Cold weather settled across the West during the second week of January, following a barrage of storms that improved high-elevation snow packs. Below-normal temperatures persisted in the West through month’s end, accompanied by additional periods of rain and snow. Meanwhile, stormy weather largely bypassed the Plains but hammered parts of the Midwest with flooding rains and rare January tornadoes. Further east, heavy precipitation in the Northeast contrasted with near-to below-normal totals across the remainder of the Atlantic coast states. Elsewhere, significant rain fell along and near the Gulf Coast.

Cold weather and high winds caused some damage to Florida’s non-citrus winter crops and ornamentals on January 3, but low temperatures were not a significant threat thereafter across the Deep South. January temperatures were persistently below normal but never extremely low in California, where light freezes were noted on as many as 10 days in the agricultural San Joaquin Valley. Elsewhere, January temperatures ranged from 5 to 10°F below normal in a few high-elevation Western valleys but averaged at least 5°F above normal in parts of the Northeast.

Under (High) Pressure

In early January, bitterly cold conditions persisted across snow-covered areas of the Intermountain West. In Colorado, Alamosa noted 5 daily-record lows in 6 days from December 27-January 1, including readings below -30°F on December 29 (-33°F) and January 1 (-31°F). Elsewhere in Colorado, Crested Butte (-36°F) also tallied a daily-record low on New Year’s Day.

Meanwhile, cold air swept into the Midwest and East, accompanied by snow squalls downwind of the Great Lakes. Daily-record totals for New Year’s Day reached 8.5 inches in South Bend, Indiana, and 7.0 inches in Marquette, Michigan. By the 2nd, Galveston, Texas, measured a record-high barometric pressure of 30.91 inches of mercury (1047 millibars), eclipsing the standard of 30.90 inches (1046 millibars) set on January 6, 1924. The same record was established the following day in Tallahassee, Florida (30.77 inches, or 1042 millibars), where the former standard was 30.74 inches, or 1041 millibars, set on January 4, 1979, and February 5, 1996.

Record lows in Florida for the 3rd included 32°F in Fort Myers, 40°F in Miami Beach, and 45°F in Key West. For_key West, it was the first reading at or below 45°F since January 24, 2003. It was also the coldest day since January 24, 2003, in Tampa, Florida (29°F); Pensacola, Florida (23°F); and Mobile, Alabama (21°F).
Western Whack

Meanwhile, a ferocious storm bore down on the West Coast. By the 4th, much of California was under an assault of heavy precipitation and high winds. In Bishop, California, where the normal annual precipitation is 5.02 inches, an amazing 4.00 inches fell on the 4th. Previously Bishop’s wettest day on record occurred on February 24, 1969, when 3.50 inches fell. Heavy precipitation also spilled into western Nevada, where a levee break along the Truckee Canal near Fernley flooded more than 200 homes. Reno, Nevada (1.91 inches on January 4), experienced its third-wettest day in the last century behind 2.29 inches on January 21, 1943, and 2.02 inches on December 23, 1955.

Reno received 7.4 inches of snow on the 4th-5th, but unofficial 3-day totals topped 100 inches at a few Sierra Nevada locations, including Kirkwood and Horse Meadow. In Southern California, the early-January storm dumped 10.94 inches of rain on San Marcos Pass, near Santa Barbara. At the height of the storm on the 4th, a wind gust to 163 mph was clocked atop the Sierra Nevada crest just west of Tahoe City, California. In the Sacramento Valley, peak gusts on the 4th reached 70 mph in Redding and 69 mph in Sacramento. A gust to 87 mph was measured along the Oregon coast at Cape Blanco.

Opids Camp (Los Angeles County) netted a 2-storm total of 18.16 inches, while San Marcos Pass (Santa Barbara County) collected 12.68 inches. Downtown Los Angeles received 5.78 inches from the 21st-28th, compared with a record-low total of 3.21 inches during last year’s entire season (July 1, 2006-June 30, 2007). Torrential late-month rainfall was not just confined to California; in southeastern Arizona, as much as six to eight inches drenched the Santa Catalina Mountains, near Tucson.

Late-January snowfall locally topped 2 feet in Southern California, between Los Angeles and Bakersfield, with as much as 27 inches reported in Lockwood Valley and 24 inches in Frazier Park. Elsewhere, Northwestern snowfall was especially heavy late in the month, when Mullan Pass, Idaho, received 32 inches in a 24-hour period on the 26th-27th. Spokane, Washington, measured 13.7 inches on the 26th-27th, while as much as a half-foot of snow blanketed Eugene, Oregon. Another 9.2 inches fell in Spokane from the 29th-31st, boosting its monthly total to 40.0 inches. It was Spokane’s fourth-snowiest January and snowiest such month since 1969, when 48.7 inches fell.

Texas’ Trying Times

Meanwhile, San Antonio, Texas, received rainfall totaling just 3.06 inches (23 percent of normal) from September...
2007-January 2008, its second-driest such period behind 2.72 inches in 1917-1918. During one of the few rainfall events in Texas, McAllen (1.25 inches from the 15th-18th) noted its first measurable rainfall since November 25. McAllen’s dry spell lasted 50 days from November 26-January 14. In addition, McAllen’s 1.00-inch rainfall on the 15th marked its first day with at least an inch of rain since September 15.

**January Thaw**

Warm weather quickly returned to the Midwest, South, and East, despite a cold start to the month. In fact, a stunning January warm spell shattered hundreds of daily-record highs and several monthly record highs. On January 6, daily records included 81°F in Wichita Falls, Texas; 80°F in Alexandria, Louisiana; 79°F in Lawton, Oklahoma; and 73°F in St. Louis, Missouri. A day later, January record highs were established in several locations, including Chicago, Illinois (65°F; previously 63°F on January 31, 1989), and Milwaukee, Wisconsin (63°F; previously, 62°F on January 26, 1944).

Elsewhere, daily-record highs for January 7 reached 89°F in McAllen, Texas; 73°F in St. Louis; and 68°F in Columbus, Ohio. By the 8th, monthly record warmth shifted into the Northeast, where highs climbed to 72°F in Syracuse, New York (tied 70°F on January 25, 1950, and January 25, 1967), and 67°F in Scranton, Pennsylvania (tied 67°F on January 25, 1967).

In Michigan, the 7th featured the warmest January weather since January 25, 1950, in Detroit (64°F) and Grand Rapids (63°F). In New York, Buffalo (63, 66, and 64°F) and Watertown (61, 65, and 62°F) posted 3 consecutive daily-record highs from January 7-9.

**Midwestern Mid-Winter Madness**

In parts of the Midwest heavy rain accompanied the warmth. Lincoln, Illinois, experienced its wettest January day on record on the 7th, when 2.75 inches of rain fell (previously, 2.28 inches on January 10, 1975). On the 7th-8th, consecutive daily rainfall records were established in Peoria, Illinois (1.53 and 1.02 inches); South Bend, Indiana (1.42 and 1.80 inches); and Springfield, Missouri.

Strong thunderstorms accompanied the rainfall across parts of the South and Midwest on the 7th-8th and 10th, resulting in more than 125 tornadoes, according to preliminary reports compiled by the Federal Storm Prediction Center. As many as 5 tornadoes were reported on the 7th in Wisconsin (Kenosha, Racine, and Walworth counties), representing only the second January outbreak there since the middle of the nineteenth century. Previously a single tornado was reported in Wisconsin (Kenosha, Racine, and Walworth counties) on January 24, 1967. Farther south, tornado-related fatalities occurred on the 7th (3 in Missouri) and 8th (1 in Arkansas).

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**JANUARY HIGHLIGHT**

**Just Another Snowy Day**

by Jeffrey B. Halverson

W ith the force of a prizefighter’s knockout punch, an extremely powerful cyclone roared in off the Pacific and took aim at the high Sierra Nevada mountains on Friday, January 4. The National Weather Service’s (NWS) office in Reno, Nevada, issued blizzard, winter storm, and high wind warnings, calling for snow amounts totaling 3 to 5 feet above 7,000 feet in elevation and even more along the Sierra crest. Winds at ridgetop level were forecast to howl between a sustained 80-110 mph, gusting to 150 mph. Travel in the Sierra was expected to be impossible: whiteout conditions, plows unable to keep up with snow, tractor trailers rolling over in the wind, and the very real possibility of becoming stranded on an interstate. Indeed, the warnings indicated that conditions would be life-threatening in the high mountains.

An examination of the weather charts for the storm showed that the NWS did not exaggerate its potential effects; the physical processes were all in place, and they did not disappoint. Figure 1 shows the surface analysis chart for early on the morning of the 4th. There is an enormous storm lumbering into the Pacific Northwest, burgeoning with Pacific moisture, isobars coiled tightly. These storms incubate over the Gulf of Alaska during the winter months and slam into the West at peak intensity. The central low pressure of this occluded system was an astounding 958 millibars (the East Coast Superstorm of 1993 was 960 millibars), and the high altitude jet stream winds whipped around the vortex at an astounding 270 mph.

Tightly wound, occluded storms such as this also tend to move slowly, if at all. That left plenty of time to pile on the snow pack. Occlusion meant that the cold front had wrapped all the way around the southern flank of the storm, merging with the warm front to the northeast. The storm intensity peaked as the remaining wedge of warm air was lifted. When warm air was lifted and cold air sank, this lowered the center of mass in the atmosphere, converting gravitational potential energy into kinetic energy. In other words, the vortex winds rapidly spun up.

When you took all that Pacific moisture and sent it straight up the side of the
Meanwhile, major flooding developed in parts of the Midwest. In northern Illinois, the Vermilion River crested on the 9th at its second-highest level on record in Pontiac (4.65 feet above flood stage) and near Leonore (9.50 feet above flood stage). This year’s crests fell short at both locations of the record-high levels established on December 4, 1982.

Eastern Anomalies and Southern Surprises

In the Northeast there was a rapid transition from snowy conditions in the north to drier-than-normal conditions farther south. Caribou, Maine, experienced its snowiest July-January period on record with 97.8 inches of snow, edging its standard of 95.2 inches set in 1954-1955 and 1972-1973. In contrast, it was the seventh-driest January in Allentown, Pennsylvania, with a monthly total of just 1.28 inches (37 percent of normal). Meanwhile, New York’s Central Park received no measurable snowfall (a trace) in January for only the third time on record, along with 1890 and 1933.

Much of the Southeast topped New York City’s monthly snowfall. In North Carolina, for example, daily snowfall records for the 17th included 1.5 inches in Asheville and 1.0 inch in Charlotte. Days later, snow returned to the Deep South, where the daily-record snowfall totals for the 19th reached 2.0 inches in Meridian, Mississippi. Near the Gulf Coast, rainfall records for the 19th included 1.98 inches in Pensacola, Florida, and 1.34 inches in New Iberia, Louisiana.

Second-Half Blasts

The second half of the month featured several cold blasts across the Plains, Midwest, and Northeast, while chilly conditions persisted in the West. By January 17, temperatures fell to near 0°F as far south as northern Texas, where Dalhart (1°F) posted a daily-record low. West of the Rocky Divide, Alamosa, Colorado, notched a daily-record low of -32°F on the 17th, part of a streak of 12 consecutive days (the 10th-21st) when temperatures fell to -10°F or lower. In New Mexico, Albuquerque (10°F on the 19th) reported its coldest day since January 3, 2007, when it was 6°F.

Later, even colder air settled across the northern Rockies and the interior Northwest. In western Montana, daily-record lows for the 21st included -34°F in Potomac and -30°F in Neihart. The next day, records for the 22nd dipped to -30°F in Stanley, Idaho, and -23°F in Meacham, Oregon. Meanwhile in Wyoming, lows on the same day included -39°F in Yellowstone National Park (Canyon Ranger Station) and -38°F in Bondurant.

The height of the cold wave reached the upper Midwest on the 20th and 24th. In Wisconsin, lows on those two mornings were -35 and -28°F near Necedah, Juneau County, and -31°F (both days) in Sparta, Monroe County.

Precipitous Plunge

Toward month’s end, a brief surge of warmth preceded the passage of a strong cold front. On the 28th daily-record highs included 78°F in Gage, Oklahoma, 73°F in Hill City, Kansas, and 39°F in Ottumwa, Iowa. The same day, however, Harlem, Montana, reported a maximum high of -13°F. By the 29th, warmth was pushed...
into the South and East, while temperature declines were noted across the Midwest. Daily-record highs for the 29th soared to 73°F in St. Louis, Missouri, and 64°F in Springfield, Illinois. Those highs occurred in the early afternoon, but by midnight temperatures had fallen to 15°F (with wind gusts up to 59 mph) in St. Louis and 9°F (gusts to 49 mph) in Springfield.

In La Crosse, Wisconsin, January 29 featured a high of 43°F and a low of -10°F, tying February 17, 1874, for its largest temperature fluctuation (53°F) during a calendar day. Similarly, Minneapolis, Minnesota (high of 36°F and low of -13°F on the 29th) experienced its second-largest temperature swing during a calendar day, behind only December 26, 1903 (high of 34°F and low of -17°F). By the morning of the 29th, wind chill temperatures below -50°F were measured at several locations in the upper Midwest, including Dickinson, North Dakota (-55°F), and Sand Lake, South Dakota (-53°F).

High winds preceded and followed the Arctic blast. On the 27th a gust to 76 mph was recorded in Buffalo, Wyoming. Two days later, peak gusts across the Plains and the Midwest included 73 mph in Carbondale, Illinois; 71 mph in Evansville, Indiana; and 66 mph in Lubbock, Texas. Gusts were particularly severe on the 29th across the lower Midwest and interior Southeast, with preliminary reports indicating at least 4 tornadoes and more than 250 reports of damaging winds. A tornado in Posey County, Indiana, was responsible for two deaths.

At month's end, January 30-31 snowfall reached 2.6 inches in Amarillo, Texas, followed by January 31-February 1 totals of 8.4 inches in St. Louis, Missouri, and 7.4 inches in Chicago, Illinois. Springfield, Illinois, measured 11.3 inches of snow in 24 hours on January 31-February 1, representing its fourth-highest 24-hour total on record—but well below the standard of 15.0 inches set February 28, 1900. Elsewhere, monthly snowfall climbed to 178.5 inches in Alta, Utah, tying its January record previously set in 1996.
January Historical Perspective

Both January temperature and precipitation values were near their respective long-term means. It was the 49th-coolest and 50th-driest January during the 114-year period of record. Across the Lower 48 states, temperatures averaged 30.5°F (0.3°F below the twentieth-century mean), while precipitation averaged 2.21 inches (0.01 inch below average).

For temperatures, state rankings ranged from the 22nd-coldest January in Colorado to the 14th-warmest January in Vermont. Precipitation values were among the 10 lowest on record in North Dakota (second-driest January), Minnesota (sixth driest), Nebraska (eighth driest), and Delaware (tenth driest). In contrast, it was the 11th-wettest January in Michigan and the 15th-wettest January in Utah.

Highest Temperature: 92°F in Kingsville, Texas, on the 29th

Lowest Temperature: -39°F in Gunnison, Colorado, on the 17th and in Yellowstone National Park (Canyon Ranger Station), Wyoming, on the 22nd

Wettest Location in the Lower 48: (6 miles NE of) Valsetz, Oregon, with 26.9 inches of precipitation

alaskanweather by Martha Shulski, Alaska Climate Research Center; Anton S. Prechtel, retired, NWS Fairbanks; Richard Thoman, NWS Fairbanks; and Ted Fathauer, Department of Atmospheric Science, University of Alaska

Low pressure aloft held over the Alaska mainland and the Gulf of Alaska until exiting to the Arctic on the 14th. Southwesterly flow rapidly developed over the mainland and Southeast Alaska, bringing clouds and snow to much of the region. After a few days of high pressure over the mainland and cold, dry north winds over Southeast Alaska during the third week of the month, westerly flow suddenly developed, followed by the building of high pressure aloft over the Bering Sea and cold north flow over most of the mainland. Further change began on the 27th as southerly flow and snowfall developed over the Bering Sea coast.

Precipitation for the month as a whole was well above normal in the west and near normal over most of the rest of Alaska. Southeast Alaska had less onshore flow of maritime air than usual but still had near normal precipitation for January as a whole. Temperatures in the west finished on the cool side while the rest of Alaska had near or warmer than normal temperatures for the month. Overall these patterns reflected a blending of very different weather regimes.

There was plenty of serious winter weather during the month, slightly more than would normally be expected. The Interior highlands had frequent blizzards that closed area roads for days at a time.
Extensive snowfall around Anchorage contributed to numerous automobile accidents. As temperatures rose in the third week of the month, there was abundant snowfall over the Interior, including a storm that brought up to 10 inches of snow around Fairbanks from the 16th to the 17th. There were areas of freezing rain in the Interior on the 20th as temperatures reached a peak.

Rapidly falling temperatures spread to the south mainland by the 29th. In Palmer, cold temperatures and brisk wind froze and broke water pipes in a number of buildings, causing significant damage. Down in Southeast Alaska, strong outflow of cold Arctic air from the Canadian interior caused several outbreaks of widespread high northeast winds.

The ice on Interior lakes and rivers reflected the overall near-to-somewhat above-normal temperatures for the winter through January. Typical ice thickness ranged from 24 to 30 inches at the end of the month.

As the month began pack ice extended from northern Bristol Bay up the entire Bering Sea coast. The southern edge of the ice was just above St. Matthew Island. By mid-month, the ice reached its maximum extent, well above normal, and covered nearly all of Bristol Bay. By the end of the month the area of ice-covered waters in the Bering Sea was well below normal, quite a change for this short time.

During the last week of January Cook Inlet ice increased significantly, covering nearly the entire west half of the Inlet down past Cape Douglas, and the east half of the inlet down to Ninilchik.

Sea surface temperatures were typically 2 to 3°F colder than normal in the Gulf of Alaska during the month. In the Aleutians, surface water temperatures were around 2°F warmer than normal and near normal levels in the southern Bering Sea.

**Highest average temperature:** 34.5°F in Hydaburg, southern Southeast Alaska

**Lowest average temperature:** -22°F in Umiat, Arctic slope

**Most precipitation:** 9.76 inches in Ketchikan, southern Southeast Alaska

**Most snowfall:** 82.9 inches in Haines 40NW, northern Southeast Alaska

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**Environment Canada’s winter forecasts issued in late November had projected an unusually cold season with considerable precipitation for most of southern Canada. Part of this prediction was based on a maturing La Niña phase of cooler surface water in the tropical Pacific Ocean.** In effect, the forecast suggested an “old-fashioned winter” for much of the country because cooler-than-normal temperatures generally imply more snow than rain in Canada.

An unusual weather-related event ushered in the new year in British Columbia. A persistent ice jam at the meeting of the Fraser and Nechako rivers continued to plague the city of Prince George. The exceptional conditions began weeks before and caused local flooding and necessary evacuations. Hydrologic pressure forced groundwater into basements throughout January and persisted until ice breakup in February.

The Atlantic region, already wintry, began the new year in storm mode. A major winter storm stopped many festivities, including fireworks, in St. John’s, Newfoundland, because of safety concerns about strong winds. Celebrations and travel were disrupted by a hangover of wet snow and cold slush throughout Atlantic Canada.

In Nova Scotia and other eastern provinces, early January featured a combination of more rain, then snow, then near-record low temperatures. Variations of this pattern continued for the rest of January.

Other regions waited a little longer for winter immersion in January. Ontario and Quebec began with record or near-record warm temperatures. Winter weather came to many locations in week two in southern Ontario and Quebec with a rapid transition from unseasonal warmth to heavy rain with extreme winds. Wind gusts to 133 km/h were recorded in Picton, near Lake Ontario, and gusts to more than 100 km/h were commonplace.

Wind caused damage and havoc in other parts of Quebec and Ontario. Several buildings under construction were blown down, and roof damage was widespread. Toppled trees caused power failures and delayed travel for commuters.

On the 9th, the International Bridge between Johnstown, Ontario, and Ogdensburg, New York, was closed to traffic. A tractor-trailer had blown on its side and was hanging over the edge of the bridge above the St. Lawrence River. The driver suffered minor injuries.

The Yukon Territory, adjacent to the state of Alaska, has an established reputation for extremely cold winters. This reputation was disputed for most of January, with temperatures about 5 to 10°C (9 to 18°F) higher than average. However, a pool of Arctic air during the final days of January meant temperatures struggled to reach -30°C (-22°F).

**Highest temperature:** 17.4°C (63.3°F) at Vineland, Ontario, on the 7th

**Lowest temperature:** -53.7°C (-64.6°F) at Waterton Lake, Yukon, on the 31st

**Highest average temperature:** 5.5°C (41.9°F) at Saturna Island, British Columbia

**Lowest average temperature:** -40.9°C (-41.6°F) at Eureka, Nunavut

**Highest monthly precipitation:** 549 millimeters (21.6 inches) at Boat Bluff, British Columbia
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