

Alaska Statewide Climate Summary

December 2013

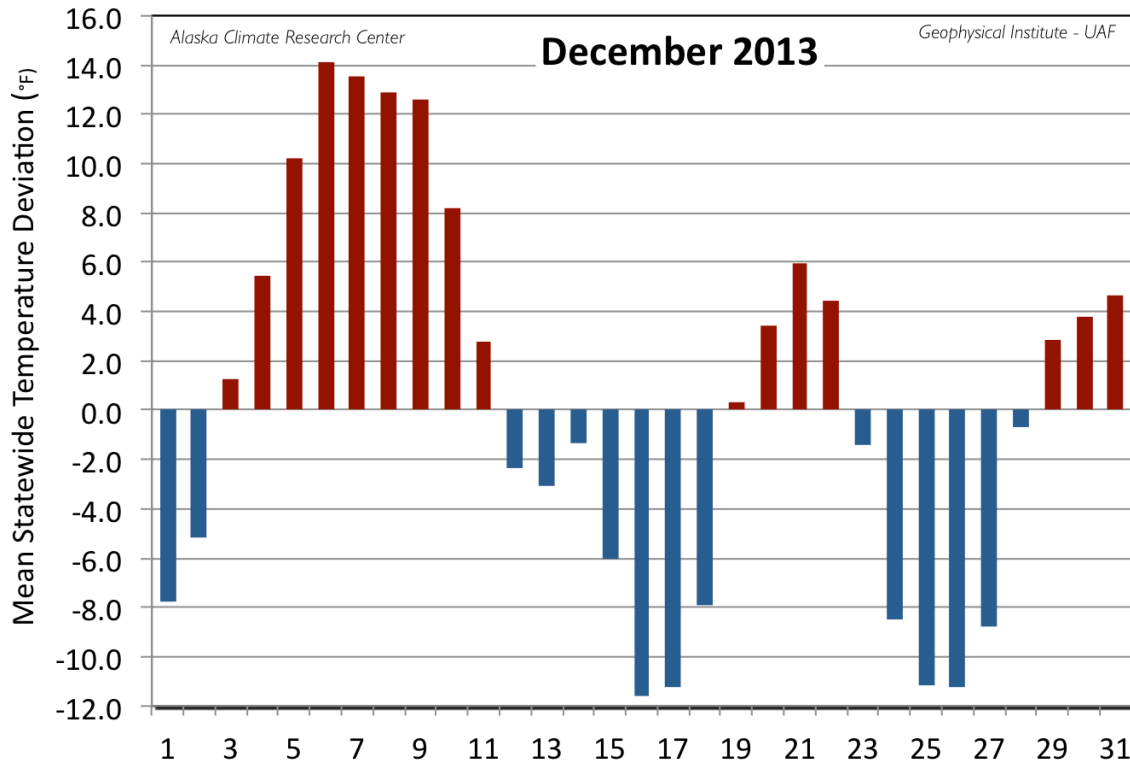
Temperature

Temperatures were mixed spatially and temporally for December, with 16 of the days and eight of the 20 first order stations reporting above normal temperatures. Eleven stations came in with below normal temperatures and Kodiak reported no deviation from its normal temperature for December. The monthly mean temperature for all 20 First Order Stations was 14.9°F, the same as the normal. The most extreme deviation for the state this month occurred on the 6th at 14.1°F. Cold Bay held the highest positive deviation from normal at 6.9°F over its long-term mean of 31.1°F. This high deviation was fueled in part by ten daily record high events and twelve daily high minimums events. Following Cold Bay with positive deviations exceeding 4°F were: Barrow (5.3°F), Nome (4.9°F), Bethel (4.5°F), and St Paul (4.1°F). Stations with negative deviations from normal were greater than -4.0°F: Gulkana (-4.8°), Delta Junction (-4.7°F), Bettles (-4.5°F), Talkeetna (-4.5°F) and Anchorage (-4.3°F).

The warmest temperature reported for the 20 First Order Stations was 54°F at King Salmon on the 6th, a new daily record. The coldest temperature was -47°F at Bettles on the 26th during a cold snap. Cold Bay reported the highest mean temperature for the month at 38.0°F, while Bettles reported the coldest at -10.2°F.

Station	Temperature		
	Observed (°F)	Normal (°F)	Delta (°F)
Anchorage	14.7	19.0	-4.3
Annette	35.7	37.1	-1.4
Barrow	-2.5	-7.8	5.3
Bethel	14.9	10.4	4.5
Bettles	-10.2	-5.7	-4.5
Cold Bay	38.0	31.1	6.9

Delta Junction	-2.6	2.1	-4.7
Fairbanks	-4.5	-4.1	-0.4
Gulkana	-4.4	0.4	-4.8
Homer	24.2	27.1	-2.9
Juneau	27.6	29.9	-2.3
King Salmon	21.5	18.6	2.9
Kodiak	31.2	31.2	0.0
Kotzebue	5.9	2.3	3.6
McGrath	-1.2	-3.2	2.0
Nome	14.4	9.5	4.9
St. Paul Island	33.0	28.9	4.1
Talkeetna	11.5	16.0	-4.5
Valdez	22.7	26.0	-3.3
Yakutat	27.4	29.6	-2.2



Daily mean temperature deviation from the normal temperature for the mean of the 20 first order stations for December 2013.

All of the record events this December were for high temperatures and no low events were reported. Most of the events occurred around the warm spell from the 4th to the 10th. Cold Bay pulled out all the stops with a total of ten high temperature events; seven of them in a row from the 3rd to the 9th. In addition, there were eleven high minimum temperature events from the 3rd to the 26th (not shown). This is simply an astounding number of record events for one station for one month. The new high temperature in Cold Bay of 53°F on both the 5th and 6th smashed the old records, both of 46°F from 2009.

Date	Temperature Records				
	Station	Element	New Record	Old Record	Year of old Record
12/03/13	Barrow	High Temperature	28	28	1972
12/03/13	Cold Bay	High Temperature	49	48	1979

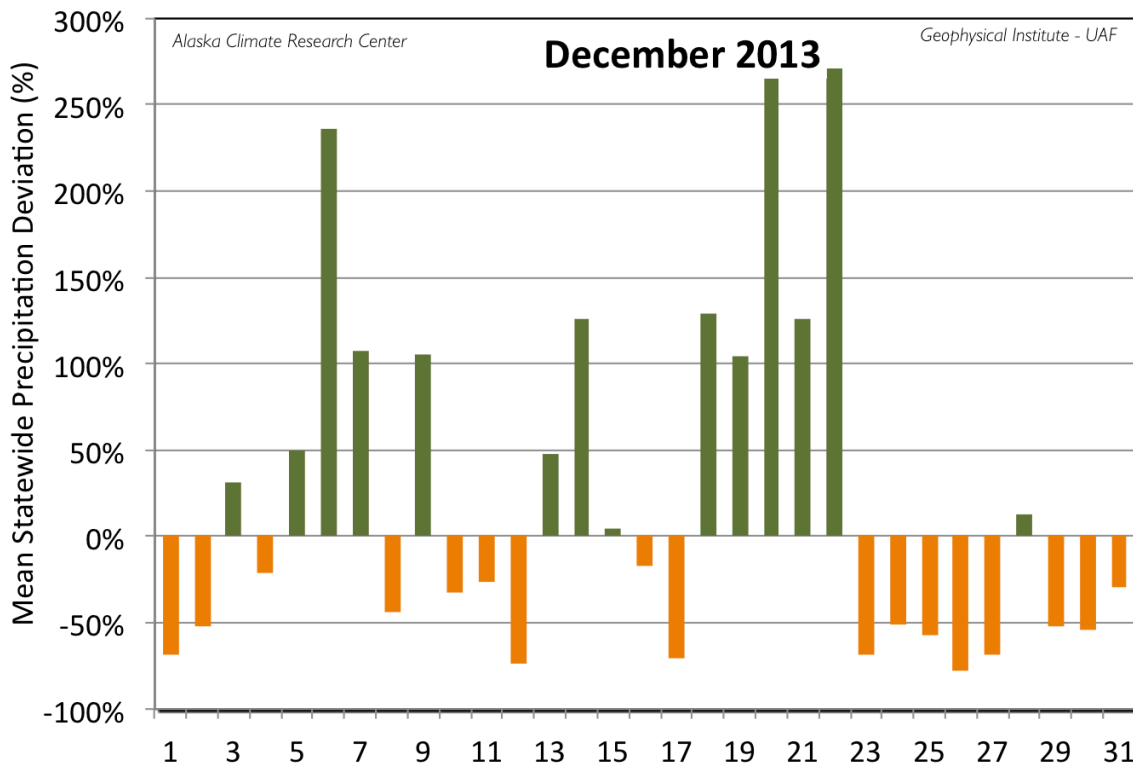
12/04/13	Bethel	High Temperature	40	40	2009
12/04/13	Cold Bay	High Temperature	50	47	1978
12/05/13	Bethel	High Temperature	41	41	1972
12/05/13	Cold Bay	High Temperature	53	46	2009
12/06/13	Bethel	High Temperature	48	47	2009
12/06/13	Cold Bay	High Temperature	53	46	2009
12/06/13	King Salmon	High Temperature	54	48	2002
12/06/13	Kotzebue	High Temperature	37	36	2002
12/07/13	Barrow	High Temperature	30	30	1972
12/07/13	Bettles	High Temperature	35	33	1960
12/07/13	Cold Bay	High Temperature	47	46	1961
12/07/13	King Salmon	High Temperature	45	45	2005
12/07/13	Kotzebue	High Temperature	36	35	1960
12/08/13	Bettles	High Temperature	35	31	2005
12/08/13	Cold Bay	High Temperature	47	46	1994
12/09/13	Cold Bay	High Temperature	48	47	1961
12/10/13	Kodiak	High Temperature	47	46	1986
12/18/13	Cold Bay	High Temperature	45	44	1984
12/20/13	Cold Bay	High Temperature	46	45	1983
12/27/13	Cold Bay	High Temperature	45	45	1984

Precipitation

Precipitation for December exceeded the normal for the state, at 46% over the expected amount. A large portion of the deviation came from Barrow's extremely wet December. Removing Barrow from the list results in a mean deviation of just 92% of normal. The greatest daily deviation of 280% occurred on the 20th. Eleven of the 20 stations reported above normal values. Barrow had the greatest positive deviation from normal, with 1.17", or 736% above the expected amount of 0.14". This extremely high amount was helped by two new daily precipitation records on the 7th and 9th. Following Barrow with deviations at or above 50% were: Nome (86%), and Bethel (84%) and Annette (71%). Leading the stations with lower than normal precipitation was Valdez with just 31% of normal.

Station	Precipitation				
	Observed (in)	Normal (in)	Delta (in)	Delta (%)	(%)
Anchorage	1.60	1.11	0.49	44%	144%
Annette	18.38	10.72	7.66	71%	171%
Barrow	1.17	0.14	1.03	736%	836%
Bethel	2.06	1.12	0.94	84%	184%
Bettles	0.55	0.92	-0.37	-40%	60%
Cold Bay	4.31	4.46	-0.15	-3%	97%
Delta Junction	0.20	0.38	-0.18	-47%	53%
Fairbanks	0.78	0.64	0.14	22%	122%
Gulkana	1.16	0.78	0.38	49%	149%
Homer	1.50	3.08	-1.58	-51%	49%
Juneau	8.52	5.84	2.68	46%	146%
King Salmon	1.13	1.23	-0.10	-8%	92%
Kodiak	4.45	8.73	-4.28	-49%	51%
Kotzebue	0.77	0.76	0.01	1%	101%

McGrath	1.45	1.29	0.16	12%	112%
Nome	2.01	1.08	0.93	86%	186%
St. Paul Island	3.19	2.25	0.94	42%	142%
Talkeetna	1.05	1.93	-0.88	-46%	54%
Valdez	2.54	8.24	-5.70	-69%	31%
Yakutat	9.68	16.28	-6.60	-41%	59%



Daily mean precipitation deviation from the normal for the 20 first order stations for December 2013.

Snowfall was only slightly above normal (9%) for the 16 stations that report snowfall. As above, Barrow topped the stations with positive deviations at 274% above normal. Juneau also had a heavy snowfall month at 159% above normal. King Salmon came in on the low side with just 34% of the expected snowfall.

Station	Snowfall				
	Observed (in)	Normal (in)	Delta (in)	Delta (%)	(%)
Anchorage	23.1	16.7	6.4	38%	138%
Annette	3.4	8.1	-4.7	-58%	42%
Barrow	13.1	3.5	9.6	274%	374%
Bethel	7.3	11.4	-4.1	-36%	64%
Bettles	5.4	15.6	-10.2	-65%	35%
Cold Bay	7.3	12.6	-5.3	-42%	58%
Fairbanks	14.3	12.1	2.2	18%	118%
Juneau	40.4	15.6	24.8	159%	259%
King Salmon	3.2	9.5	-6.3	-66%	34%
Kodiak	11.6	13.8	-2.2	-16%	84%
Kotzebue	7.2	11.5	-4.3	-37%	63%
McGrath	17.4	20.2	-2.8	-14%	86%
Nome	18.4	14.5	3.9	27%	127%
St. Paul Island	5.5	12.1	-6.6	-55%	45%
Valdez	43.9	71.9	-28.0	-39%	61%
Yakutat	36.7	23.2	13.5	58%	158%

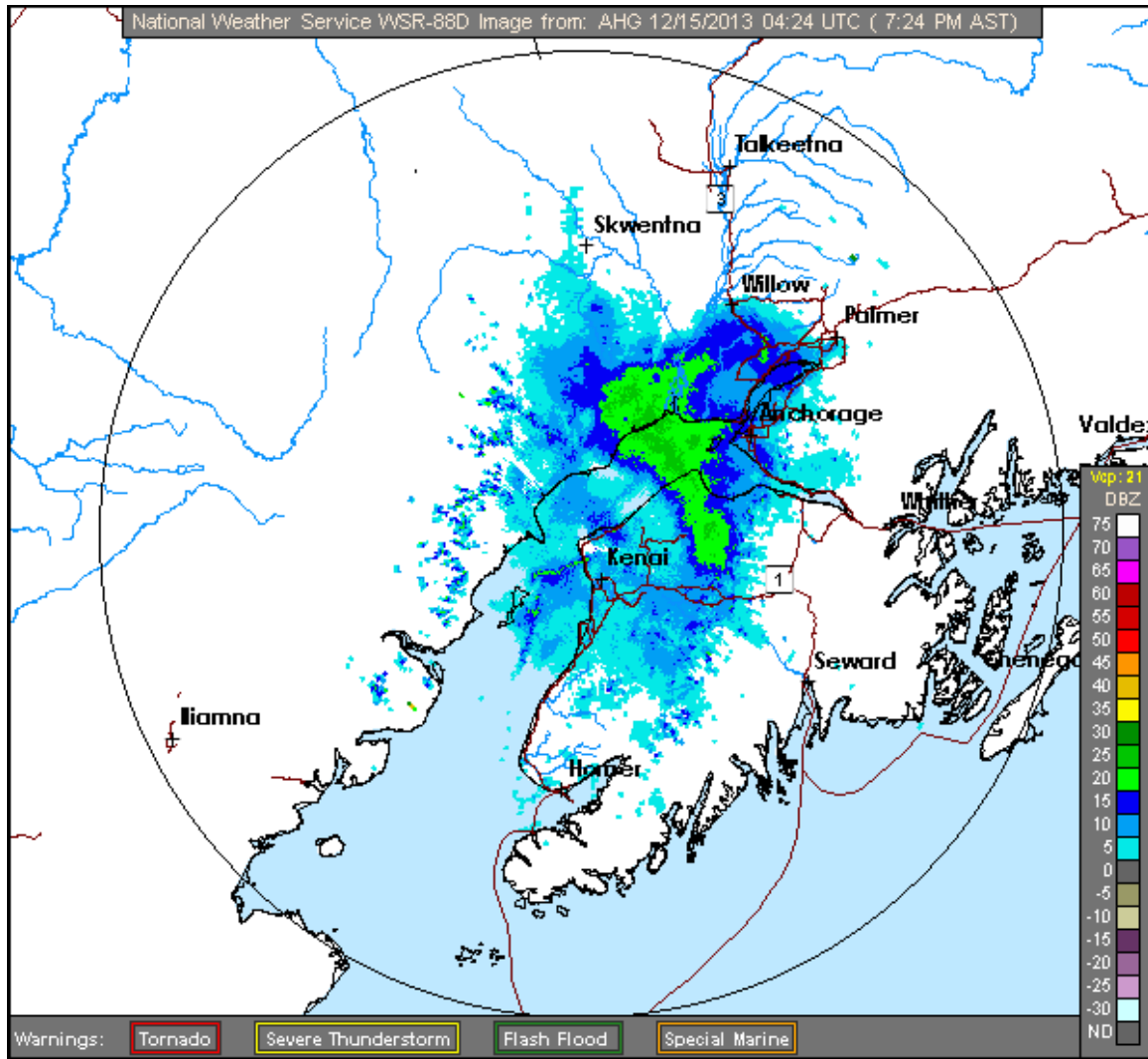
The maximum monthly precipitation total reported for the 20 First Order Stations was 18.38" at Annette, which also reported the highest daily total of 2.21" on the 11th. The highest one-day snowfall also occurred

at Yakutat on the 19th with 13.3", while Valdez reported the highest monthly snowfall of 43.9". Valdez also topped the stations for the deepest snowpack of 40" on the 22nd.

A high number of daily record precipitation and snowfall events were set in December, occurring throughout the month and across the state from Annette to Barrow to St Paul. Almost a third were set during the storm on 11th hitting the Southeast. The record precipitation and snowfall in Barrow on the 7th broke records that had been in place since 1923. By the end of December, Valdez's 2013 yearly precipitation total was 96.82", breaking the 1981 record of 93.30". Normal annual precipitation for Valdez is 69.03".

Date	Precipitation Records				
	Station	Element	New Record	Old Record	Year of old Record
12/04/13	St. Paul	Precipitation	0.69	0.44	1997
12/06/13	Kotzebue	Precipitation	0.34	0.14	2005
12/06/13	St. Paul	Precipitation	0.67	0.40	2011
12/07/13	Barrow	Precipitation	0.24	0.16	1923
12/07/13	Barrow	Snowfall	3.00	2.40	1923
12/09/13	Barrow	Precipitation	0.36	0.13	1967
12/09/13	Barrow	Snowfall	3.90	2.80	1967
12/11/13	Annette	Precipitation	2.21	1.21	1959
12/11/13	Annex Creek	Snowfall	17.00	13.00	1984
12/11/13	Annex Creek	Precipitation	2.48	1.41	2007
12/11/13	Auke Bay	Snowfall	7.70	6.30	1984
12/11/13	Auke Bay	Precipitation	1.68	0.69	2007

12/11/13	Juneau	Precipitation	1.24	1.04	2005
12/11/13	Ketchikan	Precipitation	5.04	2.30	1962
12/11/13	Sitka	Precipitation	2.60	1.63	1984
12/19/13	Annex Creek	Snowfall	11.40	11.20	1974
12/19/13	Yakutat	Snowfall	13.30	12.10	1999
12/20/13	McGrath	Snowfall	6.50	3.50	1977
12/20/13	McGrath	Precipitation	0.63	0.37	1990
12/20/13	Nome	Snowfall	6.40	3.80	2003
12/22/13	Anchorage	Snowfall	8.50	7.70	1967
12/22/13	Annex Creek	Precipitation	1.84	1.74	1943
12/22/13	Fairbanks	Snowfall	4.80	3.80	1989
12/22/13	Fairbanks	Precipitation	0.25	0.21	1989
12/22/13	Juneau	Precipitation	1.28	1.19	1953
12/25/13	Annette	Precipitation	1.69	1.01	1976
12/25/13	Annette	Precipitation	1.69	1.01	1976



This radar image from the National Weather Service shows strong storm system affecting the Cook Inlet region on December 14, 2013. The storm generated record snowfall in the Anchorage area.

Newsworthy Events

The cold that started the month off resulted in air quality alerts being issued for Fairbanks and North Pole on the 1st and 2nd. The cold snap also caused localized flooding on the 3rd along Chester Creek in Anchorage as the creek froze from the bottom up in phenomena called 'anchor ice'; the result of cold snap and warm seasonal rains. The first warm spell hit on the 4th, and a freezing rain advisory was issued for Anchorage and Mat-Su areas. Most schools in the area were closed on the 5th, and the advisory was extended into the Interior including Fairbanks. Travel advisories were issued for Interior roads.

The 10th saw a change in weather that brought heavy snow to blanket the Interior with up to 5" of snow. Up to 6,000 households went without power again as the snow caused widespread outages in the Fairbanks area. An avalanche blocked the Dalton Highway from mile 243-245. High winds and drifting snow closed the Steese Highway on the 11th at Eagle Summit, and the winds generated more power outages with up to 4,500 again in the dark in the Fairbanks area. Also on the 11th strong storms impacting the Southeast generating record snowfall and precipitation events, and caused power outages for up to 600 homes. Snowy weather from the 13th to the 15th brought 13.5" of snow to Anchorage, including the record setting 8.5" on the 14th, and total of 26" in Girdwood area.

The cold spell around the 16th brought back the air quality alerts for Fairbanks and North Pole. Flooding started in the Butte area as cold and lack of snowfall caused minor channels that flow to the Matanuska River to freeze up. The 18th saw blizzard warning issued for the western Kenai Peninsula and Mat-Su areas. The fluffy snow on top of icy roads resulted in a high number of vehicle accidents. At the same time, winter storm warnings were dispensed for northern portions of the Southeast Panhandle and Bethel areas. The storm in the Southeast generated minor damage at the Gustavus ferry terminal and record snowfall in Yakutat and Annex Creek. Heavy snow loads resulted in the sinking of a few boats in the Juneau area.

The 23rd saw the Steese Highway at Eagle Summit closed again due to high winds and blowing snow. Temperatures dropped again and Fairbanks had its coldest day of the winter on the 26th at -41°F, while the lowest temperature that day was recorded at Chicken with a bone chilling -58°F. North Pole reported in at -48°F. The cold once again resulted in air quality alerts being issued for Fairbanks and North Pole. All the snowfall during the month generated elevated avalanche danger for the Chugach and Kenai Mountains at the end of the month.

This information consists of preliminary climatological data compiled by the Alaska Climate Research Center, Geophysical Institute, University of Alaska Fairbanks. This summary is based on the 20 first order stations in Alaska operated by the National Weather Service. Extreme events of other stations are also mentioned. It should be noted that the new climate normals for the time period of 1981-2010 are applied for the calculations of the deviations, and they can be slightly different from the old normals (1971-2000), which were in use up until end of August 2011.