# MONTHLY WATER INVENTORY REPORT FOR OHIO

**December 2008**

http://www.dnr.state.oh.us/tabid/4191/Default.aspx

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*Water Inventory Unit*

**PRECIPITATION** during December was noticeably above normal statewide. The state average was 4.68 inches, 1.92 inches above normal. This was the 5th wettest December for the state as a whole during the past 126 years. Regional averages ranged from 5.45 inches, 2.61 inches above normal, for the Southeast Region to 4.05 inches, 1.51 inches above normal, for the North Central Region. Nine of Ohio's 10 climatic regions ranked in their top 10 wettest Decembers of record. Miamisburg (Montgomery County) reported the greatest amount of December precipitation, 6.66 inches. Captain Meldahl Lock and Dam (Clermont County) reported the least amount, 2.26 inches.

Precipitation during December fell as both rain and snow. Snowfall for the month was below normal across most of the state. Although precipitation was reported on many days during the month, daily amounts were usually light. However, there were some days during which more than 0.50 inch fell. Widespread precipitation during December 9-10 totaled 0.50-1.5 inches throughout most of the state with the greatest amounts falling across northern and southeastern Ohio. About 1 inch of precipitation was reported across the state on December 19 with some locations receiving more than 1.5 inches. Another 1-1.5 inches of precipitation fell across much of the state during December 23-24 with only northwestern Ohio receiving less. On December 26 rain spread across the state, but was greatest across the central one-third where amounts of 0.50-1.0 inch fell. Additional precipitation fell on December 28 mainly across northwestern Ohio where 0.25-1.0 inch was reported while less than 0.25 inch fell elsewhere.

Precipitation for the 2009 water year is above normal for most of the state, but below normal in the Southwest Region. The average for the state is 8.98 inches, 0.77 inch above normal. Regional averages range from 11.34 inches, 2.11 inches above normal, for the Northeast Region to 8.02 inches, 0.14 inch above normal, for the Central Region.

Precipitation for the 2008 calendar year was above normal statewide. The average for the state was 44.44 inches, 6.42 inches above normal. For the state as a whole, this was the 13th wettest year during the past 126 years. Regional averages ranged from 49.25 inches, 10.74 inches above normal, for the Northeast Region to 41.94 inches, 7.66 inches above normal, for the Northwest Region. This was the 4th wettest calendar year for both the Northwest and North Central regions, the 5th wettest for the Northeast Region and the 8th wettest for the West Central Region (see Precipitation table, departure from normal, past 12 months column). Painesville (Lake County) reported the greatest amount of precipitation for the year, 63.16 inches. Portsmouth (Scioto County) reported the least amount, 31.08 inches. An isohyetal map and regional averages with percentages of normal for the 2008 calendar year appear on the last page of this report.

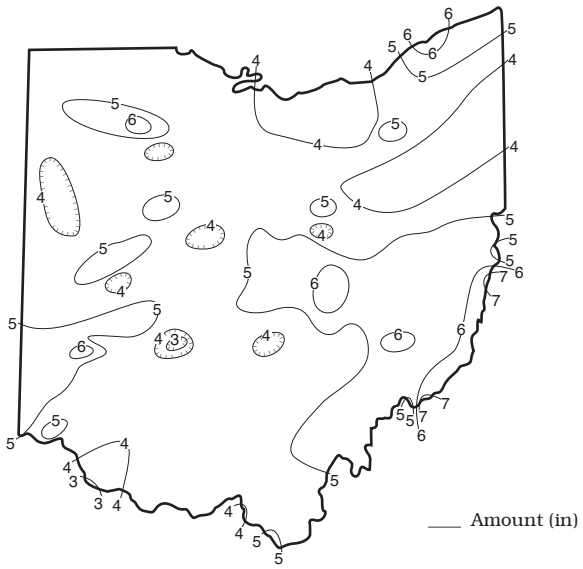
(continued on back)

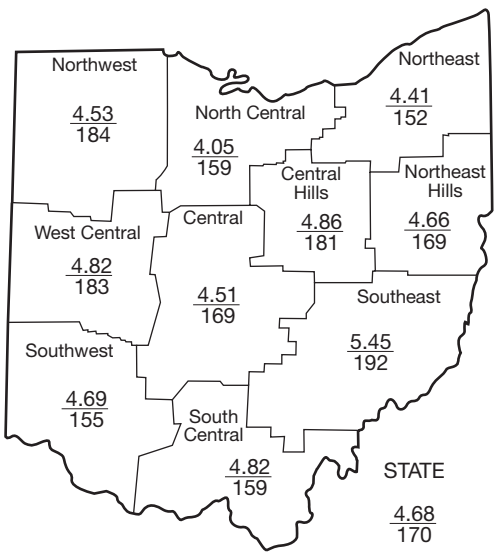
## PRECIPITATION

| Region | DEPARTURE FROM NORMAL (IN.) Base period 1951-2000 | | | | | Palmer Drought Severity Index* |
|---|---|---|---|---|---|---|
| | This Month | Past 3 Mos. | Past 6 Mos. | Past 12 Mos. | Past 24 Mos. | |
| Northwest | +2.07 | +1.36 | +0.09 | +7.66 | +15.26 | +2.5 |
| North Central | +1.51 | +1.45 | +0.32 | +9.34 | +17.24 | +3.5 |
| Northeast | +1.50 | +2.11 | +3.00 | +10.74 | +16.30 | +4.2 |
| West Central | +2.18 | +0.48 | -2.30 | +7.44 | +13.99 | +1.0 |
| Central | +1.84 | +0.14 | -3.09 | +5.48 | +10.27 | +0.5 |
| Central Hills | +2.17 | +0.59 | -2.24 | +3.72 | +9.09 | +0.3 |
| Northeast Hills | +1.91 | +0.57 | -1.63 | +3.83 | +9.00 | +0.7 |
| Southwest | +1.66 | -0.82 | -5.02 | +4.45 | +4.88 | 0.0 |
| South Central | +1.78 | +0.57 | -2.92 | +4.89 | +1.61 | +0.4 |
| Southeast | +2.61 | +1.29 | -0.99 | +6.77 | +6.64 | +0.9 |
| State | +1.92 | +0.77 | -1.49 | +6.42 | +10.40 | |

*Above +4 = Extreme Moist Spell
3.0 To 3.9 = Very Moist Spell
2.0 To 2.9 = Unusual Moist Spell
1.0 To 1.9 = Moist Spell
0.5 To 0.9 = Incipient Moist Spell
0.4 To-0.4 = Near Normal
-0.5 To -0.9 = Incipient Drought
-1.0 To -1.9 = Mild Drought
-2.0 To -2.9 = Moderate Drought
-3.0 To -3.9 = Severe Drought
Below -4.0 = Extreme Drought

## PRECIPITATION DECEMBER



## MEAN STREAM DISCHARGE

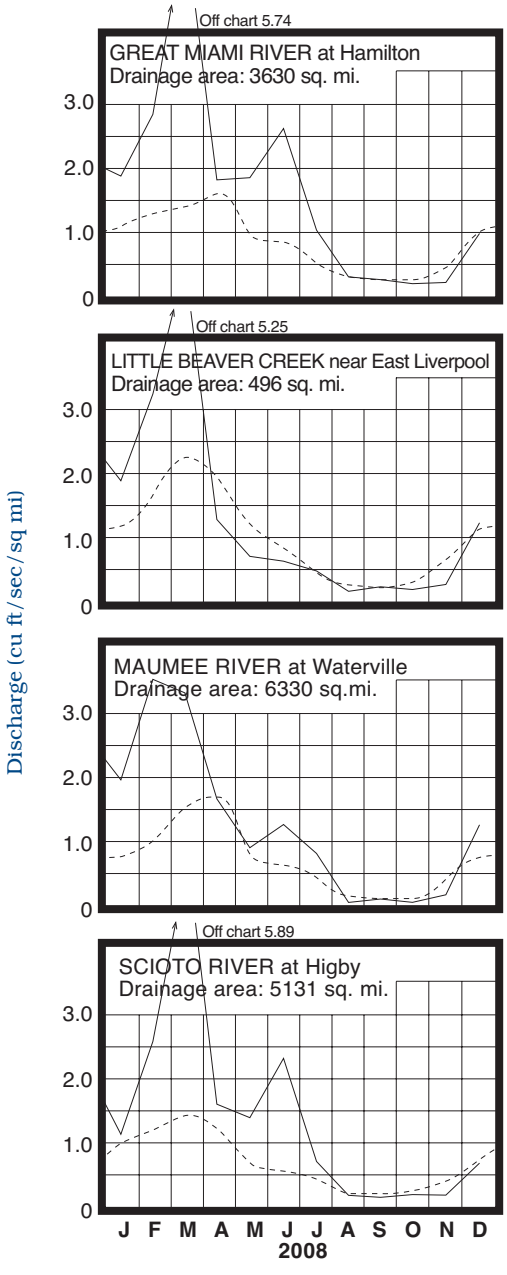
| River and Location | Drainage Area (Sq. Mi.) | Mean Discharge (CFS) | % of Normal | % of Normal Past | | |
|---|---|---|---|---|---|---|
| | | This Month | | 3 Mos. | 6 Mos. | 12 Mos. |
| Grand River near Painesville | 685 | 2,655 | 194 | 140 | 133 | 141 |
| Great Miami River at Hamilton | 3,630 | 3,610 | 98 | 65 | 82 | 161 |
| Huron River at Milan | 371 | 830 | 340 | 151 | 131 | 192 |
| Killbuck Creek at Killbuck | 464 | 457 | 109 | 63 | 70 | 116 |
| Little Beaver Creek near East Liverpool | 496 | 609 | 108 | 63 | 62 | 111 |
| Maumee River at Waterville | 6,330 | 7,948 | 168 | 79 | 84 | 139 |
| Muskingum River at McConnelsville | 7,422 | 8,929 | 82 | 105 | 128 | 113 |
| Scioto River near Prospect | 567 | 477 | 179 | 51 | 58 | 164 |
| Scioto River at Higby | 5,131 | 3,470 | 76 | 48 | 57 | 139 |
| Stillwater River at Pleasant Hill | 503 | 462 | 125 | 58 | 71 | 163 |

**STREAMFLOW** during December was above normal across the northern half of the state and below normal in the southern half. Flows were high enough to be considered excessive in some basins in north-central and northeastern Ohio. Flows during December increased seasonally from the flows recorded during November.

At the beginning of December, streamflow was below normal throughout most of the state, but above normal in north-central and northeastern Ohio. Although low flows for December occurred at various times across Ohio, they all occurred during the first half of the month. The majority of the low flows occurred between December 5 and 9. Flows increased rapidly following the December 19 precipitation. Greatest flows for the month occurred between December 25 and 29 nearly statewide following several days of widespread precipitation. At the end of the month, streamflow was above normal throughout most of the state.

Streamflow during the 2008 calendar year was above normal throughout the state (see Mean Stream Discharge table, percent of normal, past 12 months column). Flows were above normal during most of the first 7 months of the year. Record or near-record monthly flows were observed at several gauging stations during February, March and June. March was especially notable in that 8 of the 10 gauging stations published in this report established new high monthly flows for March for their respective periods of record. Significant flooding occurred during February, March and June. Generally, flows were below normal throughout the late summer and fall months as drier conditions prevailed throughout most of the state.

## MEAN STREAM DISCHARGE



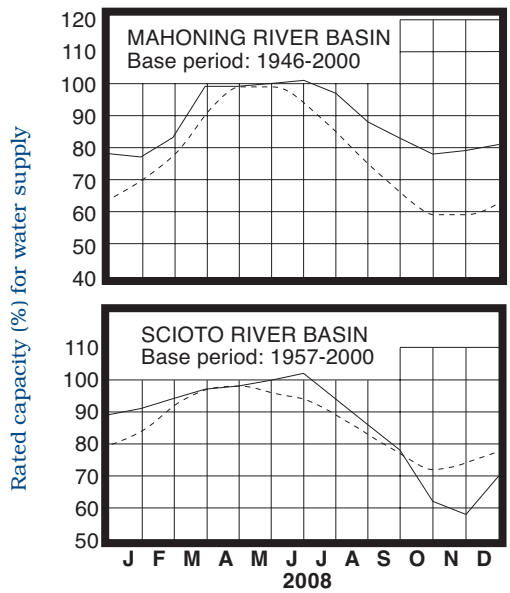

Base period for all streams: 1971-2000

**RESERVOIR STORAGE** during December increased in both the Mahoning and Scioto river basins. At the end of December, storage continues to remain above normal in the Mahoning River basin and below normal in the Scioto River basin.

Reservoir storage at the end of December in the Mahoning basin index reservoirs was 81 percent of rated capacity for water supply compared with 79 percent for last month and 78 percent for December 2007. Month-end storage in the Scioto basin index reservoirs was 70 percent of rated capacity for water supply compared with 58 percent for last month and 89 percent for December 2007.

Surface water supplies were adequate during the 2008 calendar year. Reservoir storage in the Mahoning basin index reservoirs was generally above normal the past 12 months. Reservoir storage in the Scioto basin index reservoirs was generally above normal the first 9 months of the year and below normal during the last 3 months.

## RESERVOIR STORAGE FOR WATER SUPPLY




Normal – – – – Current ———

## GROUND-WATER LEVELS

Based on daily lowest level in feet below land-surface datum

| Index Well | Location | Aquifer | Mean This Month | Departure From Normal | Change in feet from: | |
|---|---|---|---|---|---|---|
| | | | | | Last Month | Year Ago |
| F-1 | W. Rushville, Fairfield Co. | Sandstone | 16.91 | +0.18 | -0.52 | -0.42 |
| Fa-1 | Jasper Mill, Fayette Co. | Limestone | 11.19 | -3.00 | -0.29 | -0.34 |
| Fr-10 | Columbus, Franklin Co. | Gravel | 45.21 | -1.26 | +0.25 | -0.25 |
| H-1 | Harrison, Hamilton Co. | Gravel | 24.27 | -1.23 | +0.01 | -0.69 |
| Hn-2a | Dola, Hardin Co. | Dolomite | 12.50 | -3.62 | -0.54 | -5.73 |
| Po-1 | Windham, Portage Co. | Sandstone | 16.99 | +1.78 | +0.90 | +3.75 |
| Tu-1 | Strasburg, Tuscarawas Co. | Gravel | 15.45 | -1.96 | +0.11 | -1.90 |

**GROUND WATER** levels during December rose slightly in most unconsolidated aquifers in Ohio and declined in most consolidated aquifers. Exceptions were in some consolidated aquifers in northeastern Ohio where levels rose. Levels in most aquifers were rather stable or declined slightly during the first 3 weeks of the month, then rose during the last week in response to the widespread, above-normal precipitation that fell during the second half of December.

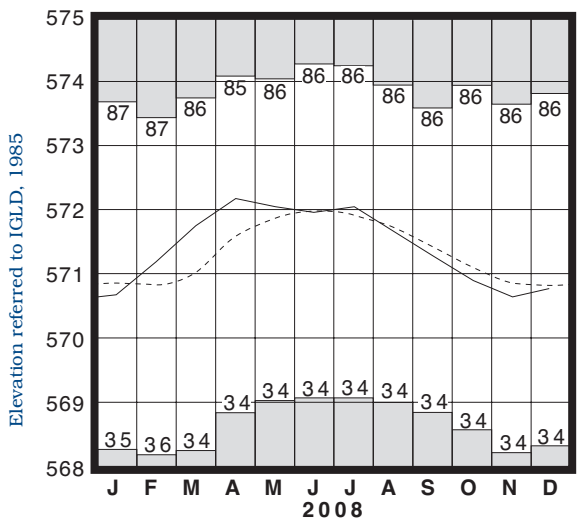
Ground water levels during the 2008 calendar year were generally favorable. At the beginning of the year, levels were generally above normal across northern Ohio and below normal in southern Ohio. During the first 6 months of 2008, ground water levels responded favorably to above normal precipitation. By the end of March levels were above normal across most of the state and at the end of June levels were higher than they were a year earlier in nearly all aquifers. Below normal precipitation during the next 5 months across much of the state, especially in the southern two-thirds of Ohio, was reflected in ground water supplies. By the end of August, ground water levels were below normal throughout most of the state. The above normal precipitation that fell during December was beneficial to Ohio's ground water resources as aquifers statewide were rising during the last week of the month. However, levels at the end of the calendar year remained below normal across much of the state with only levels in some consolidated aquifers in eastern Ohio being above normal. Also, levels at the end of the calendar year were lower than they were at the beginning of the year in most aquifers across the state. In spite of this, ground water supplies remained adequate across most of the state throughout the year.

**LAKE ERIE** level rose during December. The mean level was 570.78 feet (IGLD-1985), 0.14 foot higher than last month's mean level and 0.05 foot below normal. This month's mean level is 0.18 foot higher than the December 2007 level and 1.58 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during December averaged 4.91 inches, 2.31 inches above normal. For the entire Great Lakes basin, December precipitation averaged 3.96 inches, 1.63 inches above normal. For calendar year 2008, the Lake Erie basin averaged 42.06 inches of precipitation, 7.04 inches above normal, while the entire Great Lakes basin averaged 37.08 inches, 4.67 inches above normal.

Lake Erie level started the 2008 calendar year below normal. With the above normal precipitation during the first half of the year, the Lake Erie level quickly rose to above normal by the end of February. Lake Erie level remained above normal for most of the next 6 months before falling to below normal in August where it remained during the remainder of the year. However, above average precipitation and runoff into Lake Erie during December helped levels rise to near normal levels. The USACE reports that based on the current condition of the Great Lakes basin and anticipated weather conditions, the level of Lake Erie is expected to remain near normal for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from about 8 inches above to as much as 13 inches below the normal seasonal average.

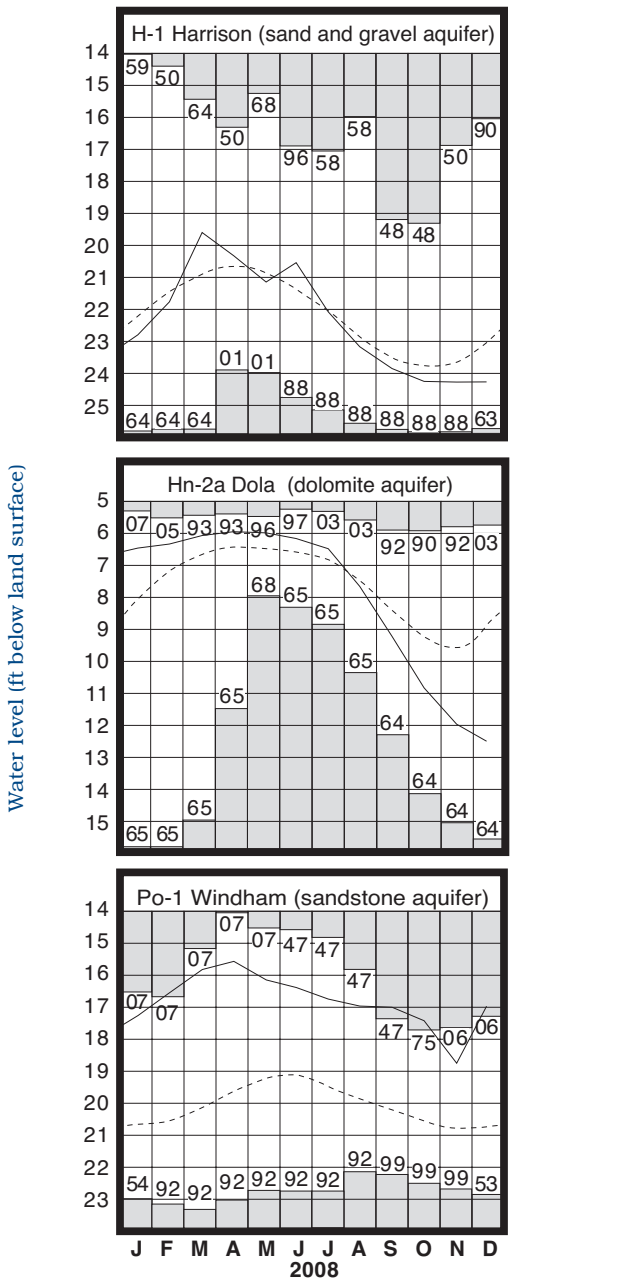
## LAKE ERIE LEVELS




Base period: 1918-2000

Record high and low, year of occurrence

## GROUND-WATER LEVELS




Base periods: H-1, 1951-2000. Hn-2a, 1955-2000. Po-1, 1947-2000

Record high and low, year of occurrence

Normal – – – – Current ———

(Precipitation continued from front)

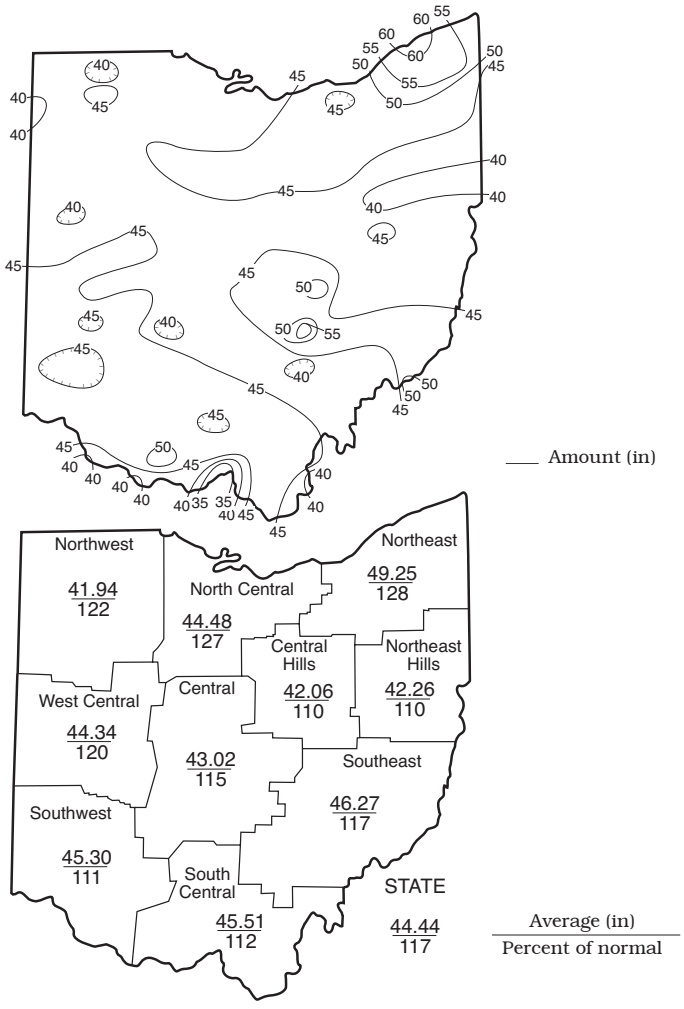
Precipitation during the first six months of the 2008 calendar year was above normal statewide with extremely wet conditions during much of this period. For the state as a whole, it was the 7th wettest February, the 4th wettest March and the 7th wettest June of record. Precipitation during the second half of the year was generally above normal in the northern one-third of Ohio and below normal elsewhere. August 2008 was the 13th driest August for the state as a whole. Conditions were driest across portions of central and southwestern Ohio during the second half of the year. The year ended with noticeably above normal precipitation during December.


**SUMMARY**

Precipitation during December was noticeably above normal statewide. Streamflow was above normal in northern Ohio and below normal in southern Ohio. Reservoir storage increased throughout the state and remained above normal in the Mahoning River basin, but below normal in the Scioto River basin. Ground water levels generally rose in unconsolidated aquifers and declined in consolidated aquifers. Lake Erie mean level rose 0.14 foot and was 0.05 foot below the long-term December average.

Both precipitation and streamflow for the 2008 calendar year were above normal statewide. Reservoir storage in the Mahoning River basin was generally above normal throughout the year while storage in the Scioto River basin was generally above normal through September, and below normal during the last 3 months of the year. Ground water supplies were adequate across most of the state, although they ended the year lower than at the beginning. Lake Erie level was generally above normal during the first half of the year and below normal the second half.


## PRECIPITATION 2008 CALENDAR YEAR





## ACKNOWLEDGMENTS

This report has been compiled from Division of Water data and from information supplied by the following:

Precipitation data:
*U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service: The Miami Conservancy District: U.S. Army Corps of Engineers, Muskingum Area.*

Streamflow and reservoir storage data:
*U.S. Geological Survey, Water Resources Division.*

Lake Erie level data:
*U.S. Army Corps of Engineers, Detroit District.*

Palmer Drought Severity Index:
*U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service.*

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