



Annual Snowpack Report 2012-2013

Central Alaska Network

Natural Resource Report NPS/CAKN/NRR—2015/1013



ON THE COVER

Photograph of Lake Minchumina near Denali National Park taken during a snow survey flight.
Photograph courtesy of the National Park Service

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Pamela J. Sousanes

National Park Service
4175 Geist Road
Fairbanks, AK 99709

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Executive Summary

Statewide snowfall totals were variable throughout the 2012-2013 season. The regional snowpack started to develop in mid-October 2012 with the first persistent snows arriving at Central Alaska sites between October 8 and 16. November and December were very cold region-wide with monthly temperatures 13°F to 20°F below normal; snowfall totals were below normal during this cold stretch.

By January 1 most of Wrangell-St. Elias and Yukon-Charley had snowfall totals that were well below normal. The southeast coastal region and the eastern Alaska Range were the exceptions; most of the southeast panhandle up to Yakutat received abundant snow in the fall with snowpacks that were 110-129% of normal for the start of the year. The snowpack around Denali was also variable with near normal snow conditions in the western area of the park, and below normal snowfall around park headquarters. The southern flanks of the Alaska Range were well below normal for the start of the year. January was warm and wet and brought the snowfall totals closer to normal. Snow continued to accumulate in the region through February and March. April of 2013 was one of the coldest on record; and because of the sustained cold temperatures the snowpack continued to grow through April and melt-out dates were delayed. The snowpack persisted well into May at most sites in the CAKN region, with a few exceptions. Snow off dates were recorded at May Creek on May 13, followed by Chisana on May 15, American Creek on May 23, Kantishna on May 27, and Tokositna on June 3.

The Natural Resources Conservation Service (NRCS) started using new 30-year normals to describe snowpack hydrologic data. Starting in January 2013, all 'percent of normal' values will be calculated using the 1981-2010 period instead of the 1971-2000 period. They are also changing the way the snow water equivalent (swe) metric is analyzed; it will be based on the median value instead of the average. The median is determined by ranking the years from highest to lowest and then identifying the middle year. Using this method does a better job of filtering out the effects of a few anomalous years, which can skew the data. This is especially evident at the very beginning and end of the season.

Introduction and Methods

Denali National Park and Preserve, Wrangell –St. Elias National Park and Preserve, and Yukon-Charley Rivers National Preserve make up the Central Alaska Inventory and Monitoring Network (CAKN) covering over 21 million acres. The network was established to monitor key components of ecosystems in the three parks and to provide that information back to park managers for use in the stewardship of natural resources. A predominate feature of climate in high latitude regions is the presence of a seasonal snowpack. The snow cover protects and insulates the ground and low-lying plants, reduces desiccation, and maintains ground temperatures near the freezing level. This seasonal snow cover, lasting up to eight months out of the year, is an important ecological factor for subarctic park ecosystems. It is a primary vital sign of the CAKN program as presence of water in any form is a key component of the boreal forest ecosystem.

A main objective of the CAKN snowpack monitoring program is to record long-term trends in snow and monitor changes in the extent, duration, and character of the seasonal snow cover. This is accomplished through an interagency agreement with the Natural Resources Conservation Service (NRCS) to survey snow courses and aerial snow markers and to install and maintain Snow Telemetry (SNOTEL) sites in all three CAKN parks. The SNOTEL sites have proven to be the most accurate instrumented sites to document all forms of precipitation in Alaska, including snowfall which is difficult to measure in remote locations. The agreement between the NPS and NRCS includes data dissemination and archiving. These summary reports compile snowpack data for the central Alaska region and are produced annually. The timing of the report follows the end of the water year which runs from October 1 through September 30. The data provided in this report comes almost exclusively from the NRCS Alaska Snow, Water and Climate Services web based server (NRCS 2014).

Snow pack is measured in several different ways in the Central Alaska Network. A brief description of the survey methods and data collection follows. For detailed methods refer to the Snowpack Monitoring Protocols for the CAKN (Sousanes, 2006).

SNOTEL

The most useful information available on snow pack is from the new CAKN automated SNOW TElemetry (SNOTEL) sites at Kantishna and Tokositna Valley in Denali National Park and Preserve and at May Creek and Chisana in Wrangell – St. Elias National Park and Preserve. . Each SNOTEL site has a year round precipitation gauge that measures snow and rain along with a meteorological station that records air temperature, solar radiation, summer rainfall, and snow depth. Most SNOTEL sites also have a pressure sensing snow pillow that records the density of the snowpack. The data are recorded and transmitted hourly from these sites. SNOTEL sites adjacent to CAKN parks are also useful, including the new American Creek site at Eagle near Yukon-Charley Rivers National Preserve, and the Upper Tsaina SNOTEL south of Copper Center near Wrangell – St. Elias National Park and Preserve.

Snow Courses and Aerial Markers

There are also snow courses and aerial snow markers in the three CAKN parks (Figure 1). Park staff, including park pilots, as well as vendor pilots fly these surveys the last 3 days of each month from November through April. The aerial markers are 10 (or 12) feet high and have large red crossbars every two feet and smaller black crossbars every foot. The snow depth can be determined by flying by the marker and noting where the snow is on the marker. The snow courses consist of five markers along a 75-100 foot transect where depth and density are measured with specialized snow tubes and a spring scale. A certain amount of logistic flexibility and cold weather hardiness is necessary to undertake these surveys. Weather and daylight are critical factors in making sure they are done safely.

Snow Depth Sensors

Acoustic snow depth sensors were added to most of the CAKN and Remote Automated Weather Station (RAWS) climate stations that were installed in the past few years. This measurement offers a cumulative look at snowpack development through the season.

National Weather Service Sites

The McKinley Park, Eagle, Cantwell, McCarthy, and Yakutat National Weather Service Cooperative Observer sites, or COOP sites, manually record snow depth and precipitation on a daily basis. These sites have records dating back many decades and are valuable for long term trend analysis.



Figure 1. Example of a snow course (left), SNOTEL (center), and aerial snow marker (right).

Snow surveys in all three CAKN parks are done on Dec 1, Feb 1, March 1, April 1 and May 1, if weather conditions permit. The snow monitoring sites for the CAKN are shown in Figure 2. Data are available on the NRCS website at <http://www.ak.nrcs.usda.gov/snow/>; the sites specific to the Central Alaska region are compiled in this report. See Appendix A for a list of the snow sites in the three CAKN parks.

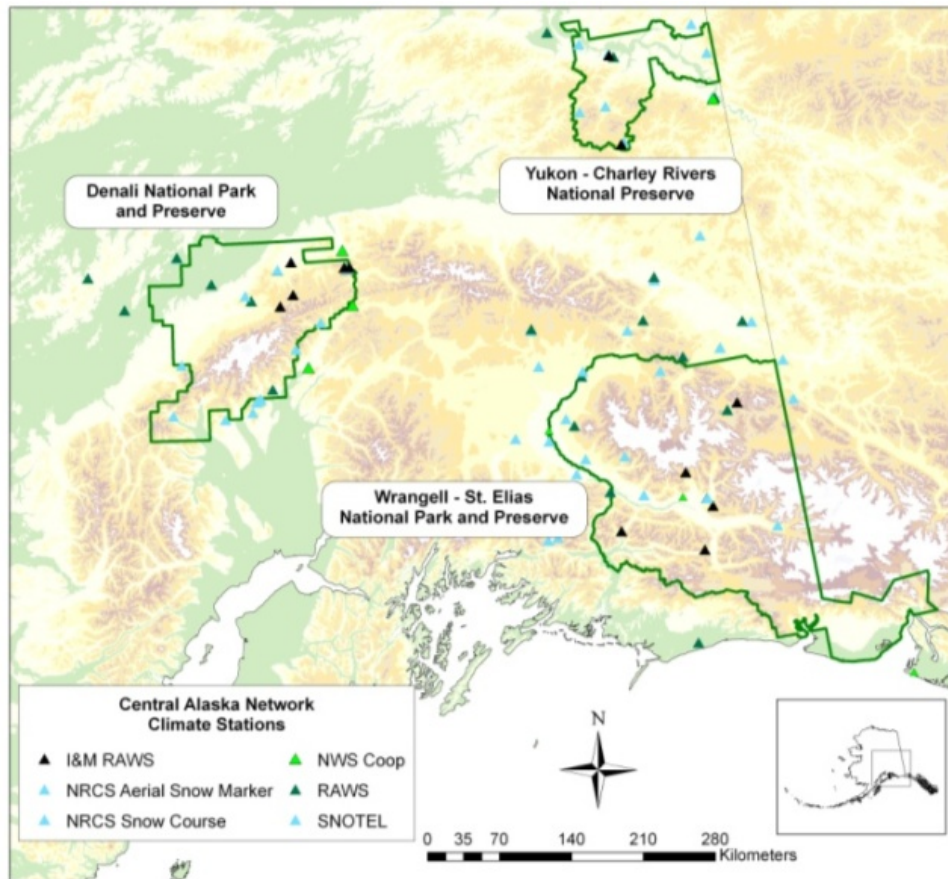


Figure 2. Locations of snow monitoring sites in the Central Alaska Network.

Results

Statewide snowfall totals were variable throughout the 2012-2013 season. The regional snowpack started to develop in mid-October 2012 with the first persistent snows arriving at Central Alaska sites between October 8 and 16. November and December were very cold region-wide with monthly temperatures 13 to 20°F below normal; snowfall totals were below normal during this cold stretch. By January 1 most of Wrangell-St. Elias and Yukon-Charley had snowfall totals that were well below average. The southeast coastal region and the eastern Alaska Range were the exceptions; most of the southeast panhandle up to Yakutat received abundant snow in the fall with snowpacks that were 110-129% of normal for the start of the calendar year. The snowpack around Denali was also variable with near normal snow conditions in the western area of the park, and below normal snowfall around park headquarters. The southern flanks of the Alaska Range were well below normal for the start of the year.

January was warm and wet and brought the snowfall totals closer to normal. The air temperatures remained above normal through February and snow continued to accumulate in the region through February and March. April of 2013 was one of the coldest on record for the interior; and because of the sustained cold temperatures the snowpack continued to grow through April and melt-out dates were delayed. The snowpack persisted well into May at most sites in the CAKN region, with a few exceptions. Snow off dates were recorded at May Creek on May 13, followed by Chisana on May 15, American Creek on May 23, Kantishna on May 27, and Tokositna on June 3; two to three weeks later than the average melt-out date.

The following sections provide a summary of the snowpack season for each of the major hydrologic units in the central Alaska region including the Central Yukon Basin, Tanana Basin, Western Interior Basin, Copper River Basin, and the Matanuska-Susitna Basin (Figure 3).

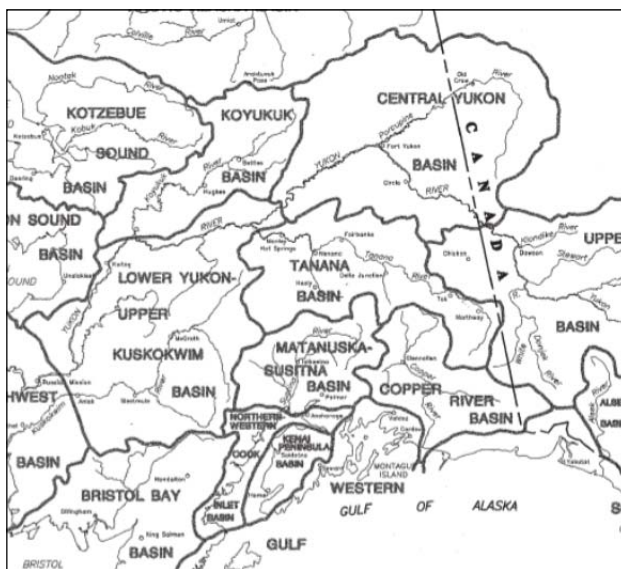


Figure 3. Map showing USGS hydrologic basins of Alaska. Map courtesy of the Natural Resources Conservation Service (NRCS, 2011) and available at <http://ambcs.org/pub/BasinRpt/2011/may.pdf>.

Central Yukon Basin

Yukon-Charley Rivers lies within the Central Yukon Basin. This region had below normal conditions in the early season. The first day of persistent snow at the long term weather station at Eagle occurred on October 15. Eagle reported a total of 8.0 inches of snow for October, normal is 9.6 inches. In November, Eagle had 9.5 inches of snow for the month – below the average of 10.6 inches. The December snowfall total for Eagle was 7.0 inches, below the normal of 11.3 inch average for the month. At the end of October, the YUCH snow markers had snow depths that ranged from 11 inches at Crescent Creek on the western side of the Preserve to ~ 16 inches at the markers to the east, both north and south of the Yukon River in the central and eastern areas of the Preserve.

No surveys were done in Yukon-Charley in January or February due to weather, but the surrounding snow courses were reporting near normal snowpack. The April 1 survey indicated that the snow course at Coal Creek was reporting 24 inches of snow with 4 inches of water equivalent, which is near normal for that site. Three fingers in the Upper Charley basin had 42 inches of snow and Cathedral Creek north of the Yukon had 40 inches of snow on April 1. The sites in the central part of the Preserve and eastern areas had between 23 and 28 inches of snow.

In Eagle April was cold and snowy. An impressive 17.9 inches of snow fell during April; normal snowfall is 3.1 inches for the month. Most of the snow fell between April 8 and 10, when a total of 14.4 inches of snow was recorded during the 3 day period. The total precipitation for the month was 1.06 inches, normal is 0.30 inches. Often times during the May 1 survey we find little to no snow, which was not the case this year with 21 inches still on the ground at Coal Creek. There was still more than two feet of snow on the ground at the snow markers that are north of the Yukon River and between 22 and 26 inches at those south of the river.

The cold snowy spring lingered through May; normally the snow starts to melt in April with warming temperatures, but due to cold conditions and moisture it kept growing through the end of the month and into May. The average temperature in Eagle for May was almost 5°F colder than normal. The snowfall total for the month was 7.0 inches; normally, less than 1 inch of snow falls in Eagle during May. The 2012-2013 seasonal snowfall by May 31 was 83.1 inches, which is 134% of normal. The snow-off date, which is the last day of where there is measureable snow on the ground, was May 22. The melt out date for the Upper Charley River climate site was May 29.

There was a total of 3.8 inches of precipitation accumulated from October 1 through May. The Eagle NWS COOP site recorded an annual snowfall amount of 83.1 inches or 134% of the normal 61.8 inches. The American Creek SNOTEL site was installed in summer of 2011, so normal conditions cannot be calculated for this site. Figure 4 shows the 2013 snowpack conditions and average monthly temperatures compared to normal. See Appendix B for snowfall and precipitation accumulation graphs.

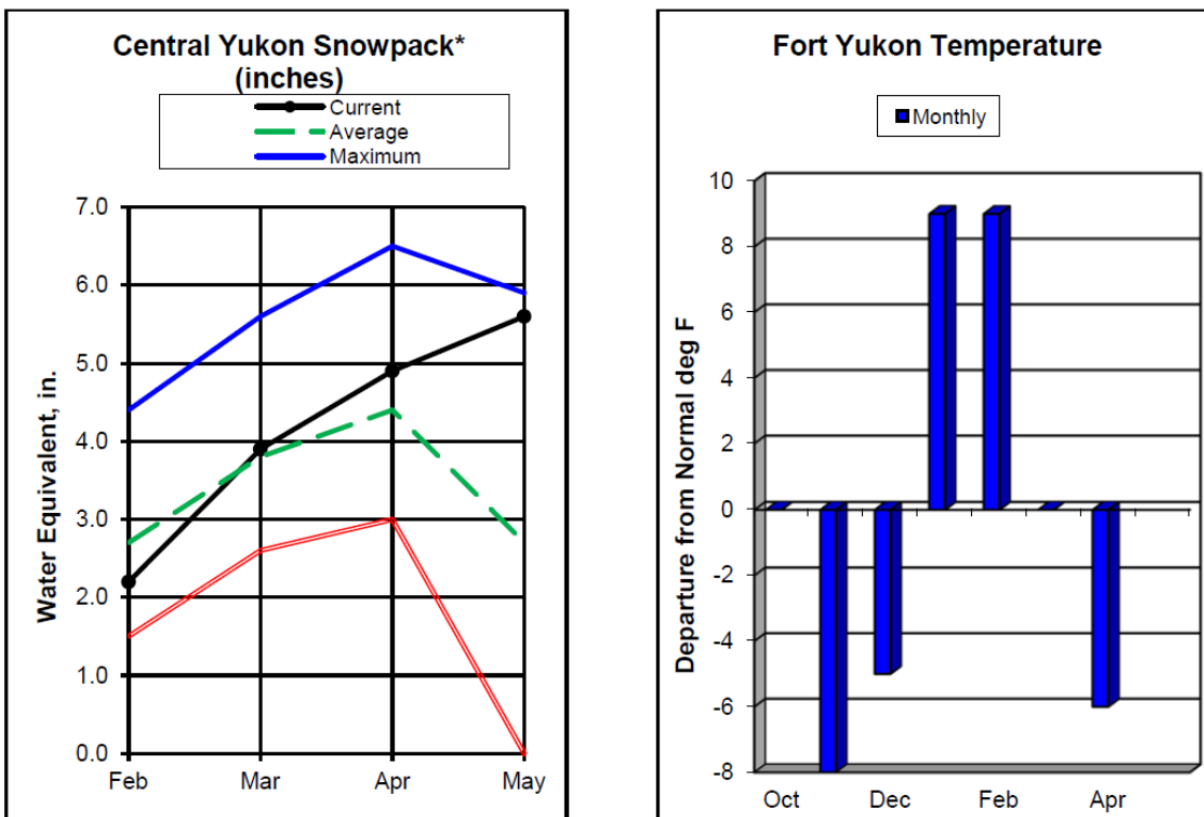


Figure 4. Central Yukon Basin 2012-2013 snow season. Courtesy of NRCS, Anchorage, AK (NRCS, 2014).

Tanana Basin

The park regions that are part of the Tanana Basin hydrologic basin, just north of the Alaska Range, include the north side of Denali from park headquarters to Kantishna and the northern areas of Wrangell - St. Elias from the Canadian border to the northeastern areas of Wrangell – St. Elias, including Chisana. The SNOTEL sites at Kantishna in Denali and Chisana in Wrangell–St. Elias record daily snow depth and precipitation data, which provides the “snow on” date for the seasonal snowpack, after this date snow generally remains on the ground for the rest of the winter. On October 8, Kantishna recorded the first persistent snow of the season and October 9 marked the beginning of the season at Chisana. At the Denali Park headquarters site the day of the first persistent snow was October 15.

The snow accumulation during late fall and early winter was near normal at the beginning, with snow fall tapering off in December. On December 1 the Kantishna site had 9 inches of snow and Chisana had 7 inches of snow. The Denali Park headquarters site had 7 inches of snow on November 30; the long-term average (1931-2014) is 10 inches for this date. Jatahmund Lake, north of Chisana in WRST, reported 11 inches of snow on November 30, normal is 10 inches. After the first survey of the season, there was little additional snowfall throughout the Tanana Basin in December. The December snowfall total for Denali Park headquarters NWS site was 7.2 inches, 51% of normal.

It was a cold January and snowfall totals were light. On February 1, the snowpack in the western portion of the Tanana Basin was just about normal; Kantishna had 20 inches of snow with a SWE of 3.5 inches. The middle Tanana Basin snowpack was below normal; the Denali Park headquarters site was 78% of normal, with a snow depth of 14 inches on February 1. The snow depth at Chisana was about 75% of normal with 14 inches of snow and a SWE of 2.4 inches. Lost Creek snow course on the Nabesna Road had 16 inches of snow and Jatahmund Lake snow course had 17 inches of snow, 3 inches below normal.

Through March and April the eastern region had a snowpack that was similar to February. Kantishna had 25 inches of snow and a SWE of 4.6 inches on March 1, about 105% of normal. . The snowpack was just below normal at Lost Creek with 16 inches of snow. Jatahmund Lake was just above normal for snow depth and snow water content at 17 inches and 3.1 inches, respectively. At Chisana, the snow depth was 16 inches and the snow water equivalent was 3.0 inches, normal is 4.1 inches. The site at Denali Park headquarters was below normal with 14 inches of snow on the ground, normal is 20 inches on March 1. Lake Minchumina was visited for the March 1 survey and had 19 inches of snow, which is right at normal for the month. The snow water equivalent was 3.3 inches, normal is 3.4 inches for March 1.

April of 2013 was the coldest on record for many locations including Denali. The annual snow pack generally starts to shrink in the spring, but many sites saw increases in both snow depth and snow water content through the end of April and into the first part of May. For the last snow survey of the season the snow depths ranged from 14 inches of snow at Chisana in the eastern region to 30 inches of snow at Kantishna, which normally has 9 inches of snow on this date. Jatahmund Lake snow course, which started in 1993, produced a May 1 site record with 15” of snow and 3.7” of water content. There was no snow at Lake Minchumina, Jatahmund Lake, and the lower Rock Creek site on May 1. Denali Park headquarters had 24 inches of snow on the ground on May 1, normal is 10 inches. Figure 5 shows the NRCS snow survey report graphs for the area. See Appendix A for individual site data.

The Kantishna SNOTEL site recorded 6.7 inches of total winter precipitation (snow water equivalent) from October 1, 2012 through May 1, 2013, which is 108% of average. The total annual precipitation for the site was 20.0 inches; normal is 20.7. The winter snow accounted for 34% the total annual precipitation. Snow-on date was October 8 and the snow-off date was May 26, 2013. The Chisana SNOTEL site recorded 6.9 inches of total winter precipitation from Oct 1 through May 1. The total annual precipitation was 15.9 inches; the winter snow accounted for 43% of the total annual precipitation. The McKinley Park long-term NWS site was 104% of normal for the year with an annual total of 79.9 inches of snow. Snow on date was October 15 and snow off date was May 26, 2013.

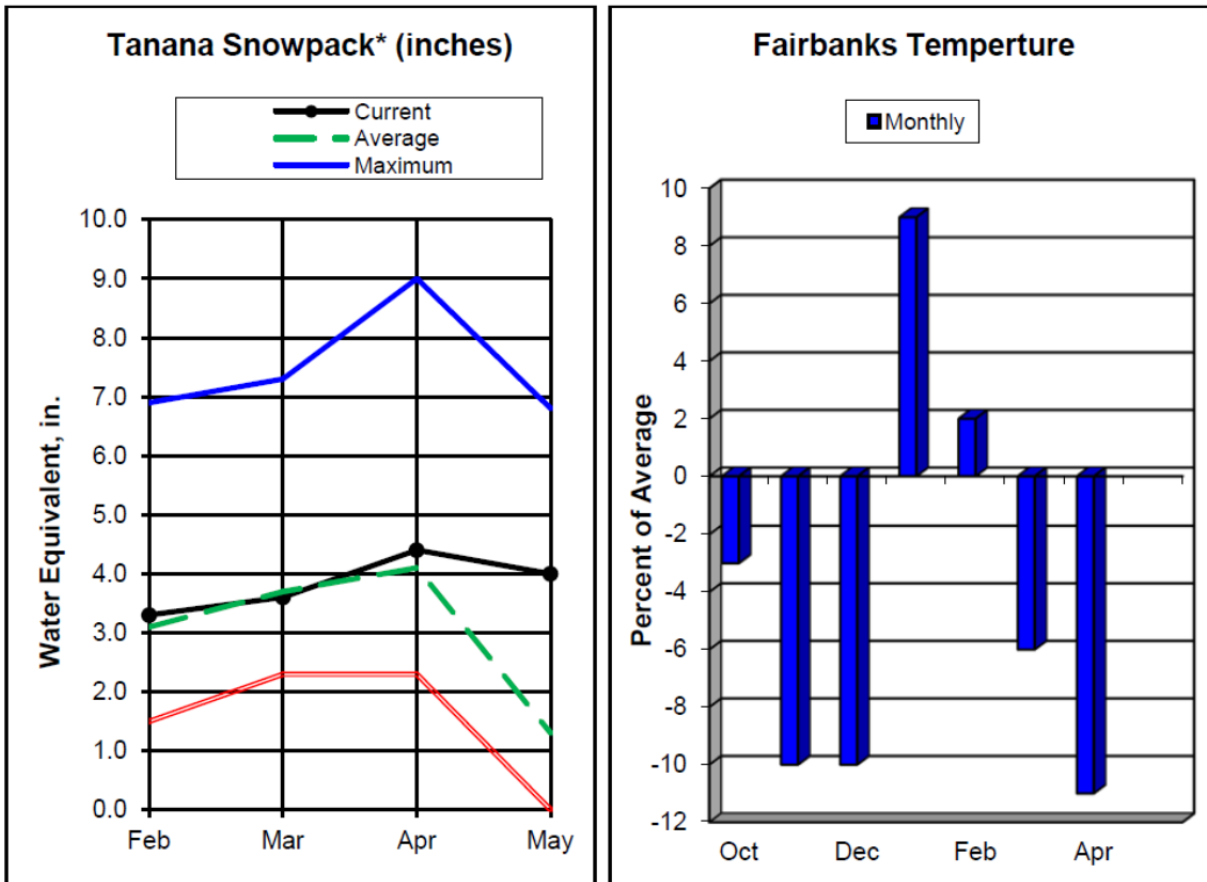


Figure 5. Tanana Basin 2012-2013 snow season. Graphs courtesy of the NRCS, Anchorage, AK (NRCS, 2014).

Western Interior Basin

The northwestern areas of Denali, that include the watersheds that drain west into the Kuskokwim River, are part of the Western Interior Basin hydrologic unit. The sites in this area were not surveyed much during the 2012-2013 season due to cold temperatures and/or bad weather. The Purkeypile site was surveyed on March 1 and there was about half as much snow as normal with 12 inches of snow and 2.1 inches of water content. There are other snow courses in the region that provided data on the late season conditions; the area showed the same trend as other regions with an increasing snowpack through April and persistent snow on the ground at the sites as of May 1st. Figure 6 shows the NRCS snow survey report graphs for the entire Western Interior Basin.

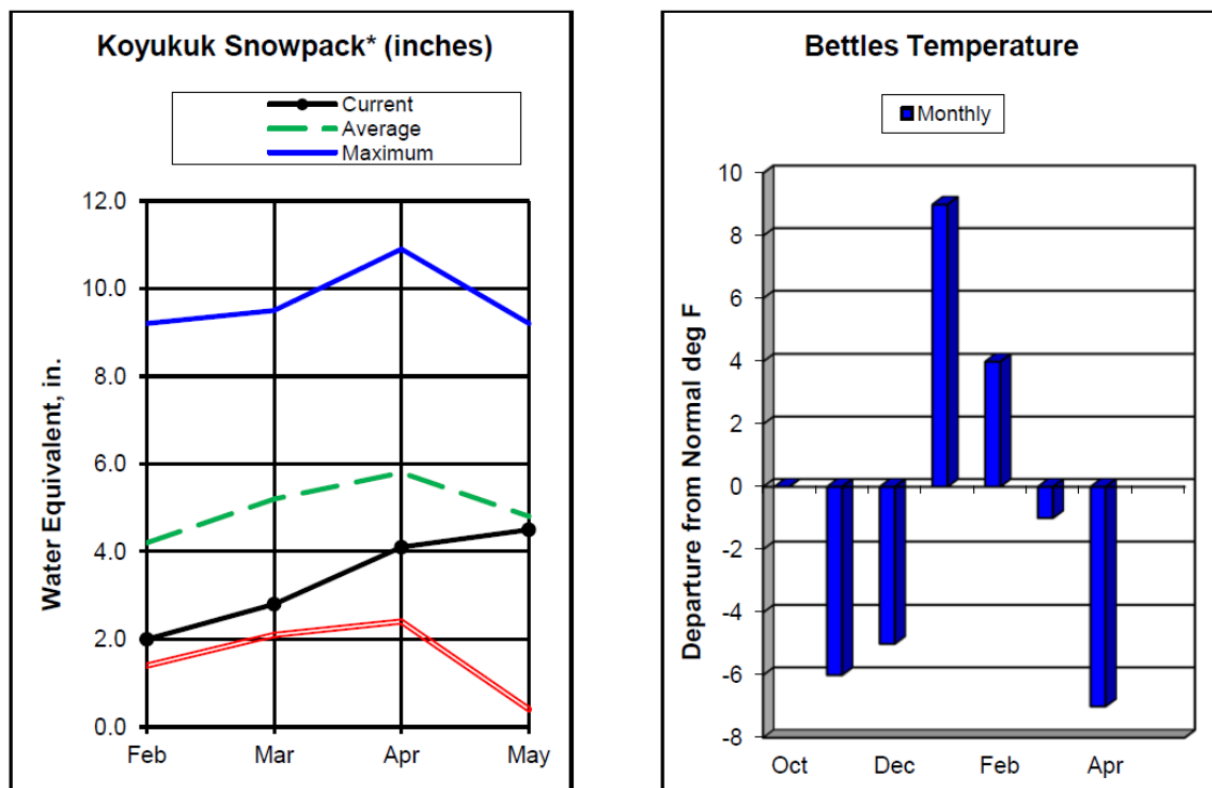


Figure 6. Western Interior (Koyukuk Basin) 2012-2013 snow season. Courtesy of NRCS, Anchorage, AK 2014.

Copper Basin

The Copper Basin is divided into 3 regions that encompass Wrangell – St. Elias: the Chugach Range, the Basin Floor and the Wrangell Mountains. There are two SNOTEL sites in the park, one at May Creek on the Basin Floor, and one at Chisana. The Chisana data is included in the Tanana Basin hydrologic unit. The May Creek SNOTEL recorded the first persistent snow on October 16, 2012 and the snowpack steadily increased throughout the snow season, although it varied quite a bit from north to south. The Chugach Range was below normal for most of the season, while the Wrangell Range and Alaska Range had above normal snow conditions. On December 1st there was 9 inches of snow at May Creek with a water content of 0.9 inches, which is 45% of normal for that time of year. The data from the early season surveys showed the Basin Floor at 83% of normal, the Chugach Range at 65% of normal, and the Wrangell Mountains at 118% of normal.

There was some snow accumulation in February, but not enough to bring conditions up to normal. The Wrangell Mountain snow courses were 79% of normal, the Chugach Range sites were 71% of normal, and the Basin Floor was 94% of normal. There was 20 inches of snow on the ground at May Creek on April 1; the aerial surveys were not flown. Because of the sustained cold temperatures and increase in snowpack throughout April, many of the sites at low elevation that normally melt out in

late April still had snow. The Chugach Range was the only area that had conditions still under normal because of the lack of snow all season long.

There was still 19 inches of snow at May Creek on May 1; usually there is no snow or very little remaining by May 1. All of the sites in the region that average 0 inches of snow on May 1 had between 13 and 21 inches of snow the first day of May. The Basin Floor was at 279% of normal for the last survey of the season. The Chugach Range was about 92% of normal and the Wrangell Range was 275% of normal. Figure 7 shows the NRCS snow survey report graphs for the area (NRCS, 2012).

The SNOTEL site at May Creek reported 6.9 inches of total precipitation (water equivalent) from October 1 through May 1st, which is 106% of normal. The annual total precipitation was 13.1 inches, so the winter snowfall accounted for over half of the total precipitation for the year. The snow-on date was October 16, 2012 and the snow-off date was May 14.

The Yakutat summary is included in this section because it helps characterize the north Gulf Coast and the southern extent of WRST. There are no snow courses in this area, but the NWS Yakutat COOP station records snowfall. It was an impressive year for the north Gulf Coast. The site reported a total of 179 inches of snow for the year, or 97% of the 185 inches the site normally receives. February and April had snowfall totals that were above normal. Because of the cooler temperatures, more precipitation fell as snow rather than rain in March and April, which brought the snowfall totals above normal. The total snowfall for April was almost 18 inches more than normal. The water equivalent of the snow was less than what normally falls as rain during March and April, so while there was more snow, the precipitation totals for early spring were less than normal.

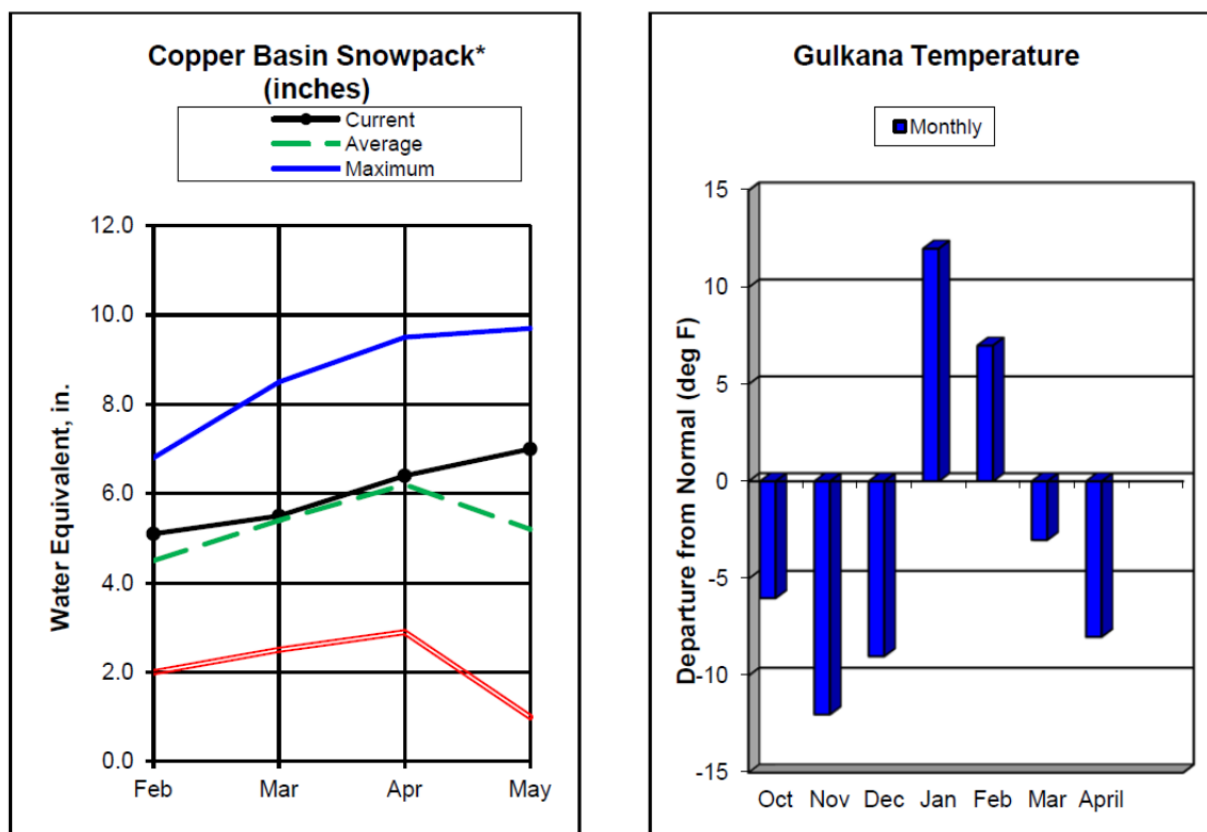


Figure 7. Copper Basin 2012-2013 snow season. Courtesy of NRCS, Anchorage, AK 2014.

Matanuska – Susitna Basin

According to the CAKN Tokositna Valley SNOTEL site, the first measurable snow that persisted through the winter was on October 15. The early season aerial markers were not flown due to cold weather. On February 1, the Tokositna Valley site was 101% of normal with 38 inches of snow and 8.6 inches of water content.

By March 1 most of the aerial markers were reporting snow depths and snow water contents that were just above normal. The snow depth at Chelatna Lake was 49 inches with 11.8 inches of water content, 118% of normal. The Tokositna site had 52 inches of snow on March 1 with 13.1 inches of water content, 125% of normal. There are other snow courses and aerial markers in the Susitna basin that fill in for the data gaps we experienced. Figure 8 shows the NRCS snow survey report graphs for the area.

The precipitation gage at Tokositna Valley recorded 19.0 inches of precipitation from October 1, 2012 through May 1, 2013. This is 39% of the total annual precipitation of 48.6 inches for the 2013 water year.

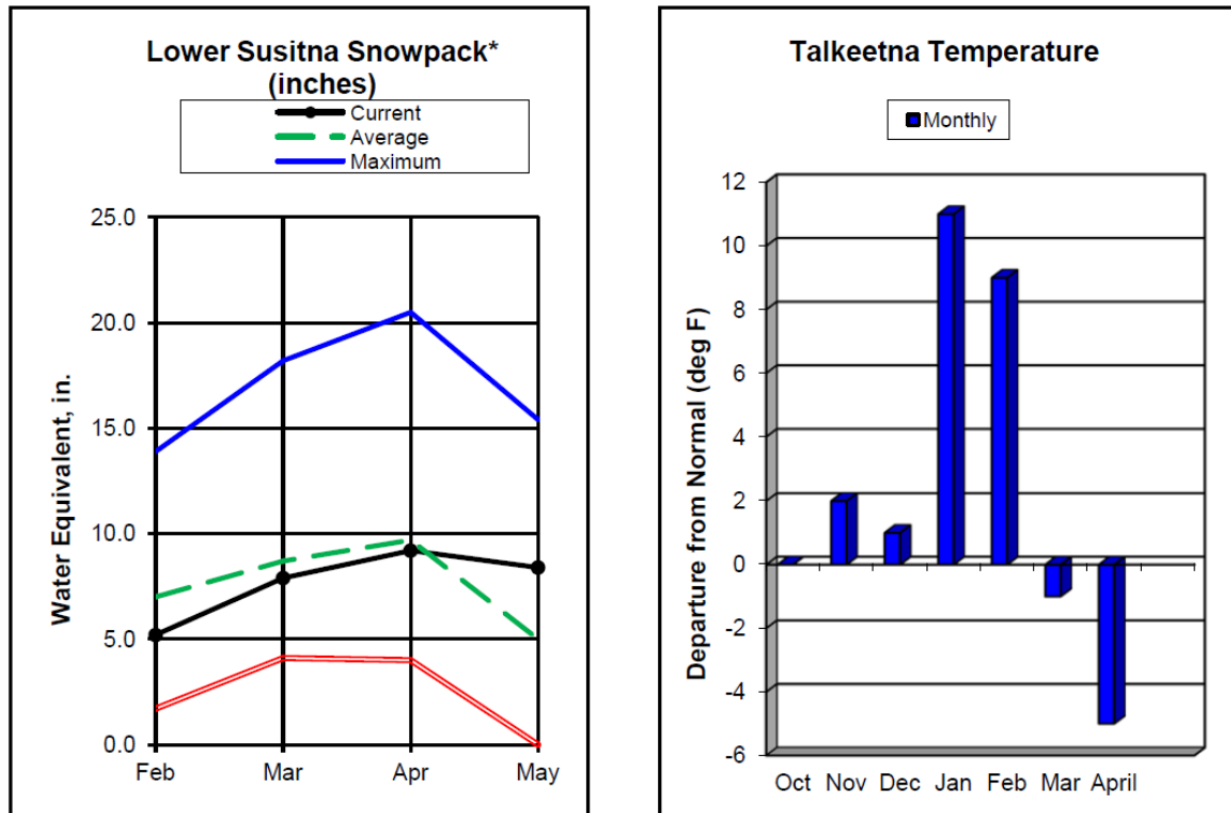


Figure 8. Lower Susitna Basin 2012-2013 snow season. Courtesy of NRCS, Anchorage, AK 2014.

Summary

The 2012-2013 snow season was quite variable with a very cool fall period, a wet and warm mid-winter period, and a cold, extended spring that generated well-above normal conditions for May due to the late melt out dates.

The NRCS publishes Alaska snowpack maps for each month the snow surveys are done starting on Feb 1. These maps provide an overall picture of snowpack variability around the state (Appendix B).

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Appendix A. CAKN Snow Sites

Wrangell-St. Elias National Park and Preserve Snow Sites

Station	Type	Years of Record	Elev. (ft.)	Latitude North	Longitude West
<i>Inside Park/Preserve Boundary</i>					
Chisana	Snow Course	1993 - present	3320	62.07194	-142.06528
Chisana	SNOTEL	2008 - present	3320	62.07194	-142.06528
May Creek	Snow Course	1993 - present	1650	61.34833	-142.69417
May Creek	SNOTEL	2007 - present	1650	61.34833	-142.69417
Chititu	Sonic sensor	2004 - present	4544	61.27359	-142.62090
Gates Glacier	Sonic sensor	2005 - present	4060	61.60289	-143.01321
Tebay	Sonic sensor	2005 - present	1880	61.18095	-144.33920
Tana Knob	Sonic sensor	2005 - present	3739	60.90800	-142.90131
Chicken Creek	Sonic sensor	2004 - present	5240	62.12402	-141.84737
Notch Airstrip	Aerial Snow Marker	2005 - present	2643	61.00562	141.53171
Tebay	Aerial Snow Marker	2005 - present	1927	61.18095	144.33920
Long Glacier	Aerial Snow Marker	2005 - present	4818	61.82166	144.07982

Surrounding Area Outside Park/Preserve Boundary

Yakutat	NWS Coop	1949 - present	30	59.51667	-139.66667
Jatahmund Lake	Snow Course	1993 - present	2300	62.60000	-142.70389

Yukon-Charley River National Preserve Snow Sites

Station	Type	Years of Record	Elev. (ft.)	Latitude North	Longitude West
<i>Inside Preserve Boundary</i>					
Coal Creek	Snow Course	2002 - present	1000	65.31667	-143.16667
Coal Creek	RAWS	2004 - Present	958	65.30413	-143.15701
Cathedral Mountain	Aerial Snow Marker	2002 - present	1800	65.17407	-143.14387
Copper Creek	Aerial Snow Marker	2002 - present	2000	64.86852	-143.39677
Crescent Creek	Aerial Snow Marker	2003 - present	2600	64.85280	-143.94443
Three Fingers	Aerial Snow Marker	2002 - present	3350	65.64844	-143.15283
<i>Surrounding Area Outside Preserve Boundary</i>					
Eagle	NWS Coop	1949 - present	810	64.76667	-141.20000
American Creek	SNOTEL	2011-Present	900	64.78333	-141.20000
Step Mountain	Aerial Snow Marker	2002 - present	2850	65.44562	-141.34963

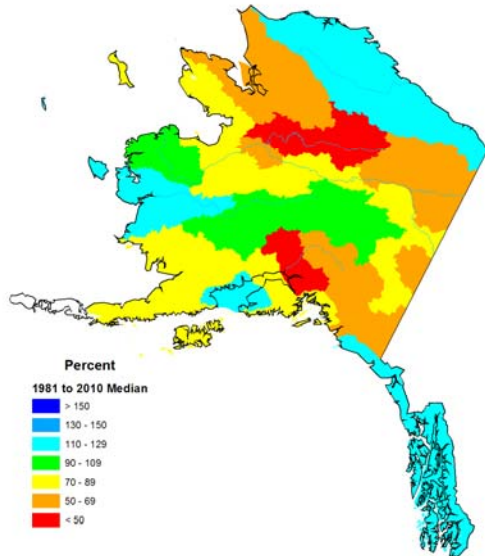
Denali National Park and Preserve Snow Sites

Station	Type	Years of Record	Elev. (ft.)	Latitude North	Longitude West
<i>Inside Park/Preserve Boundary</i>					
McKinley River	RAWS	1992 - present	840	63.64867	-151.64211
Ruth Glacier	RAWS	1998 - present	3300	62.70996	-150.53984
Stampede	RAWS	2003 - present	1800	63.74778	-150.32805
Wigand	RAWS	2013 - present	5640	63.81208	-150.04977
Dunkle Hills	RAWS	2004 - present	2850	63.26699	-149.54153
Dunkle Hills	Aerial Snow Marker	2005 - present	2770	63.26823	-149.53887
McKinley Park Weather	NWS Coop	1931 - present	2070	63.71953	-148.96567
Rock Creek Bottom	Snow Course	1993 - present	2100	63.72300	-148.96724
Rock Creek Ridge	Snow Course	1993 - present	2600	63.72631	-148.98683
Kantishna	Snow Course	1995 - present	1670	63.53845	-150.98365
Kantishna	SNOTEL	2005 - Present	1670	63.53845	-150.98365
<i>Surrounding Area Outside Park/Preserve Boundary</i>					
Minchumina	Snow Course	1967 - present	730	63.88705	-152.30276
Purkey Pile	Snow Course	1980 - present	2025	62.94543	-152.25745
Chelatna Lake	Aerial Snow Marker	1964 - present	1650	62.46456	-151.46103
Dutch Hills	Aerial Snow Marker	1980 - present	3100	62.60516	-150.85509
Nugget Bench	Aerial Snow Marker	1968 - present	2010	62.51782	-150.93996
Ramsdyke Creek	Aerial Snow Marker	1980 - present	2220	62.61684	-150.80858
Tokositna River	Aerial Snow Marker	1980 - present	850	62.62942	-150.77578
Tokositna River	SNOTEL	2006 - present	850	62.62942	-150.77578

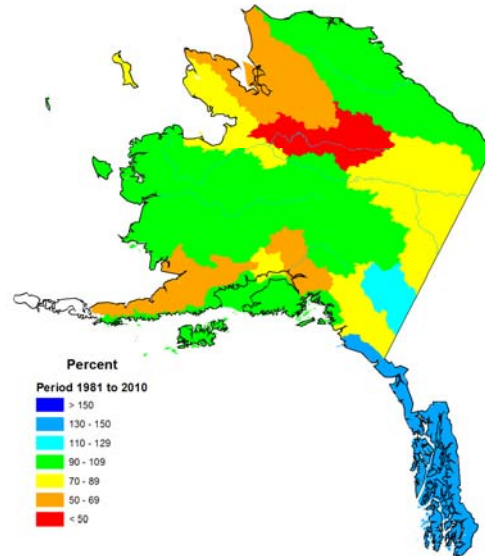
Appendix B. Statewide Snowpack Maps for 2012 - 2013

Published by the Natural Resources Conservation Service each month during the season and available online at http://www.wcc.nrcs.usda.gov/cgibin/ak_snow.pl?state=alaska

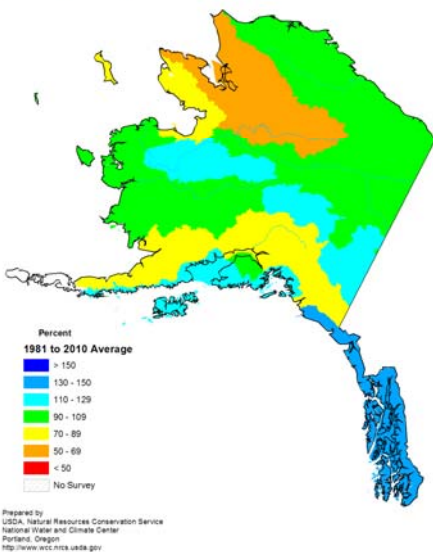
**Alaska Snowpack
as of January 1, 2013**



**Alaska Snowpack
as of February 1, 2013**

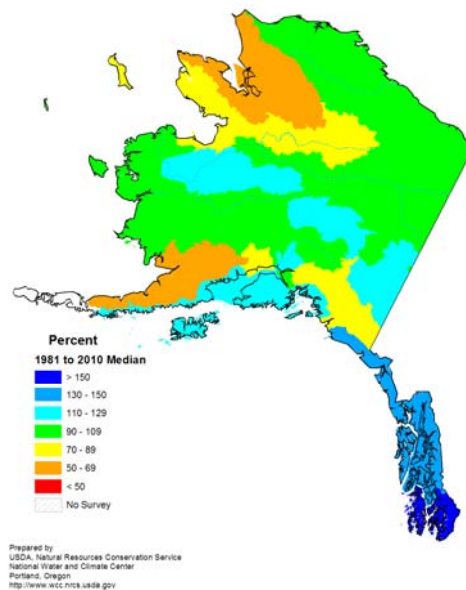


**Alaska Snowpack
as of March 1, 2013**

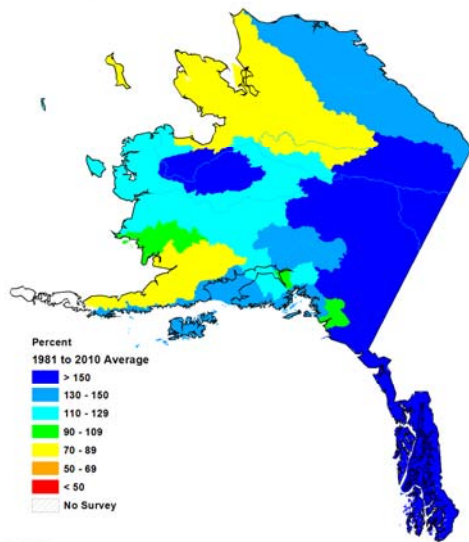


Manual snow course data are no longer available in some regions due to program decisions to meet reduced budgets. As a result, this map may have additional unrepresented areas and some regions may not be directly comparable to previous years.

**Alaska Snowpack
as of April 1, 2013**



**Alaska Snowpack
as of May 1, 2013**



Prepared by
USDA, Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
<http://www.nwc.nrcs.usda.gov>

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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National Park Service
U.S. Department of the Interior



Natural Resource Stewardship and Science

1201 Oakridge Drive, Suite 150
Fort Collins, CO 80525

www.nature.nps.gov