Alaska Climate Research Center

The Alaska State Climate Center

STATEWIDE CLIMATE SUMMARY
DECEMBER 2025

Ice fog in a Fairbanks neighborhood near Fort Wainwright on 31 Dec 2025. Photo: Sara Eliza Johnson (UAF).

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GEOPHYSICAL INSTITUTE
University of Alaska Fairbanks

HIGHLIGHTS

Almost month-long cold spell

Snowiest December on record in Juneau

Ice storm on the west coast, multiple severe wind events in the Mat-Su Valley

Wettest December on record in Utqiaġvik

Arctic Sea ice extent still very low

Alaska's Statewide Climate Summary for December 2025 provides an overview of weather for the month based on data from selected weather stations throughout the state. "Departure from normal" refers to the climatological average over the 1991-2020 normal period. Here, we report on temperature, precipitation and drought conditions in the state, as well as the condition of the Arctic Sea ice.

Significant Weather Events and Synoptics

The main story this month is the ongoing, persistent cold spell that has plunged most of Alaska into a deep freeze. Temperatures in Interior, Southcentral, and Southeast Alaska have been continuously below normal for over three weeks and have dropped to impressively low values. Juneau dipped below -10°F and multiple stations in the Interior recorded -50°F and below.

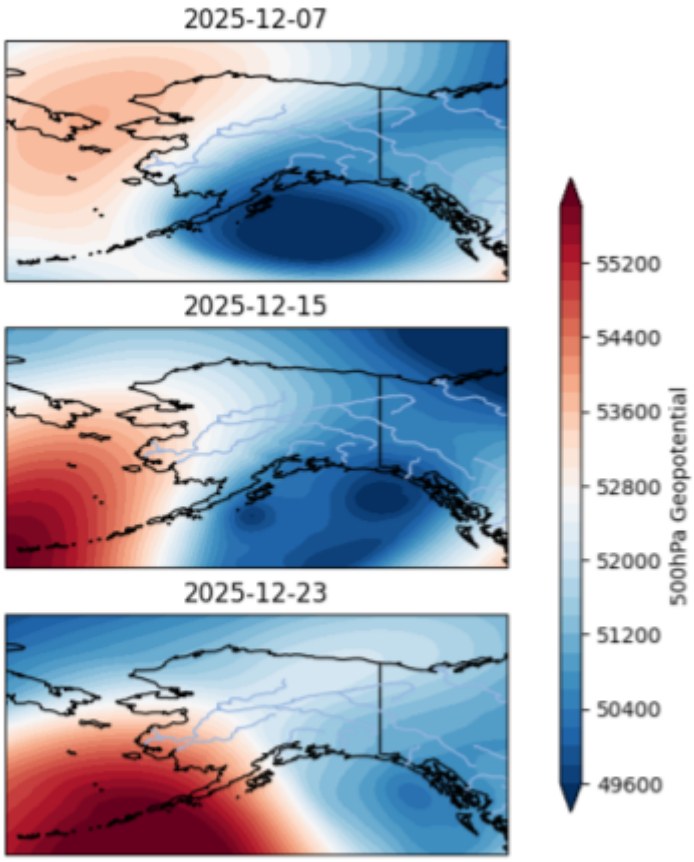

Figure 1. Geopotential height at 500hPa on December 7, 15, and 23. Data: ERA5 reanalysis

Synoptically, the prolonged cold can be explained by a blocking pattern in the upper levels of the atmosphere. During the first week of the month, a pronounced ridge of high pressure built over the Bering Sea (Fig. 1), while upper level low pressure deepened over Siberia. On the downstream side of the ridge, a northerly upper level flow allowed cold, Arctic air masses to move into mainland Alaska and the Canadian Yukon.

The resulting upper level pressure constellation of a ridge flanked on both sides by low pressure systems is known as an Omega block. This type of blocking pattern inhibits the typical west-east flow of the Westerlies and can remain in place over multiple weeks, as has been evident this month (Fig. 1).

In addition to the cold, some parts of the state had an exceptionally snowy month. The Panhandle in particular had record breaking snowfall; Juneau registered the snowiest December ever and is blanketed by several feet of snow. Fairbanks also had a snowy but not record-breaking December.

The Fairbanks Police Department highlighted the traffic hazard caused by ice fog in a recent social media post. Ice fog is fog that consists entirely of frozen particles (in contrast to normal fog, which contains water droplets) and forms below about -30°F. Dense ice fog caused strongly reduced visibility in Fairbanks on multiple occasions this month.

Strong wind events impacted communities in western Alaska and in the Mat-Su region (Fig. 2). Blizzard conditions caused a temporary closure of the Unalaska airport and communities on the Bering Sea Coast had power generation issues related to a severe ice storm early in the month. In the Mat-Su Valley, multiple episodes of very strong winds caused infrastructure damage and temporary power outages due to downed trees and power lines. Under certain conditions, cold air advection can produce strong outflow and gap winds from the Copper River Basin into the Matanuska Valley. These winds are dynamically similar to Bora-type downslope wind systems but are not regionally classified as Bora winds; hereafter, we refer to them as **Alaska-Bora winds**. Alaska-Bora winds differ from the more common Chinook winds in that they are typically cold and driven primarily by pressure gradients and cold-air drainage rather than adiabatic warming. For more information on the storm events, refer to the "Newsworthy Events" section at the end of this report.

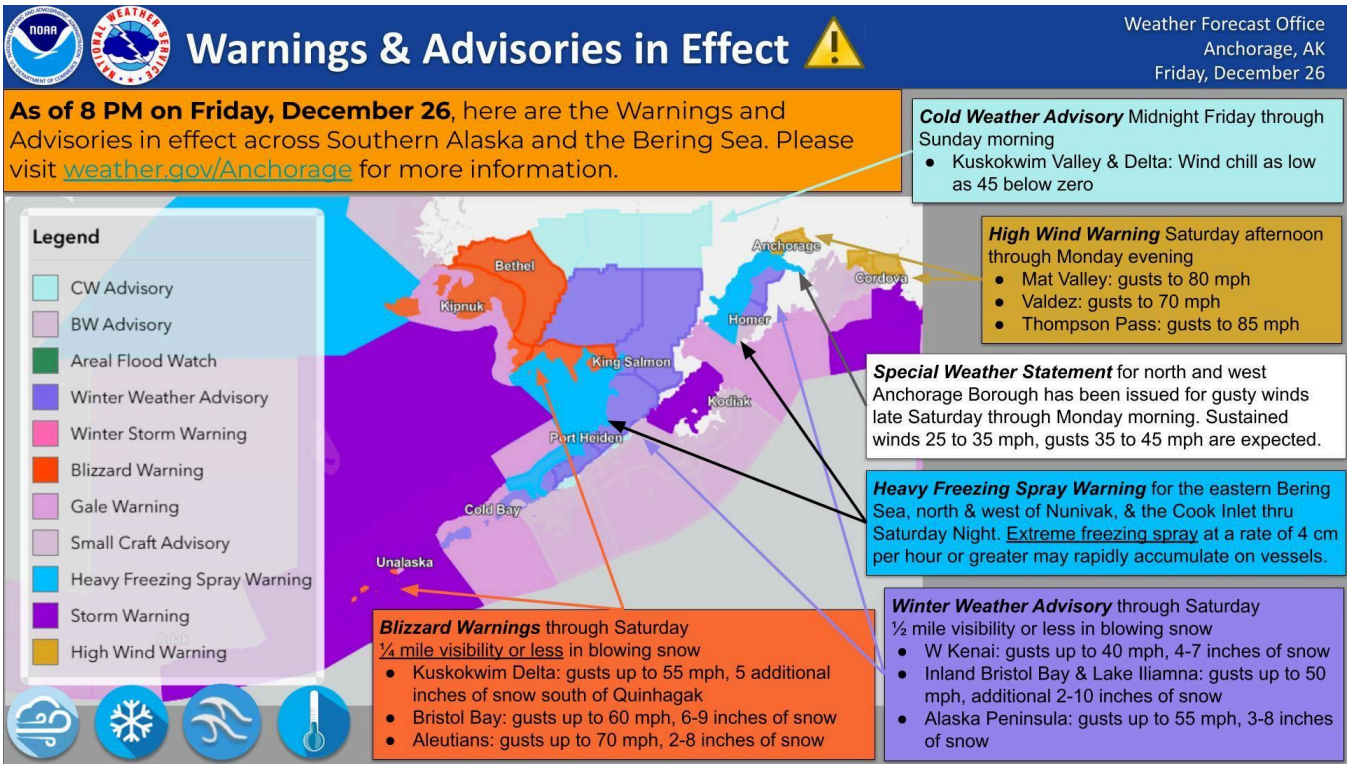

Figure 2. Example advisory map issued by the NWS office in Anchorage on December 26th, 2025, showing an abundance of winter weather hazards in Southcentral and Southwest Alaska.

Temperature

In stark contrast to last month, most of our selected First Order stations had a colder-than-average December. The largest negative deviations were recorded in the Interior, with impressive monthly anomalies of -17°F to -19°F relative to the 1991-2020 climate normal in Bettles, Fairbanks, Gulkana, and Delta Junction. The monthly temperature deviation in Juneau was also very notable with -12.4°F (Fig. 3, Table 1). Southwestern Alaska was least affected by the cold spell. Cold Bay, St. Paul Island, and Utqiaġvik were the only stations in our selection to record moderately positive deviations of +0.9°F, +1.9°F and +0.7°F, respectively. All other stations were between about -3°F (Kodiak) and -11°F (McGrath) colder than the 1991-2020 climatology.

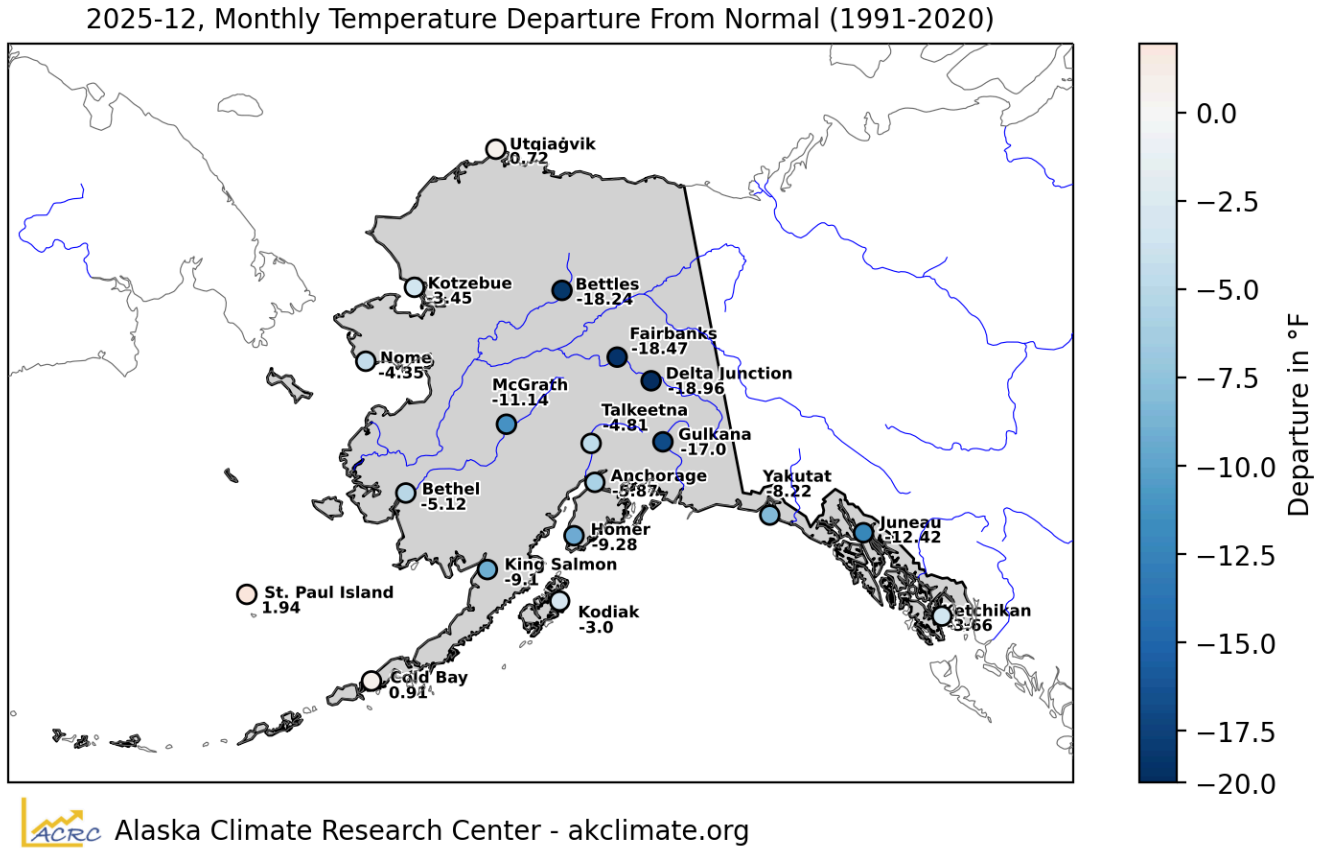

Figure 3. Monthly mean temperature departure from normal (ºF), December 2025, at the selected First Order stations in Alaska. Note: Gulkana had technical problems and a long data gap during the first half of the month.

Considering the daily anomalies (Fig. 4), the first bitter cold outbreak for the Interior occurred from December 6th onwards with temperatures as low as -50°F at East Circle Hot Springs and Tok, and -32°F at Fairbanks International Airport. Wind chills at many locations in the hills north of Fairbanks dropped below -60°F. Aside from a brief warm air intrusion on December 12th, temperatures at the First Order stations in the Interior (Fairbanks, Bettles, Delta Junction, …) remained well below normal for the rest of the month, repeatedly dropping more than 30°F below the 1991-2020 normal.

The most negative daily anomaly of this remarkable cold spell at the First Order stations was recorded on December 23rd in Gulkana with -38.9°F below normal at a daily mean temperature of -40.5°F. The standard graphic of the daily anomalies (Fig. 4) that we include in these reports usually has a scale from -25°F to +25°F. This covers the range of daily anomalies at the stations in most months. For December, we had to extend the scale to -40°F to account for the very low temperatures.

In Juneau, the coldest phase of the cold spell occurred just before Christmas. Multiple records for lowest daily average, maximum, and minimum temperatures were set at the Juneau airport station between December 19th and 23rd. Anomalies reached more than 30°F below normal and absolute temperatures dipped to -10°F.

See the tables in the Appendix for a full list of daily temperature records at the selected stations.

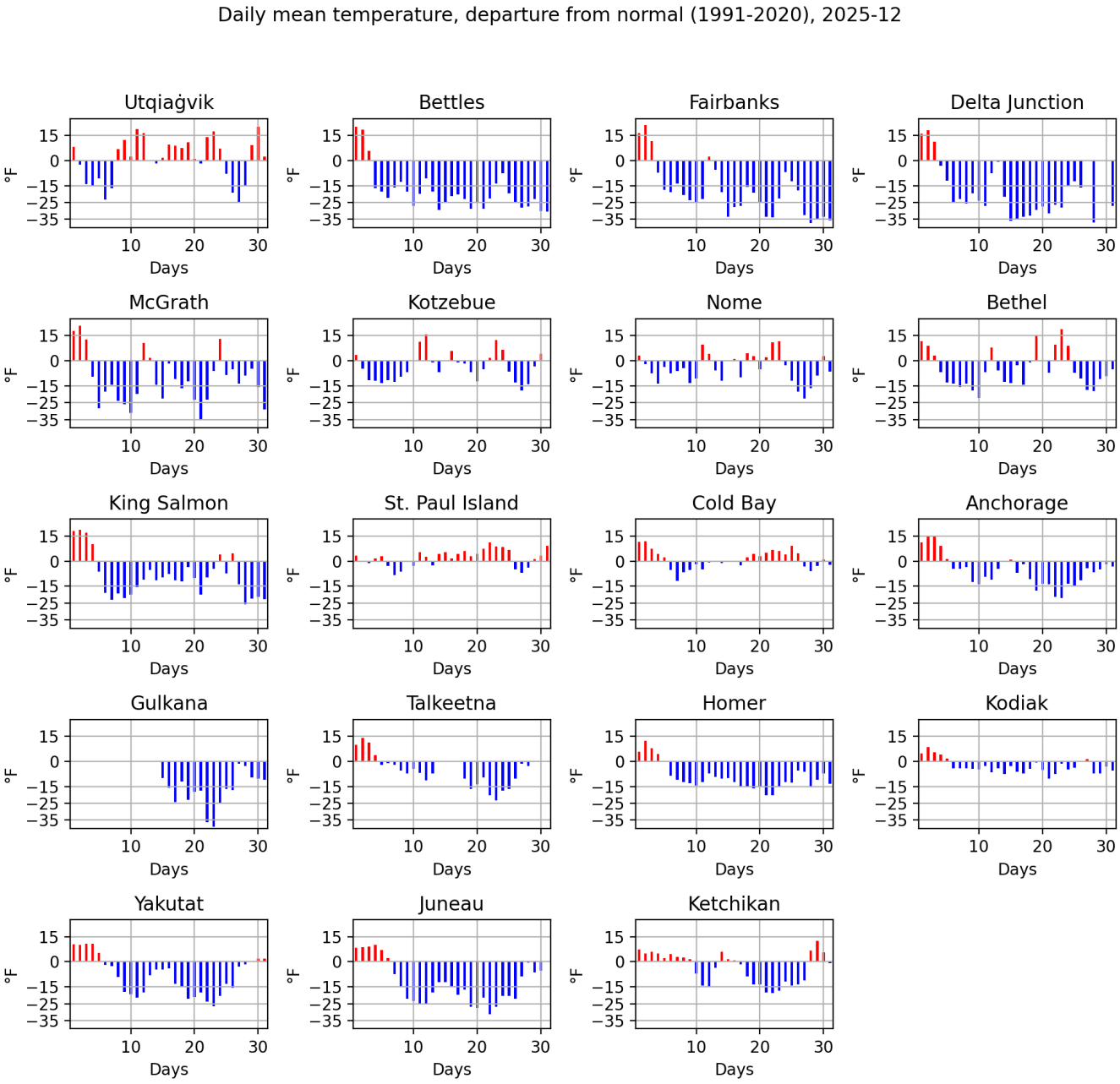

Figure 4. Daily mean temperature departures from normal for each day in December 2025 at the selected stations. Note: There was a prolonged data outage in Gulkana during the first half of the month.

Station	Observed (ºF)	Normal (ºF)	Departure (ºF)
Anchorage	13.5	19.4	-5.9
Bethel	4.9	10.0	-5.1
Bettles	-24.2	-6.0	-18.2
Cold Bay	31.7	30.7	0.9
Delta Junction	-16.2	2.4	-19.0
Fairbanks	-22.8	-4.4	-18.5
Gulkana*	-18.6	-0.2	-17.0
Homer	18.4	27.7	-9.3
Juneau	17.9	30.3	-12.4
Ketchikan	32.7	36.4	-3.7
King Salmon	9.5	18.6	-9.1
Kodiak	28.9	31.9	-3.0
Kotzebue	-1.0	2.4	-3.4
McGrath	-13.4	-2.3	-11.1
Nome	4.7	9.1	-4.4
St. Paul Island	30.8	28.9	1.9
Talkeetna	10.8	15.6	-4.8
Utqiaġvik	-5.6	-6.3	0.7
Yakutat	22.5	30.8	-8.2

Table 1. Mean monthly air temperature, normal (1991-2020) and departure for selected stations throughout state, December 2025. Color-coded to match Figure 3. *There was a prolonged data outage in Gulkana duri the first half of the month.

Precipitation and snow

December 2025 precipitation measurements in Utqiaġvik, Alaska, indicate the wettest December on record, with a total of 1.4 inches (water-equivalent) of precipitation—approximately six times the long-term monthly average (Figs. 5–6; Table 2). Winter precipitation is notoriously difficult to measure in Arctic environments; if confirmed, this value would represent a remarkable record. The reported measurements are currently under review by the Fairbanks NWS office, while independent observations from multiple instruments (Geonor type bucket, Present Weather Detector, Laser Distrometer) at the nearby Department of Energy Atmospheric Radiation Measurement (ARM) site support the exceptionally high precipitation total for the month. The previous December precipitation record was 1.17 inches, set in 2013.

Precipitation was also above average in Fairbanks (172%) and Bethel (125%). The First Order stations in Southcentral Alaska mostly had a relatively dry month with less than 50% of normal December precipitation.

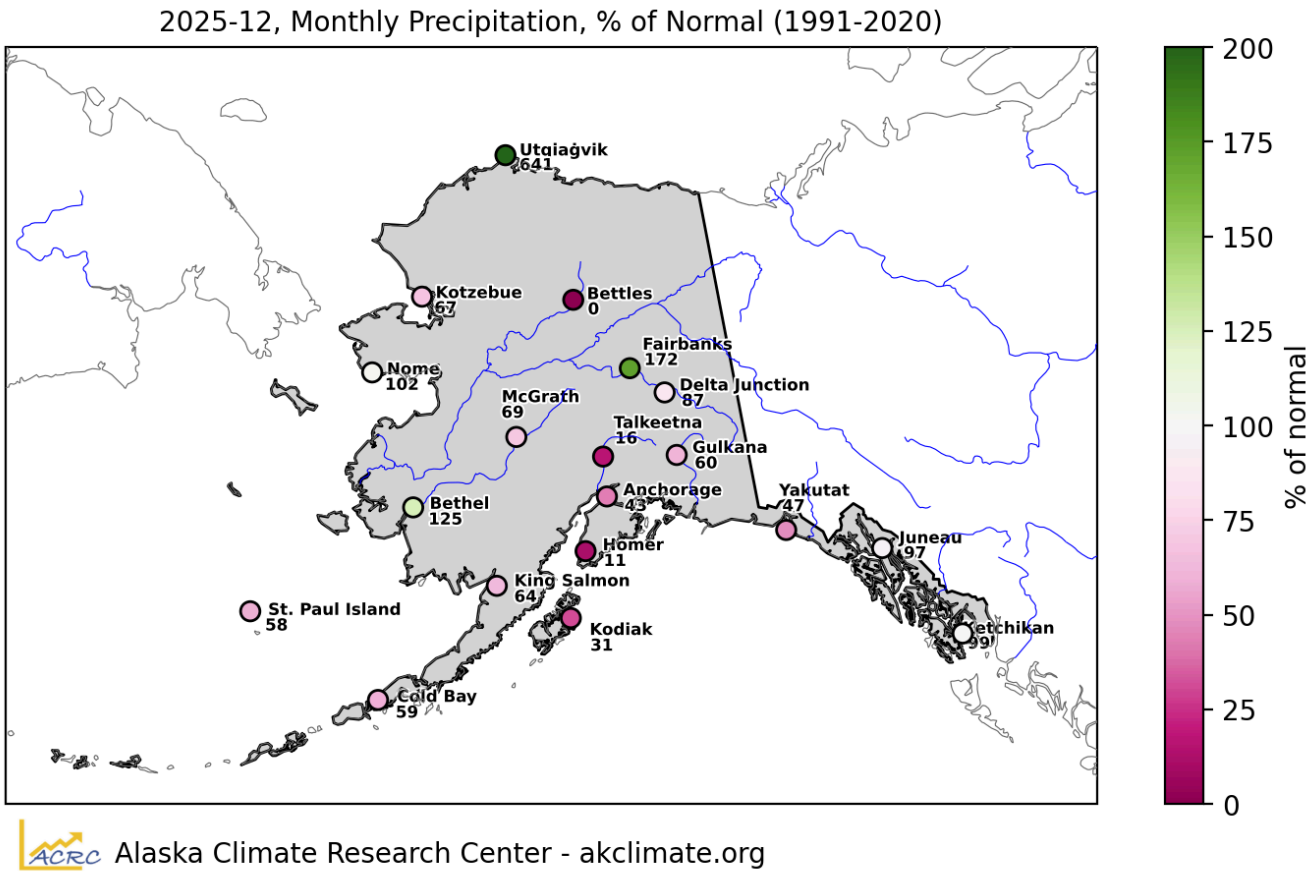

Figure 5. Monthly precipitation in percentage of normal (1991-2020 reference period), December 2025, at the

selected First Order stations. Note: The Utqiaġvik data is currently being reviewed by the Fairbanks NWS office and is believed to be erroneous. There was also a prolonged data outage in Gulkana during the first half of the month.

The near normal total precipitation values in Juneau and Ketchikan hide exceptionally snowy conditions. With a total of 82 inches, snow fall in Juneau was 453% above normal, making it the snowiest December on record at the airport station. Several rounds of storms produced an impressive snow accumulation of 50 inches in Juneau, far above the December normal for the airport station (Fig. 7). Fairbanks also had more than double their normal December snowfall with a total of 23.7 inches. Multiple daily snowfall records were set in Juneau and Fairbanks this month. (The station in Bettles is reporting below normal snowfall and snow depth. However, the total reported precipitation of 0 suggests technical problems and/or a substantial undercatch of solid precipitation.)

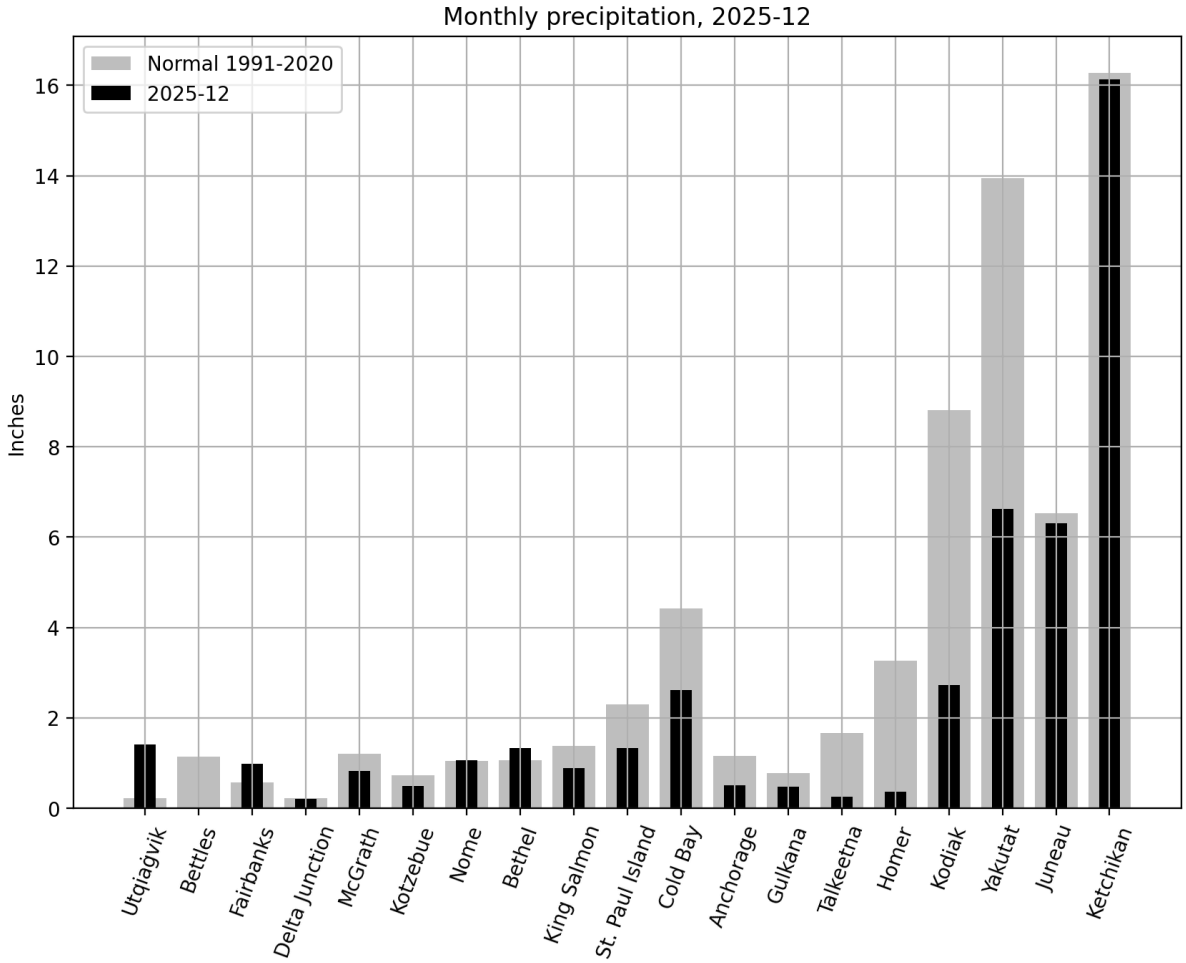

Figure 6: Monthly precipitation (inches) compared to the 1991-2020 normals at the selected First Order stations. Note: The Utqiaġvik data is currently being reviewed by the Fairbanks NWS office and is believed to be erroneous. There was also a prolonged data outage in Gulkana during the first half of the month.

During the last week of December, an atmospheric river event caused 1-3 feet of snow to fall in Juneau between December 27th and the 30th. During this event Juneau set multiple daily snowfall records with 7.8 inches on December 27th, 11.4 inches on December 28th, and 16.4 inches on December 30th. The city and Borough of Juneau activated a new avalanche information page to keep residents updated on hazards in and around town. The Coastal Avalanche Center reported multiple human and natural avalanches in the back country on December 28th with a high (4 of 5) avalanche risk for all elevations (Coastal Alaska Avalanche Center). Eagle Crest ski area was closed on December 28th due to road conditions and reopened the day after. As of December 31st, Thane Road in Juneau remains closed at the Avalanche gates, residents have been advised, but not evacuated for the avalanche risk.

Compared to the Interior and Southeast Alaska, the Anchorage area was considerably less snowy. Snowfall totals were below average with only 27% of normal (4.9 inches). Snow depth has dropped to moderately below normal values (Fig. 7). However, new snow, wind loading, and older weak layers caused elevated avalanche danger in popular Anchorage/Kenai Peninsula backcountry zones. Avalanche centers issued danger ratings up to “considerable” (3 of 5) in the Turnagain Pass area due to a weak layer 1-3 feet deep in the alpine zone while the Hatcher Pass area has issued a moderate risk with many glide avalanches noted in the area. Avalanche risks declined by the end of December to low (1 of 5) below alpine elevations and moderate (2 of 5) above.

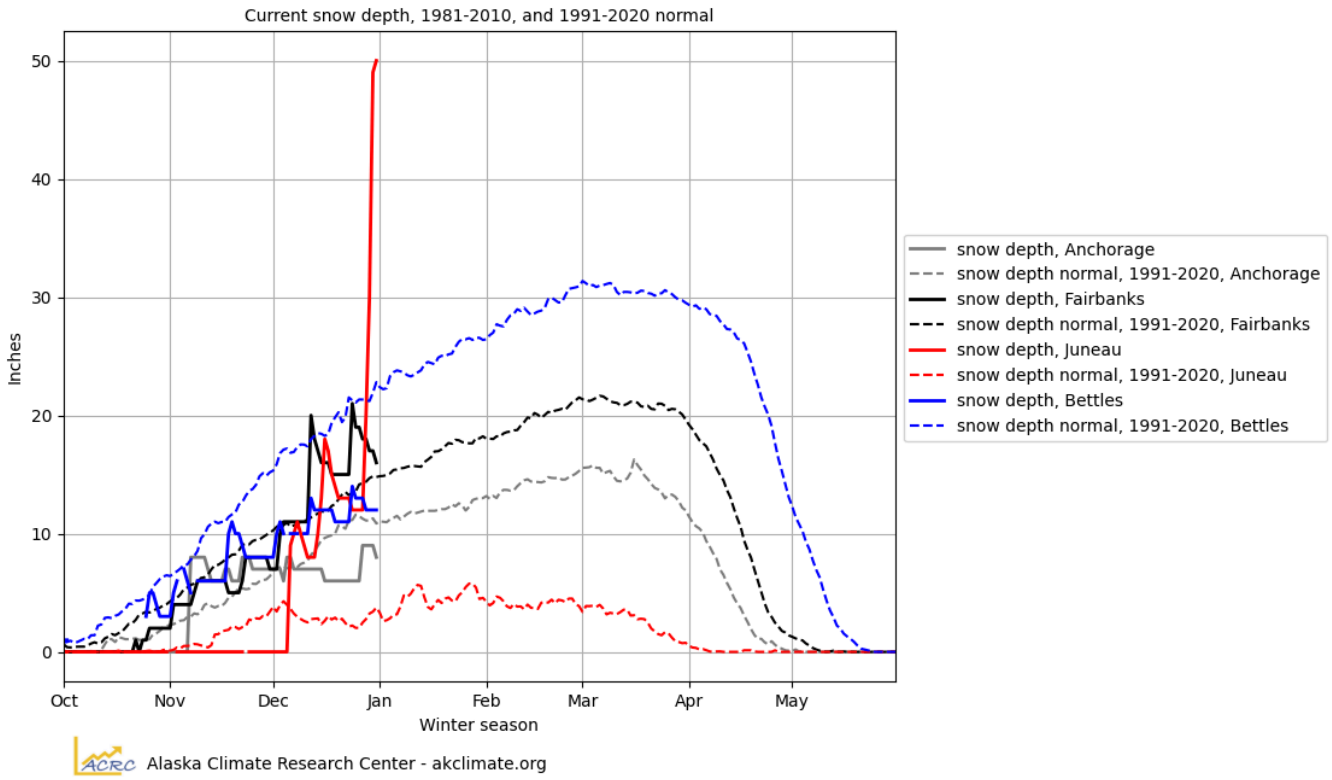

Figure 7. Snow depth evolution for the current season compared to the 1991-2020 normal for Anchorage (grey), Fairbanks (black), Juneau (red), and Bettles (blue). Juneau had an exceptional month and the snowiest December on record at the airport station.

Station	Precipitation (in)	Normal (in)	% of Normal
Anchorage	0.5	1.2	43.1
Bethel	1.3	1.1	125.5
Bettles	0.0	1.1	0.0
Cold Bay	2.6	4.4	59.3
Delta Junction	0.2	0.2	87.0
Fairbanks	1.0	0.6	171.9
Gulkana*	0.5	0.8	60.3
Homer	0.4	3.3	11.3
Juneau	6.3	6.5	96.6
Ketchikan	16.1	16.3	99.1

King Salmon	0.9	1.4	64.5
Kodiak	2.7	8.8	31.0
Kotzebue	0.5	0.7	67.1
McGrath	0.8	1.2	68.6
Nome	1.1	1.1	101.9
St. Paul Island	1.3	2.3	57.8
Talkeetna	0.3	1.7	15.7
Utqiaġvik	1.4	0.2	640.9
Yakutat	6.6	13.9	47.5

Table 2. Monthly precipitation sum, normal (1991-2020) and departure expressed as a percentage of the normal (1991-2020) for selected stations throughout the state, December 2025. Colors match the color scale in Figure 5. Note: The Utqiaġvik data is currently being reviewed by the Fairbanks NWS office and is believed to be erroneous. *There was also a prolonged data outage in Gulkana during the first half of the month.

Arctic Sea Ice

The Arctic Sea ice extent has continued its seasonal growth but remains at very low levels. At present, sea ice extent is the fourth lowest in the satellite-era time series (extent in 2016, 2017, and 2024 were even lower at this time of year; Fig. 8). Figure 8 also shows there were multiple days in December where sea ice extent was lower than all other years in the satellite-era time series. The total sea ice extent on December 30th was 12.339M km^2 up from 9.519M km^2 on November 30th (NDISC data). Figures 9 A and B show Arctic Sea ice extent and concentration on December 30th, respectively.

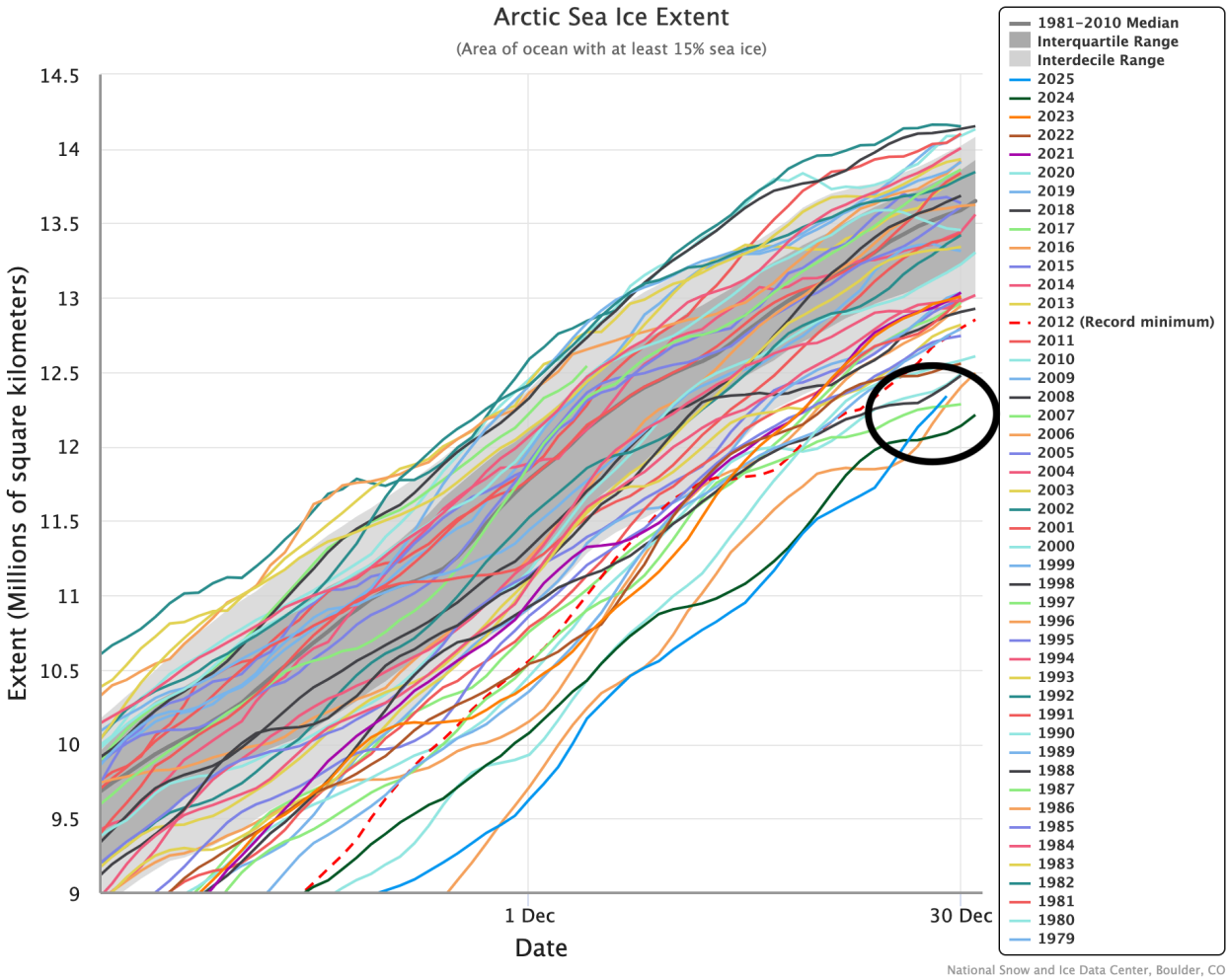

Figure 8. Time series of daily Arctic sea ice extent. This year's data are updated through December 30th, 2025. All years of the available time series are shown as colored lines. Data and graphics: NSIDC ("https://nsidc.org/sea-ice-today"https://nsidc.org/sea-ice-today)

Note: NSIDC sea ice graphics and time series have been switched to a sea ice product generated from data collected by the GCOM-W1 AMSR2 instrument on a satellite operated by the Japanese Space Agency (JAXA).

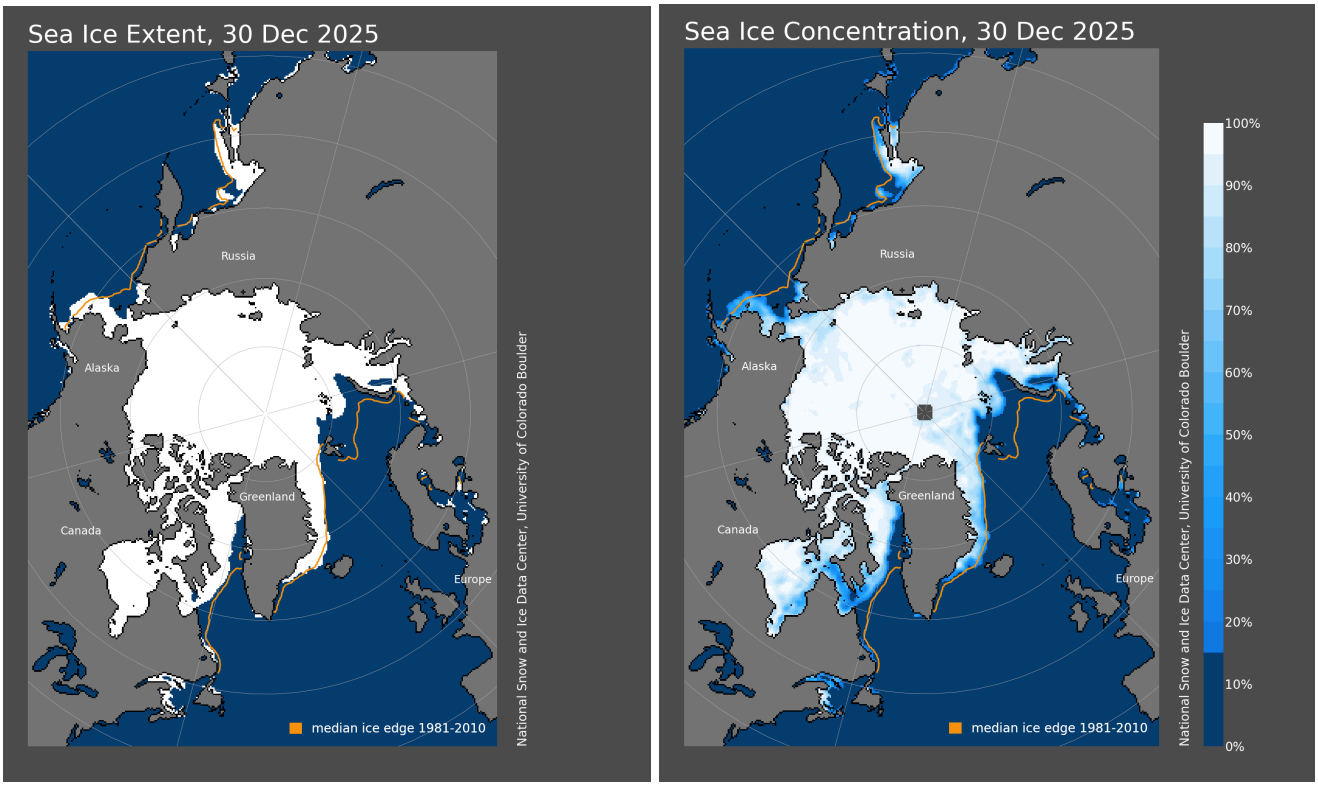

Figure 9. A (left) Arctic Sea ice extent and B (right concentrations as of December 30th 2025 compared to the average from 1981-2010 (Data and images: NSIDC)

Newsworthy Information

Magnitude 7.0 Earthquake Shakes Alaska-Canada Boarder

Saturday, December 6th 2025, a 6 mile deep 7.0 magnitude earthquake occurred with an epicenter near the Alaska–Yukon border about 230 miles north-west of Juneau, 58 miles north of Yakutat, and 155 miles west of the Yukon Territory capital city of Whitehorse. Luckily the area near the epicenter is sparsely populated in a mountainous region, with no major damage or injuries reported. There were numerous reports of objects falling from shelves and walls in Yakutat, Haines Junction (Yukon), and Whitehorse. AP News Article.

Ice Storm Hits Typhoon Halong Recovery Efforts

The National Weather Service issued an ice storm warning for ½ to ¾ inch of ice along the coast and ¼ inch for the Kuskokwim Valley along with 4 inches of new snow for December 2nd and 3rd. Just to the North-West Nunivak Island and Nelson Island had blizzard conditions forecast with 6 to 12 inches of snow and wind gusts of 35 to 45 mph. The ice and wind caused some local power issues and hampered the ongoing Typhoon Halong recovery with over 150 flights canceled at Bethel Airport, a major hub for the clean-up and fix efforts. Local news articles for the event are available here and here.

Strong High Pressure brings high winds and cold temperatures to interior and South-Central Alaska

The Mat-Su valley and Anchorage had over 29,000 homes without power starting Saturday December 6th with over 12,000 houses remaining without power through Monday December 8th. The Red Cross opened an emergency shelter for anyone without power and heat. Wind gusts hit 100 MPH in Palmer for the highest gust ever recorded at Palmer Airport, and 52 MPH in Anchorage. Gusts continue blowing in the 50MPH range through December 8th hampering the tree and powerline cleanup. The Kenia Peninsula also saw 4,000 homes lose power on Saturday December 6th due to high winds. More information is available from Alaska News Source.

The following week, December 13th through 15th, a second high wind event occurred in the Mat-Su valley and anchorage with another round of minor power outages for 1,200 homes. Winds were recorded at 93 MPH at Palmer Airport, second highest ever measured to the previous December 7th storm, and a 75 MPH gust in Anchorage, tied with a 1989 record for highest ever recorded wind at Ted Steven's Airport. High winds also occurred in Valdez with a 77 MPH gust, and a gust of 87 MPH was also recorded in the Kenai Peninsula (Alaska News Source).

By the end of the month, a total of four major wind events in the Mat-Su region were registered. All were related to the synoptic situation, which allowed cold air to be funneled from the Copper River Basin into the Matanuska Valley. A general summary of winter weather hazards that impacted Alaskans this month was compiled by ADN.

Record snowfall and high winds in Juneau strain power infrastructure

Juneau had their snowiest December on record and set multiple records for daily snowfall during several intense winter storms this month. The AELP facebook page confirmed multiple power outages including one city wide after an early December storm due to downed trees and power lines. The impacts of the early December winter weather were covered by local news outlets.

The next round of snow arrived in Juneau on the weekend of December 13th through the 15th with Juneau receiving 15.5 inches, and Petersburg measuring 16 inches of new snow (Alaska News Source). An atmospheric river event led to another 1-3 feet of snow on December 27th through the 30th in the mid-to-northern Southeast Alaska Panhandle. The Southern Panhandle and low lying areas saw freezing rain and rain mix into the total precipitation with flood warnings issued for some areas (Juneau Independent).

Juneau's Dock and Harbor department reported multiple boats and boat shelters had sunk or failed due to the weight of wet snow after the late December snowfalls mentioned above (KTOO News).

Events cancelled due to cold weather

Continued cold weather through New Years postponed the New Years Eve Fireworks display at the University of Alaska Fairbanks main campus for only the 2nd time in 36 years. Temperatures between -40°F and -50°F caused this safety decision. The event has not yet been rescheduled with cold temperatures forecasted to remain through January 5th.

The Arctic Report Card celebrated its 20th anniversary

Find the NOAA summary here: https://arctic.noaa.gov/report-card/report-card-2025/

Highlights in this year's report include:

- Arctic air temperatures for 2024-2025 were the warmest recorded since 1900 for the Oct - Sep period. The last 10 years were the warmest 10 years in that record.
- This year's Arctic Fall, Winter and Spring precipitation were all within the top 5 years since 1950.

- March 2025 had the lowest annual maximum sea ice extent in the 47 year satellite record while September had the 10th lowest sea ice minimum adding to the last 19 years having the 19 lowest sea ice minimums of the same 47 years of observation.
- Atlantification has now reached beyond the North Pole, hundreds of miles from the former Atlantic extent, weakening the layering of waters with different densities to enhance heat transfer and ice melt. This contributes to the 95% reduction since 1980 of 4+ year Arctic Sea Ice.
- "*Alaskan glaciers have lost an average of 125 vertical feet (38 meters) of ice since the mid-20th century*"
- "*In over 200 Arctic Alaska watersheds, iron, and other elements released by thawing permafrost have turned pristine rivers and streams orange over the past decade. In "rusting rivers", the increased acidity and elevated levels of toxic metals degrade water quality, compromising aquatic habitat and eroding biodiversity*." More information.
- "*Warming bottom waters, declining sea ice, and rising chlorophyll in the Chukchi and northern Bering Seas are driving shifts in mid-water and bottom-dwelling species, reshaping fisheries, affecting Arctic food security and Indigenous subsistence practices*."
- The pdf version of the full report can be found here.

Appendix

Highest Average Daily Temperature Record				
Station	**Date**	**New Record (ºF)**	**Year of Old Record**	**Old Record (ºF)**
Cold Bay	2025-12-01	44.5	2002	43.5
Cold Bay	2025-12-02	44.5	1991	42.0
Lowest Average Daily Temperature Record				
Juneau	2025-12-22	-1.5	1971	5.5
Juneau	2025-12-23	2.5	1971	4.5

Table A1: December 2025 daily records of average daily temperature, i.e. highest/lowest values of average daily temperature ever recorded on specific days. Records are computed since the beginning of the respective time series.

Highest Maximum Daily Temperature Record				
Station	**Date**	**New Record (ºF)**	**Year of Old Record**	**Old Record (ºF)**
Cold Bay	2025-12-02	47.0	1991	45.0
Lowest Maximum Daily Temperature Record				
Juneau	2025-12-10	10.0	1956	11.0
Juneau	2025-12-22	7.0	1971	8.0
Ketchikan	2025-12-12	24.0	1914	25.0

Table A2: December 2025 daily records of maximum daily temperature, i.e. highest/lowest values of maximum daily temperature ever recorded on specific days. Records are computed since the beginning of the respective time series.

Highest Minimum Daily Temperature Record				
Station	**Date**	**New Record (ºF)**	**Year of Old Record**	**Old Record (ºF)**
Cold Bay	2025-12-02	42.0	2013	40.0
Ketchikan	2025-12-29	47.0	2023	46.0
Yakutat	2025-12-03	41.0	1921	39.0
Lowest Minimum Daily Temperature Record				
Juneau	2025-12-19	-6.0	1980	-3.0
Juneau	2025-12-20	-7.0	1955	-5.0
Juneau	2025-12-22	-10.0	1972	-3.0
Juneau	2025-12-23	-10.0	1971	-3.0

Table A3: December 2025 daily records of minimum daily temperature, i.e. highest/lowest values of minimum daily temperature ever recorded on specific days. Records are computed since the beginning of the respective time series.

This information consists of climatological data compiled by the Alaska Climate Research Center, Geophysical Institute, University of Alaska Fairbanks. For more information on weather and climatology, visit the center website at http://akclimate.org. Please report any comments, ideas or errors to uaf-climate@alaska.edu