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VIRGINIA SECTION.

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GENERAL SUMMARY.

The year 1919 was the warmest since 1913 and 1.0° above normal in temperature. January and February were considerably warmer than usual while December, being 2.6° below normal temperature, was, by nearly 3.0°, the coldest month of the year. January 4, 5, 6, and 7 and December 20 and 21 were the coldest days of the year, the lowest single reading being -16° at Burkes Garden January 5. July was by far the warmest month, on the average, having a mean temperature of 76.0° against 72.7° for August, the next warmest month, which this year was comparatively cool. July 3 to 6 was the hottest period and 103°, July 5 at Danville, was the highest temperature reported. The greatest departure from normal temperature conditions occurred in October. The mean for this month was 8.2° above normal and considerably higher than that for any previous October of record. Of the months not already mentioned March, April, June, September, and November showed excesses, and May a deficiency in temperature, the departure from normal in each case being moderate.

The average precipitation in Middle Virginia was slightly above normal, but there was a moderate average deficiency in the Great Valley and a large deficiency in Tidewater Virginia, resulting in an average deficiency of about one and three-quarters inches for the State, as a whole. September was the driest month of the year, there being but little more than one-third of the normal rainfall. July was the wettest, though May had generally much more than the normal amount of rainfall, and both May and June were wetter than July in the Great Valley. The large average in July was due to extremely heavy rainfall in Tidewater and most of Middle Virginia, especially in the central and southeastern portions of the State. At Callville, Brunswick County, 17.41 inches fell in that month, and 4.84 inches on one day, the 17th. These are the greatest monthly and the greatest 24-hour falls, respectively, recorded at any station during the year. The least monthly total was 0.08 inch at Cape Henry in November. The greatest annual precipitation was 51.79 inches at Mayhurst; the least, 31.07 inches at Wytheville. The annual snowfall was, with one exception, the least of record.

THE WEATHER BY MONTHS.

JANUARY.—On the whole this was a mild, moderately wet month. The lowest temperatures of the month and the lowest of the entire year at many stations occurred generally from the 1st to the 6th, inclusive. Precipitation, mostly rain, occurred in three principal periods, as follows: 1st to 3d, 15th to 18th, and 22d to 26th, all dates inclusive. The soil was continuously too wet for plowing in most districts. Snow was unusually light for January, especially in the central and south-central portions, where many stations reported none or only a trace. There was a prevalence of foggy weather throughout eastern and northeastern counties from the 21st to the 23d, inclusive. However, the number of cloudy days was the lowest of record for January, and a marked excess in the amount of sunshine resulted.

FEBRUARY.—This month, also, showed an average excess in temperature and a noticeable absence of severe wintry weather. Snowfall was light and precipitation, in general, somewhat below normal, though well distributed through the month. There was sufficient fair weather between the rainy periods to permit work in the soil and considerable plowing

was accomplished. Sunshine was again above normal in Middle Virginia. Thunder-storms occurred at scattered stations on the 14th and again about the 23d. An aurora on the 27th was observed at a few stations.

MARCH.—Again the temperature averaged considerably above normal. There were no unusually high readings, but on the other hand, the month was conspicuous for its lack of really cold weather. Rainfall was practically normal and was distributed through the month, with considerable uniformity. There was very little snow, none at most stations, the average for the State being only a trace. The eastern passage of an active storm area over the State on the 27th was attended by general rainfall, winds of gale force, thunder-storms in practically all sections, and hail in a number of Middle Virginia counties. Sunshine was somewhat above normal, except in the extreme southeast. The mild temperature and moderate precipitation were decidedly favorable for farm work and the growth of crops. Winter grains advanced rapidly, grass and pastures came out, and early varieties of fruit burst into bloom throughout the southern portion of the State.

APRIL.—Temperature averaged nearly normal in April, though the first three days were decidedly cooler than average April weather and another cold spell about the 26th carried temperatures below freezing over most of the State and produced the last killing frosts of the season at most stations, except in the extreme southeast. Precipitation was slightly deficient, though well distributed through the month; snowfall was light; sunshine adequate; and wind movement rather low. Few foggy days were reported, and hail-storms were infrequent and light. Thunder-storms were quite general about the 16th and 24th, and less general on the 9th.

MAY.—Cool, cloudy, damp weather prevailed the greater part of May. General rainfall occurred on the 1st, and from the 6th to the 25th, inclusive, showers came with great frequency, often attended by lightning and thunder and occasionally by local hail. Rainfall averaged considerably above normal. No snow was reported. Little rain fell after the 25th, none in Tidewater Virginia, and the last two days of the month were generally fair and the warmest of the month. Sunshine was general deficient. Killing frost occurred at Burkes Garden, Tazewell County, on the 3d. Oats, pastures, and meadows did remarkably well under the cool, humid conditions, and the weather was not especially unfavorable for other growing crops.

JUNE.—For the State, as a whole, both temperature and rainfall were slightly above normal. In eastern counties, however, conditions were just the opposite, the weather averaging cool and dry, the contrast as regards rainfall, especially being remarkable, rainy days having occurred with twice the frequency in the Great Valley as in Tidewater Virginia. From the 12th to the 24th, inclusive, when little or no rain fell at Tidewater stations, showers occurred occasionally in Middle Virginia and with unusual frequency in the Great Valley. June was the wettest month of the year in the Great Valley. An aurora was observed at Williamsburg on the 2d. On the whole, the month was one of good growing weather.

JULY.—The most striking feature of the month's weather was the period of almost uninterrupted heavy rainfall from about the middle through the 23d of the month. The fall was heavy throughout all of Middle and Tidewater Virginia and the central Great Valley counties, and especially so in southeastern Middle Virginia. At Callville, Brunswick County, 16.80 inches were recorded during this period and 17.41 inches for the month, as a whole. An unofficial report from Lawrenceville, in the same county, placed the fall at that point from the 14th to the 22d, inclusive, at 29.00 inches. A 24-hour fall of 4.84 inches was recorded at Callville on the

17th. For the State, as a whole, July was the wettest month of the year. The heavy rains caused considerable injury to corn and tobacco, especially the latter, on lowlands, and some damage to wheat and oats in shock.

AUGUST.—August was dry, especially in Middle Virginia, though there was a fair number of rainy days well distributed through the month. The ill effect of the lack of moisture was further lessened by the absence of extremely hot weather and an average temperature considerably below the August normal. Thunder-storms occurred with about the average frequency, but there was a noticeable lack of severe wind or hail storms. Sunshine was abundant, especially east of the Blue Ridge. Early in the month the weather was most favorable for crops and farm work; during the latter half the need of moisture began to retard first the plowing of land for winter crops, and later the growth of late corn, tobacco, and pastures.

SEPTEMBER.—Rain fell on only four days, on the average, and the total amount was only about one-third of the normal. Nearly normal temperature conditions obtained. There was a preponderance of clear weather and a considerable excess over the normal amount of sunshine. During the last week of the month light frosts formed at a number of Great Valley stations and at Arcola, Loudoun County; and killing frosts occurred locally in Montgomery and Tazewell Counties. The dry weather did considerable damage to the late corn and tobacco crops, pastures, gardens, and truck; caused apples to drop more or less freely, and retarded plowing for and the sowing of winter grains. The weather was favorable for harvesting.

OCTOBER.—The month was decidedly warmer than usual, and the warmest October of record by 3.7°. The heat was most intense during the first week. A considerable deficiency in rainfall in Tidewater Virginia was more than offset by an average excess of 1.21 inches in the Great Valley. A preponderance of rainy, cloudy weather reduced the amount of sunshine, which was especially deficient in the northern and western portions of the State. Killing frosts occurred in favorable localities in the Great Valley on the 19th, although they usually occur throughout the State, except in the extreme southeast, by the end of the month. General rains before the middle of the month permitted the resumption of fall sowing, which had been greatly retarded by drought.

NOVEMBER.—Rainfall was nearly normal for the State, as a whole, and the number of rainy days was rather high for November, but in Tidewater Virginia there was a decided deficiency in rainfall, which was most marked in the extreme southeast. A trace of snow fell at a few northern stations. The month was comparatively warm, and sunshine, cloudiness, and wind movement were near normal. On the 5th and 6th killing frosts, the first of the season at most stations, became general in the Great Valley, and by the 10th throughout Middle Virginia, except in the south. On the 14th and 15th they extended over the remaining sections.

DECEMBER.—December was continuously cold, except the second week, which was comparatively warm. Unusual features of the temperature conditions were the low monthly average and the low individual thermometer readings in Middle Virginia as compared with corresponding data for the Great Valley. Middle Virginia was most abnormal, also, in the case of precipitation, which, though deficient in all sections, was especially so there. Snowfall, usually heaviest in the mountain regions of the State, was much heavier this month over the territory extending from the extreme north southward to central counties and thence eastward to the Atlantic. The average snowfall in both Tidewater and Middle Virginia exceeded that for the Great Valley. Sunshine was deficient, except in the western portion of the State. An aurora was observed at Washington, D. C., on the 15th.—H. C. M.

CLIMATOLOGICAL DATA, 1919.

Month.	Temperature.			Precipitation.			Number of days.			
	Mean.	Highest.	Lowest.	Average.	Greatest 24-hour rain.	Average snow-fall.	Rainy.	Clear.	Partly cloudy.	Cloudy.
January.....	38.7	71	-16	3.98	2.26	2.1	8	17	6	8
February.....	37.9	72	8	2.36	1.65	1.2	8	13	6	9
March.....	47.8	80	16	3.60	2.25	T.	9	14	8	9
April.....	54.7	94	14	3.00	2.60	T.	7	14	8	8
May.....	64.4	97	31	5.29	2.61	0.0	12	12	9	10
June.....	72.2	99	42	4.70	3.92	0.0	10	13	10	7
July.....	76.0	104	41	6.81	4.84	0.0	10	14	9	8
August.....	72.7	98	39	2.88	2.40	0.0	9	15	10	6
September.....	68.8	98	27	1.18	1.95	0.0	4	19	7	4
October.....	65.6	96	30	3.29	2.97	0.0	9	11	8	12
November.....	47.8	86	10	2.04	1.63	T.	8	15	6	9
December.....	35.0	78	-7	2.50	2.37	3.9	8	12	7	12

COMPARATIVE ANNUAL DATA.

Year.	Mean temperature.	Highest.	Lowest.	Average precipitation.	Average snow-fall.	No. of rainy days.	No. of clear days.	No. of partly cloudy days.	No. of cloudy days.
1892.....	54.8	106	-8	40.01	.....	95	163	101	102
1893.....	55.1	104	-26	46.83	23.1	103	156	100	109
1894.....	57.0	106	-11	35.97	17.0	88	166	104	95
1895.....	54.6	107	-18	38.09	38.8	94	174	103	88
1896.....	56.4	105	-10	42.89	12.3	93	163	106	97
1897.....	56.0	103	-15	40.81	11.8	92	171	99	95
1898.....	56.5	105	-9	44.80	8.7	108	162	101	102
1899.....	56.4	106	-29	43.18	36.7	98	176	95	94
1900.....	57.0	107	-8	39.33	18.6	86	181	91	93
1901.....	55.3	106	-14	50.17	9.5	100	167	94	104
1902.....	55.6	108	0	51.42	14.9	95	170	97	98
1903.....	55.1	105	-13	44.85	8.4	95	172	89	104
1904.....	53.8	100	-14	36.18	24.9	96	170	101	95
1905.....	54.8	98	-15	43.58	18.5	111	155	112	98
1906.....	56.3	102	-2	49.56	15.2	124	143	120	102
1907.....	54.3	97	-16	44.19	17.4	115	159	115	91
1908.....	55.4	102	-20	45.21	30.0	110	162	108	96
1909.....	55.5	102	-5	39.81	12.9	101	171	104	90
1910.....	54.7	102	-9	41.37	20.3	112	151	116	98
1911.....	56.8	104	0	41.50	9.2	115	149	110	106
1912.....	54.5	100	-25	39.19	24.6	103	165	106	95
1913.....	57.2	102	-3	42.75	4.0	100	178	98	89
1914.....	55.0	103	-17	37.17	39.8	101	168	100	97
1915.....	55.8	101	-5	39.12	13.5	97	160	116	89
1916.....	55.5	102	-11	39.36	18.6	103	165	106	95
1917.....	53.3	103	-27	40.82	23.7	114	158	107	100
1918.....	55.3	108	-22	44.43	24.7	105	159	97	109
1919.....	56.8	103	-16	41.66	7.4	102	161	99	105

KILLING FROSTS, 1919.

Stations.	Last in spring.	First in autumn.	Stations.	Last in spring.	First in autumn.
TIDEWATER VIRGINIA.			MIDDLE VIRGINIA—CON.		
Asbland.....	Apr. 25	Nov. 6	Lynchburg.....	Apr. 3	Nov. 14
Cape Henry.....	Apr. 3	Nov. 15	Mayhurst.....	.....	Nov. 6
Diamond Springs.....	Apr. 26	Nov. 15	Mineral.....	Apr. 27	Nov. 6
Franklin.....	Apr. 3	Nov. 7	Mount Weather.....	Apr. 26	Nov. 3
Hopewell.....	Apr. 26	Nov. 14	New Canton.....	Apr. 27	Nov. 5
Newport News.....	Apr. 26	Nov. 14	Quantico.....	Apr. 25	Nov. 14
Norfolk.....	Apr. 2	Nov. 15	Rocky Mount.....	Apr. 25	Nov. 5
Onley.....	Apr. 3	Nov. 14	Swansonville.....	Apr. 27	Nov. 10
Richmond.....	Apr. 26	Nov. 9	Washington, D. C.....	Apr. 26	Nov. 10
Runnymede.....	Apr. 27	Nov. 7	THE GREAT VALLEY.		
Warsaw.....	Apr. 27	Nov. 9	Blacksburg.....	Apr. 27	Sept. 29
West Point.....	Apr. 5	Nov. 7	Buchanan.....	Apr. 19	Nov. 10
Williamsburg.....	Apr. 26	Nov. 10	Burkes Garden.....	May 3	Sept. 25
MIDDLE VIRGINIA.			Catawaba Sanatorium.....	Apr. 26	Nov. 6
Arcola.....	Apr. 27	Nov. 21	Dale Enterprise.....	Apr. 26	Nov. 6
Callaville.....	Apr. 27	Nov. 6	Dante.....	Apr. 27	Nov. 14
Charlottesville.....	Apr. 3	Nov. 14	Elk Knob.....	Apr. 26	Nov. 5
Clarksville.....	Apr. 26	Nov. 14	Hot Springs.....	Apr. 27	Oct. 19
Columbia.....	Apr. 19	Nov. 3	Lexington.....	Apr. 20	Nov. 6
Culpeper.....	Apr. 19	Nov. 6	Monterey.....	Apr. 25	.....
Danville.....	Apr. 3	Nov. 6	North Holston.....	Apr. 27	Nov. 5
Fredericksburg.....	Apr. 3	Nov. 10	Roanoke.....	Apr. 25	Nov. 14
Hawfield.....	Apr. 25	.....	Staunton.....	Apr. 27	Nov. 6
Lassiter.....	.....	Nov. 5	Winchester.....	Apr. 25	Nov. 5
Lawrenceville.....	.....	Nov. 6	Woodstock.....	Apr. 25	Nov. 3
Leeds Manor.....	Apr. 26	Nov. 9	Wytheville.....	Apr. 3	Nov. 6
Lincoln.....	Apr. 26	Nov. 7			