

below the November average for the last thirty-one years. The largest November precipitation of that period, 8.30, occurred in 1863; the smallest, 1.01, occurred in 1882.

Ohio.—Wauseon, Fulton county: monthly precipitation, 1.46, is 1.78 below the November average for the last twelve years, and is the smallest November precipitation for that period; the largest, 5.83, occurred in 1881.

Pennsylvania.—Dyberry, Wayne county: monthly precipitation, 2.48, is 0.29 below the November average for the last thirteen years.

Vermont.—Woodstock, Windsor county: monthly precipitation, 4.35, is 1.32 in excess of the November average for the last sixteen years. The largest November precipitation for that period, 4.95, occurred in 1877; the least, 0.71, occurred in 1882.

Virginia.—Variety Mills, Nelson county: monthly precipitation, 2.42, is 0.18 above the November average for the last six years.

Wytheville, Wythe county: monthly precipitation, 1.41, is 1.40 below the November average for a period of twenty years, and is the smallest November precipitation for that period, with the exception of 0.50 and 1.10 in 1862 and 1879, respectively. The precipitation for the first eleven months of 1884 is but 1.21 below the annual average, although an unprecedented drought prevailed through the greater part of the last four months, the small deficiency being due to the abnormally heavy rains of the earlier months.

West Virginia.—Helvetia, Randolph county: monthly precipitation, 2.66, is 1.93 below the November average for the last eight years.

SNOW.

The dates on which snow fell in the various districts are as follows:

New England.—1st, 19th, 20th, 25th, 26th, 28th.

Middle Atlantic states.—3d, 5th, 6th, 18th, 19th, 20th, 24th to 27th, 30th.

Ohio valley.—5th, 6th, 17th, 18th, 19th, 23d to 30th.

Lower lake region.—4th, 5th, 6th, 18th, 19th, 20th, 23d to 30th.

Upper lake region.—1st to 6th, 11th, 12th, 15th to 30th.

Extreme northwest.—1st, 3d, 4th, 11th, 12th, 16th, 18th to 22d, 24th to 30th.

Upper Mississippi valley.—4th, 5th, 9th, 17th to 30th.

Missouri valley.—1st, 3d, 16th to 27th, 29th, 30th.

Northern slope.—1st, 3d, 15th, 16th, 17th, 19th to 22d, 24th, 26th to 29th.

Middle slope.—17th, 18th, 22d, 30th; snow fell on the summit of Pike's Peak, Colorado, on dates as follows: 14th, 17th, 18th, 21st, 22d, 27th, 28th.

Southern plateau.—Fort Craig, New Mexico, on the 21st, in surrounding mountains. Fort Wingate, New Mexico, 20th.

Middle plateau.—1st, 16th, 17th.

Northern plateau.—15th, 21st 22d.

LARGEST MONTHLY SNOW-FALLS.

[Expressed in inches and tenths.]

Monthly snow-falls of 2 inches or more were reported from the various states and territories during the month as follows:

Connecticut.—Southington, 2.0.

Dakota.—Deadwood, 8.9; Richardton, 8.0; Bismarck, 6.4; Fort Buford, 2.9; Fort Totten, 2.5; Webster, 2.4.

Illinois.—Bunker Hill, 3.1; Mattoon, 3.0; Springfield, 2.6.

Indiana.—Farmland, 6.5; Logansport, 4.4; Spiceland and Sunman, 3.8; Wabash, 3.6; Noblesville, 3.0; Lafayette and Terre Haute, 2.5; Greencastle and Indianapolis, 2.1; Attica and Hancock, 2.0.

Iowa.—Indianola, 4.0; Des Moines, 3.9; West Union, 2.6.

Kansas.—Clay Centre, 5.0; Maud, 4.0; Emporia, 3.0; Atchison, 2.7; Leavenworth, 2.1; Salina, Sherlock, and Holton, 2.0.

Maine.—Gardiner, 8.0; Portland, 5.5; Eastport, 4.1.

Maryland.—Cumberland, 2.0.

Massachusetts.—Rowe, 15.0; Williamstown, 9.0; Boston, 4.8; Princeton and Mendon, 3.0; Worcester, Westborough and Mil- ton, 2.5.

Michigan.—Marquette, 24.0; Boyne, 14.8; Traverse City, 12.5; Mackinaw City, 8.0; Alpena and Northport, 7.5; Grand Haven, 8.8; Hillsdale, 5.3; Ann Arbor, 4.7; Ionia, 4.6; Escanaba, 4.2; Manistique, 3.8; Swartz Creek, 2.3; Lansing, 2.2.

Minnesota.—Duluth, 9.5; Saint Paul, 7.2; Minneapolis, 6.6; Northfield, 6.0; Saint Vincent, 4.7; Moorhead and Chester, 4.0.

Montana.—Fort Custer, 19.2(?); Fort Shaw, 7.4; Helena, 4.6; Fort Assinaboine, 4.2; Fort Benton, 3.6; Fort Maginnis, 2.8.

Nebraska.—Tecumseh, 6.0.

New Hampshire.—Mount Washington, 22.8; Antrim, 10.0.

New York.—Humphrey, 14.5; Oswego, 7.6; North Volney, 7.0; Ithaca, 6.8; Cooperstown, 6.5; Albany, 6.2; Menand Station (near Albany), 6.0; Palermo, 6.5; Penn Yan, 4.5; Port Jervis, 3.0; Le Roy, 2.5.

Ohio.—Hiram, 10.0; Sandusky, 7.7; New Athens, 5.5; Cleveland, 4.7; Columbus, 4.2; Cincinnati, 3.2; College Hill and North Lewisburg, 3.9; Wauseon, 2.5; Ruggles, 2.0.

Pennsylvania.—Erie, 32.0; Grampian Hills, 9.0; Wellsborough, 6.6; Troy, 6.2; Pittsburg, 4.0; Leetsdale, 3.8; Drifton, 2.8; Catawissa, 2.6; Dyberry and Chambersburg, 2.5.

Rhode Island.—Providence, 2.0.

Vermont.—Woodstock, 10.2; Dorset, 10.0; Strafford, 8.0; Lunenburg, 6.0; Newport, 5.8; Burlington, 2.0.

West Virginia.—Helvetia, 6.0.

Wisconsin.—Wausau, 10.0; Neillsville, 7.0; Sussex, 6.5; Embarras, 6.0; La Crosse, 5.7; Madison, 4.4; Beloit, 3.8; Prairie du Chien, 2.5; Franklin, 2.0.

Wyoming.—Cheyenne, 2.0.

DEPTH OF UNMELTED SNOW ON GROUND AT END OF THE MONTH.

[Expressed in inches and tenths.]

Colorado.—Pike's Peak, trace.

Dakota.—Deadwood, 33.

District of Columbia.—West Washington, 0.5.

Illinois.—Mattoon, 2.0; Springfield, 1.1; Riley, 0.5.

Indiana.—Spiceland, 3.0; Lafayette, Logansport, and Terre Haute, 2.0; Indianapolis and Wabash, 1.5; Greencastle, 1.1; Fort Wayne, 0.5.

Iowa.—West Union, 2.0; Independence, Keokuk, and Monticello, 1.0; Guttenberg and Somersset, 0.8; Des Moines, 0.5; Clay Center, Dubuque, and Indianola, trace.

Maryland.—Baltimore, trace.

Michigan.—Marquette, 12.0; Traverse City and Northport, 6; Boyne, 4.5; Grand Haven, 3.5; Ann Arbor and Port Huron, 2.0; Detroit, 1.5; Ionia, 1.0; Escanaba, 0.1.

Minnesota.—Minneapolis, 5.0; Saint Paul, 4.5; Chester, 4.0; Saint Vincent and Northfield, 3.0.

Montana.—Fort Maginnis, trace.

New Hampshire.—Mount Washington, 10.0.

New Jersey.—Readington and South Orange, 0.5.

New York.—Humphrey, 3.0; Oswego, 1.0; Palermo, 0.2; Ithaca, North Volney and Rochester, trace.

Ohio.—Cleveland, 3.2; North Lewisburg, Ruggles, and Hiram, 2.0; New Athens, 1.0; Wauseon, and Westerville, 0.5.

Pennsylvania.—Erie, 4.0; Leetsdale, 1.0; Troy, 0.8; Grampian Hills, 0.5; Wellsborough, trace.

Vermont.—Burlington, 2.0; Newport, 0.2; Dorset, trace.

Virginia.—Variety Mills, 1.0; Wytheville, 0.5; Lynchburg, 0.3; Blacksburg, 0.2.

West Virginia.—Helvetia, 1.5.

Wisconsin.—La Crosse and Sussex, 4.0; Madison, 3.0; Wausau and Prairie du Chien, 2.0; Milwaukee, 1.0; Beloit and Neillsville, 1.5; Embarras, trace.

SLEET.

Arizona.—Prescott, 2d.

Connecticut.—New London, 19th.

Dakota.—Yankton, 21st; Huron, 26th to 29th.
District of Columbia.—Washington City, 18th.
Illinois.—Cairo, 28th; Springfield, 23d; Anna, 27th.
Indiana.—Greencastle, 25th.
Indian Territory.—Cantonment, 22d.
Iowa.—Dubuque, 26th.
Kansas.—Leavenworth, Holton, Independence, and Clay Centre, 22d; Allison, 29th.
Maine.—Eastport, 20th, 21st.
Maryland.—Baltimore and Fallston, 18th.
Massachusetts.—Thatcher's Island and Boston, 19th.
Michigan.—Grand Haven, 1st, 5th; Kalamazoo, 4th.
Montana.—Fort Maginnis, 26th.
Nebraska.—North Platte, 21st, 27th; Yutan, 22d.
New Hampshire.—Mount Washington, 1st, 2d, 11th.
New Jersey.—Sandy Hook, 18th.
New York.—Oswego, 5th, 29th, 30th; Buffalo, 23d; Fort Hamilton and Fort Columbus, 18th, 19th.
Ohio.—Cleveland, 5th.
Pennsylvania.—Philadelphia, 18th, 19th; Fallsington, 18th; Leetsdale, 24th.
Rhode Island.—Point Judith, 8th to 11th, 16th, 18th, 19th, 20th; Narragansett Pier, 19th.
Utah.—Salt Lake City, 17th, 18th.
Virginia.—Fort Myer, 18th.
Wisconsin.—La Crosse, 1st; Beloit, 5th; Milwaukee, 23d.

HAIL.

Fort Smith, Arkansas, 3d: heavy rain fell at 4.15 p. m., followed at 4.25 by hail, lasting eight minutes; the hail stones measured from one-fourth to one-half inch in diameter.
 Fort Apache, Arizona, on the 8th, small hail stones fell for three minutes, beginning at 4.15 p. m.
 Hail is also reported to have fallen at the following places:
 Fort Bidwell, California, 16th.
 North Colebrook, Connecticut, 4th, 19th, 20th.
 Fort Wayne, Indiana, 30th.
 Guttenberg, Iowa, 1st, 26th.
 Bowling Green, Kentucky, 18th.
 Moorestown, New Jersey, 18th.
 Factoryville, New York, 5th.
 Menand Station (near Albany), New York, 5th.
 Wauseon, Ohio, 18th, 20th, 21st, 22d.
 Dale Enterprise, Virginia, 18th, 19th.
 Embarras, Wisconsin, 21st, 23d.

Table of excessive and greatest monthly precipitation—November, 1884.

Station.	Specially heavy.		Largest monthly. Amount.	Station.	Specially heavy.		Largest monthly. Amount.
	Date.	Amt.			Date.	Amt.	
<i>Alabama.</i>				<i>North Carolina.</i>			
Clintonsville.....	27, 28	3.10		Hatteras.....	15, 16	5.15	13.02
Summerville.....	28	2.75		Do.....	28, 29	3.22	
Bolling.....	27	2.13		Kitty Hawk.....	15, 16	4.07	7.14
Fayette.....	28	2.00		Highland.....	22, 23	3.00	
<i>Arkansas.</i>				Charlotte.....	28, 29	2.75	
Lead Hill.....	22	2.34		Beyard.....	22, 23	2.65	
<i>Florida.</i>				<i>Pennsylvania.</i>			
Key West.....	4	3.51	6.03	Wellsborough....	23, 24	5.50	6.51
Do.....	27, 28	2.29		Drifton.....	23, 24	2.14	
Jacksonville.....	27, 28	3.93		Bloomington Grove.	23	2.10	
Mayport.....	27, 28	2.37		<i>Rhode Island.</i>			
Pensacola.....	22, 23	3.21		Nayatt Point.....	1, 2	2.00	7.68
<i>Kansas.</i>				<i>Texas.</i>			
Independence.....	22	2.06		Cleburne.....	22	2.75	
<i>Louisiana.</i>				Galveston.....	22	2.51	
Point Pleasant.....	27, 28, 29	6.49	7.99	New Ulm.....	11	2.00	
Shreveport.....	22	3.13		Do.....	22	2.75	
New Orleans.....	22	2.03		<i>Washington Ter.</i>			
<i>Massachusetts.</i>				Nash Bay.....	1	2.05	9.10
Princeton.....	24, 25	2.82		Do.....	3, 4	2.10	
Worcester.....	19, 20	2.50		Tatoosh Island.....			6.80
<i>Michigan.</i>				West Virginia.			
Northport.....	24, 25	5.25?	7.00?	Helvetia.....	28, 29	2.00	
Do.....	28, 29	2.25?		<i>Wisconsin.</i>			
<i>New Hampshire.</i>				Franklin.....	22	2.09	
Mt. Washington.....	4, 5	2.16	7.99				
Do.....	23, 24	3.37					

WINDS.

The most frequent directions of the wind during November,

1884, are shown on chart ii., by arrows flying with the wind. Over the northern portions of the country the prevailing winds were westerly; on the Atlantic coast south of Virginia, they were northeasterly; in the southern states they were northerly, and in the other districts variable.

HIGH WINDS.

(In miles per hour.)

Wind velocities of fifty or more miles per hour were recorded during the month as follows:

Mount Washington, New Hampshire, 68, nw., 2d; 80, se., 5th; 96, nw., 6th; 80, nw., 7th and 8th; 60, nw., 9th and 10th; 68, nw., 12th; 60, nw., 13th; 107, nw., 14th; 100, nw., 15th; 60, nw., 18th; 64, w. and nw., 21st; 68, nw., 28th; 128, s., 23d; 96, s., 24th; 88, sw., 25th; 60, sw., 26th; 52, w., 27th; 60, sw., 28th.

Pike's Peak, Colorado, 60, w., 2d; 60, nw., 19th; 52, nw., 20th; 82, nw., 23d.

Cape Mendocino, California, 68, se., 6th; 54, s., 8th; 62, s., 9th; 64, s. 10th; 58, s., 14th.

Fort Macon, North Carolina, 55, sw., 29th.

Sandy Hook, New Jersey, 52, sw. and nw. 5th; 64, nw., 24th.

Barneget City, New Jersey, 52, s., 23d.

Cape May, New Jersey, 56, w., 24th.

Delaware Breakwater, Delaware, 24, se., 23d.

Buffalo, New York, 60, w., 23d.

Fort Maginnis, Montana, 56, nw., 26th.

Cheyenne, Wyoming, 56, nw., 26th.

Fort Canby, Washington Territory, 53, se., 23d.

The total movements of the air, with the highest velocities recorded during November at the various Signal Service stations are shown in the table of miscellaneous meteorological data.

LOCAL STORMS AND TORNADES.

New Orleans, Louisiana, 24th: a tornado occurred near Edgard, Saint John Baptist parish, about 5.30 p. m. on the 22d. The length of path was between three and four miles, and its width was but a few rods. The tornado was but a moment in passing a given point. The losses to life and property are as follows: two persons killed, and ten seriously injured; a number of mules and cattle killed; fifteen buildings destroyed; the total loss of property is estimated at \$50,000. At New Orleans a storm prevailed during the afternoon from 12.55 to 5.35 p. m.; a wind-velocity of 28 miles per hour occurred at 1.10 p. m.; no damage resulted from the storm.

A violent wind and rain storm occurred at Vacherie, Saint James' parish, Louisiana, between 4 and 5 p. m. on the 22d; the wind blew from the southeast. A heavy wind and rain storm also occurred at Thibodeaux, La Fourche parish, causing great damage to life and property. One person was killed by lightning at La Fourche Crossing.

Wilkesbarre, Pennsylvania, 23d: a heavy wind and rain storm occurred on this date. The wind during the early morning blew from the south and southwest in strong gusts. Shortly after noon rain began to fall, at first lightly, but at 6 p. m. very heavily, still accompanied by high wind, which subsided about 7 p. m., but the heavy rain continued until 11 p. m. Much damage was done in the city by the wind and rain.

Seranton, Pennsylvania: a heavy rain and wind storm occurred on the 23d, the storm being most violent about 6 p. m., and ending at 9 p. m. Trees and fences were blown down, also the upper part of a church spire.

Cumming, Forsyth county, Georgia: at 5 p. m. on the 29th, a heavy gale blew from the west; at 8 p. m. the wind changed to northwest and blew at the rate of forty-miles per hour.

Pensacola, Florida: a severe squall occurred at 1.35 a. m. on the 23d, lasting fifteen minutes, the wind attaining a velocity of thirty-two miles per hour; many trees were uprooted or broken down and fences leveled.