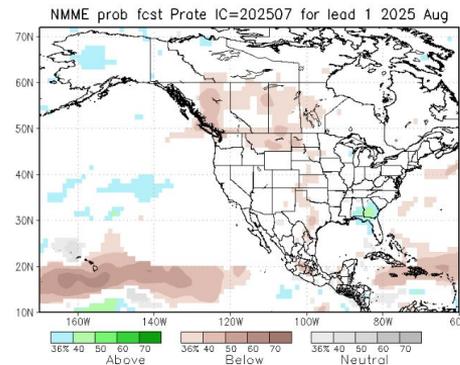
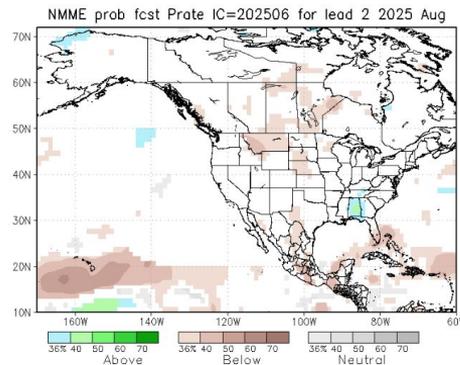
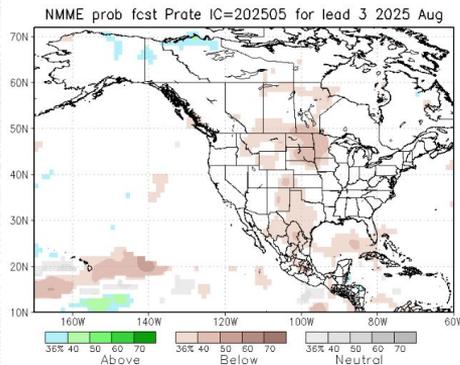
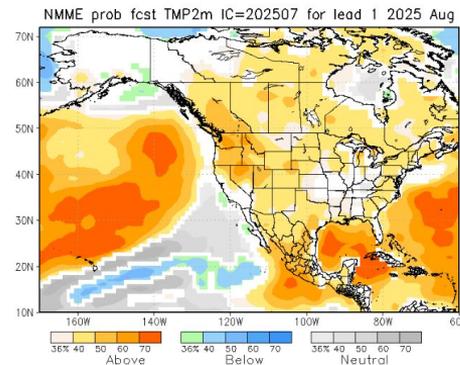
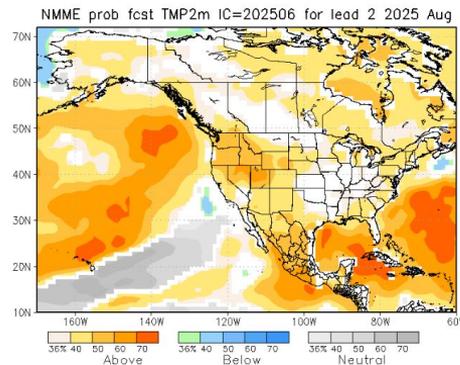
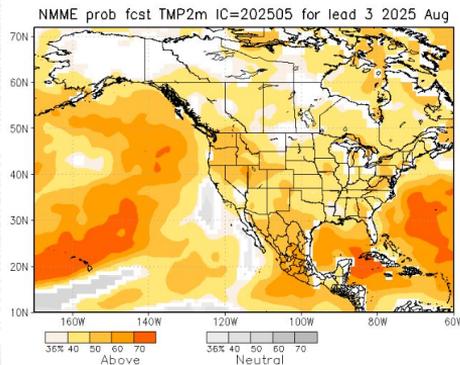
May

June

July

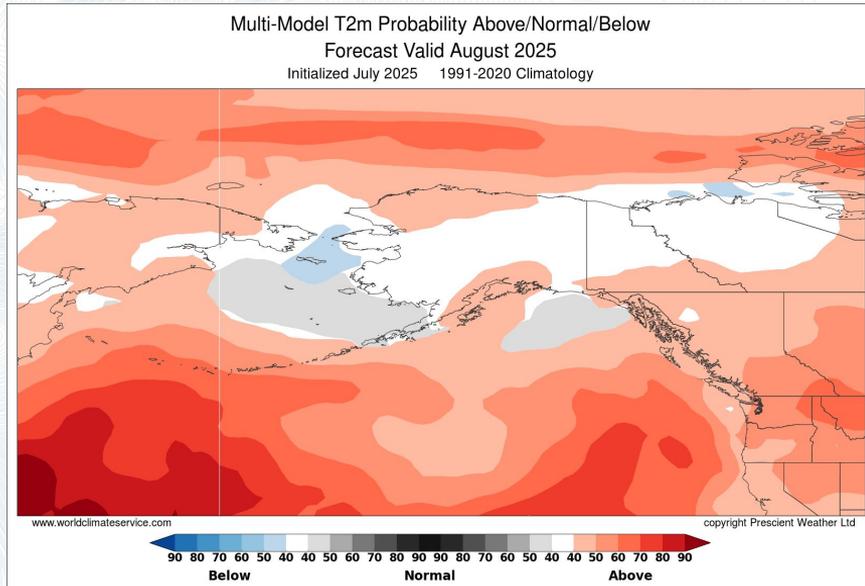
Temperature

Precipitation

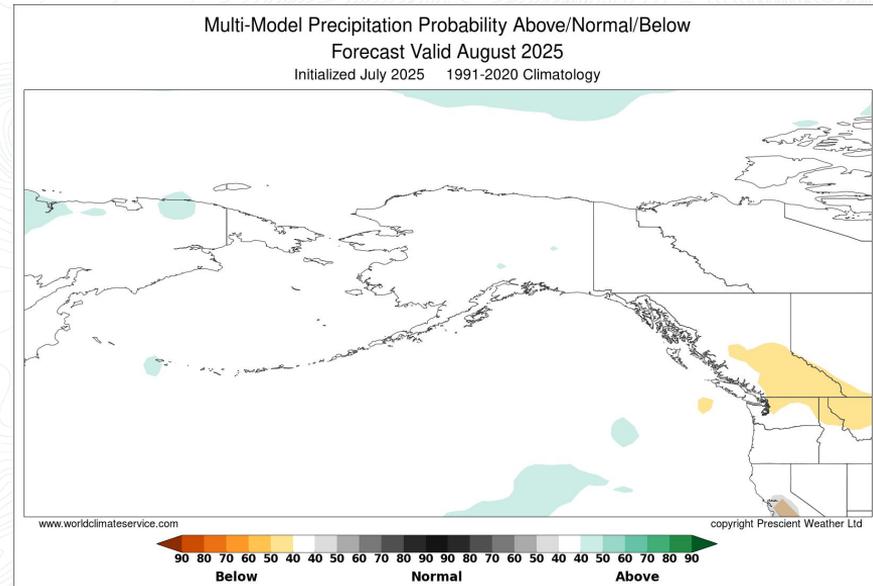


# August 2025 outlooks ➤ World Climate Service

## Temperature



## Precipitation



Bias Corrected, Skill Weighted CFS + ECMWF

# August-October 2025 calibrated probability forecast ➤ NMME

Forecast from →

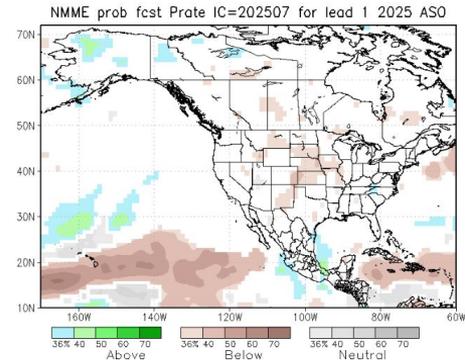
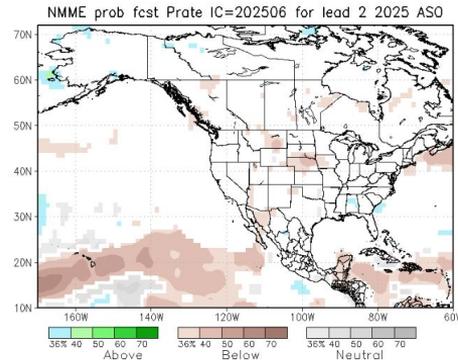
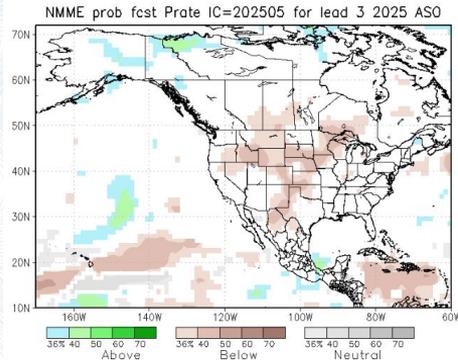
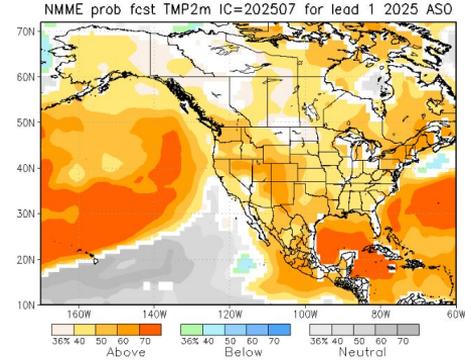
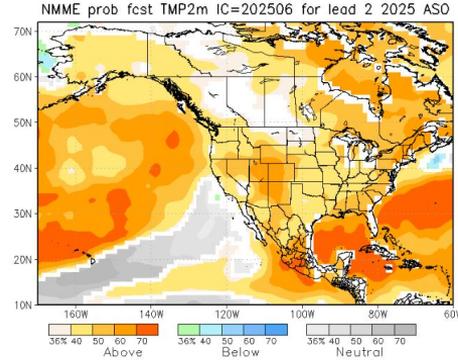
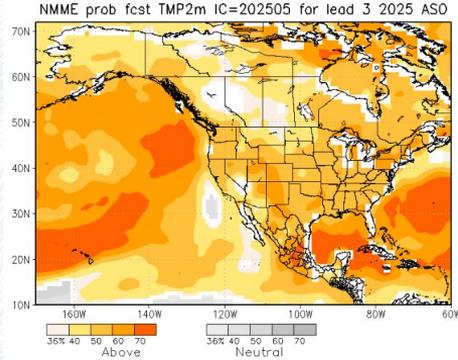
Temperature

Precipitation

May

June

July

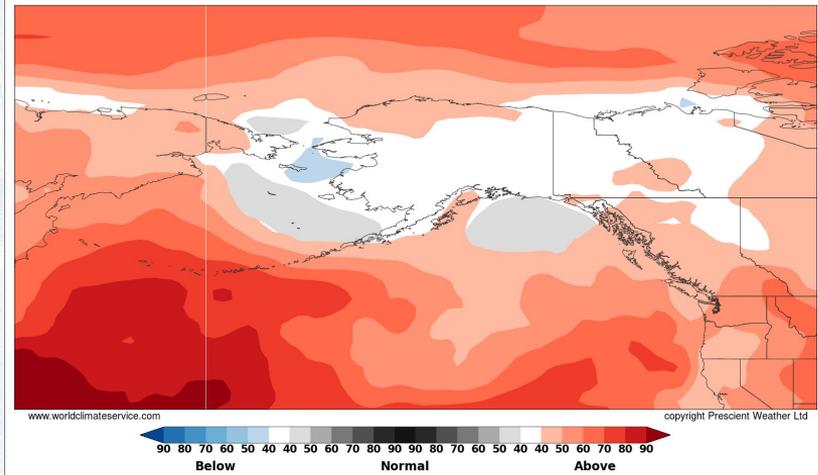


# August-October 2025 outlooks > World Climate Service

## Temperature



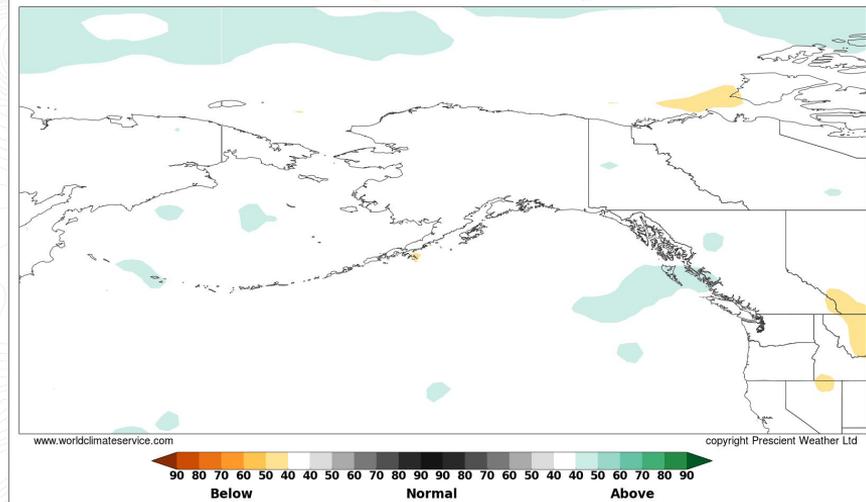
Multi-Model T2m Probability Above/Normal/Below  
Forecast Valid Aug 2025 - Oct 2025  
Initialized July 2025 1991-2020 Climatology



## Precipitation



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

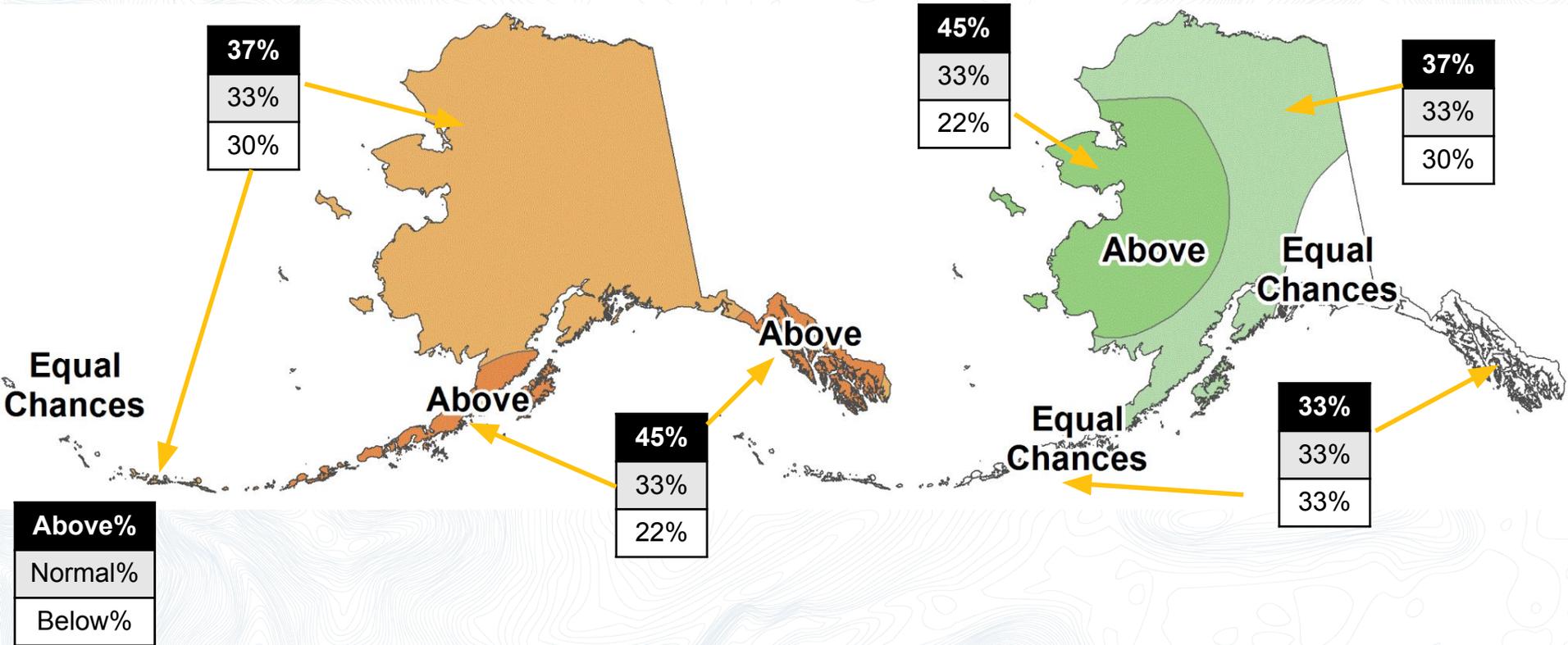


Bias Corrected, Skill Weighted CFS + ECMWF

# August-October 2025 outlooks from **June**

Temperature

Precipitation



Future  
outlook

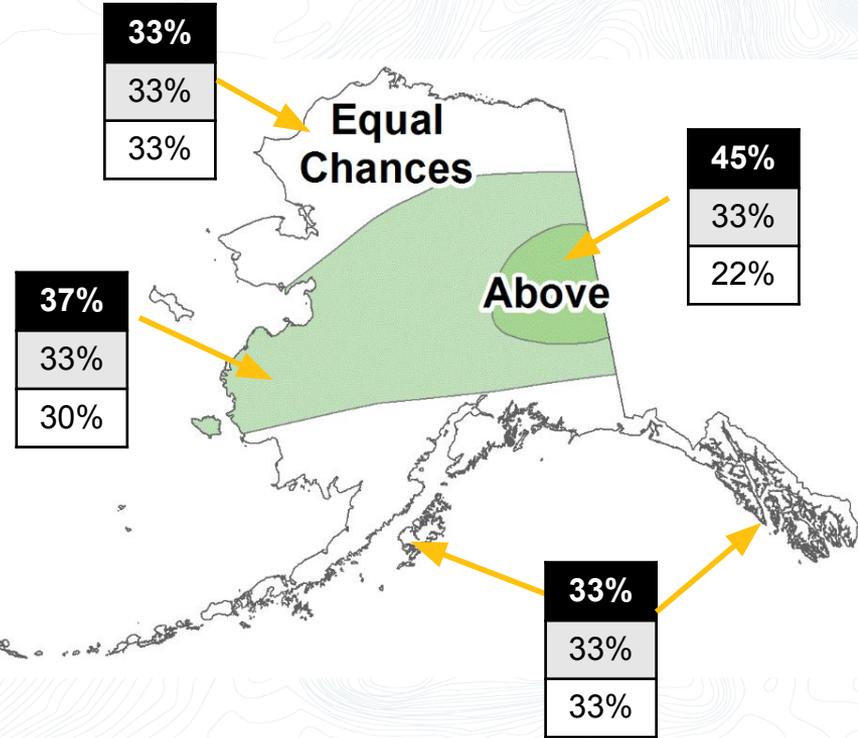
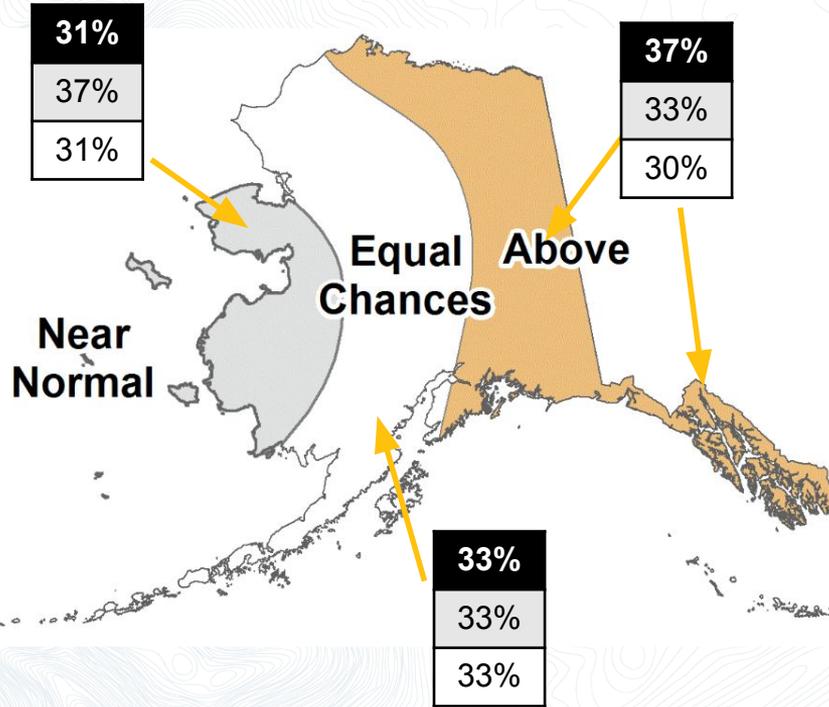


And the answer is...

# CPC August 2025 outlooks

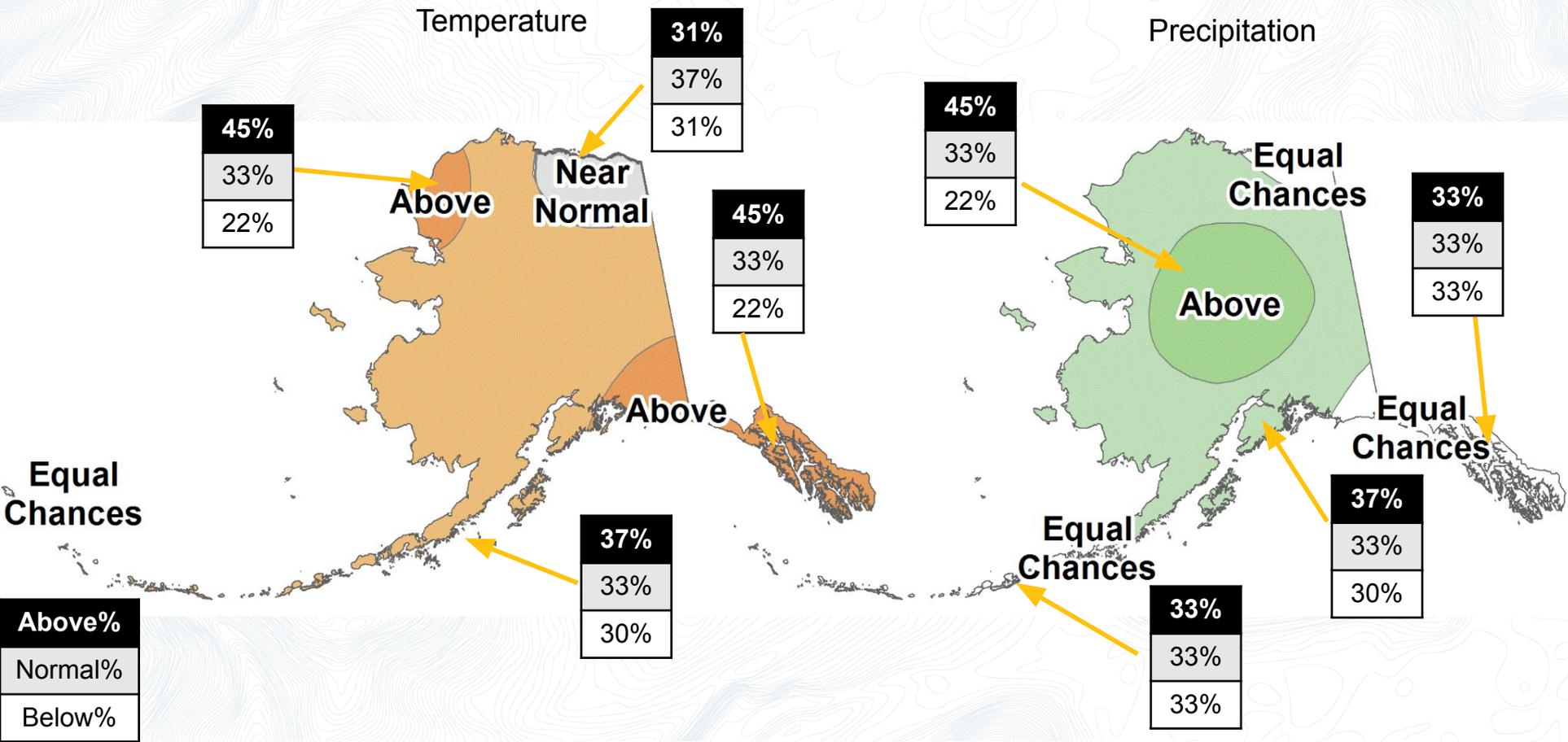
Temperature

Precipitation

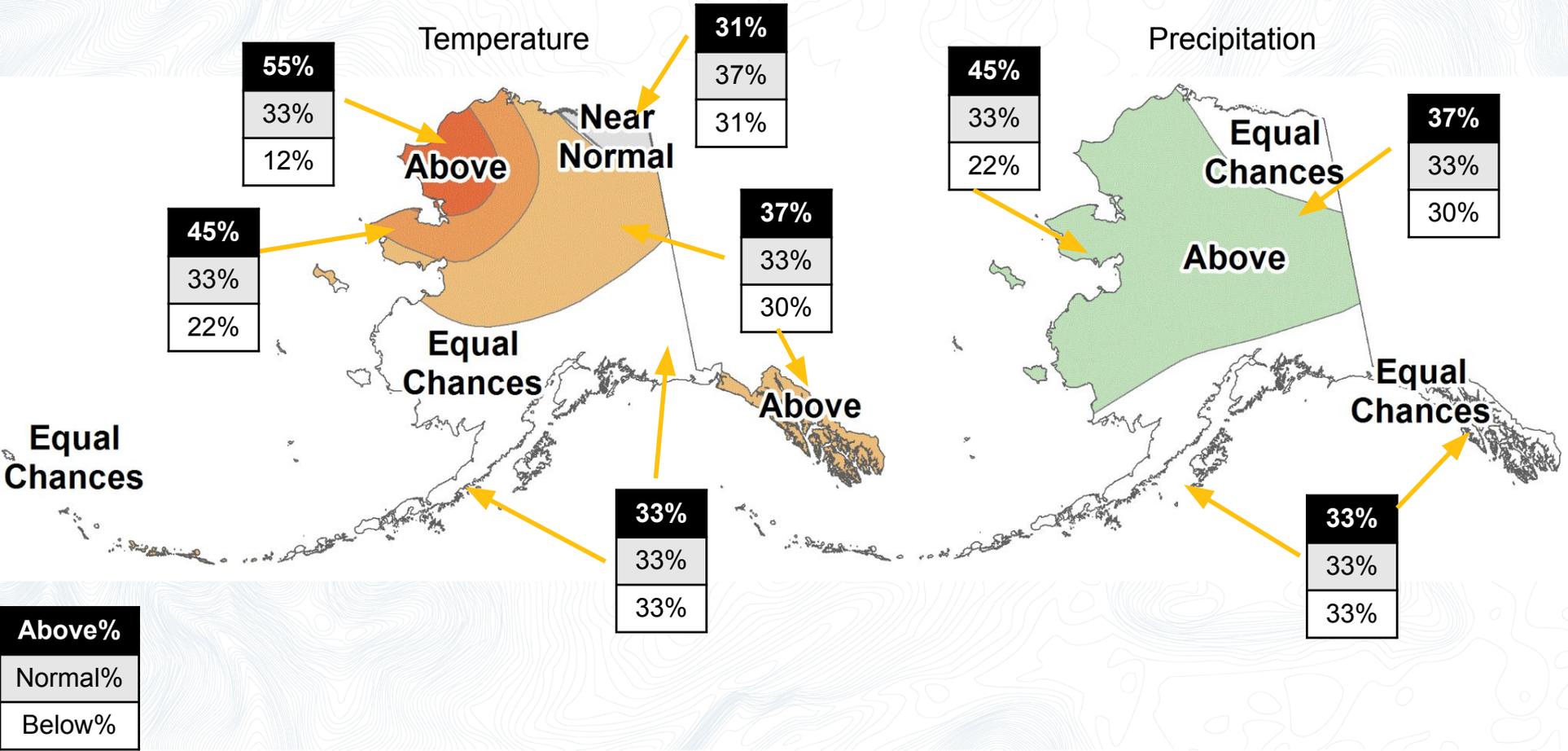


<b>Above%</b>
Normal%
Below%

# CPC August-October 2025 outlooks



# Autumn 2025 outlook

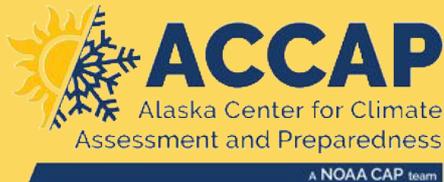


# Upcoming ACCAP webinars

Upcoming ACCAP webinars [accap.uaf.edu/events](http://accap.uaf.edu/events)

- July 23 ▶ Introduction to the Metop-SG constellation and METImage
- August 22 ▶ NWS Monthly Climate Outlook Briefing

Email Rick Thoman [rthoman@alaska.edu](mailto:rthoman@alaska.edu)



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Research Center on the University of Alaska  
Fairbanks Troth Yeddha' Campus