

U. S. DEPARTMENT OF COMMERCE
 ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
 IN COOPERATION WITH THE RHODE ISLAND AGRICULTURAL EXPERIMENT STATION
 CLIMATOGRAPHY OF THE UNITED STATES NO. 20-37

LATITUDE 41° 29'N
 LONGITUDE 71° 32'W
 ELEV. (GROUND) 100 ft.

CLIMATOLOGICAL SUMMARY

STATION KINGSTON, R.I.

Rhode Island Agricultural Extension Service
 Circular 157

MEANS AND EXTREMES FOR PERIOD 1936-1965

Month	Temperature (°F)								** Mean degree days	Precipitation Totals (Inches)						Mean number of days					Month		
	Means			Extremes						Mean	Greatest daily	Year	Snow, Sleet				Precip. .10 inch or more	Temperatures					
	Daily maximum	Daily minimum	Monthly	Record highest	Year	Record lowest	Year	Mean					Maximum monthly	Year	Greatest daily	Year		Precip. 90° and above	32° and below	32° and below		° and below	° and below
(a)	30	30	30	30		30		15	30	30		30	30		30		30	30	30				
Jan	37.6	19.2	28.4	62	1937	-23	1942	1126	3.98	3.93	1962	8.6	34.3	1965	10.3	1961	7	0	8	27	2		
Feb	39.1	20.4	29.7	62	1957	-15	1965	970	3.38	3.26	1960	7.3	28.3	1962	16.2	1961	6	0	5	25	1		
Mar	45.6	27.3	36.5	82	1945	-4	1949	880	4.00	2.30	1947	5.3	33.7	1956	15.0	1956	7	0	2	23	*		
Apr	56.3	35.2	45.8	84	1957	9	1954	545	4.00	3.46	1964	.5	4.0	1938	4.0	1938	7	0	0	11	0		
May	66.9	44.1	55.5	91	1964+	25	1956	289	3.35	2.73	1956	0	0		0		7	*	0	2	0		
Jun	75.3	53.1	64.2	95	1952	30	1945	77	2.78	2.61	1938	0	0		0		6	1	0	*	0		
Jul	80.1	59.3	69.7	98	1949	38	1945	13	2.86	3.58	1953	0	0		0		5	2	0	0	0		
Aug	79.1	58.1	68.6	99	1949	33	1965+	28	4.48	5.34	1955	0	0		0		6	1	0	0	0		
Sep	72.8	50.9	61.9	95	1953	25	1957	143	3.58	6.48	1961	0	0		0		5	*	0	1	0		
Oct	64.1	40.9	52.5	87	1949+	13	1940	379	3.27	4.00	1939	0	T	1952	T	1952	5	0	0	8	0		
Nov	52.6	32.3	42.4	75	1950	5	1938	650	4.54	3.54	1953	.9	11.0	1955	4.3	1938	7	0	*	16	0		
Dec	41.0	22.1	31.6	65	1962+	-17	1942	1023	3.86	2.08	1942	6.0	22.2	1963	11.6	1960	7	0	6	26	1		
Year	59.2	38.6	48.9	99	Aug 1949	-23	Jan 1942	6123	44.07	6.48	Sept 1961	28.6	34.3	Jan 1965	16.2	Feb 1961	75	4	21	139	4	Year	

(a) Average length of record, years.

T Trace, an amount too small to measure.

** Base 65°F

+ Also on earlier dates, months, or years.

* Less than one half.

CLIMATE OF KINGSTON

Kingston is located in Southern Rhode Island in low rolling agricultural land about 5 miles west of the inlet between Narragansett Bay and Block Island Sound. The weather station is located on the Agronomy Farm at the University of Rhode Island, 3 miles northeast of Worden Pond and its surrounding swamp and marsh area.

During the 30 year period from 1936-65 the summer months of June through August had an average temperature of 67.5° with a variation from year to year of less than 2.5° above or below the mean. The coolest summer occurred in 1946 when the temperature averaged 65.0°. The warmest summer, in 1955, averaged 70.0°. Although Kingston is near the coast, it has a sandy soil of Bridgehampton silt-loam which contributes to the large diurnal variability in the temperature. Even so, during the entire period of the available record beginning in 1893 there were only two below freezing measurements in the months of June through August. On the average there are only four days a year with a high temperature of over 90°, though there is a great deal of variation from year to year. Seven years out of thirty had no days with temperatures over 80° while in 1949 there were 14 such days and in July of that year the record high of 99° set in 1926 was tied. There are an unusually large number of heating degree days in Kingston in the months of June through August. Low night-time temperatures and cool afternoon sea breezes combine to produce an average of 118, the highest number in the state for the summer months.

The progression to winter is marked by the first freeze which occurs about October 5th. Seventy percent of the time the date of the 1st freezing temperature falls between Sept. 24th and October 17th. In only one year did the daily minimum for September fall below freezing more than 3 times. Readings below 20° in October are extremely rare, but occur occasionally in November when lows of 32° or less are common, especially toward the end of the month. The coldest autumn in the 30 year period occurred in 1939 when the mean for September through November was 50.3° and November had 22 days with lows below 32°.

In the winter months of December, January, and February, the daily maximum is usually well above freezing and there are on the average only 19 days a year without significant afternoon thawing. Winter has the greatest year to year temperature variation of any season. The coldest winter, 1960-61, had an average temperature of 26.4° and was 9.5° below the mean temperature of the warmest winter, 1936-37. While the daily minimum is below freezing on all but 12 days during the average winter, the mercury dips below 10° only one day in five. Below zero readings usually occur on only four days a year but the probability of a winter with no sub-zero temperatures is only one in six. The greatest number of days with below zero minima was 17 which occurred during the record cold winter of 1960-61.

The transition from winter to spring is more gradual than the change from autumn to winter. March is, on the average, 6° colder than November and has temperatures below freezing on most days. Seventy percent of the time the last freezing temperature occurs within 12 days of May 9th. In one year out of five the last freeze occurs in April. Temperatures above 70° are not likely in March, as the warmest day of the month averages 63°, but in April days with highs of over 70° are common and are found in most years. The warmest spring averaged 48.1° in 1945 and the coldest, in 1956, averaged 42.6°.

Precipitation is highly variable from year to year. The probability of any one year being four or more inches below normal is about one in four. The chance of having less than one inch of precipitation in any month is roughly twice as great from May through October as it is during the rest of the year. In one year out of three, less than .25 inch of rain can be expected for periods ranging from 20 to 40 days during the growing season. The worst dry spell on record occurred in 1957. During the 116 day period from April 10 through August 3, total precipitation was only 3.94 inches compared with a normal of 12.22 inches. Extended droughts as severe as that of 1957 are comparatively rare.

Seasonal snowfall averages 28.6 inches. Snow is most likely in January and February but may occur in any month from November to April, though the chance of no snow at all in November and April is 50 percent. The months of December through March have all had totals of over 20 inches, but such great accumulations are exceptionally rare. The number of days of snowfall of one inch or more averages eight. Half of these come in January and February. Days with snowfall of two inches or more average six; four inches or more, three; six inches or more, two; and eight inches or more, once per season. A day with 10 inches or more comes about once in two winters. The average greatest monthly snow cover in February is six inches and is the greatest of any month. Usually there are at most four to five inches on the ground during the snowiest part of any month, with bare ground most of the winter. The greatest amount of snow ever on the ground was 30 inches in February, 1961, but even this exceptional amount was completely melted within 20 days.

Thunderstorms are most likely in the months from April through September. An average of seven per year occur, though the amount varies between 2 and 10. Kingston receives a significantly smaller number of thunderstorms than do areas to the northwest.

Although Rhode Island is far north of the usual hurricane track some hurricanes move close to or through the state, producing heavy rain, high winds, and widespread damage. Important storms of tropical origin affected Kingston in 1831, 1869, 1938, 1954, 1955, and 1961. Probably the most damaging hurricane to strike the area was hurricane Carol in August 1954. Moving inland on the morning of the 31st,

Kingston, Rhode Island
Average Temperature (°F)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1936	26.4	29.2	41.4	43.4	56.6	64.6	67.9	68.8	62.6	53.0	38.9	36.0	48.6
1937	37.5	34.2	33.4	44.3	56.8	64.0	69.7	71.4	60.2	50.2	41.5	31.0	49.6
1938	27.0	31.7	38.4	47.0	53.7	63.8	70.5	72.8	60.8	43.6	43.6	32.6	49.6
1939	27.8	33.3	34.8	43.6	56.7	63.8	69.4	72.0	60.2	52.6	38.2	32.6	48.8
1940	20.4	30.2	31.9	42.5	54.6	62.6	69.2	64.6	60.4	47.6	41.3	35.2	46.7
1941	27.0	28.6	33.0	49.4	57.0	64.1	69.4	66.4	62.8	51.0	44.2	37.2	49.3
1942	25.4	27.6	39.6	46.4	58.4	67.4	70.4	67.8	62.2	41.2	41.2	27.2	48.4
1943	26.6	28.2	34.2	40.0	55.2	67.4	70.4	67.8	61.4	51.6	40.8	27.4	47.6
1944	29.6	28.3	33.5	43.2	58.4	64.6	70.4	70.1	62.6	50.4	41.0	29.1	48.4
1945	22.3	28.5	42.6	49.8	52.0	62.0	69.4	66.4	65.2	49.7	42.8	24.8	48.1
1946	29.0	27.2	42.2	42.6	53.8	62.2	67.2	65.6	62.8	54.6	44.2	32.4	48.6
1947	31.6	28.2	34.2	44.0	53.8	60.8	70.8	70.1	62.0	55.9	39.0	28.4	48.2
1948	22.0	24.4	36.4	45.8	53.4	62.8	69.8	68.8	62.9	50.7	45.1	32.6	47.9
1949	34.6	33.7	36.8	47.7	55.6	66.5	73.0	71.2	60.7	55.4	41.1	34.4	50.9
1950	36.6	28.0	32.7	42.9	53.3	63.0	69.0	67.6	59.1	53.7	44.0	32.2	48.5
1951	32.4	33.5	37.9	48.6	55.5	63.2	70.7	69.1	61.9	53.1	40.1	34.5	50.0
1952	32.1	31.6	36.0	48.6	54.2	66.2	73.5	69.7	62.9	49.2	41.8	33.4	49.9
1953	37.7	34.3	38.2	46.6	57.2	65.1	69.0	68.8	62.9	52.5	44.6	37.7	51.0
1954	27.6	36.1	37.3	46.8	54.3	64.7	67.3	65.8	60.3	57.0	43.4	33.5	49.5
1955	27.7	31.6	37.6	47.8	57.8	63.5	78.0	72.0	62.1	54.2	40.3	25.4	49.5
1956	29.7	32.4	32.5	42.9	52.6	65.6	68.3	68.0	59.6	52.2	43.8	36.9	48.8
1957	22.8	34.0	38.9	48.0	56.7	67.6	69.1	65.9	63.2	51.3	43.3	38.1	50.1
1958	30.5	24.7	37.2	46.9	53.3	61.3	70.4	68.2	62.1	51.4	44.8	24.7	48.0
1959	28.6	27.6	36.5	48.2	58.6	64.0	71.0	72.1	65.5	54.3	43.7	33.2	50.3
1960	28.6	34.5	30.3	47.8	56.0	65.3	67.7	68.8	61.3	51.1	43.7	27.2	48.5
1961	22.4	29.5	37.1	44.9	54.4	64.9	70.7	69.4	68.6	54.9	44.0	32.0	49.4
1962	28.6	26.5	36.2	47.1	54.7	64.5	65.7	67.1	59.0	52.0	40.4	28.3	47.5
1963	28.4	26.1	37.8	46.3	55.2	65.3	70.8	58.6	58.6	55.5	45.9	24.7	48.5
1964	29.9	27.6	37.3	45.0	57.9	63.9	69.6	64.6	61.5	50.4	43.1	33.4	48.7
1965	24.3	27.1	35.0	43.8	58.3	63.6	68.5	68.8	62.6	50.4	40.4	33.2	48.0

Kingston, Rhode Island
Total Precipitation (Inches)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1936	6.85	4.21	6.47	3.41	1.81	4.29	1.56	4.46	7.91	2.45	1.19	11.59	56.20
1937	4.45	2.47	4.07	5.47	3.31	4.36	.97	4.06	3.24	4.02	5.73	2.71	44.86
1938	3.93	2.29	2.57	3.33	5.84	7.05	4.49	3.51	5.91	3.95	4.42	3.57	50.74
1939	3.83	4.73	6.63	3.39	.67	3.33	1.00	8.82	2.29	4.77	1.55	2.71	45.76
1940	2.34	4.40	3.60	5.15	4.18	1.93	3.46	.81	3.59	2.38	7.16	2.04	41.64
1941	3.75	1.56	3.27	1.99	2.48	6.83	4.15	1.87	.35	2.19	3.75	6.38	35.02
1942	3.61	4.60	7.10	1.72	1.72	2.65	4.26	6.00	2.21	4.27	5.19	2.83	48.71
1943	3.43	2.10	2.60	3.33	3.61	1.40	2.69	2.63	1.20	4.57	2.66	1.54	31.76
1944	2.03	1.82	5.61	3.32	.76	2.10	.67	1.82	6.10	2.46	9.90	2.89	39.48
1945	3.14	3.18	2.28	2.59	4.86	2.84	1.22	3.83	1.25	2.33	8.16	7.17	42.85
1946	4.47	2.60	1.73	2.53	4.77	2.83	2.04	11.12	2.24	.57	.96	3.38	39.24
1947	3.41	.67	3.33	5.26	4.42	3.31	4.79	1.62	2.35	3.60	6.12	2.80	41.68
1948	5.79	2.77	4.43	4.20	8.61	2.37	1.87	.79	.96	4.22	4.52	2.20	42.73
1949	5.22	4.39	2.58	4.57	2.63	.04	1.89	2.51	4.02	1.60	3.40	3.00	35.85
1950	3.55	3.97	3.46	2.14	3.02	2.00	1.18	2.94	1.28	1.56	6.89	3.55	35.54
1951	4.07	3.67	4.48	2.81	3.90	2.38	1.05	3.55	2.35	2.60	6.84	4.75	42.65
1952	5.02	3.60	4.76	3.06	4.18	2.43	4.3	13.56	1.17	.88	1.86	4.00	42.95
1953	7.12	4.48	9.02	6.39	4.27	6.24	6.24	2.49	2.49	4.72	6.02	5.77	62.09
1954	2.65	2.63	3.15	5.14	5.63	1.75	2.55	9.77	7.00	2.19	5.23	6.13	53.82
1955	.83	4.38	4.25	2.60	1.86	3.14	3.79	10.08	5.26	7.45	5.93	.83	50.40
1956	4.31	1.75	5.15	3.31	2.51	2.31	6.96	1.07	2.96	3.87	3.73	4.70	45.69
1957	2.03	4.45	3.29	4.34	1.99	1.12	1.46	1.60	1.79	3.03	3.94	5.48	33.52
1958	7.79	3.37	4.25	7.73	4.44	2.81	4.29	7.18	5.71	3.77	3.00	1.48	55.82
1959	2.19	2.47	5.45	2.99	2.90	6.92	4.23	3.88	.83	4.45	4.07	4.09	44.47
1960	2.67	7.55	2.95	3.24	3.90	1.84	4.22	1.77	7.27	3.22	3.81	3.94	46.38
1961	1.80	2.94	3.68	8.02	5.83	2.63	1.05	6.46	10.62	3.14	3.66	3.32	53.15
1962	6.44	3.84	1.73	2.17	1.89	5.54	1.77	4.08	3.78	8.26	4.88	3.75	49.05
1963	3.65	3.41	3.60	2.17	4.82	1.45	4.69	2.81	3.93	1.94	6.89	2.78	42.04
1964	3.53	3.47	2.67	7.95	.67	.86	4.46	.88	4.18	2.49	3.04	4.45	40.65
1965	3.37	3.65	1.73	3.69	1.94	1.55	2.30	2.83	2.99	3.14	1.68	1.82	30.69

CLIMATE OF KINGSTON (Continued)

Carol passed 35 miles west of Kingston. The hurricane yielded only 2.94 inches of rain at Kingston but lashed the area with sustained winds of 70 mph and gusts of more than 120 mph.

In summary, Kingston's climate features certain major attributes of constancy, including 1) changeableness of the weather, 2) large but not excessive ranges in temperature, both diurnal and annual, 3) ample and variable precipitation but with a tendency toward decreased rainfall during the warmer months, and 4) great variations between the same seasons in different years. Putting it another way, Kingston has a continental climate which is strongly influenced by migratory cyclones and frequently moderated by maritime air masses.

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HISTORY OF WEATHER OBSERVATIONS AT KINGSTON, R. I.

Official temperature and precipitation observations at Kingston began July 19, 1888. They have been continued without interruption by the same co-operator until the present time. At first the observations were taken at an elevation of 250 feet at the Rhode Island State Agricultural School. Later, in 1892, the observations were continued by the Rhode Island Experiment Station (Rhode Island State College). In March, 1930, the observation site was moved to a new location at an elevation of 100 feet and the observations were continued by the Agricultural Experiment Station. In 1951 Rhode Island State College became the University of Rhode Island. Soil temperature observations at various depths were begun in May, 1955, and evaporation observations were added in June, 1957.

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