



2020 Weather in Review: Gateway National Recreation Area

Weather and climate play significant roles in driving both physical and ecological processes. For example, the active processes that shape the North Atlantic coastline are largely the result of meteorological events such as wind-driven waves. For research and long-term ecological monitoring, weather and climate data provide the potential for correlations to be made with observed physical and ecological pattern data. This resource brief provides a summary of both historic and current (2020) weather data for [Gateway National Recreation Area](#) (GATE) units in Kings County, New York (NY) and Monmouth County, New Jersey (NJ). Because tide levels and wind can be significant for coastal parks, the annual water level and wind data are included.

Temperature

Kings County, NY

Overall, 2020 was the 2nd warmest year on record with an average temperature of 57.2 °F — 3.8 degrees above the normal average (Figure 1). Spring fell within the “near normal” temperatures, while summer, autumn, and winter seasons fell within “much above normal” temperatures. 2020 had the 2nd warmest winter on record. Only April and May had lower than average monthly temperatures (Table 1).

Table1. Kings County, New York average monthly, average annual, and departures from long-term average temperatures. Departures from average are based on a comparison of 2020 average temperatures to relevant averages from 1895-2019. Data are available at NOAA NCEI: Climate at a Glance (<https://www.ncdc.noaa.gov/cag/county/time-series/NY-047/tavg/all/12/2020-2020>).

Month (2020)	Average temperature (°F)	Departure from long-term average temperature (°F)
January	39.1	+7.5
February	40.0	+7.7
March	47.3	+7.0
April	49.4	-0.9
May	59.6	-1.2
June	73.5	+3.3
July	80.6	+4.9
August	77.6	+3.5
September	69.2	+1.7
October	58.5	+1.9
November	52.0	+6.3
December	39.2	+3.5
Annual	57.2	+3.8

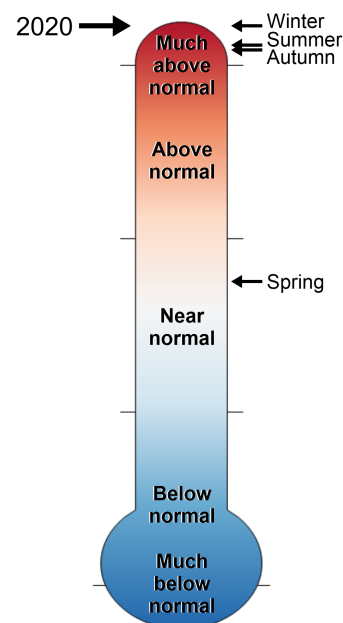


Figure 1. Kings County, New York annual and seasonal temperature rankings from 1895-2020. Of the 126 records, 2020 was the 2nd warmest year. Seasonally, it was the 2nd warmest winter, 55th warmest spring, 6th warmest summer, and the 7th warmest autumn. Data are available at NOAA NCEI: Climate at a Glance (<https://www.ncdc.noaa.gov/cag/county/rankings/NY-047/tavg/202012>).

Monmouth County, NJ

Overall, 2020 was the warmest year on record with an average temperature of 56.7 °F — 4.3 degrees above the normal average (Figure 2). Spring fell within “above normal” temperatures, while summer, autumn, and winter seasons fell within “much above normal” temperatures. 2020 also had the warmest winter on record. Ten out of twelve months had a higher than average temperatures (Table2).

Table 2. Monmouth County, New Jersey average monthly, average annual, and departures from long-term average temperatures. Departures from average are based on a comparison of 2020 average temperatures to relevant averages from 1895-2019. Data are available at NOAA NCEI: Climate at a Glance (<https://www.ncdc.noaa.gov/cag/county/time-series/NJ-025/tavg/all/12/2020-2020>).

Month (2020)	Average temperature (°F)	Departure from long-term average temperature (°F)
January	38.3	+7.6
February	40.6	+8.9
March	47.4	+7.5
April	49.4	-0.4
May	59.8	-0.5
June	72.8	+3.5
July	79.7	+5.2
August	76.9	+4.2
September	68.4	+2.3
October	58.2	+3.2
November	50.5	+6.2
December	38.5	+4.0
Annual	56.7	+4.3

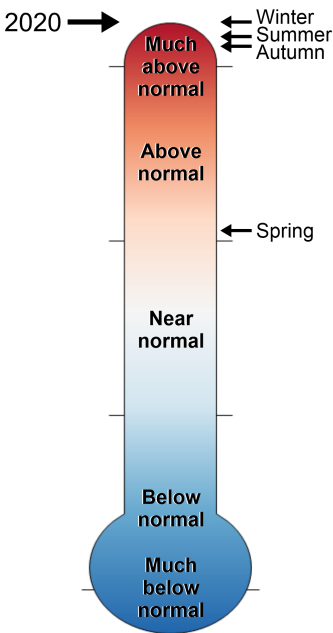


Figure 2. Monmouth County, New Jersey annual and seasonal temperature rankings from 1895-2020. Of the 126 records, 2020 was the warmest year. Seasonally, it was the warmest winter, 44th warmest spring, 4th warmest summer, and the 6th warmest autumn. Data are available at NOAA NCEI: Climate at a Glance (<https://www.ncdc.noaa.gov/cag/county/rankings/NJ-025/tavg/202012>).



Precipitation

Kings County, NY

Overall, 2020 was the 61st wettest year on record with a total of 44.90 inches of precipitation (Figure 3, Table 3). Seasonally, winter and spring fell within “below normal” levels, while summer and autumn reached “above normal” levels. Six months had higher than average amounts of precipitation. July had the greatest amount of precipitation in 2020 at 7.15 inches — 2.72 inches above average. May had the lowest amount at 1.66 inches — 2.19 inches below average.

Table 3. Kings County, New York monthly and annual total precipitation and departures from long-term average totals. Departures from average are based on a comparison of 2020 precipitation levels to relevant averages from 1895-2019. Data are available at NOAA NCEI: Climate at a Glance (<https://www.ncdc.noaa.gov/cag/county/time-series/NY-047/pcp/all/12/2020-2020>).

Month (2020)	Total precipitation (in)	Departure from long-term average precipitation (in)
January	1.91	-1.50
February	2.86	-0.39
March	3.89	-0.15
April	4.03	+0.24
May	1.66	-2.19
June	2.28	-1.37
July	7.15	+2.72
August	3.96	-0.34
September	3.73	+0.09
October	5.24	+1.70
November	4.09	+0.63
December	4.10	+0.38
Annual	44.90	-0.17

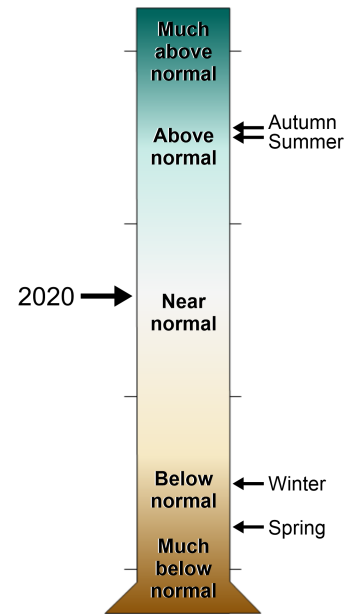


Figure 3. Kings County, New York annual and seasonal precipitation rankings from 1895-2020. Of the 126 records, 2020 was the 61st wettest year. Seasonally, it was the 27th driest winter, 18th driest spring, 28th wettest summer, and 26th wettest autumn. Data are available at NOAA NCEI: Climate at a Glance (<https://www.ncdc.noaa.gov/cag/county/rankings/NY-047/pcp/202012>).

Monmouth County, NJ

Overall, 2020 was the 36th wettest year on record with a total of 48.87 inches of precipitation (Figure 4, Table 4). Seasonally, winter fell within a “below normal” level, spring and summer fell within “near normal” levels, while autumn nearly reached “much above normal” levels. October had the greatest amount of precipitation in 2020 at 6.31 inches — 2.76 inches above average. May had the lowest amount at 2.03 inches — 1.79 inches below average.

Table 4. Monmouth County, New Jersey monthly and annual total precipitation and departures from long-term average totals. Departures from average are based on a comparison of 2020 precipitation levels to relevant averages from 1895-2019. Data are available at NOAA NCEI: Climate at a Glance (<https://www.ncdc.noaa.gov/cag/county/time-series/NJ-025/pcp/all/12/2020-2020>).

Month (2020)	Total precipitation (in)	Departure from long-term average precipitation (in)
January	2.14	-1.37
February	2.91	-0.30
March	4.22	+0.20
April	4.16	+0.44
May	2.03	-1.79
June	4.74	+1.00
July	5.96	+1.31
August	4.13	-0.44
September	3.48	-0.14
October	6.31	+2.76
November	3.37	-0.11
December	5.42	+1.64
Annual	48.87	+3.19

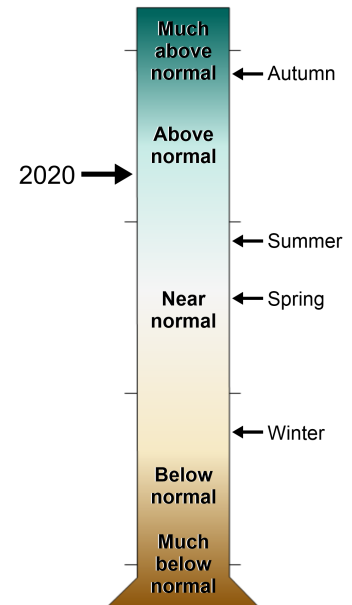


Figure 4. Monmouth County, New Jersey annual and seasonal precipitation rankings from 1895-2020. Of the 126 records, 2020 was the 36th wettest year. Seasonally, it was the 37th driest winter, 65th driest spring, 50th wettest summer, and 15th wettest autumn. Data are available at NOAA NCEI: Climate at a Glance (<https://www.ncdc.noaa.gov/cag/county/rankings/NJ-025/pcp/202012>).

Temperature and Precipitation Trends (1895–2020)

Temperature and precipitation data are gathered from the [U.S. Climate Division Database](#), which stores data from January 1895 to the present, and can be accessed via the National Oceanic and Atmospheric Administration's (NOAA) [National Centers for Environmental Information \(NCEI\) website](#) (Figures 5 and 6). Users can choose different geographic scales (i.e., global, national, statewide), different temporal scales, and display them in various types of graphical formats. Temperature and precipitation data presented in this brief are for Kings County, NY, and Monmouth County, NJ.

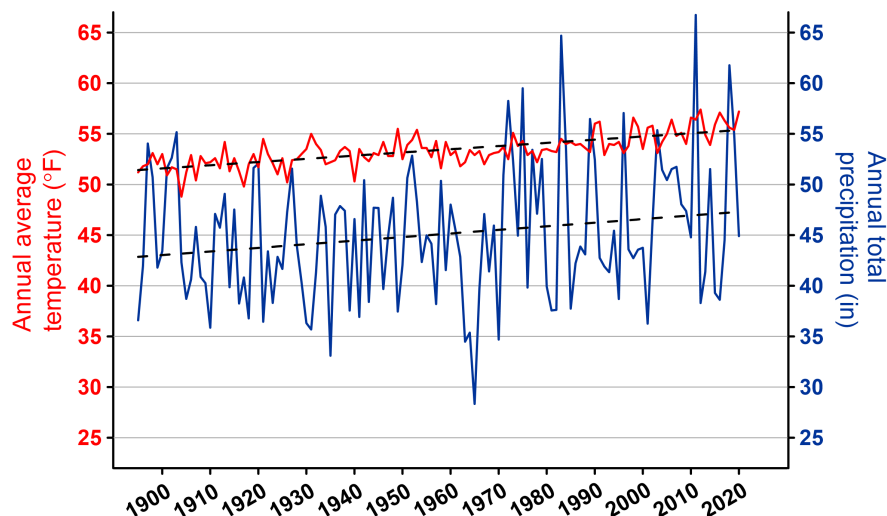


Figure 5. Kings County, New York yearly average temperature and precipitation from 1895 to 2020. Dashed lines represent the 1895-2020 trend for each parameter; $+0.3^{\circ}\text{F}/\text{decade}$ for temperature and $+0.36\text{ in}/\text{decade}$ for precipitation. Data are available at <https://www.ncdc.noaa.gov/cag/county/time-series/>.

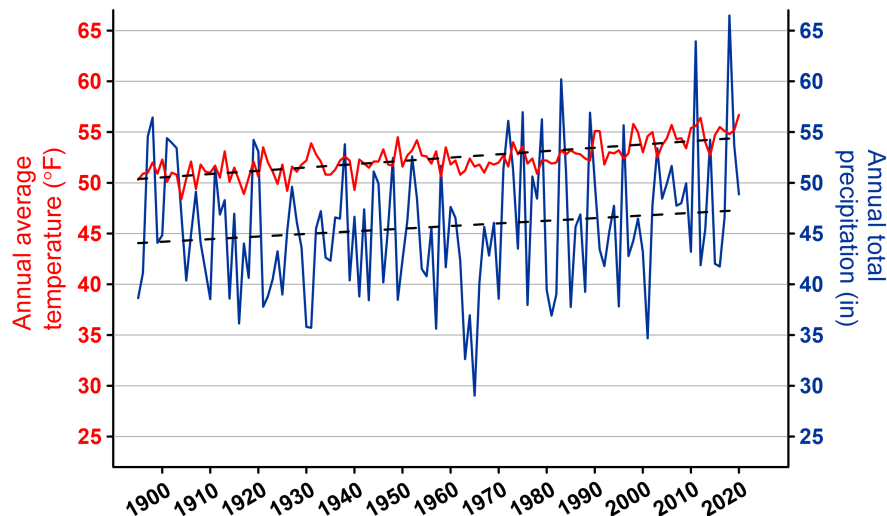


Figure 6. Monmouth County, New Jersey yearly average temperature and precipitation from 1895 to 2020. Dashed lines represent the 1895-2020 trend for each parameter; $+0.3^{\circ}\text{F}/\text{decade}$ for temperature and $+0.26\text{ in}/\text{decade}$ for precipitation. Data are available at <https://www.ncdc.noaa.gov/cag/county/time-series/>.



Wind

Wind data (wind speed and direction) was collected from NOAA's National Water Level Observation Network (NWLON) station 8531680, located at Sandy Hook, NJ. Each direction is divided into categories called bins that are color coated to represent the frequency of a certain wind speed. The length of the bin represents the number of times wind comes from a given direction as well as the speed of the wind. The longer the length of the bin, the more frequent the given speed was recorded (Figure 7).

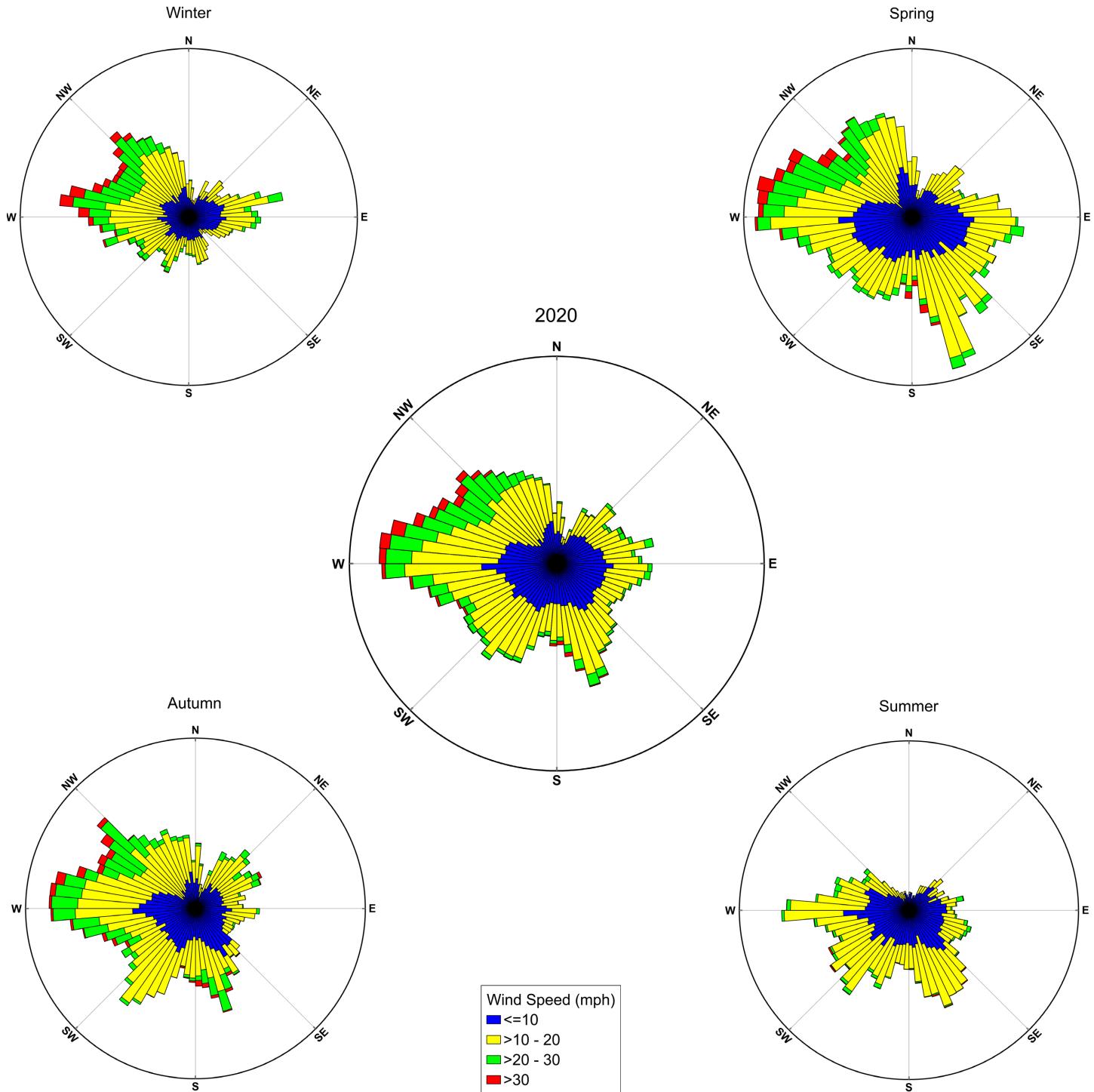
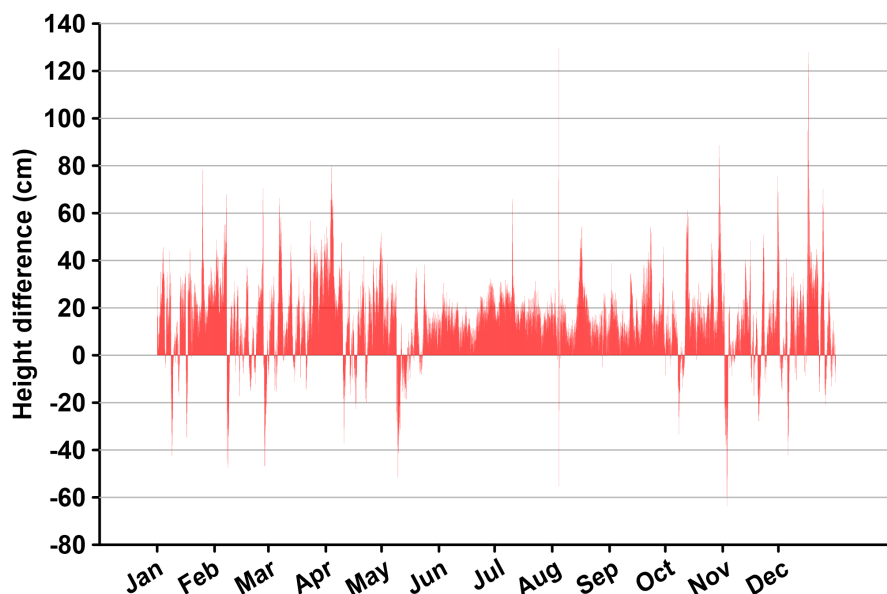


Figure 7. Wind charts reflecting both the seasonal and annual wind direction and speed at at Sandy Hook, New Jersey during 2020. Each direction is divided into categories called bins that are color coated to represent the frequency of a certain wind speed. The length of the bin represents the number of times wind comes from a given direction as well as the speed of the wind. The longer the length of the bin, the more frequent the given speed was recorded. Data are available at <https://tidesandcurrents.noaa.gov/met.html?id=8531680>.

Tide Levels

Water level data is also collected from the NOAA's NWLON station 8531680 located at Sandy Hook, NJ. The data is graphed to show the difference in the predicted tide level verses what was observed (Figure 8). The offsets in height reflect the effect from storm surge on the normal, astronomically driven tide level.

Figure 8. This bar graph (right) depicts the difference in the predicted and observed tide levels at Sandy Hook, New Jersey for 2020. Data available at <https://tidesandcurrents.noaa.gov/waterlevels.html?id=8531680>.



Northeast Coastal and Barrier Network

University of Rhode Island

Dept. Natural Resources Science

Coastal Institute, Room 105

1 Greenhouse Road, Kingston, RI 02881

<http://science.nature.nps.gov/im/units/ncbn>