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The 2008-2009 Snow Report: A Repeat for the Northern Tier

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THE 2008-2009 SNOW REPORT:

A Repeat for the Northern Tier

by David A. Robinson

WIKIPEDIA/ERIC PETERSON

A frozen forest in Hillsborough County, NH. The December 2008 ice storm of New England and Upstate New York was a damaging ice storm that took out power for millions of people in those regions. The storm was deemed the worst ice storm in a decade for New England[2] and the most severe in 21 years for Upstate New York.[3]

Years from now, no one will be blamed for confusing the 2007-2008 and 2008-2009 snow seasons across the contiguous 48 states and Alaska. Nowhere is this more apparent than from the Pacific Northwest to the North Central states, where each season produced record snowfall totals. Even the timing of the two seasons was somewhat similar—each beginning slowly then quickly getting to business. Over the winter of 2008-2009, snow visited a wide range of locations, including the South. As reported each year in *Weatherwise* since the first Almanac Issue in February 1955, here is a month-by-month summary of notable snow events.

July 2008

The snow season started with Rainier Paradise, Washington, retaining a 115-inch cover from the previous season, with 25 inches remaining on July 31—both impressive amounts for July, even at this station. Traces of falling snow were observed on July 18 at the summit of Mount Washington, New Hampshire, and on several occasions in Barrow, Alaska, on the Arctic coast. Barrow was whitened with 0.9 inch on July 29.

August 2008

Rainier Paradise lost its snowpack on August 8. Several locations in Alaska reported traces of snowfall at times during the month; however nothing was measurable.

September 2008

Flakes flew at only a few western locations in September. Georgetown Lake, Montana, received 3.6 inches on September 1; Burgess Junction, Wyoming, saw 3.0 inches on September 2; and Climax, Colorado, had 2.5 inches on September 12. In the 49th state, a late-month event saw 2.0 inches fall at both Circle Hot Springs and Colville Village on September 27 and 5.8 inches at Kobe Hill on September 28. Barrow, Alaska, received only 0.6 inch for the month and did not have a day with measurable snow cover.

October 2008

A vigorous early-season storm impacted the northern Intermountain West and Plains from October 10-13. Boise, Idaho, received its earliest measurable snow on record, with 1.7 inches on October 10. The 12.8 inches in Glasgow, Montana, on October 12 represented the greatest total on record for the entire month. Unofficial reports of as much as four feet were observed in the mountains of southern Montana, while Lander, Wyoming's 29.7-inch October 10-12

storm total was an October record. Snow fell as far east as Williston, North Dakota, which received 8.4 inches from October 11-13.

Northern New England had its first measurable snow of the season on October 22, with 3.5 inches falling at Fort Kent, Maine. Meanwhile, in the central Plains, October 23-24 brought 6.0 inches to McDonald, Kansas.

Damage to leaf-covered trees and power outages accompanied a record-breaking, early-season event in the Mid-Atlantic on October 28. Slide Mountain, New York, took top honors with 27.0 inches, while East Jewett, New York, received 20.0 inches; Tobyhanna, Pennsylvania, 16.0 inches; and High Point, New Jersey, 14.0 inches. High Point's total is seven inches greater than any previously observed New Jersey October snowfall.

Snow cover became established over the interior and North Slope of Alaska during the first week of October. Some of the more impressive snow episodes brought 17.0 inches to Alyeska and 13.6 inches to Seward on October 6-7; 21.7 inches to Skwentna on October 9-10; and 20.7 inches to Annex Creek from October 25-27. Barrow saw flakes flying on every day, totaling 22.7 inches, and Fairbanks received 12.2 inches for the month. Interestingly, the mean monthly temperature at Barrow was 8.0°F above average, while Fairbanks was 8.4°F below average.

November 2008

While a series of storms crossed the nation, overall, outside of the Great Lakes region, November saw little snow. The first area to be hit was the mountains of Utah, where 37.0 inches accumulated at Alta from November 2-5. November 6-7 brought 51.2 inches to the Black Hills town of Lead, South Dakota, and 22.0 inches to Karlsruhe, North Dakota. Lake-effect snow accumulated to 14.3 inches at Hooker, New York, on November 10-11, 36.0 inches at Marquette, Michigan, from November 15-20, and 49.8 inches at Mayville, New York, from November 16-23.

Fall was a snow bust in Missoula, Montana, which received no measurable snowfall in October and November for only the second time in the past 50 years. Another sign of the poor start to the western snow season was the 2.5 inches of November snow in Flagstaff, Arizona, only 20 percent of its average.

Main Bay with 74.8 inches for the month and Valdez with 67.5 inches were among the snowiest Alaskan locations in November. Meanwhile, events such as Nome's daily-record 4.5 inches on November 26 exemplified the moderate totals



Snow rollers formed near Medical Lake, Washington, in late December 2008. A snow roller is a rare meteorological phenomenon in which large snowballs are formed naturally as chunks of snow are blown along the ground by wind, picking up material along the way.

during several events scattered around the state during each week of November.

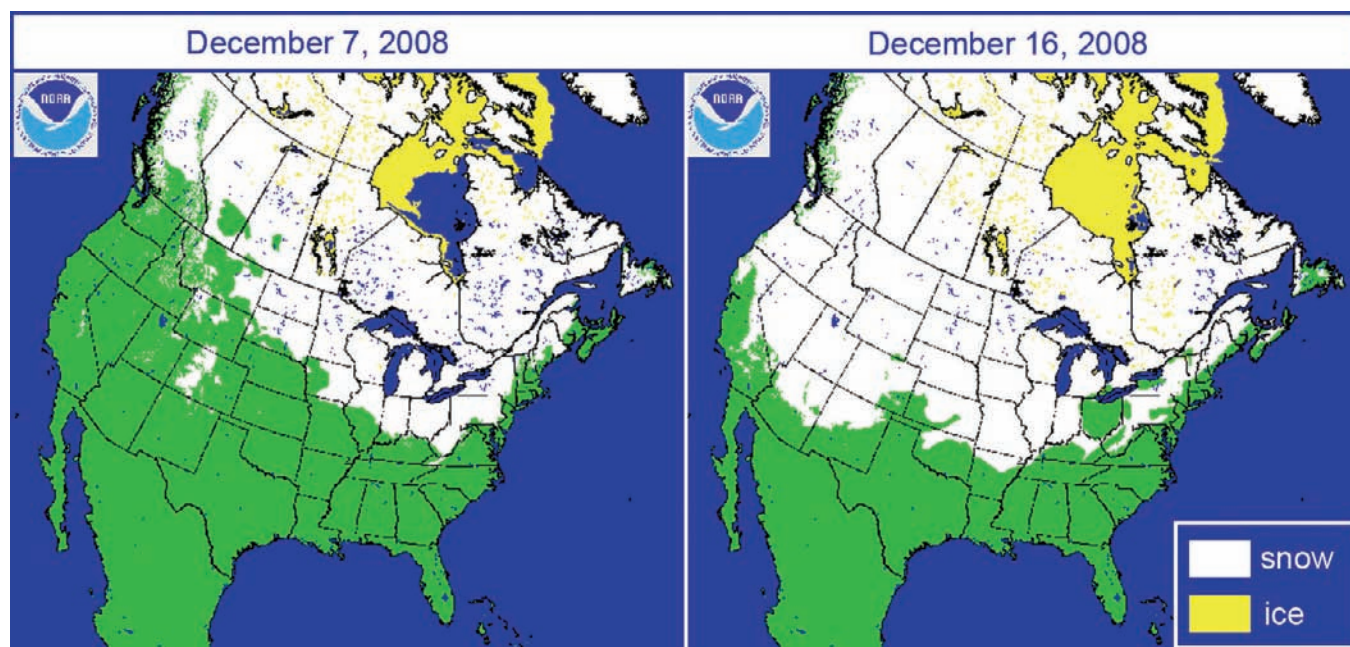
December 2008

The snow machine finally got cranking in earnest in December. On December 2, Billings, Montana, received 4.6 inches, and December 4 brought 7.2 inches to Boulder, Colorado, and 3.6 inches to Denver, Colorado. Denver's snow was accompanied by a -5°F temperature reading, just two days after reaching 69°F . Snow moved through the Northeast on December 6-7, with 5.8 inches at Robinson, Maine. Meanwhile, the lake-effect areas of Michigan saw 11.2 inches at Muskegon and 14.0 inches in Saint James. Mount Mansfield, Vermont, saw 12.0 inches from December 7-10.

Northern-tier snowfall on December 8-9 brought 12.5 inches to Fond du Lac, Wisconsin, and 8.0 inches to Alpena, Michigan. December 10-11 saw flakes flying in the deep South. Houston, Texas' 1.4 inches was this city's first one-inch snowfall since December 22, 1989. Tree damage and power outages accompanied the storm, which included totals of 8.0 inches in Bogue Chitto, Mississippi, and Amite, Louisiana. Baton Rouge and New Orleans, Louisiana, received 3.0 inches and 1.0 inches, respectively, while 3.1 inches was measured in Hamilton, Alabama. December 11-12 saw a crippling ice storm in portions of western Massachusetts and southern New Hampshire.

Snow covered the Pacific Northwest and northern Plains from December 13-15. Among the more impressive totals were 54.0 inches at Rainier Paradise, Washington; 38.2 inches at Crater Lake, Oregon; 13.8 inches at Williston, North Dakota; and 13.7 inches in International Falls, Minnesota. December 17-18 brought 25.0 inches to Coeur d'Alene, Idaho, and 19.4 inches to Spokane, Washington—both totals falling within 24 hours and making for record 24-hour totals. Elsewhere, Las Vegas, Nevada, was whitened with 3.6 inches on December 17, which exceeded the previous record for the entire month of December.

The first of two successive events came east on December 19, with 11.4 inches at Milwaukee, Wisconsin; 15.5 inches in Marquette, Michigan; and 11.6 inches in Worcester. December 21 brought daily-record snowfall to Buffalo, New York (11.3 inches), and Portland, Maine (14.5 inches).



Another storm hit the Pacific Northwest from December 20-22. Portland, Oregon, with 12.4 inches, saw its worst storm since 14.8 inches fell in the 1968-1969 winter. Government Camp, Oregon, accumulated 55.0 inches from December 18-21, and Seattle, Washington, received 8.7 inches. The six-inch snow cover in Portland, Oregon, on December 25 gave the Rose City its first Christmas with more than a trace of snow cover since at least 1940. Christmas day saw daily snowfall records at Salt Lake City, Utah (7.2 inches), and Pocatello, Idaho (5.9 inches). This storm brought 34.0 inches to Alta, Utah, and 39.0 inches to Coal Bank Pass, Colorado. The final storm of the month brought an additional 8.3 inches to Spokane, Washington, on December 29, 8.8 inches to Fargo, North Dakota, on December 30, and 11.7 inches to Rochester, New York, on December 31.

By the time all the December flakes had been counted, all-time monthly snowfall records were reached at Spokane, Washington (61.5 inches); Bismarck, North Dakota (33.3 inches); and Madison, Wisconsin (40.4 inches). December records fell in Portland, Oregon (18.9 inches); Pendleton, Oregon (32.5 inches); Great Falls, Montana (30.5 inches); Green Bay, Wisconsin (45.6 inches); and Rochester, New York (46.2 inches). Ontonagon, Michigan, recorded measurable snow on every day, totaling 92.1 inches.

In Alaska, a wet system started the month in southeastern Alaska, with 9.6 inches of snow and 2.37 inches of rain and melted snow at Yakutat on December 3-4. December 9-11 brought 28.8 inches to Valdez and 22.2 inches to Annex Creek. Late-month totals included 30.4 inches at Haines, 26.0 inches at Pelican, and 50.3 inches at Hidden Falls Hatchery from December 26-29.

January 2009

The Northwest received another bout of snow before melting set in, resulting in flooding. Kalispell, Montana, totaled 24.4 inches on January 1-2. Spokane, Washington, received 7.5 inches on January 5, culminating in a 27-day period over which 78.4 inches fell. However, within several days of this event, Spokane's snow cover decreased from 27 inches to four inches.

January 7-8 saw a major event in the East, which brought considerable amounts of freezing rain and 9.0 inches of snow to Syracuse, New York, and 10.0 inches to Jackman, Maine. The next in this series of storms saw daily records fall on January 10 in Chicago, Illinois (8.4 inches), and Detroit, Michigan (6.4 inches). Storm totals from January 9-12 included 11.9 inches in Toledo, Ohio; 16.7 inches at Erie, Pennsylvania; and 10.0 inches in Groveland, Massachusetts. A Northeast event

on January 18-19 saw snow accumulate to 16.0 inches at Reading, Massachusetts; 16.8 inches in Tamworth, New Hampshire; and 14.5 inches in Bangor, Maine. The Carolinas were visited by snow on January 20-21, with Dillion, South Carolina, receiving 4.2 inches and Beech Mountain, North Carolina, receiving 9.5 inches.

From January 23-27, snows flew from the Great Basin to the western Plains. Totals included 15.0 inches at Great Basin National Park, Nevada; 12.0 inches in Silver City, Idaho; 33.5 inches at Alta, Utah; 24.5 inches in Crested Butte, Colorado; and 13.2 inches at Scottsbluff, Nebraska. Farther west, a dry January left the water content of the Sierra Nevada snowpack at just 59 percent of average at month's end.

A devastating ice storm took center stage as the last storm of the month, traveling from the southern Plains into the Northeast from January 27-29. One to two inches of ice accumulated in the hardest-hit areas from Arkansas to Kentucky. North of there, snowfall totals included 7.1 inches in St. Louis, Missouri; 13.0 inches in Mansfield, Ohio; 16.0 inches at Little Valley, New York; and 17.2 inches at Alexandria, New Hampshire.

In Alaska, Juneau was hit with record daily snowfalls on January 4 (5.9 inches), January 8 (12.4 inches), January 10 (6.1 inches), and January 26 (9.1 inches). The capital's monthly total of 75.2 inches was a record 260 percent of normal. Annex Creek received 114.9 inches for the month, with eight inches or more falling on nine days. There was a 91-inch snow cover at the Valdez airport (105 feet above sea level) on January 31.

February 2009

Lake-effect snows brought 20.3 inches to Marquette, Michigan, from February 1-4. February 3-4 saw a moderate coastal storm bring 2.5 inches to Mullins, South Carolina; 2.8 inches to Fort Bragg, North Carolina; 10.2 inches to Nora, Virginia; 8.4 inches to Philadelphia, Pennsylvania; and 9.0 inches to Marblehead, Massachusetts.

Long-awaited snow returned to the West, with February 6-10 bringing Lodgepole, California, 33.0 inches; Great Basin National Park, Nevada, 21.0 inches; Flagstaff, Arizona, 29.3 inches; Ibapah, Utah, 13.0 inches; and Mancos, Colorado, 13.0 inches. On February 10, snows visited the Dakotas, with 15.0 inches at Wildrose, North Dakota, and 7.0 inches in Lemmon, South Dakota.

On February 16-17, more snow fell in Southern California, with 18-24 inches at locations including Mount Baldy and Lockwood Valley. Once inland, the storm brought Mount Shasta, California, 45.0 inches; Mount Charleston, Nevada, 26.0 inches; and Pine View Dam, Utah, 19.0 inches from February 13-18. By February 22,

February storms had added eight inches of liquid to the Sierra Nevada snow pack, which had a water equivalency of 18 inches (76 percent of average for the date).

Meanwhile at the opposite corner of the nation, heavy snow accumulated from February 18-21, with totals including 32.0 inches at Hooker, New York, and 30.0 inches in Warren, Vermont. Another storm on February 22-24 brought 28.1 inches to Sutton, Vermont, and 28.0 inches to Medway, Maine.

The final storm of the month traveled from the Northwest into the Great Lakes from February 26-27. Snowfall totals included 2.1 inches in Seattle, Washington; 7.2 inches in Billings, Montana; 18.0 inches in Pretty Rock, North Dakota; 15 inches in Pollock, South Dakota; 10.5 inches in Peshtigo, Wisconsin; and 12.0 inches in Pellston, Michigan.

Juneau, Alaska, was again under the snow gun in February, receiving 13.8 inches from February 12-14. However it was the western Alaska town of Kotzebue that received the most unusual February snow. A monthly-record total of 47.4 inches (912 percent of normal) fell, punctuated by an event of 10.7 inches on February 27-28 that was accompanied by a 64-mph wind gust.

Earlier, Nome received 8.2 inches on February 18, making this its third-snowiest February day on record. Snettisham received 25.0 inches of its state-high 82.0 inches on February 25th. The snow depth at the Valdez airport was up to 122 inches on February 28.

March 2009

A storm that began producing snow on the last day of February (4.6 inches in Gravette, Arkansas, and 3.0 inches at Memphis, Tennessee) continued moving through the South and to the Northeast on March 1-2. Lambert, Mississippi, saw 5.0 inches; Rockford, Alabama, 4.0 inches; Nicholson, Georgia, 8.0 inches; and Jackson, Tennessee, 13.5 inches. Totals from 6-12 inches were common in the Mid-Atlantic and New England, including 6.3 inches at Richmond, Virginia; 8.6 inches in Philadelphia, Pennsylvania; 11.6 inches in Providence, Rhode Island; and 11.5 inches at Concord, New Hampshire.

A storm on March 9-10 brought heavy snow to locations such as McLaughlin, South Dakota (10.0 inches); Jamestown, North Dakota (14.0 inches); and International Falls, Minnesota (18.8 inches). The temperature at this last location reached 57°F on March 15, and a day later

CARRIE ANDERSON



Ice encases cranberries in Finland, Minnesota, after an ice storm on March 24, 2009.



Ice hangs from a sign at the Wolf Ridge Learning Center in Finland, Minnesota, after an ice storm on March 24, 2009.

Green Bay, Wisconsin's, 106-day snow cover streak (since December 1) came to an end, its sixth-longest such streak in the past 60 years. This "false spring" was short lived, as snow soon returned. From March 22-26, 30.7 inches accumulated at Lead, South Dakota, and 22.5 inches at Marmarth, North Dakota. A considerable amount of freezing rain coated northeast Minnesota on March 23-24.

A prodigious snow producer came out of the Rockies on March 26, making its way to the Midwest by March 29. Storm totals included 40.0 inches at Alta, Utah; 21.0 inches at Campo, Colorado; 29.0 inches at Laverne, Oklahoma; 28.0 inches at Pratt, Kansas; 11.0 inches at Amarillo, Texas; and 5.8 inches at Springfield, Illinois. It was Amarillo's second-latest 10-inch storm on record. The 25.0 inches that fell in a 24-hour period at Follett, Texas, and Fort Supply, Oklahoma, established new state records.

The final storm of the month tracked through the northern-central region on March 30-31, with 12.8 inches at Mitchell, South Dakota; 11.8 inches in Bismarck, North Dakota; and

27.0 inches in Campbell, Minnesota. With 29.7 inches, March was the second-snowiest on record in Bismarck. Fargo, North Dakota, had a record snowfall of 28.1 inches in March, with a remarkable 4.62 inches of rain and melted snowfall, setting the stage for devastating April flooding.

It was a cold, snowy March throughout Alaska, although the majority of the snow fell in the first and last weeks. Fairbanks' 9.0-inch snowfall on March 5 left 30 inches on the ground, this city's greatest depth since 2000. Kotzebue saw 13.1 inches during the first week of the month, leaving 62 inches on the ground. Kodiak received 24.1 inches from March 22-25, and Yakutat was whitened by 9.5 inches on March 29. Whittier took top snowfall honors with 126.8 inches, while Main Bay's 148 inches on the ground on March 31 was a winner.

April 2009

With the arrival of April, winter refused to relinquish its grip in many areas. Alta, Utah, received 50.0 inches in the first few days of the month. From March 22-April 4, this Wasatch



Rocky Mountain National Park, Colorado, still had large amounts of snow in late May, 2009. This photo shows the snow pack adjacent to Trail Ridge Road at an elevation of approximately 10,900 feet, on May 20, 2009, the first day when the road was open after a long winter.

Mountain community was smothered with 170.0 inches of fresh snow with a 10.83-inch water equivalent. April 4 brought 12.4 inches to Rapid City, South Dakota, and 10.0 inches to Eldora, Iowa. The Southwest saw snow from April 14-16, with 8.3 inches at Elko, Nevada; 39.0 inches at Brighton Crest, Utah; and another 39.0 inches to Alta. Meanwhile, Evergreen, Colorado, was buried under 22.4 inches of snow. Marquette, Michigan, saw 20.5 inches and Rhinelander, Wisconsin, received 10.2 inches on April 20-21. A record-breaking storm buried a few locations on the eastern slopes of the northern Rockies with four to five feet of snow from April 27-29. Great Falls, Montana, received 25.4 inches, in the process establishing two- and three-day records for snowfall. Snowpack in the Sierras was 66 percent of average for April 30.

Few Alaskan towns received more than a few inches of snow in April. Still, snow cover held on throughout most of the state until the unusually warm last several days of the month. Among the snowier locations, Kodiak totaled 6.6 inches on April 3 and 6.9 inches on April 11. Nome

received 9.5 inches for the month, with impressive depths of 72 inches on April 1 and 35 inches on April 30. Whittier was the snowiest location, with 22.8 inches for the month.

May 2009

Crater Lake, Oregon's snowpack increased to 93 inches following a 13.8-inch snowfall on May 3. May 3-4 brought 7.5 inches to Climax, Colorado, and 4.5 inches to Cooke City, Montana. Old Faithful, Wyoming, saw 6.0 inches from May 4-6. The snow cover in Great Falls, Montana, disappeared by May 4, but another 1.3 inches fell on May 13, while Raynesford, Montana, received 5.0 inches. Back east, Mount Washington, New Hampshire, received 2.8 inches of May snow, while the snow cover atop Mount Mansfield, Vermont, disappeared on May 23 after beginning the month at 50 inches.

Only the North Slope of Alaska saw appreciable snowfall in May, with most falling in the last week of the month when Colville received 8.8 inches of its monthly total of 12.7 inches. Barrow was whitened by 6.7 inches on May 30-31 follow-

ing an early decrease to a trace on May 25. Main Bay's snow cover decreased from 103 inches on May 1 to 32 inches on May 31.

June 2009

The northern Rockies had one last bout of snow from June 6-8, with the mountains of northern Wyoming receiving 5-10 inches. Pocatello, Idaho, and Billings, Montana, saw rare traces of snow, while Halliday and Taylor in western North Dakota each received 2.0 inches. Snowpack at Rainier Paradise, Washington, decreased from 128 inches on June 1 to 68 inches at month's end.

In Alaska, an early-summer snow storm brought 6.0 inches to Nabesna and 2.0 inches to Mentasta Lake in the Copper River basin on June 26-27. No other stations in the state recorded a measurable event in June. Colville Village lost its two-inch cover on June 1, while Main Bay's cover was gone on June 13.

Seasonal Snowfall

Totals for the 2008-2009 snow season are reported for 37 stations across the nation in Table 1. Only 14 stations reported below-average snowfall, while 14 reported more than 125 percent of average. Five locations had twice to more than three times their average snowfall, with Portland, Oregon, coming in first at 319 percent. Spokane, Washington, topped its 2007-2008 total of 195 percent of average with 209 percent this season; the 97.7 inches that fell there was a record. Meanwhile, Barrow, Alaska's, record 266 percent of average topped last year's impressive 186 percent. International Falls, Minnesota, was buried under a record 125.6 inches for the season, while Bismarck, North Dakota's, seasonal snowfall of 100.3 inches (214 percent of average) was second only to the 101.6-inch final seasonal total observed in 1996-1997. Impressive eastern totals included 357.4 inches in Hooker, New York, situated on the Tug Hill Plateau in the Lake Ontario snowbelt; 254.3 inches atop Mount Mansfield, Vermont; and 220.8 inches on the summit of Mount Washington, New Hampshire.

Among the stations with less-than-average snowfall, Denver, Colorado, with 43 percent of average snowfall came out on the low end. This was followed by Washington, D.C. (49 percent); and Richmond, Virginia (53 percent); then Reno, Nevada, and Saint Louis, Missouri, each at 57 percent of average. Columbia, Missouri, with only 3.6 inches for the season, recorded its second-lowest total since 1899. Yet just to the north, statewide, Iowa had a third consecutive year of above-average snowfall.

Seasonal Snow Cover

As in the 2007-2008 snow season, the 2008-2009 snow cover season got off to a slow start in the lower 48 states, with the extent of snow covering land the 12th-lowest of the past 43 years. The NOAA satellite snow maps used for this assessment showed a rapid onset of cover in early December, which had the seventh most extensive cover. Each month from January through April ranked between 15th and 23rd, making for a rather snowy picture across the United States.

Alaskan snow cover ranked in the lower half of the satellite record in September but surged to a ranking of the second-most-extensive October cover. From there until March, the vast majority of the state remained covered, until a slightly delayed melt began in late April. W

DAVID A. ROBINSON is chairman of the Department of Geography at Rutgers University and the New Jersey State Climatologist. He would like to thank colleagues in a number of state climate offices, regional climate centers, the National Climatic Data Center, National Weather Service offices, and especially Mathieu Gerbush, Jenell Walsh-Thomas, and Jacob Carlin at Rutgers University for assisting with information-gathering.

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Annual Snowfall Totals

Table 1. 2008-2009 snowfall for select United States cities.

City	Snowfall Total (inches)	Average Snowfall (inches)
Marquette, Michigan	246.0	184.5
Rochester, New York	103.7	100.3
Bismarck, North Dakota	100.3	50.3
Buffalo, New York	100.2	97.0
Spokane, Washington	97.7	47.4
Anchorage, Alaska	93.4	69.5
Burlington, Vermont	91.4	83.1
Rapid City, South Dakota	90.2	40.9
Portland, Maine	81.1	66.4
Cleveland, Ohio	80.0	63.1
Barrow, Alaska	76.6	29.0
Milwaukee, Wisconsin	76.0	52.4
Billings, Montana	75.6	59.0
Duluth, Minnesota	73.6	83.1
Fairbanks, Alaska	71.5	67.4
Cheyenne, Wyoming	69.5	60.3
Detroit, Michigan	65.7	44.0
Chicago, Illinois (O'Hare)	52.7	38.0
Salt Lake City, Utah	48.3	62.7
Minneapolis, Minnesota	45.0	55.9
Des Moines, Iowa	41.3	36.4
Sioux Falls, South Dakota	34.8	40.6
Boise, Idaho	33.7	19.5
Charleston, West Virginia	31.7	38.4
New York City (Central Park)	27.6	22.4
Denver, Colorado	26.1	61.0
Indianapolis, Indiana	24.3	27.0
Philadelphia, Pennsylvania	22.9	19.3
Lincoln, Nebraska	19.2	26.3
Portland, Oregon	16.6	5.2
Kansas City, Missouri	14.6	20.1
Amarillo, Texas	13.9	17.8
Reno, Nevada	13.5	23.5
Saint Louis, Missouri	12.9	22.5
Washington, D.C. (Reagan)	7.5	15.2
Raleigh-Durham, North Carolina	7.1	7.1
Richmond, Virginia	6.6	12.4