

REPORT  
OF THE  
**Maryland State Weather Service**

(Including Maryland and Delaware),

FOR THE MONTH OF

**NOVEMBER, 1891.**

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**No. 7.**

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ISSUED UNDER THE AUSPICES OF  
**THE JOHNS HOPKINS UNIVERSITY,  
THE MARYLAND AGRICULTURAL COLLEGE,  
AND  
THE U. S. DEPARTMENT OF AGRICULTURE,  
WEATHER BUREAU.**

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**CENTRAL OFFICE  
AT THE  
JOHNS HOPKINS UNIVERSITY,  
BALTIMORE, MD.**

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*Johns Hopkins University.*

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*Meteorologist in Charge :*

C. P. CRONK, M. D.,  
*U. S. Department of Agriculture, Weather Bureau.*

## Brief Review of the Weather for the Month.

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There were five rain periods during November and a like number of fair periods. The month was ushered in with fair weather, extending from the 1st to the 3d. It was mainly due to an area of high atmospheric pressure, which, from the 1st to the 3d, moved from Montana, and adjacent territory, southeast to the Atlantic coast.

The succeeding rain period extended from the 4th to the 6th, and a glance at the weather maps shows that the light rains of those dates were in consequence of a storm which made its appearance on the Pacific coast, just north of Washington, at 8 a. m. the 1st instant. It followed the usual course of such storms eastward as far as the Great Lakes, and then, instead of passing down the St. Lawrence Valley, spread out (on the morning of the 5th) into an extensive but shallow "low" which included the greater portion of the territory east of the Mississippi, excluding New England. It disappeared early on the morning of the 6th, giving place to an area of high pressure which settled, with its accompaniment of fair weather, down over the Lake Region, New England, the Middle and South Atlantic States, as well the Ohio Valley and Tennessee. It made its appearance north of the Lakes on the 5th, and from the 6th to 9th dominated the weather in the states along the Atlantic coast. It passed eastward from the Middle Atlantic coast on the 9th.

The severe storm, which, from the 8th to the 12th, passed from Texas to the St. Lawrence Valley, was the cause of the rains which occurred in Maryland and Delaware from the 10th to the 12th.

A "high" from the northwest followed the storm above mentioned, and the generally fair weather, which prevailed from the 13th to the 15th, was the result.

The rain period from the 16th to 17th was due to two storms, both of which originated on the morning of the 15th, the one north of the Dakotas, the other in eastern Kansas. By 8 p. m. of the same day they had united over Wisconsin, and the resulting storm moved over the Lakes and down the St. Lawrence Valley.

A "high," passing from west to east across the country, caused the fair weather which prevailed from the 18th to the 20th.

The rain which fell from the 21st to the 23d was due to two storms, from the southwest and northwest, respectively, which united over Lake Superior on the 21st, and to a storm, which from the 21st to the 24th, moved from its place of origin in Indian Territory to the St. Lawrence Valley.

Fair weather followed with another "high," and the last rains of the month, from the 26th to the 29th, were due to three storms. The first of these developed north of Montana on the 24th, and following the well beaten storm track over the chain of Lakes and down the St. Lawrence Valley, reached the Atlantic on the 27th; the second developed off the Virginia coast on the 26th, and moving northward, joined the first off the Main coast on the 27th; and the third, beginning on the 26th north of Montana, near the origin of the first storm, took a more southerly course, and its centre passed south of the Lakes on the 27th and north of Maryland and Delaware on the 28th. It disappeared east of the Gulf of St. Lawrence on the 29th.

A well defined area of high pressure, which from the 27th to 30th moved from the northwest southeast to the Atlantic coast, closed the month with fair weather.

Though rain was frequent during the month, the amount of precipitation was considerably below the normal in eastern and central sections. Western Maryland received nearly, or quite, the normal amount.

The cold waves during the month were three in number, and they reached their extremes of intensity on the 4th, 19th, and 30th, respectively. They corresponded with the presence of areas of high pressure.

It was the coldest November at Baltimore since 1882 when the mean temperature of the month was the same as this year, 44°. From tables furnished by H. Shriver, Esq., Cumberland, it appears that though the month was colder there (mean 46°) than November 1890, it was warmer than in preceding years since 1859. Tables furnished by A. E. Acworth, Esq., Barron Creek Springs, indicate that the weather was colder in southeastern Maryland than in any previous years since 1823, with but two or three exceptions.

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# Meteorological Stations reporting to the Director of the Maryland State Weather Service.

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<i>Stations of Observation.</i>	<i>Observer.</i>
> Agricultural College.....	Wm. H. Zimmerman, A. M.
Annapolis.....	Walter Hay, M. D.
Baltimore.....	{ G. N. Wilson. W. D. White. A. T. Brewer.
Barron Creek Springs.....	A. E. Acworth.
Boettcherville.....	F. F. Brown.
Bryantown.....	B. M. Edelen, Jr.
Charlotte Hall.....	R. W. Silvester.
Cumberland.....	Howard Shriver.
Cumberland.....	E. T. Shriver.
Darlington.....	A. F. Galbreath.
Distributing Reservoir, D. C.....	Lieut.-Col. Elliot.
Dover, Del.....	Jno. S. Jester.
Drum Point.....	Alex. de Barrill.
Easton.....	G. W. Minnick.
Emmitsburg.....	J. A. Mitchell, M. A.
Fallston.....	G. G. Curtiss, A. M.
Frederick.....	McClintock Young.
Jewell.....	Jos. Plummer.
Johns Hopkins Hospital.....	H. M. Hurd, A. M., M. D.
Kirkwood, Del.....	W. C. L. Carnagy.
Leonardtwn.....	G. W. Joy.
McDonogh.....	G. M. Carvill.
New Market.....	H. H. Hopkins, M. D.
Norfolk, Va.....	A. J. Davis.
Princess Anne.....	B. O. Bird.
Taneytown.....	C. W. Weaver, M. D.
Upper Marlboro'.....	Frederick Sasscer.
Washington, D. C.....	S. W. Beall.
Woodstock.....	T. J. A. Freeman, S. J.

<i>Crop Reporting Stations.</i>	<i>Correspondent.</i>
Barron Creek Springs.....	A. E. Acworth.
Berlin.....	Wash. Hanley.
Bristol.....	E. O. Welch.
Catonsville.....	A. L. Crosby.
Chaneyville.....	J. F. Talbott.
Chaptico.....	Geo. R. Garner.
Chestertown.....	H. Brown.
Cumberland.....	Howard Shriver.
Darlington.....	A. F. Galbreath.

## MARYLAND STATE WEATHER SERVICE.

Denton.....	F. C. Ramsdell.
Drum Point.....	Alex. de Barrill.
Ellicott City.....	Clarence Oldfield.
Fallston.....	G. G. Curtis, A. M.
Frostburg.....	C. J. Conner.
Frederick.....	McC. Young.
Greensboro.....	S. W. West.
Hagerstown.....	T. J. C. Williams.
Hampstead.....	H. H. Stansbury.
Havre de Grace.....	W. S. McCombs.
Keedysville.....	J. A. Miller.
Kirkwood, Del.....	W. C. L. Carnagy.
Mechanicstown.....	J. J. Henshaw.
Middletown.....	G. C. Rhoderick, Jr.
Milford, Del.. ..	J. T. Foulk.
New Market.....	H. H. Hopkins, M. D.
Pope's Creek.....	Fred. Richmond.
Princess Anne.....	B. O. Bird.
Rutland.....	Benj. Watkins.
Salisbury.....	Lemuel Malone.
St. Leonard's.....	N. D. S. Parran.
St. Michael's.....	W. Willis.
Taneytown.....	C. W. Weaver, M. D.
Trappe.....	Percival Mullikin.
Westminster.....	Uriah Bixler.
West River.....	James Cheston, Jr.
White Plains.....	W. Hicks.

*Stations displaying Weather Signals.**Displaymen.*

Annapolis.....	Wm. M. Abbott.
Bel Air.....	N. N. Nock.
Bradshaw.....	B. F. Taylor.
Darlington.....	A. F. Galbreath.
Dickerson.....	W. H. Dickerson.
Emmitsburg.....	J. A. Mitchell, M. A.
Frostburg.....	C. J. Conner.
Greensboro.....	Plummer & Plummer.
Hagerstown.....	R. J. Hamilton.
Hancock.....	F. Lee Carl.
Havre de Grace.....	W. S. McCombs.
Lonaconing.....	J. J. Robinson.
Middletown.....	G. C. Rhoderick, Jr.
Milford, Del.....	J. Y. Foulk.
Oakland.....	J. M. Litzinger.
Odenton.....	C. W. Claggett.
Salisbury.....	L. W. Gunby.
Seaford, Del.....	Hugh Martin, M. D.
Snow Hill.....	Purnell & Vincent.
St. Michael's.....	E. M. Jefferson.
Taneytown.....	C. W. Weaver, M. D.
Westminster.....	W. S. Myer & Bro.
Wilmington, Del.....	Wm. Lawton.

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# MONTHLY SUMMARY,

## MARYLAND AND DELAWARE,

### NOVEMBER, 1891.

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**Temperature** (degrees).—Mean monthly, 42.5. Highest monthly mean, 45.6, at Cumberland (H. Shriver). Lowest monthly mean, 37.7, at Boettcherville. Highest temperature, 75, at Mt. St. Mary's on the 1st. Lowest temperature, 10, at Darlington and Kirkwood, on the 30th. Greatest local monthly range, 63, at Mt. St. Mary's. Least local range, 44, at Jewell and Leonardtown. Mean monthly range, 51.0. Mean maximum, 52.2. Mean minimum, 35.3.

**Precipitation** (in inches).—Average, 2.11. Greatest amount, 2.92, at Cumberland. Least amount, 1.33, at Baltimore.

**Wind**.—Prevailing direction, northwest.

**Thunderstorms**.—At Baltimore, on the 23d; at Barron Creek Springs, on the 23d; at Boettcherville, on the 23d; at Cumberland (H. Shriver), on the 23; at Frederick, on the 23d; at Mt. St. Mary's, on the 23d; at New Market, on the 23d; at Taneytown, on the 23d; at Woodstock, on the 23d.

**Halos**.—At Baltimore, on the 19th; at Barron Creek Springs, on the 1st, 10th, 19th, 20th and 25th; at Norfolk, on the 16th.

**Hail**.—At Barron Creek Springs, on the 29th; at Boettcherville, on the 23d; at Cumberland (H. Shriver), on the 23d; at Woodstock, on the 23d.

**Frost**.—At Baltimore, on the 3d, 6th, 7th, 8th, 9th, 12th, 13th, and 14th; at Barron Creek Springs, on the 2d, 7th, 8th, 12th, 13th, 14th, 15th, 19th, and 21st; at Cumberland (H. Shriver), on the 4th, 7th, and 8th; at Mt. St. Mary's, on the 3d, 4th, 8th, 9th, 25th, 28th, and 30th; at Woodstock, on the 3d, 7th, 13th, 14th, 19th, 20th, and 26th.

**Meteors**.—At Barron Creek Springs, on the 9th, 15th and 28th; at Cumberland (H. Shriver), on the 25th; at Mt. St. Mary's, on the 7th.

**Polar Bands**.—At Baltimore, on the 7th and 12th; and at Cumberland (H. Shriver), 4th and 25th.

Average number of cloudless days, 13; partly cloudy days, 9; cloudy days, 8; rainy days (.01 of an inch or more), 8.

Local verification of weather and temperature signals for November, reported by displaymen:

Weather,	. . . . .	89.0	per cent.
Temperature,	. . . . .	87.3	" "
Average,	. . . . .	89.2	" "

**Note**.—From report of G. G. Curtiss, A. M., Fallston, Md., received too late for publication in Summary; highest temperature, 65° on the 10th; lowest, 14° on the 30th; mean, 41.8°. Total rainfall in November, 1.74 inches.

## NOTES BY OBSERVERS.

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**Baltimore.**—1, high wind. 3, frost. 4, first freeze. 6, 7, frost. 7, polar bands. 8, 9, frost. 10, high wind. 12, frost; polar bands. 13, 14, frost. 17, 18, high wind. 18, coldest day this Fall. 19, lunar halo, 9–10 p. m. 19, 20, 21, 22, fog. 23, severe storm from S. W. to N. E., between noon and 2 p. m., accompanied by rain, lightning and thunder. Max. velocity of wind, 48 miles from South. Wind before, during, and after storm, South. Rain began 12.48 a. m., ended during night; began 10.30 a. m., ended 10.33 a. m.; began 11.10 a. m., ended 11.50 a. m.; began 12.20 p. m., ended 1.40 p. m. Temperature at 8 a. m., 57°; 9, 58°; 10, 60°; 11, 60°; 12, 61°; 1, p. m., 54°; 8, 49°. Much damage resulted on land, and considerable on water. 28, trace of snow between 10.30 p. m. and 11.05 p. m.

**Barron Creek Springs.**—1, snow birds seen here. Halo at noon. 2, 3, frost, ice. 4, smoky. 7, frost, ice. 8, heaviest frost of the season, ice. 9, fog, 7 a. m., 9 p. m. Meteor going S. W. at 7 p. m. 10, halo of moon, 7 to 9 p. m. 12, frost, fog. 13, slight frost. 14, heavy white frost, ice, fog. 15, fog, frost. 4 meteors S. W. at 7 p. m. 17, heavy blow N. W. at 3 p. m. 18, cold wave, ice in house, coldest day since 1838 (26°), ice in reservoir of wet bulb thermometer,  $\frac{1}{2}$  inch. 19, heavy frost, solar halo, 4 p. m. 20, lunar halo, 5 a. m. 21, frost; fog. 23, single flash of lightning with peal of thunder E. S. E. at 1 p. m. 25, cold wave, frost, solar halo, 1 p. m. 28, heavy blow during night, 12 to 5 p. m., meteor N. E. at 6 p. m.

**Darlington.**—17, high wind; chimneys and window glass demolished, and fences blown down.

**Easton.**—The cold of the 19th, 20th, 21st, 29th, and 30th was unusually intense for this season of the year. Weather otherwise was generally fine and seasonable, excepting rather unusual lack of rain.

**Frederick.**—On the 5th snowed nearly the whole day, and at one time the snow was probably 2 inches deep. 23, beginning about 12 m, violent wind storm from the South, accompanied by rain and lightning; blowing down and unroofing some buildings and levelling fences.

**Leonardtwn.**—First decided frost on the 14th. First snow on 29th—average depth, 5 inches.

**Mt. St. Mary's.**—Smoky appearance of atmosphere. 7, meteors. 10, dense fog. 23, thunder and lightning.

**New Market.**—3, frost. 4, frost, ice. 5, first snow. 9, 15, 19, hazy. 21, foggy. 23, brisk wind in a. m., with slight rainfall until 12.15 p. m. when the wind suddenly increased to a gale accompanied by heavy rain, hail, lightning and thunder, lasting 15 minutes, after which the clouds dispersed. Barometer fell from 29.20 at 10 a. m. to 28.88 at noon. Thermometer fell from 62° at 10, to 54° at 1.45 p. m. At 1 p. m. the wind changed from S. E. to S. W. In going over a radius of a few miles after the storm, fencing and fodder was shown to have been moved due northeast and northwest, showing a change in the direction of the wind during its greatest intensity.

**Taneytown.**—The storm passing across this section of the country destroyed lives and property.

**Woodstock.**—3, hoar frost. 5, slight snowfall beginning 6.45 a. m., ending 8 a. m., and again at 8.30 until 9 a. m. 7, frost. 10, fog; rained during night. 13, 14, frost. 16, fog. 19, 20, frost. 21, 22, foggy. 23, distant thunderstorm to S. E. Rain fell about ten minutes. 26, frost; hail and snow in morning.



# DAILY PRECIPITATION

## For November, 1891.

Date.	Baltimore.	Barron Creek Springs.	Boetcherville.	Cumberland.	Cumberland.	Dist. Reservoir, D. C.	Dover, Del.	Easton.	Frederick.	Great Falls.	Jewell.	Leontartown.	McDonogh.	Mt. St. Mary's.	New Market.	Rec. Reservoir, D. C.	Taneytown.	Woodstock.	Norfolk, Va.	Washington, D. C.	
1																					
2																					
3																					
4			.10																		
5	.13	.12				.18	.07		.30	.34	.25	.14		.35	.52	.25			.01	.34	
6	.01					.28			.10	.10						.17	.25	.12	.07		
7																					
8																					
9																					
10	.02		1.50	1.50	1.60			.19					1.00						.50	.01	
11	.49	.29					.36		.66	.60	.33			.92	.81	.73	.65		.25	.43	
12	.01							T	T						T		.01			T	
13																					
14						.73															
15																					
16	.06					.05		.08	.02		1.00	.10		.03		.04	.01	.20	.34	.06	
17	.24	.69				.30	.44	.27	.45	.04		1.04	.35	.57	.55	.15	.66	.50	.03	.25	
18						.26				.50						.23					
19																					
20																					
21	T		.60		.49				.04		.50	.06		.08	T		.02				
22			1.00	.50	.15				.07					.54	.11		.11	T	T	T	
23	.18	.32		.70	.66		.28	.12	.21				.02		.65	.07	.24	.35	.05	.19	
24						.27				.26		.12				.23					
25			.10																		
26	.08	.59			.02			.43	T		.63	.64	.08	.02	.04			.15	.14	.14	
27	.10					.22	.52			.14						.18			.08	.05	
28	.01								T				.02	.03			.14			.01	
29	T	.35										.53							1.13	T	
30																			T		
Month.	1.33	2.26	2.30	2.70	2.92	2.29	1.67	1.19	1.85	1.98	2.71	2.63	1.47	2.54	2.68	2.05	2.09	1.82	2.11	1.47	

Note.—T indicates trace of rain or snow.

# MONTHLY SUMMARY OF REPORTS, NOVEMBER, 1891.

STATIONS.	COUNTIES.	Altitude above sea in feet.	Latitude.	Longitude.	† BAROMETER.				TEMPERATURE.							Total precipitation.	Clear days.	Fair days.	Cloudy days.	Number of rainy days (01 or more.)	Prevailing Wind.	OBSERVERS' NAMES.			
					Monthly mean.	Maximum.		Minimum.		Monthly mean.	Mean of maximum.	Mean of minimum.	Maxim.		Minim.								Monthly range.		
						Height.	Date.	Height.	Date.				Degrees.	Date.	Degrees.									Date.	
Baltimore.....	.....	179	39° 17'	76° 36'	30.197	30.343	19	29.442	23	44.3°	51.8°	36.8°	64	12	18	30	46°	1.33	12	12	6	11	N.W.	{ G. N. Wilson, W. D. White, A. T. Brewer. Albert E. Acworth. F. F. Brown. H. Shriver. E. T. Shriver. A. F. Galbreath. Lt.-Col. Elliot. Jno. S. Jester. G. W. Minnick. McClintock Young. Jos. Plummer. W. C. L. Carnagy. G. W. Joy. G. M. Carvill. A. F. Dorley. H. H. Hopkins, M.D. Lt.-Col. Elliot. C. W. Weaver, M. D. T. J. A. Freeman, S.J. A. J. Davis. S. W. Beall.	
Barron Cr'k Springs...}	Wicomico.....	25	38° 30'	75° 39'	...	...	...	...	...	44.1°	55.8°	34.6°	69	12	13	30	56°	2.26	16	10	4	8	N.W.		
Boettcherville	Alleghany.....	...	...	...	...	...	...	...	...	37.7°	...	...	67	9	12	19	45°	2.30	...	...	...	...	...		...
Cumberland...	Alleghany.....	700	39° 39'	78° 46'	30.189	30.916	20	29.311	23	45.6°	53.8°	36.2°	73	16	20	19	53°	2.70	...	...	...	...	...		...
Darlington....	Harford.....	300	39° 39'	76° 14'	...	...	...	...	...	40.9°	...	...	62	9	15	19	47°	2.92	12	11	7	5	...		...
Distributing Reservoir..}	Dist. Columbia	...	...	...	...	...	...	...	...	41.6°	49.7°	42.8°	65	12	10	30	55°	...	23	...	7	...	...		N.W.
Dover.....	Kent, Del.....	...	...	...	...	...	...	...	...	43.7°	...	...	66	10	16	30	50°	2.29	...	...	...	...	...		...
* Easton.....	Talbot.....	35	38° 42'	76° 6'	...	...	...	...	...	43.5°	53.1°	34.9°	68	12	16	30	52°	1.67	16	8	6	9	N.W.		
Frederick.....	Frederick.....	...	...	...	...	...	...	...	...	44.3°	52.0°	36.6°	67	23	16	30	51°	1.19	10	8	5	5	S.W.		
Great Falls...	Montgomery..	...	...	...	...	...	...	...	...	43.3°	53.1°	34.1°	67	1, 10	16	30	51°	1.85	...	...	...	...	...		...
Jewell.....	Anne Arundel	...	...	...	...	...	...	...	...	41.9°	...	...	63	25	15	19	48°	1.98	...	...	...	...	...		...
Kirkwood.....	New Castle, } Del.....	...	...	...	...	...	...	...	...	44.0°	...	...	63	10	19	30	44°	2.71	...	...	...	...	...		...
Leonardtown.	St. Mary's.....	...	...	...	...	...	...	...	...	42.8°	...	...	66	17	10	30	56°	...	...	...	...	...	...		...
McDonogh....	Baltimore.....	535	39° 23'	76° 44'	30.181	30.381	19	29.551	23	41.9°	...	...	60	11	16	30	44°	2.63	...	...	...	...	7		N.W.
Mt. St. Mary's	Frederick.....	720	39° 41'	77° 21'	30.169	30.389	19	29.339	23	42.5°	50.9°	34.8°	69	1	13	30	56°	1.47	...	...	...	...	6		...
New Market...}	Frederick.....	500	39° 23'	77° 18'	30.175	30.320	19	29.420	23	44.3°	49.3°	32.3°	75	1	12	30	63°	2.54	9	8	13	9	...		
Receiving Reservoir..}	Dist. Columbia	...	...	...	...	...	...	...	...	40.4°	...	...	62	10	13	30	49°	2.68	14	9	7	7	N.W.		
Taneytown....	Carroll.....	...	...	...	...	...	...	...	...	40.5°	...	...	65	10	17	30	48	2.06	...	...	...	...	9		...
Woodstock College...}	Howard.....	392	39° 20'	76° 49'	30.150	30.726	19	29.234	23	43.2°	...	...	65	10	17	30	48	2.09	...	...	...	...	10		...
Norfolk, Va....	.....	43	36° 51'	76° 17'	30.188	30.301	19	29.624	23	40.5°	50.4°	30.6°	69	1	15	19, 30	54°	1.82	9	11	10	6	N.W.		
Wash'n, D. C..	.....	112	38° 52'	77° 0'	30.200	30.339	19	29.490	23	40.5°	50.4°	30.6°	69	1	15	19, 30	54°	1.82	9	11	10	6	N.W.		
Averages.....	.....	.....	.....	.....	30.180	.....	.....	.....	.....	42.5°	52.2°	35.3°	.....	.....	.....	.....	51.0	2.11	13.3	8.8	7.6	7.6	.....	.....	

\* For 18 days.

† Excluding Norfolk.

‡ Readings reduced to sea level.