

# Circumpolar One Health Summer 2023 Climate Review and Autumn 2023 Outlook

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# Summer 2023 Alaska Weather & Climate Highlights

**Utqiagvik** average temperature 43.2F, warmest summer on record



**Beaufort Sea** August average sea ice extent 4<sup>th</sup> lowest on record



**Statewide** 19,000 lightning strikes July 24-25<sup>th</sup>, highest 1-day total since July 2019

**West Coast/Interior** rare low elevation summer snow June 1-2

**Nome** 53 days with rain, 3<sup>rd</sup> highest past 80 summers



**Fairbanks** average temperature 62.9F, 3<sup>rd</sup> warmest summer on record

**Statewide** wildfire burned less than half average, 298,000 acres.



**Gulkana** driest summer since 2004: only 43% normal rainfall

**Anchorage** 48 days with rain, 2<sup>nd</sup> highest summer total



**Juneau** August 6<sup>th</sup> severe Mendenhall River flooding from glacier lake outburst

**Homer** wettest summer: rainfall 233 percent of normal



**King Salmon** 2<sup>nd</sup> wettest summer: 141 percent of normal

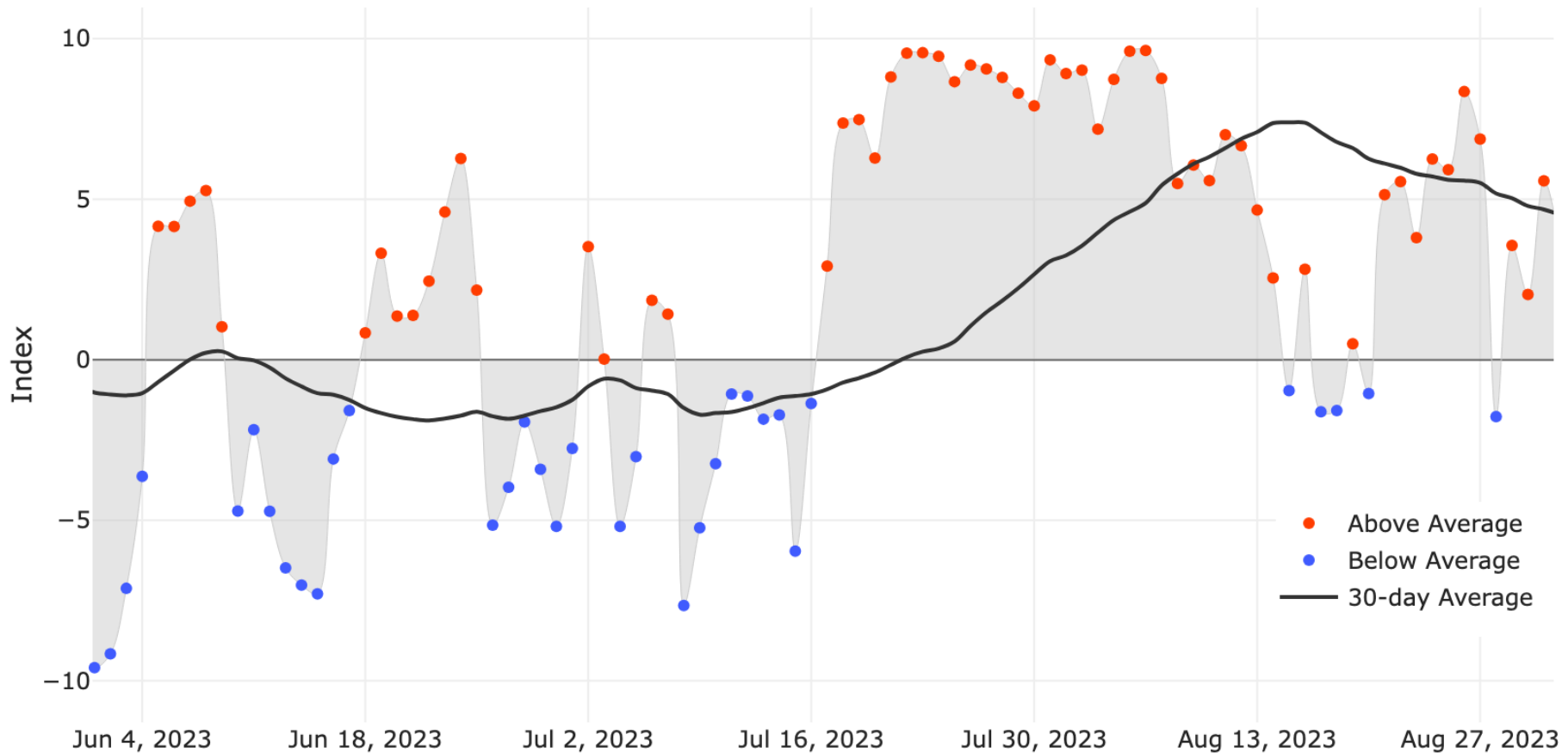


**Sitka** average temperature 58.0F, 3<sup>rd</sup> warmest summer on record



# Alaska Daily Temperature Index

Alaska Statewide Temperature Index  
June 1 to August 31, 2023

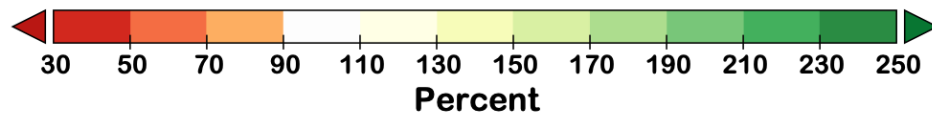
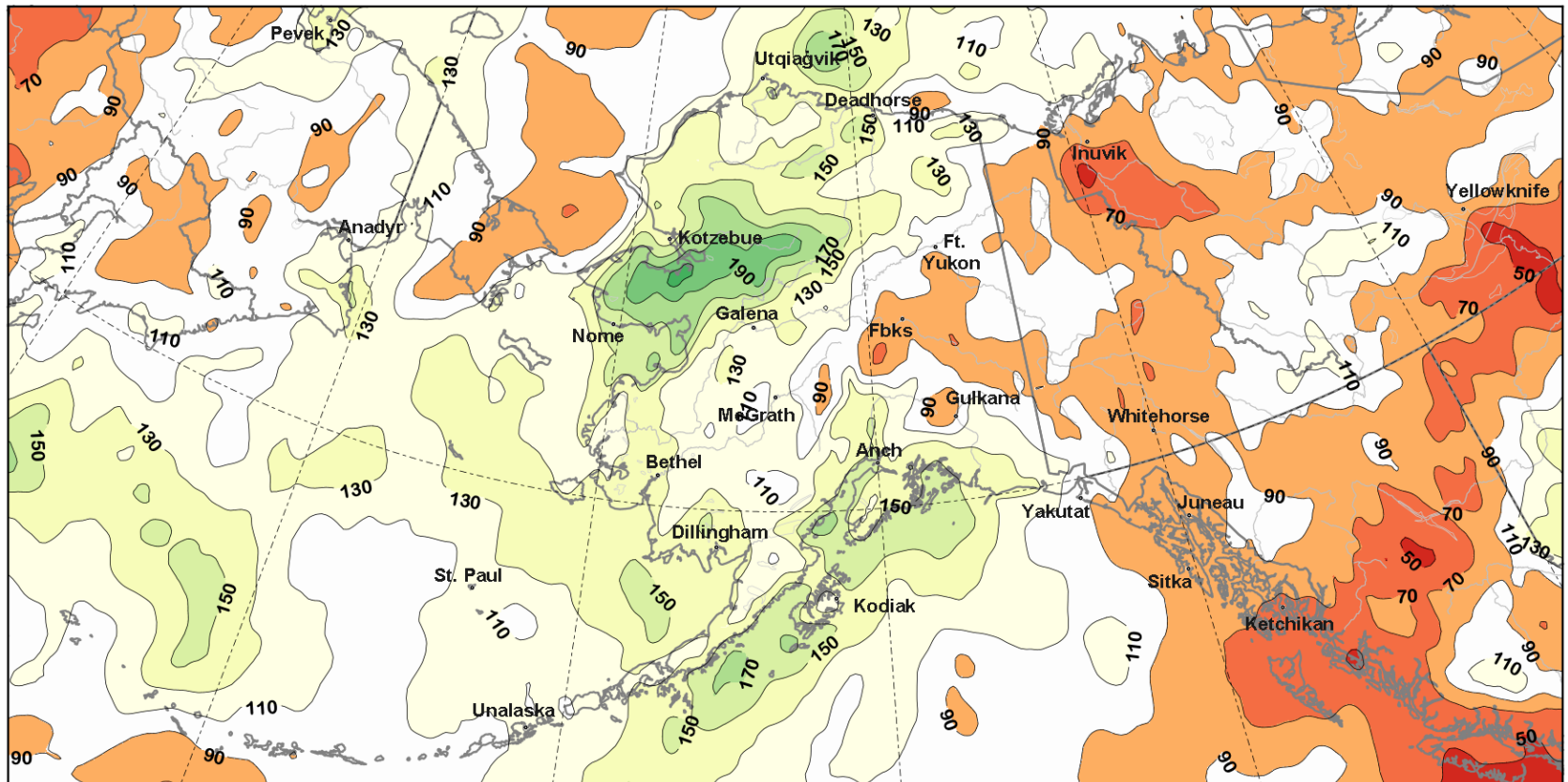


Online: <http://accap.uaf.edu/tools/statewide-temperature-index>



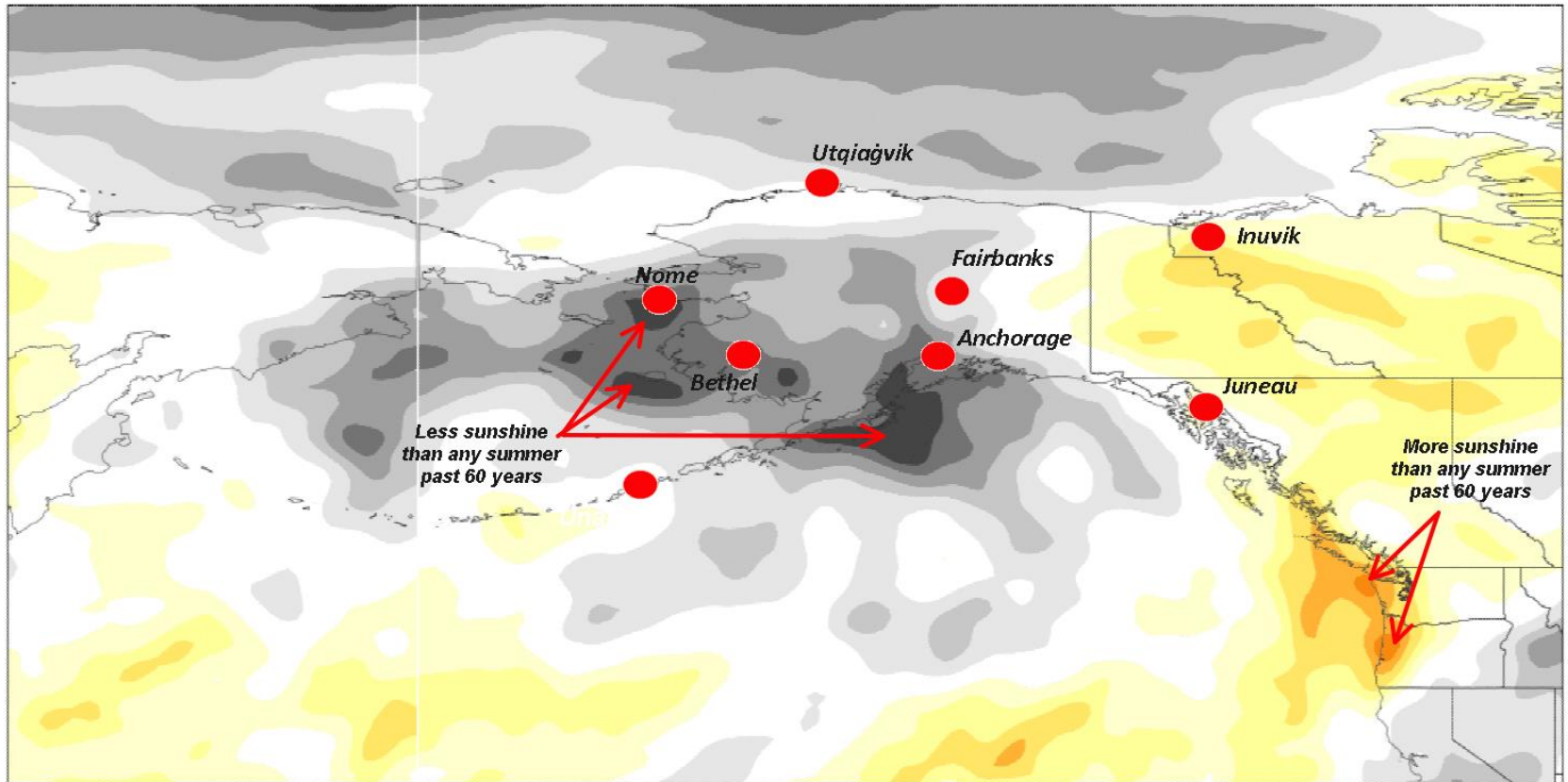
# Dramatic Precipitation Differences

Total Precipitation: Percent of Normal  
Summer (June through August) 2023



# How Gray was It?

Shortwave Radiation Rank Compared to 1963-2022  
June 2023 - August 2023  
ERA5 Reanalysis



Less Sunshine

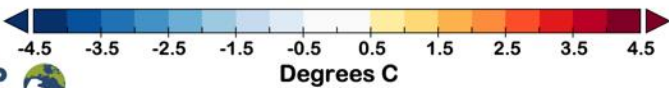
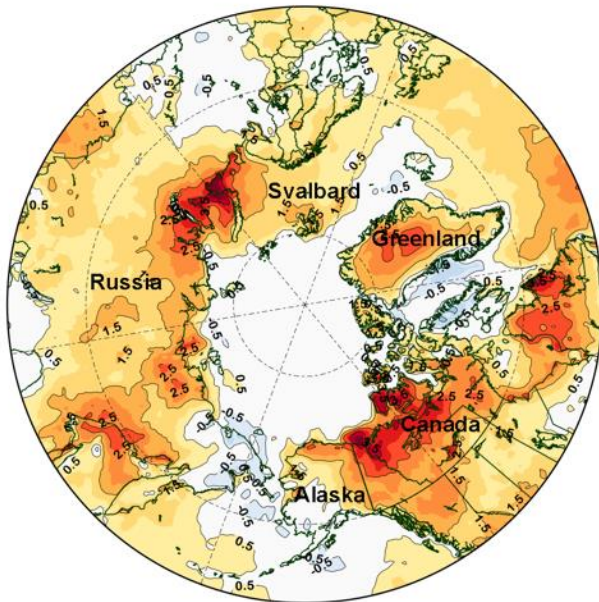
More Sunshine

1 2 5 10 20 42 52 57 60 61



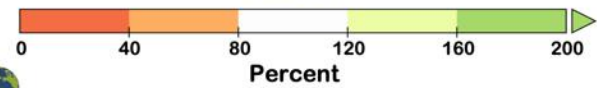
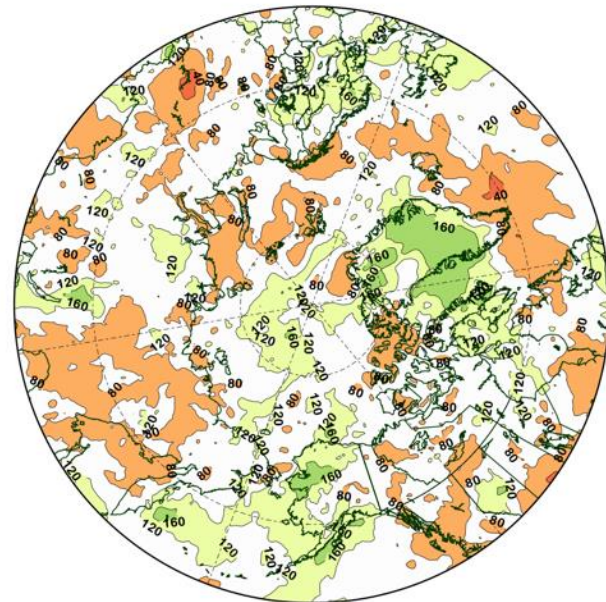
# Summer 2023 Arctic-wide

Average Temperature: Departure from Normal  
Summer (June through August) 2023



ERA5 courtesy of ECMWF/Copernicus

Total Precipitation: Percent of Normal  
Summer (June through August) 2023



ERA5 courtesy of ECMWF/Copernicus

Temperature Departures from Average

Precipitation Percent of Average

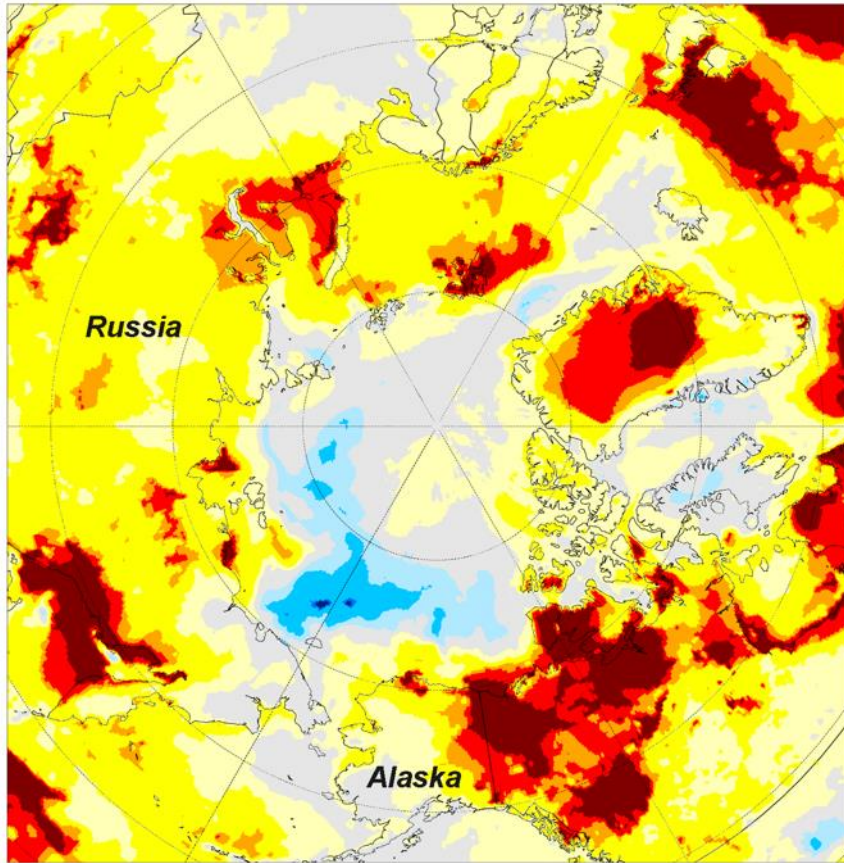
Data: ERA5 courtesy of EMCWF/Copernicus  
1991-2020 Baseline





# Summer 2023 Arctic-wide

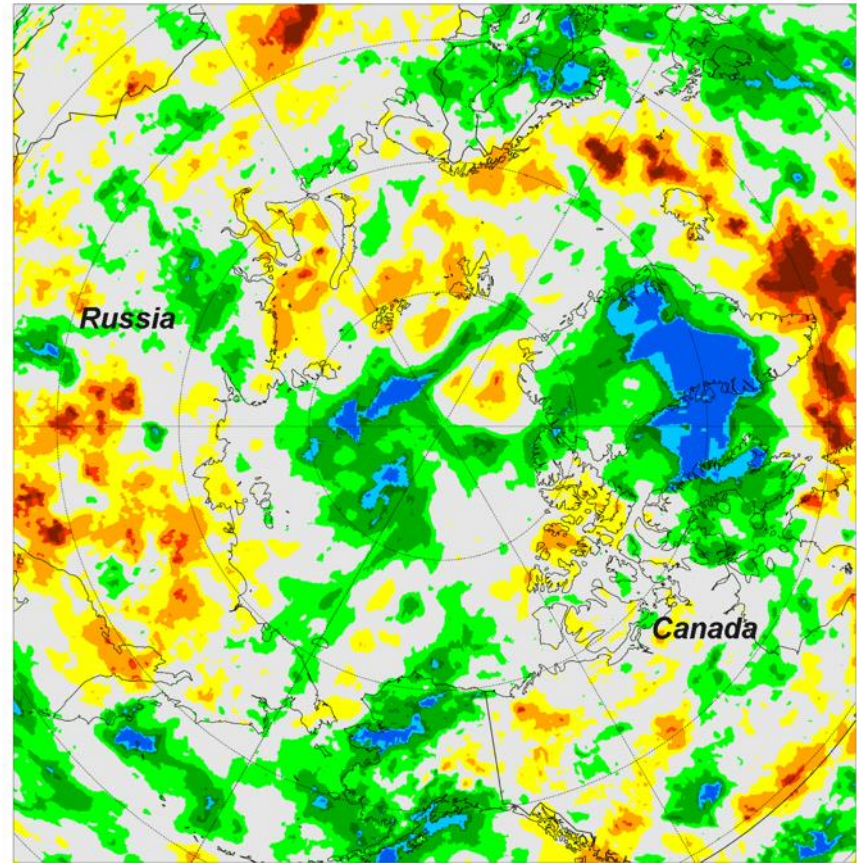
Temperature Ranking for Jun-Aug 2023



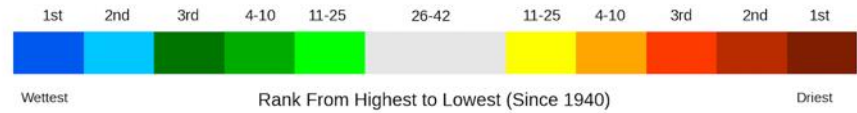
Source: ERA5 Reanalysis Arctic (60N-90N) Rank for Jun-Aug 2023 is: 2 out of 84 Map by: Brian Brettschneider



Precipitation Ranking for Jun-Aug 2023



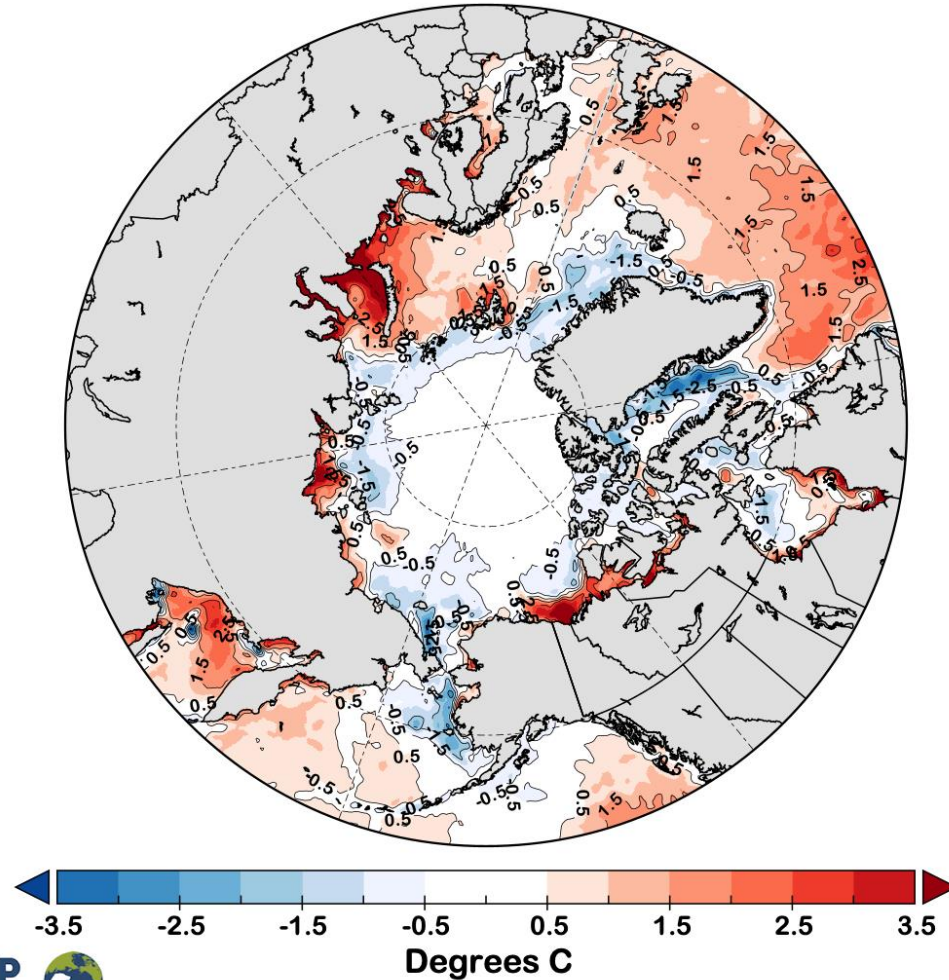
Source: ERA5 Reanalysis Arctic (60N-90N) Rank for Jun-Aug 2023 is: 26 out of 84 Map by: Brian Brettschneider



Data: ERA5 courtesy of EMCWF/Copernicus  
 Graphics courtesy B. Brettschneider/NWS Alaska Region

# Summer 2023 Ocean Temperatures

Average Sea Surface Temperature Departure from Normal  
Summer (June through August) 2023





# Northwest North America 2023 Wildfire

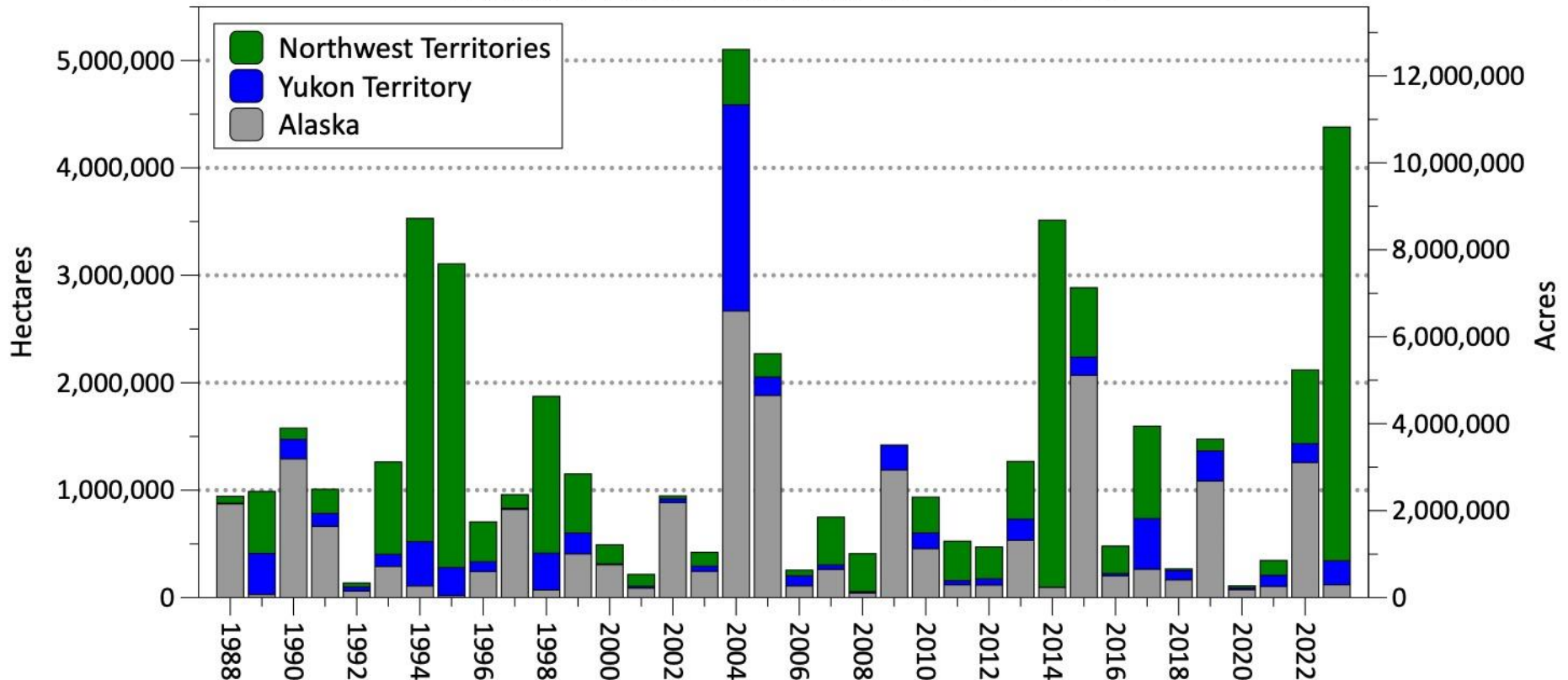


Graphic from NASA/FIRMS  
Acreage burned from:  
AICC (Alaska), CIFFC (Canada)



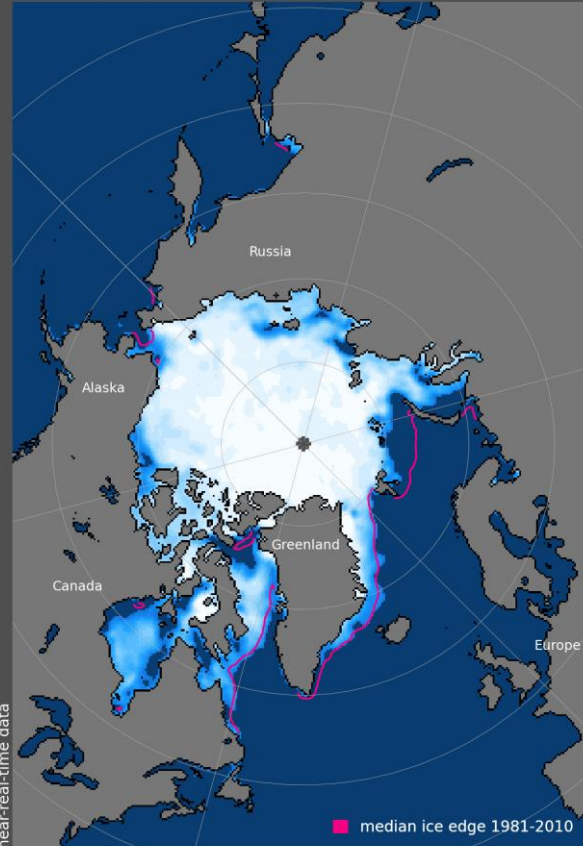
# Northern North American Wildfire

## Alaska, Yukon Territory & Northwest Territories Wildfire Area Burned, 1988 to 2023



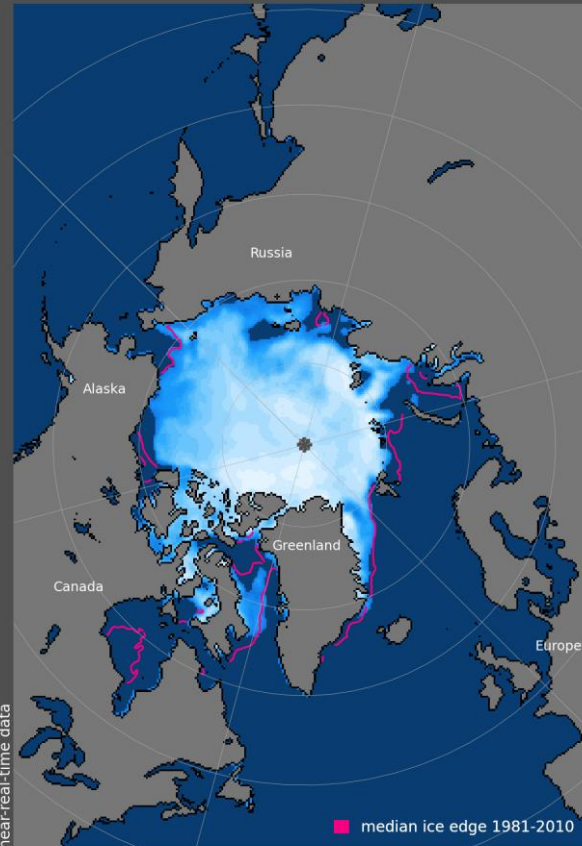
# Arctic Sea Ice Extent: Summer 2023

Sea Ice Concentration, Jun 2023



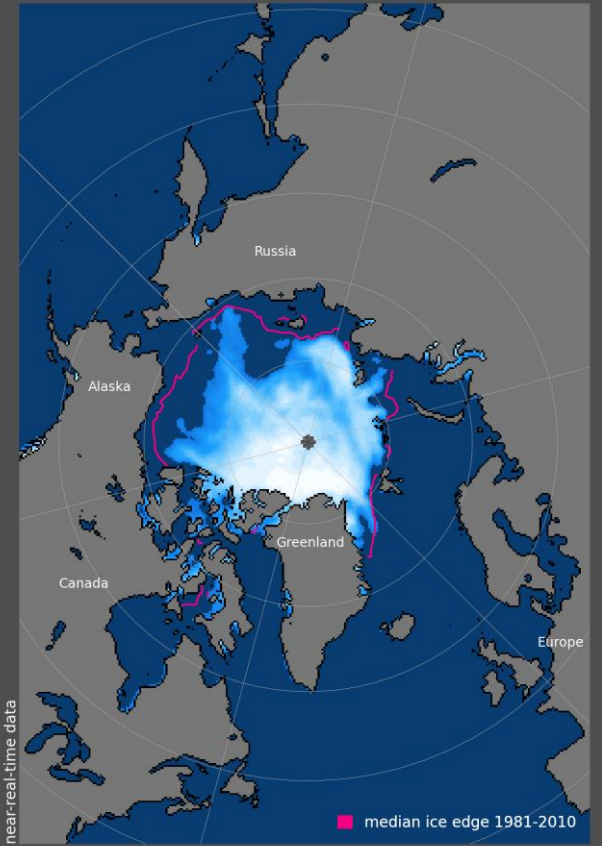
Total Area = 8.7 million sq km

Sea Ice Concentration, Jul 2023



Total Area = 5.5 million sq km

Sea Ice Concentration, Aug 2023



Total Area = 3.5 million sq km

13<sup>th</sup> lowest

12<sup>th</sup> lowest

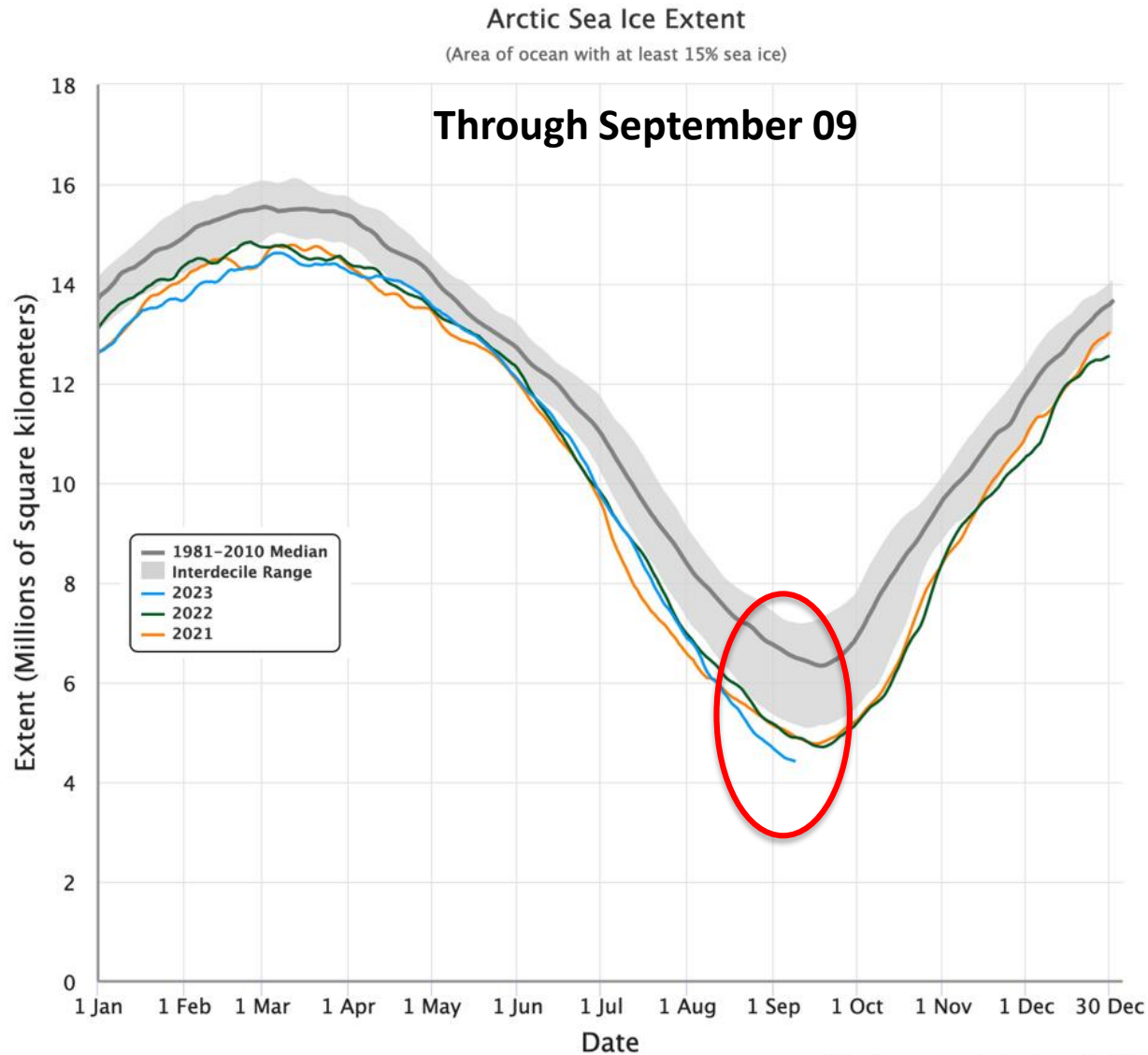
8<sup>th</sup> lowest

Since 1979





# 2023 Daily Arctic Sea Ice Extent

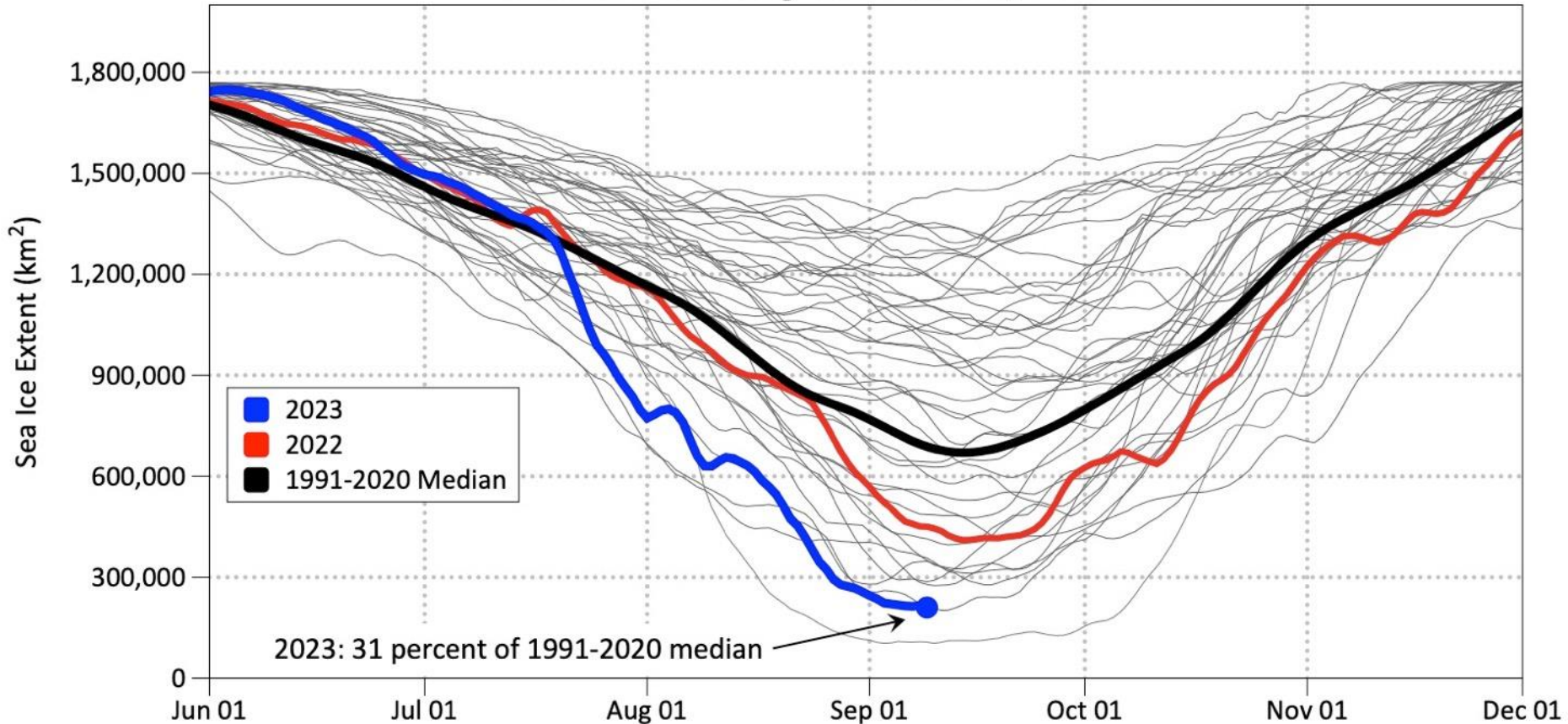


National Snow and Ice Data Center, Boulder, CO



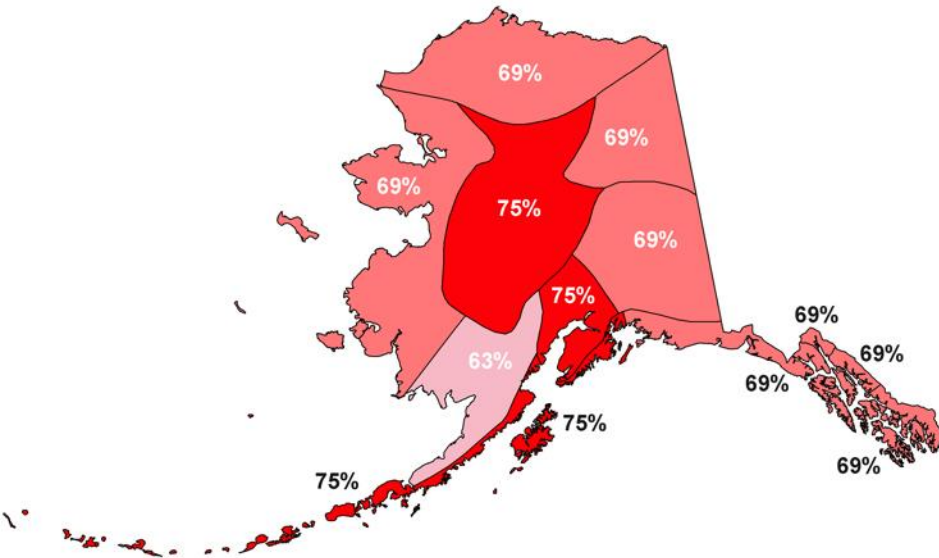
# Summer Sea Ice Around Alaska

## Chukchi & Beaufort Seas Combined Daily Ice Extent, 1979-2023

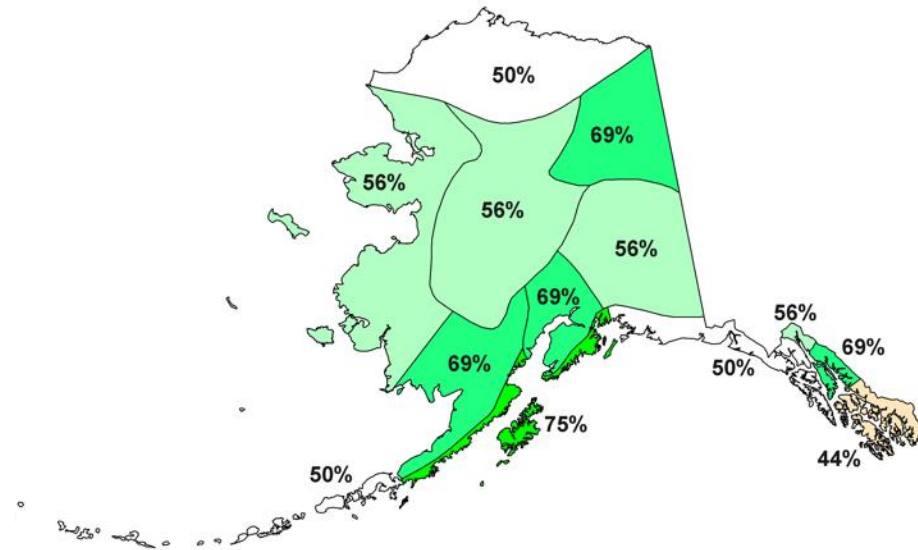


# El Niño is Here

## What does that Mean?



Percent Autumns with Average Temperature above average



Percent Autumns with Total Precipitation above Average

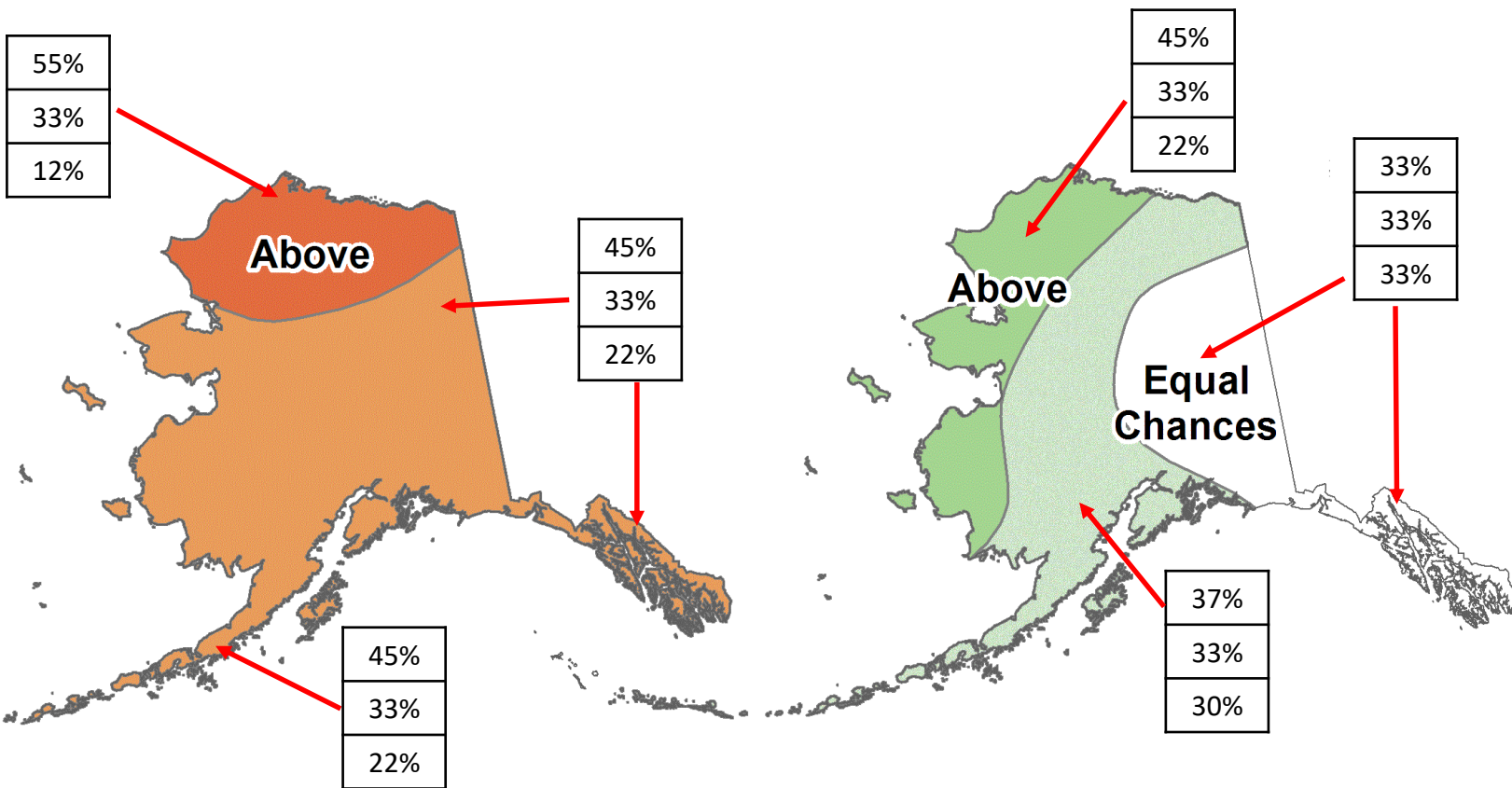
16<sup>th</sup> El Niño Autumns since 1976:

1976, 1977, 1979, 1982, 1986, 1987, 1991, 1994, 1997,  
2002, 2004, 2006, 2009, 2014, 2015, 2018





# NOAA/NWS Climate Prediction Center September to November 2023 Outlook



**Average Temperature Outlook**

**Total Precipitation Outlook**

Above%
Normal%
Below%



# Autumn 2023

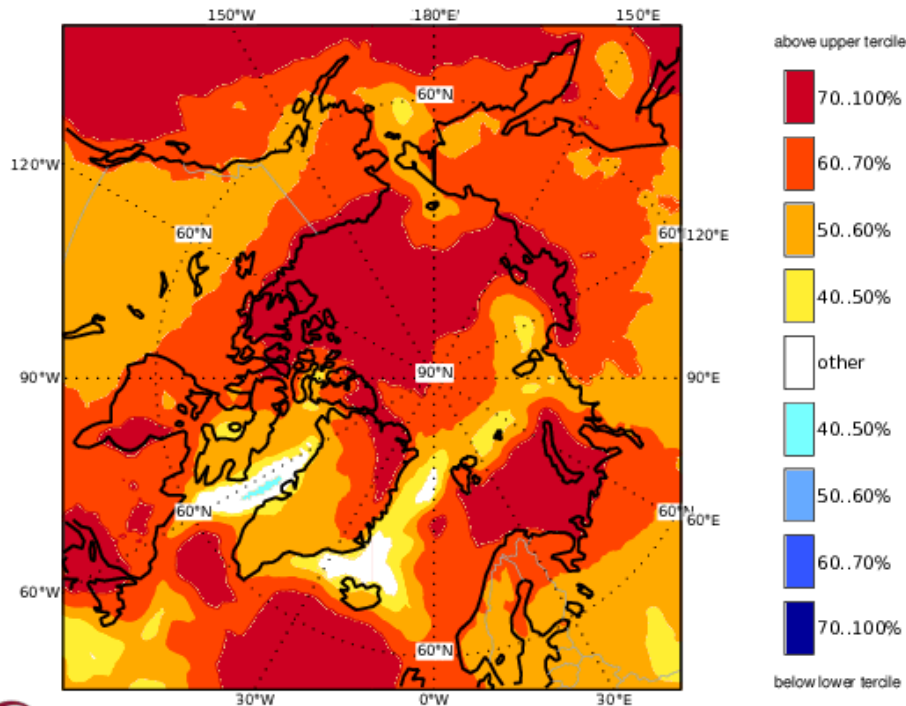
## Arctic Temperature and Precipitation Outlook

C3S multi-system seasonal forecast

Prob(most likely category of 2m temperature)

Nominal forecast start: 01/08/23

Unweighted mean

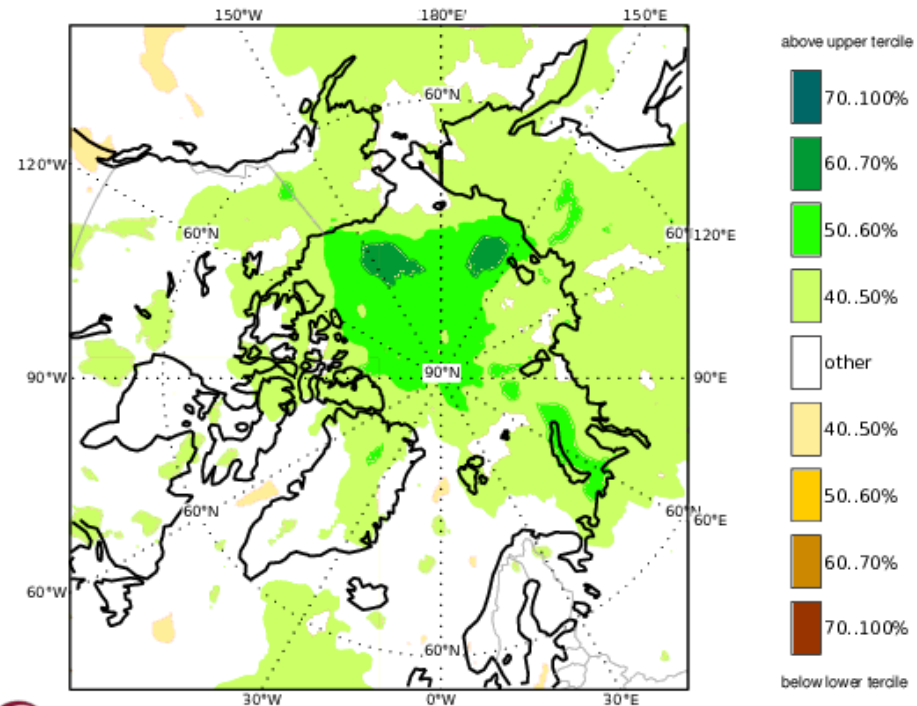


C3S multi-system seasonal forecast

Prob(most likely category of precipitation)

Nominal forecast start: 01/08/23

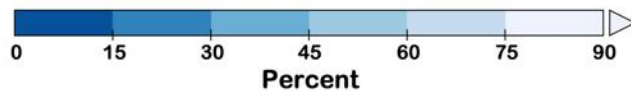
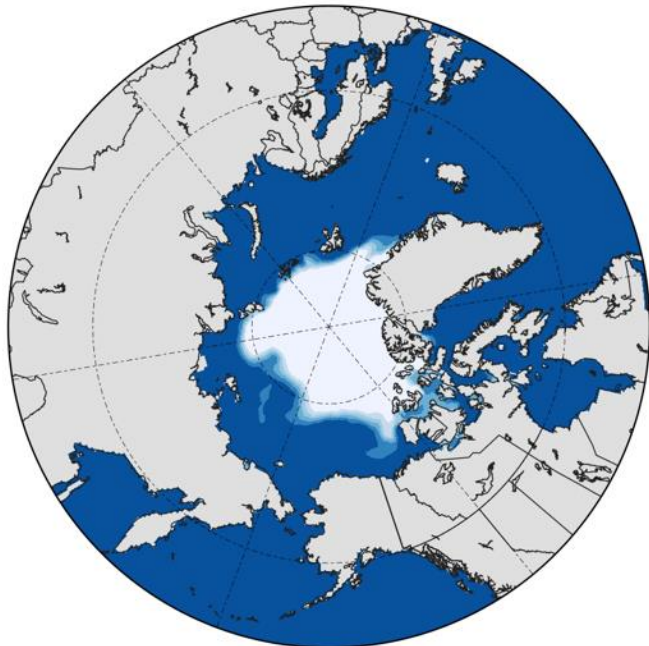
Unweighted mean



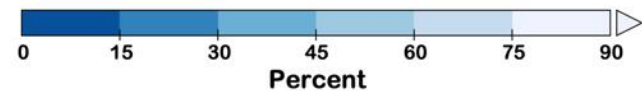
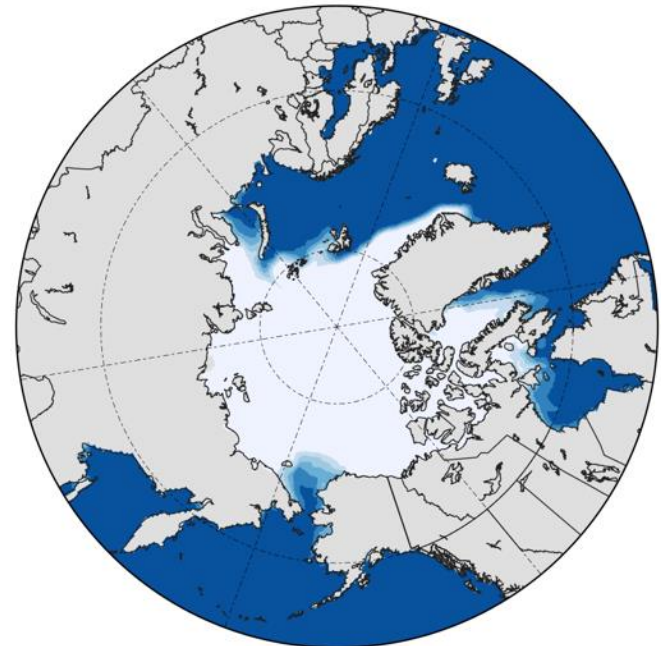
Outlooks courtesy Copernicus C3S (Climate Change Service)

# Autumn 2023 Sea Ice Outlook

Average Sea Ice Concentration Outlook  
September 2023



Average Sea Ice Concentration Outlook  
November 2023



Data: NOAA/Climate Prediction Center Exp. Sea Ice Outlook  
Outlook produced from late August 2023 data





# Thanks very much



Summer Solstice at Sitka  
Photo: SEDA

