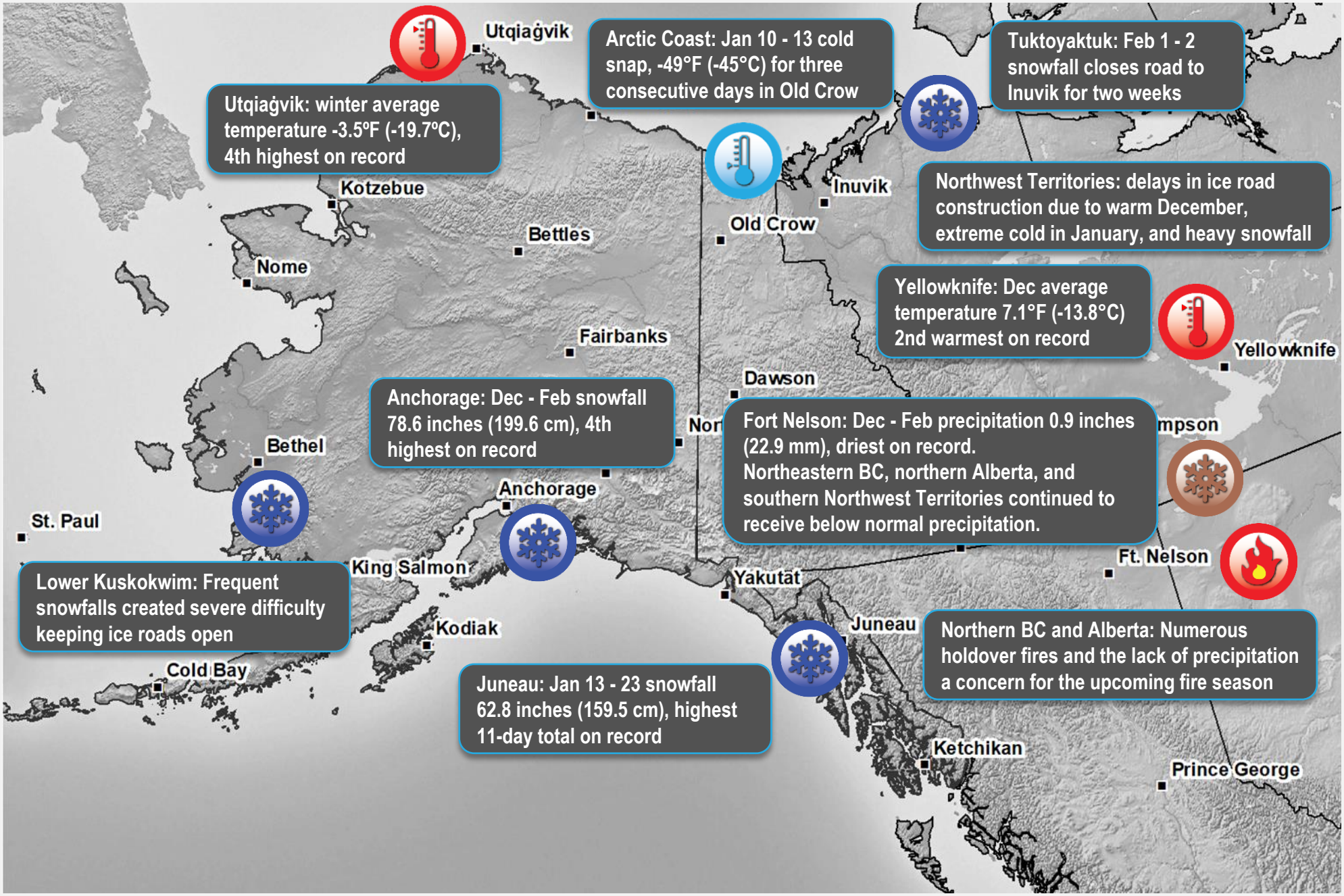
ALASKA and NORTHWESTERN CANADA

Weather and Climate Highlights and Impacts, December 2023 to February 2024
Climate Outlook, April 2024 to June 2024

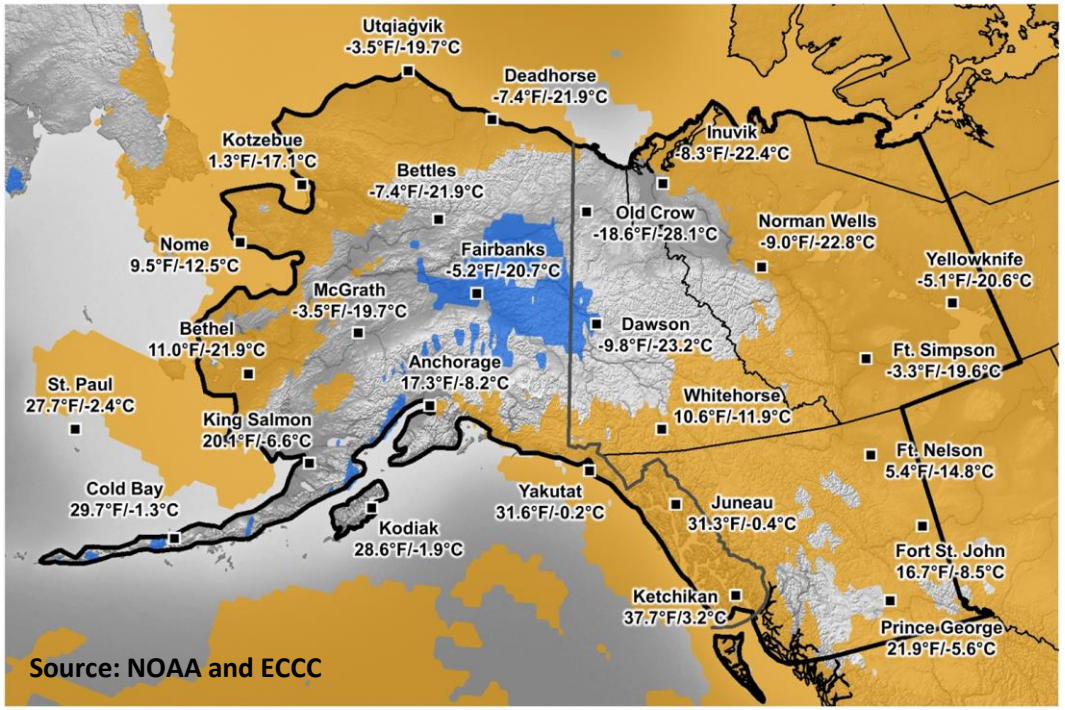
NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

ACCAP Alaska Center for Climate Assessment and Policy
A NOAA CAP/RISA Team

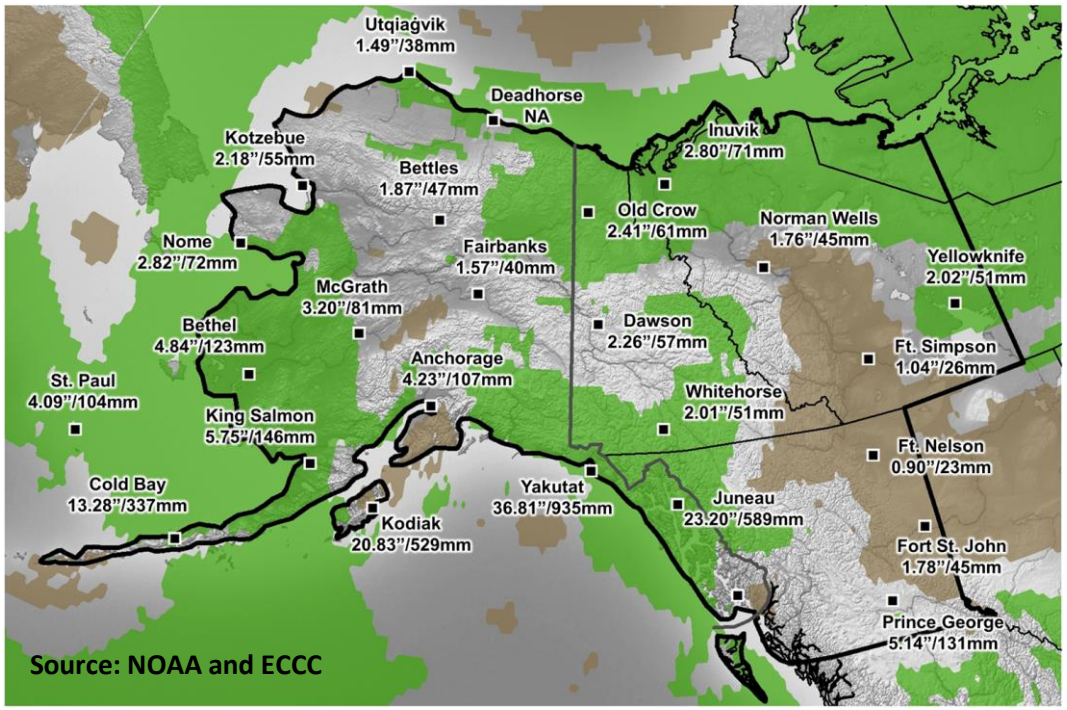
Environment and Climate Change Canada | Environnement et Changement climatique Canada



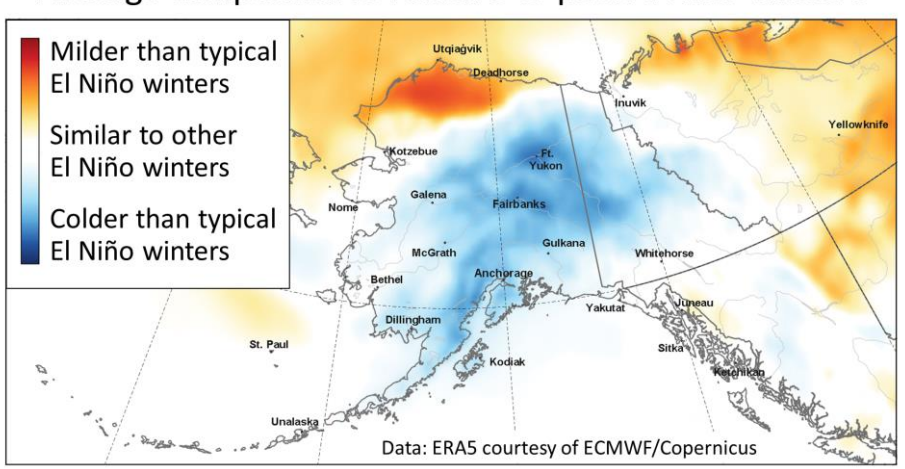
Dec 2023 to Feb 2024 Temp Averages (°F/°C) & Anomalies Below / Above / Normal



Dec 2023 to Feb 2024 Precip Totals (inches/mm) & Anomalies - Dry / Wet / Normal



El Niño 2023-24: Alaska and Northwest Canada

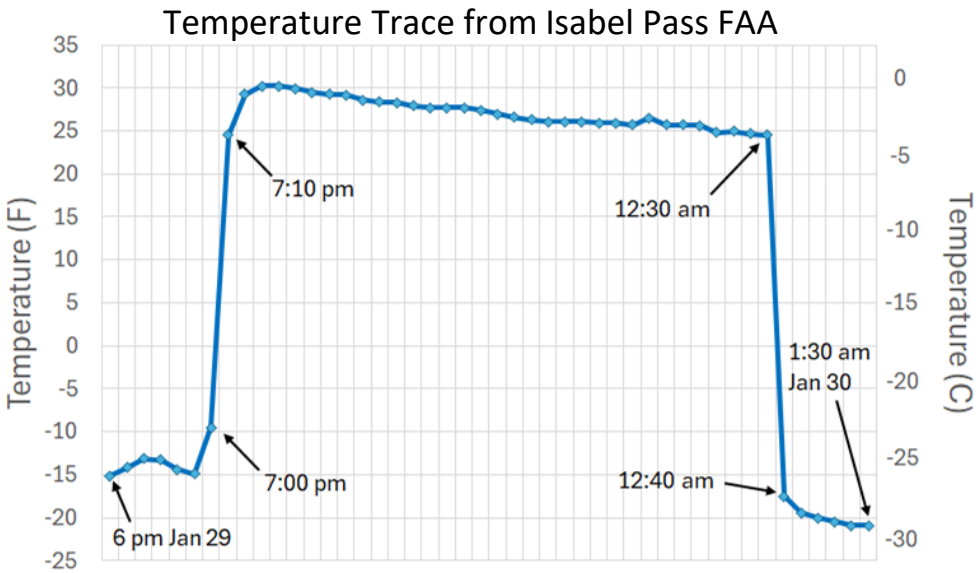


Average temperature December 2023 through February 2024 relative to the 16 El Niño winters between 1976-77 and 2022-23.

El Niño conditions emerged in the equatorial Pacific during the summer of 2023 and a strong El Niño was widely expected for the winter of 2023-24. That’s exactly what happened. NOAA’s widely used El Niño Southern Oscillation (ENSO) index ranked this El Niño as the fourth strongest during the winter season in the past 50 years, yet across much of northwest North America this was not a typical El Niño. The average temperature this winter was lower than in most recent El Niños in both the Yukon Territory and much of mainland Alaska, south of the Brooks Range. At Fairbanks, this was the first El Niño winter with an average temperature even slightly below normal in more than 50 years.

Why this winter was so different from typical El Niños in the north will be researched in the coming months. What is immediately clear is that that the response at the jet stream level of the atmosphere at middle and high latitudes was less strongly influenced by the tropics than in many previous El Niño winters. This contributed to the dramatic swings between unusual warmth and deep cold that are more characteristic of La Niña winters. Globally, ocean surface temperatures are at record high levels, and it’s possible that this influenced the weather patterns observed this winter.

Remarkable Temperature Swings



Isabel Pass FAA station 10 minute temperature readings from Jan 29 6:00 pm to Jan 30 1:30 am, station Z32WC. Data obtained from Mesowest

On January 29 – 30, 2024, a remarkable temperature swing occurred in central Alaska. At the Isabel Pass FAA web camera station, the temperature rose from -9.5°F (-23.1°C) to +24.5°F (-4.2°C) in the span of 10 minutes. This rise in temperature of 34°F (18.9°C) is the largest known occurrence of a temperature increase for this short of a time period in Alaska. The temperature stayed just a few degrees below freezing for the next 5 ½ hours, and then it dropped a staggering 42°F (23.3°C) in a 10-minute period. Again, no known occurrence of a temperature drop of this magnitude has occurred in Alaska.

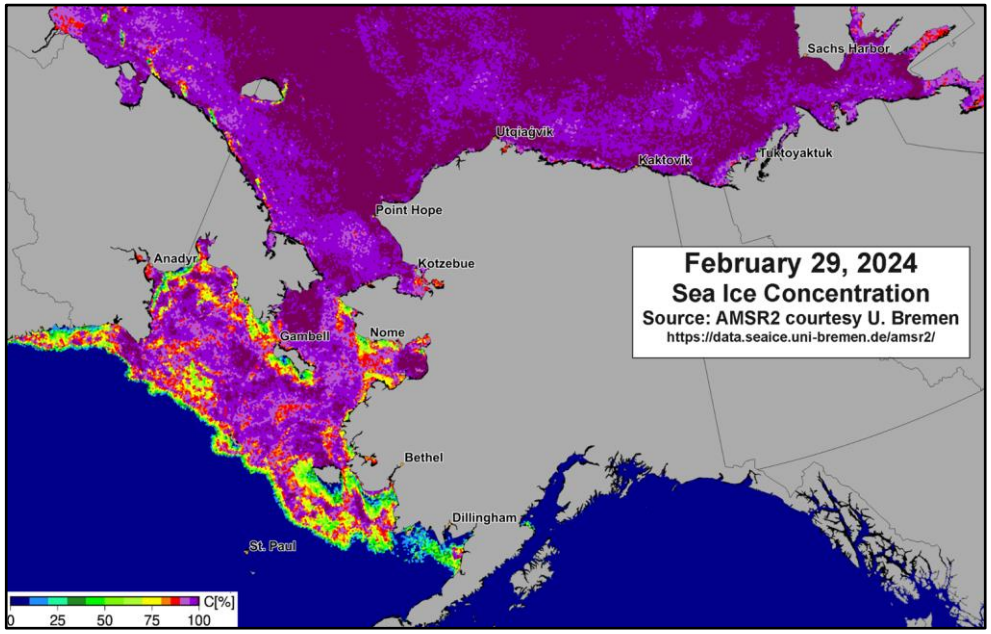
The nearby Fairbanks weather balloon noted a very sharp delineation between a cold Arctic air mass at the surface and a much milder airmass 1 – 2 km above the surface – at the elevation of Isabel Pass (3,619' / 1103 m). Readings at other nearby stations support this sharp air mass differentiation. Unfortunately, the Isabel Pass station only broadcasts temperature observations every 10 minutes, and there is no way to recover higher cadence data; nor is there any information on smoothing/averaging that may or may not take place during those 10 minutes.

Unusual Warm Periods Creating Problematic Ice Conditions

Water overflowing the ice on the East Blackstone River at Km 86 of the Dempster Highway on January 30
Photo credit : Benoit Turcotte, Yukon University

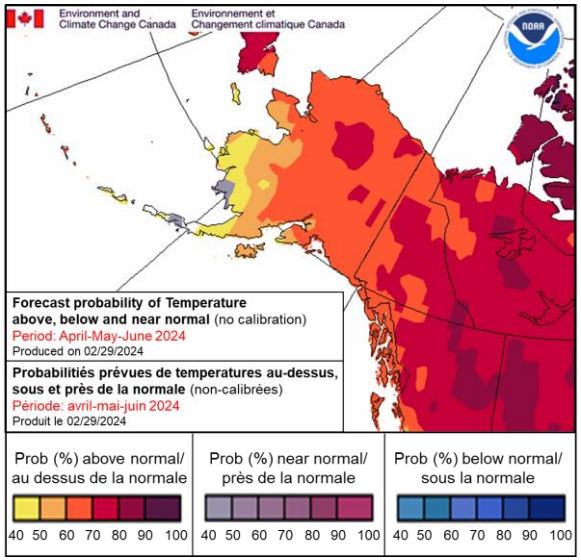
Unusually warm weather affected southern and central Yukon at the end of January. Air temperatures of 48°F (9°C) and 42°F (6°C) were registered in Mayo and on the Lower Dempster Highway, respectively, on January 29. Light rain also affected some areas, including Whitehorse. Although no overland flow came from this event, the usual mid-winter reduction in river flow in headwater catchments was temporarily reversed. This increased flow created a layering of overflow ice in several streams, as reported by Benoit Turcotte of Yukon University. At the end of February, the Blackstone River surface was now one full meter under several layers of water, slush, and ice. The 13' (4 m) culverts carrying water from one side of the Dempster Highway to the other were blocked more than 50% by ice. Based on observations from recent years, it seems that warmer winter conditions in subarctic areas may result in thicker ice accumulations in small and shallow streams, with potential consequences for the maintenance of road and drainage infrastructure.

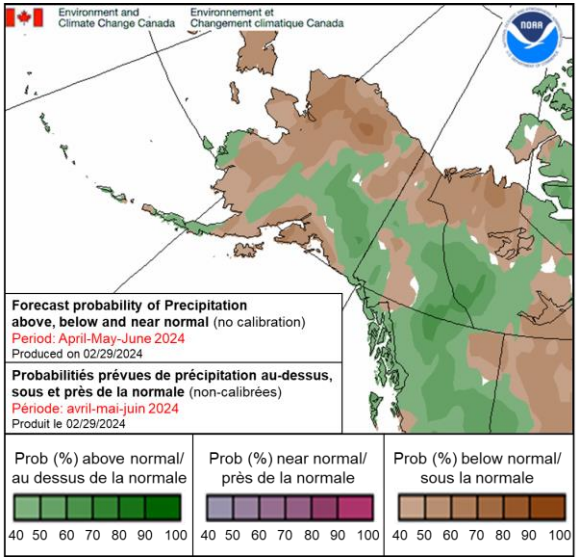
Sea Ice Concentration Conditions February 29, 2024 in the Bering, Chukchi and Beaufort Seas



The delay in sea ice development in the autumn has continued to have effects through the winter, alongside the above normal air temperatures much of the Arctic experienced this season. Open water remained much later in the year than usual, with the Chukchi Sea icing over around December 15. This has been typical for the past decade but never occurred this late prior to 2006. Similarly, the Beaufort Sea contained much less multi-year ice than normal, with the extent of old ice situated well north of its usual location, around 73°N. Normally by the end of February both fast ice hugging the coast and ice in the Beaufort Sea would be thick first-year ice, however this year, ice across the Beaufort was thinner than normal and composed of primarily medium and thin first-year ice. In the Bering Sea, the season began in December with a very low sea ice extent, followed by rapid expansion until early January when a change to stormy weather and southeasterly winds reduced the sea ice extent. The Bering Sea ended the season with the ice edge located well north and northeast of St. Paul Island and a seasonal ice extent 14% below the 1991 – 2020 average.

Temperature Outlook: Apr to Jun 2024 Precipitation Outlook: Apr to Jun 2024





A combined Canada - USA weather forecast model is used to provide a temperature and a precipitation outlook for April to June 2024.

The temperature outlook map shows that all of Alaska and Canada, except for a coastal area of southwestern Alaska, has a 60% to 90% chance of above average temperature (orange and red colors), with the highest probabilities found in the eastern part of the Canadian northwest.

The precipitation outlook map shows a complex pattern of below and above normal precipitation. Most of coastal Alaska, northern Yukon and northern Northwest Territories will have a 40 to 80% chance of below normal precipitation (brown) with other areas forecasted to be wetter than normal conditions (green).

Content and graphics prepared by NOAA's National Weather Service and National Center for Environmental Information; the Alaska Center for Climate Assessment and Policy at the University of Alaska; and Environment and Climate Change Canada, as well as our regional partners: Alaska Climate Research Center, Alaska Climate Science Center, National Snow and Ice Data Center, and Scenarios Network for Alaska + Arctic Planning.

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