

Alaska Statewide Climate Summary

December 2015

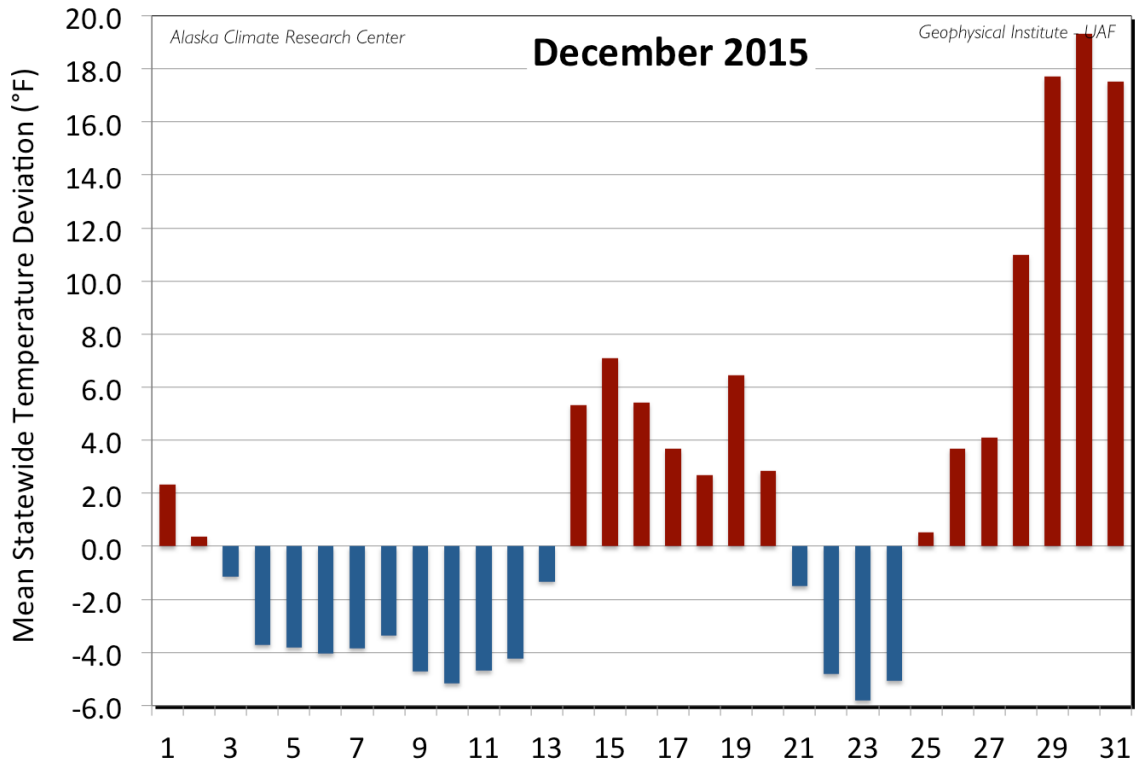
Temperature

Like October and November, temperatures were above normal this December across much of the state. The monthly mean temperature of all First Order Stations was 15.7°F, 1.4°F above the normal of 14.3°F. This is 6.1°F below the December 2014 mean of 21.8°F. Monthly mean temperatures were above normal for 14 of the 19 First Order Stations. Calculating the mean daily temperatures of the First Order Stations (see Figure), 16 days of the month were above the 30-year normal. There were two cold spells: the 2nd to 13th, and the 21st to 24th. The peak warm deviation, an extreme 19.3°F, occurred on the 30th, while the coldest deviation of -5.8°F occurred on the 26th. King Salmon held the greatest positive deviation from normal with a modest value of 4.6°F above its long-term mean of 18.6°F. Stations following King Salmon with deviations exceeding 3.0°F were McGrath (4.3°F), Bethel (3.4°F), and Kodiak (3.4°F). The Station with the coldest deviation was Barrow at -2.8°F. Bettles also posted a deviation below -2.0°F at -2.2°F.

Station	Temperature		
	Observed (°F)	Normal (°F)	Delta (°F)
Anchorage	21.5	19.0	2.5
Annette	35.9	37.1	-1.2
Barrow	-10.6	-7.8	-2.8
Bethel	13.8	10.4	3.4
Bettles	-7.9	-5.7	-2.2
Cold Bay	32.6	31.1	1.5
Delta Junction	2.9	2.1	0.8
Fairbanks	-2.2	-4.1	1.9
Gulkana	-1.2	0.4	-1.6

Homer	27.9	27.1	0.8
Juneau	32.0	29.9	2.1
King Salmon	23.2	18.6	4.6
Kodiak	34.6	31.2	3.4
Kotzebue	1.9	2.3	-0.4
McGrath	1.1	-3.2	4.3
Nome	11.5	9.5	2.0
St. Paul Island	31.8	28.9	2.9
Talkeetna	17.3	16.0	1.3
Valdez	0.0	0.0	0.0
Yakutat	31.8	29.6	2.2

The highest temperature of the First Order Stations was 50°F reported at Annette on both the 5th and 6th of the month. Annette also held the spot for the highest mean temperature for the month at 35.9°F. The lowest temperature was -40°F at Bettles on the 24th, while Barrow reported the lowest December mean temperature at -10.6°F.



Daily mean temperature deviation from the normal temperature for the mean of the first order stations for December 2015.

There were a fair number of temperature record events in December: All were high events, and most occurred during the last three days of the month. The high of 45°F in Fairbanks on the 3rd (broke the 1982 record by 10°F) was driven by Chinook winds and is the 7th highest daily max temperature for December since 1929.

Date	Temperature Records				
	Station	Element	New Record	Old Record	Year of old Record
12/05/15	Annette	High Temperature	50	50	1959
12/06/15	Annette	High Temperature	50	50	2010
12/13/15	St. Paul	High Temperature	40	40	1955

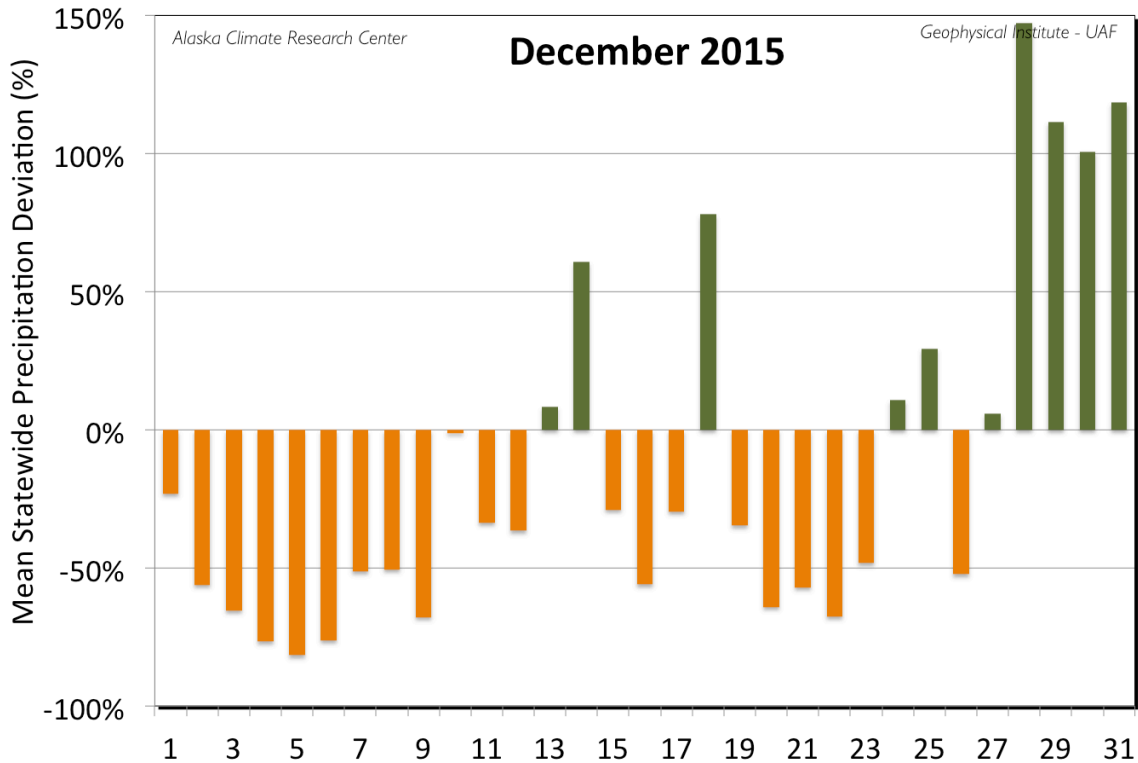
12/24/15	St. Paul	High Temperature	41	41	1983
12/29/15	Anchorage	High Temperature	46	46	1967
12/30/15	Anchorage	High Temperature	45	44	2000
12/30/15	Delta Junction	High Temperature	44	44	2014
12/30/15	Fairbanks	High Temperature	45	35	1982
12/30/15	McGrath	High Temperature	47	43	1977
12/30/15	Nome	High Temperature	38	36	1985
12/31/15	Fairbanks	High Temperature	40	39	1969

Precipitation

December precipitation was notably lower than expected, with the overall precipitation calculated as 19% below normal; this calculation was based on the mean of the deviations in percentage of the First Order Stations. Thirteen of the First Order Stations and 21 days of the month reported below normal values. There were no days during the month without any measureable precipitation at all of the 19 First Order Stations. It was also drier than December 2014, which had a precipitation total just 2% below normal. The greatest daily deviation of 147% occurred on the 28th, driven by a strong Bering Sea storm impacting the Western, Southcentral and Interior areas of the state. On a monthly basis, Fairbanks had the greatest negative deviation from normal, with a total of 0.07", or just 11% of the expected amount of 0.64". The other stations with precipitation totals less than 30% of normal were Delta Junction (18%), Anchorage (21%), Talkeetna (29%), and Barrow (29%). The leading station with a greater than normal precipitation amount was St. Paul Island due to repeated Bering Sea storms with 106% above normal.

Station	Precipitation				
	Observed (in)	Normal (in)	Delta (in)	Delta (%)	(%)
Anchorage	0.23	1.11	-0.88	-79%	21%
Annette	6.93	10.72	-3.79	-35%	65%
Barrow	0.04	0.14	-0.10	-71%	29%

Bethel	1.24	1.12	0.12	11%	111%
Bettles	0.83	0.92	-0.09	-10%	90%
Cold Bay	7.27	4.46	2.81	63%	163%
Delta Junction	0.07	0.38	-0.31	-82%	18%
Fairbanks	0.07	0.64	-0.57	-89%	11%
Gulkana	0.61	0.78	-0.17	-22%	78%
Homer	4.00	3.08	0.92	30%	130%
Juneau	2.42	5.84	-3.42	-59%	41%
King Salmon	2.35	1.23	1.12	91%	191%
Kodiak	12.28	8.73	3.55	41%	141%
Kotzebue	0.46	0.76	-0.30	-39%	61%
McGrath	0.47	1.29	-0.82	-64%	36%
Nome	0.78	1.08	-0.30	-28%	72%
St. Paul Island	4.63	2.25	2.38	106%	206%
Talkeetna	0.56	1.93	-1.37	-71%	29%
Yakutat	9.95	16.28	-6.33	-39%	61%



Daily mean precipitation deviation from the normal for the first order stations for December 2015.

The maximum monthly precipitation total reported for a First Order Station was 12.28" at Kodiak, while Yakutat reported the highest daily total of 2.10" on the 30th, a new record for that specific day.

There were a limited number of daily precipitation records this December, and all were at coastal stations. It was the third wettest December for McGrath. It was the fourth driest December for Anchorage, and the fifth driest for Fairbanks. From January to end of December Juneau has received 84.96" of precipitation, just second after the record annual total of 85.15" set during 1991. The normal annual precipitation for Juneau is 62.27".

Date	Precipitation Records				
	Station	Element	New Record	Old Record	Year of old Record

12/01/15	Kodiak	Precipitation	1.35	1.15	1985
12/12/15	Cold Bay	Precipitation	0.65	0.61	1960
12/13/15	St. Paul	Precipitation	0.86	0.68	1893
12/14/15	King Salmon	Precipitation	0.20	0.15	1966
12/24/15	St. Paul	Precipitation	0.44	0.42	1988
12/30/15	Yakutat	Precipitation	2.10	1.89	1955

Snowfall

Snowfall was unsurprisingly light, with nine of the 15 First Order Stations that measure snowfall reporting below normal amounts. Based on the mean of the deviations from all 15 stations, the overall deviation from the normals was 10% below the expected amount. Fairbanks reported the lowest snowfall amount at 1.1", just 9% of its normal of 12.1". Cold Bay had the highest deviation at 194% of its expected amount with a total of 24.4". Snowpack averaged about 70% of normal.

Station	Snowfall				
	Observed (in)	Normal (in)	Delta (in)	Delta (%)	(%)
Anchorage	2.6	16.7	-14.1	-84%	16%
Annette	4.1	8.1	-4.0	-49%	51%
Barrow	3.3	3.5	-0.2	-6%	94%
Bethel	13.4	11.4	2.0	18%	118%
Bettles	12.1	15.6	-3.5	-22%	78%
Cold Bay	24.4	12.6	11.8	94%	194%
Fairbanks	1.1	12.1	-11.0	-91%	9%
Juneau	16.4	15.6	0.8	5%	105%

King Salmon	16.2	9.5	6.7	71%	171%
Kodiak	14.9	13.8	1.1	8%	108%
Kotzebue	10.5	11.5	-1.0	-9%	91%
McGrath	12.7	20.2	-7.5	-37%	63%
Nome	8.3	14.5	-6.2	-43%	57%
St. Paul Island	11.5	12.1	-0.6	-5%	95%
Yakutat	24.2	23.2	1.0	4%	104%

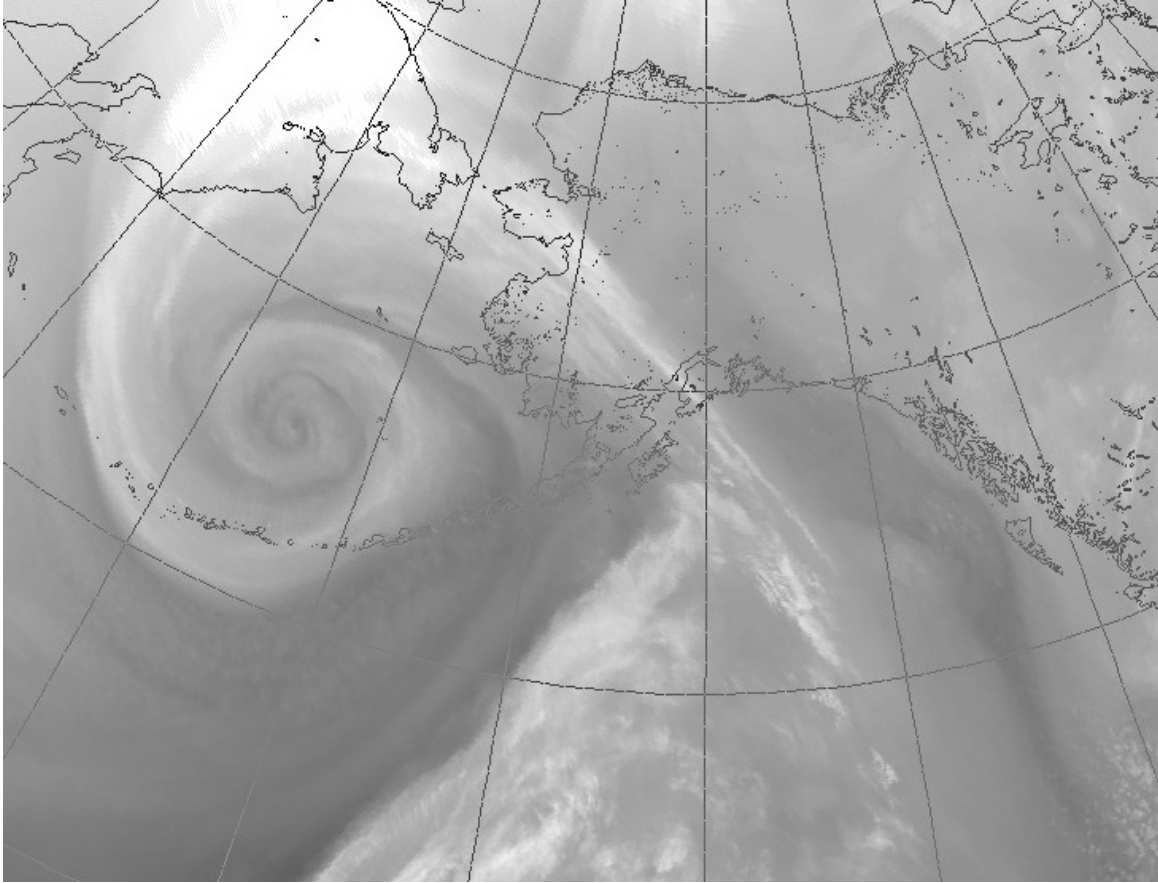
Cold Bay reported the highest total snowfall at 24.4", fourth highest December snowfall on record. Juneau reported the highest one-day snowfall at 6.6" on the 26th, a new daily record. Bettles reported the highest snow depth at 28". It was the fourth least snowiest December for both Anchorage and Fairbanks.

Date	Snowfall Records				
	Station	Element	New Record	Old Record	Year of old Record
12/07/15	Cold Bay	Snowfall	4.2	2.5	1971
12/10/15	King Salmon	Snowfall	6.0	6.0	1999
12/16/15	Cold Bay	Snowfall	2.3	2.2	1997
12/17/15	Barrow	Snowfall	1.3	1.1	1923
12/18/15	Bethel	Snowfall	4.8	4.0	1928
12/26/15	Juneau	Snowfall	6.6	6.4	2008
12/30/15	Cold Bay	Snowfall	3.3	2.6	1972

Newsworthy Events

December started out with forecasts of up to a foot of snow at Hyder. Hatcher pass reopened to vehicles and snowmachines on the 2nd after being closed in November for avalanche danger. The Elliott Highway was rendered impassable on the 3rd due to blowing and drifting snow. Dense fog advisories were issued for the Knik and Matanuska River valleys on the 5th, then again for the Glenn Highway on the 7th. Lightning was detected on the Prince of Wales Island and Ketchikan area on the 8th, while winds up to 40 mph occurred at Ketchikan as a strong front approached the southern Panhandle. Northern Panhandle areas were forecasted to receive heavy snowfall on the 13th and 14th, and Haines area received up to 6" while Yakutat totaled 4.5".

The Coast Guard and National Weather Service released warnings for a powerful storm with near hurricane force winds and 45-foot seas in the Bering Sea and 60-foot seas and winds up to 80 mph for the Pacific side of the Aleutians Islands starting the weekend of the 12th. Precautions were advised. Adak reported a wind gust of 78 mph on the 12th, then up to 112 mph on the 13th. The 13th saw gale or higher warnings for most of the coast of Alaska from the Southeast to Northwest, with the strongest warnings for the Bering Sea area. Seas were measured up to 53 ft. and the lowest atmospheric sea level pressure was 929.0 mb at a western Aleutian Buoy. The storm ended up as equal to a category 3 hurricane, and substantial property damage was reported at Adak and Atka. Wind warnings for the Bering Sea area continued until the 18th as another storm moved through the area and winds were expected to again top 80 mph at Adak, 75 mph at St. Paul Island and 60 mph at Saint Laurence Island. On the 17th, with another storm bearing down on the town, Adak declared a local disaster from the first storm.



This water vapor satellite image from the National Weather Service for the 12th of December shows the well-developed low-pressure weather pattern of the first Bering Sea storm of the month.

Winter watches for Yakutat and Juneau areas, winter warnings for southern Kenai Peninsula and parts of western Alaska were also issued on the 13th. Storm warnings moved to the southern coastal areas on the 15th, with additional winds advisories (gusts up to 60 mph) for the passes in the Alaska Range and blowing snow and near blizzard conditions for the North Slope. Heavy snow was forecasted for Yakutat and Valdez on the 15th (Valdez totaled 10.0" of snow). Freezing rain was noted in the Turnagain Pass on the 17th, and heavy blowing snow followed in the area in the 18th. Over 6" of snow was reported at Dillingham on the 18th. All the recent snow allowed the Eaglecrest ski area to fully open up the 18th. Up to 7" of snow was reported in the Haines area on the 22nd.

Storm, gale and heavy freezing spray warnings were again issued for the Bering Sea area and western Alaska on the 23rd. The same day there were wind chill warnings up to -55°F for the North Slope area. Heavy snow cautions were issued for the northern Gulf Coast and Southeast on the 24th, while high wind warnings continued for Bristol Bay area. All the warnings continued into Christmas day, with the addition of winter storm warnings and watches for the Southeast, Koyukuk and Yukon River Valleys. High winds were forecasted for the Alaska Range Passes and North Slope region for gusts up to 60 mph. Douglas received 5" of snow in the 26th, while Haines totaled 6.8".

Wind advisories for Alaska Range Passes continued on the 27th for gusts up to 65 mph, and were increased to warnings on the 28th for gusts up to 70 mph as a strong southerly flow pushed through the areas. Higher winds were again forecasted in the next day: Antler Creek near Denali Park reported 63 mph, and up to 77 mph was reported along the Richardson Highway. Electricity was knocked out for about 200 customers in the Fairbanks area on the 28th, not due to high winds, but rather snow falling off trees due to the warmer temperatures brought on the by high winds in the mountains to the south. Areas near the Alaska Range were forecast for winds up 100 mph for the 29th, and high winds continued into the 31st.

Also on the 28th and 29th high wind speeds of up to 100 mph were forecast for the Bristol Bay region. Blizzard warnings were issued for the Bering Strait Coast, while watches and warnings continued for much of western Alaska till the 30th. A mixture of snow and rain made for slippery roads in Anchorage on the 28th, while avalanche control was performed along the Seward at miles 82-89 in the Girdwood/Portage area.

High wind warnings were placed for Turnagain Arm and Portage Valley on the 29th for winds up to 80 mph that would make travel difficult. Gust up to 98 mph near McHugh Creek and 91 mph were measured near Whittier on the 29th, blowing two semitrailers off the Portage Glacier Road and causing the access tunnel to Whittier to close for about five hours. High wind warnings also stretched to Kachemak Bay and the southern Kenai Peninsula. The winds stopped a sailing from Homer to Kodiak by the ferry Tustumena. Some other high gusts: 81 mph at Cordova, 62 mph at Kodiak, 91 mph at Cape Newenham, 77 mph at King Salmon.

The winds continued into the 30th, and the warm air streamed into central Alaska from the storm resulted in new high temperature records on the 30th, as noted in the table above. The high in Fairbanks of 45°F shattered the old record of 35°F from 1982. Flood advisory was issued for Anchor River due to ice jams and recent rains. The recent high winds resulted in power outages for about 3,000 customers in Anchorage. Difficult driving conditions were predicted for the Glennallen Highway near Glennallen and icy roads made for treacherous driving on the Dalton Highway with a number of avalanches occurring at Atigun Pass. Blizzard conditions were reported at Thompson Pass on the Richardson Highway. Avalanche danger forced the closure of the Klondike Highway also on the 30th. At the end of the month, numerous grounded Murres (sea birds) were being found inland in Southcentral and all the way to Two Rivers in the Interior; it is believed they had been blown inland by the winds.

This information consists of preliminary climatological data compiled by the Alaska Climate Research Center, Geophysical Institute, University of Alaska Fairbanks. For more information on weather and climatology, contact the center at 907-474-7885 or visit the center web site at <http://akclimate.org>. Please report any errors to webmaster@akclimate.org. This summary is based on the 19 first order stations in Alaska operated by the National Weather Service. Extreme events of other stations are also mentioned.