

Rhode Island's Climate

PAST AND FUTURE CHANGES



Climate has changed throughout the Earth's history and will continue to change. However, analysis of climate data* shows that the rate of change in Rhode Island has increased significantly over the last four decades, with the region getting warmer and wetter. And with rising levels of heat trapping gases in the atmosphere, these trends are expected to continue for the foreseeable future.



TEMPERATURES

WHAT HAVE WE SEEN SINCE 1970?

- Average maximum temperatures have warmed by 2.2°F (annual) and 3.0°F (winter)
- Average minimum temperatures have warmed by 2.2°F (annual) and 3.4°F (winter)

WHAT CAN WE EXPECT BY 2020-2099?

- Warmer winters: 22-45 fewer days below 32°F
- Hotter summers: 13-44 more days above 90°F



RAINFALL AND FLOODING

WHAT HAVE WE SEEN SINCE 1970?

- Annual precipitation has increased 6-11%
- Both the frequency and magnitude of extreme precipitation events has increased

WHAT CAN WE EXPECT BY 2020-2099?

- More precipitation (annual averages will increase by 18-20%)
- A two-fold increase in extreme precipitation events
- More frequent and severe flooding



SNOW AND ICE

WHAT HAVE WE SEEN SINCE 1970?

- Fewer days with snow cover
- Lake ice-out dates are occurring earlier

WHAT CAN WE EXPECT BY 2020-2099?

- Less snow and more rain
- Less snow cover: 20-32 fewer snow covered days

CLIMATE ON THE MOVE

Changing Summers in Rhode Island

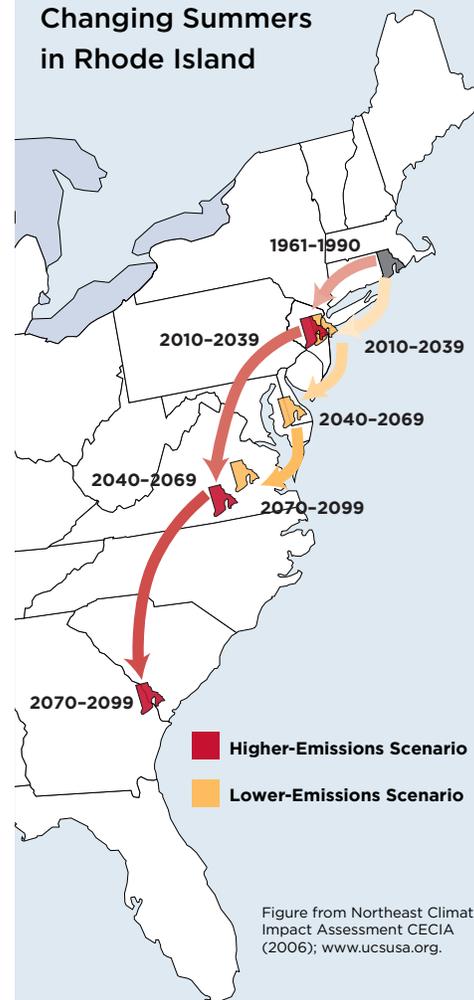


Figure from Northeast Climate Impact Assessment CECIA (2006); www.ucsusa.org.

Yellow arrows track what summers are projected to feel like under a lower emissions scenario, while red arrows track projections for a higher emissions scenario. For example, under the higher emission scenario, by late this century residents of Rhode Island would experience a summer climate more like what occurs in South Carolina and Georgia.

*Detailed results of climate data analysis and methods used to analyze meteorological data and climate model output are available at: ClimateSolutionsNE.org/assessments

CLIMATE GRID

The table below includes historical and projected future thirty-year averages of daily measures for minimum and maximum temperature (annual, seasonal, extremes), length of the growing season, precipitation (annual, seasonal, extremes), and snow-covered days. The projected values were derived from four Global Climate Models, which used historical input data from meteorological stations, provided by Global Historical Climatology Network-Daily.

RHODE ISLAND	30 YEAR AVERAGE* 1980-2009	CHANGE FROM 30 YEAR AVERAGE 1980-2009 (+ OR -)					
		SHORT TERM 2010-2039		MEDIUM TERM 2040-2069		LONG TERM 2070-2099	
		LOW EMISSIONS	HIGH EMISSIONS	LOW EMISSIONS	HIGH EMISSIONS	LOW EMISSIONS	HIGH EMISSIONS
INDICATORS							
MINIMUM TEMPERATURE (°F)							
Annual TMIN	40.4	1.6	1.8	2.7	4.7	3.5	8.1
Winter TMIN	21.6	1.8	2.0	3.0	4.5	4.1	7.6
Spring TMIN	37.0	2.7	1.4	4.3	3.8	5.4	6.8
Summer TMIN	59.7	1.6	2.1	2.8	5.7	3.5	9.7
Fall TMIN	43.6	0.3	1.8	0.6	5.3	1.1	8.8
MAXIMUM TEMPERATURE (°F)							
Annual TMAX	59.5	1.6	1.6	2.8	4.6	3.8	7.9
Winter TMAX	38.9	1.5	1.4	2.3	3.3	3.3	5.7
Spring TMAX	57.0	2.4	1.5	4.6	4.5	6.2	8.2
Summer TMAX	78.9	1.6	2.0	3.2	5.5	4.0	9.4
Fall TMAX	62.7	0.9	1.6	1.3	5.0	1.5	8.0
TEMPERATURE EXTREME (DAYS PER YEAR)							
<32°F	121	-10	-11	-16	-26	-22	-45
<0°F	3	-1	-1	-2	-2	-2	-3
>90°F	3	3	4	8	18	13	44
>95°F	0	1	1	1	4	3	16
TMAX on hottest day of the year	91.5	1.8	1.4	3.4	5.3	5.1	9.6
TMIN on coldest day of the year	-2.7	3.2	3.9	5.3	8.4	6.7	14.3
GROWING SEASON (DAYS)	206	11	12	16	28	23	44
PRECIPITATION (IN.)							
Annual Mean	48.3	5.5	4.7	6.8	6.1	8.6	9.5
Winter Mean	12.0	1.3	1.1	1.9	1.4	2.3	3.4
Spring Mean	12.6	1.4	1.8	1.6	2.2	2.4	3.6
Summer Mean	10.6	2.1	1.3	2.1	1.5	2.3	1.3
Fall Mean	13.1	0.7	0.5	1.1	0.8	1.5	1.3
EXTREME PRECIPITATION (EVENTS PER YEAR)							
1" in 24 hours	13.9	2.2	1.6	2.4	2.2	3.4	3.9
2" in 48 hours	8.0	2.0	1.5	2.9	2.6	3.8	4.7
EXTREME PRECIPITATION (EVENTS PER DECADE)							
4" in 48 hours	8.6	2.5	2.8	6.2	6.2	8.1	11.0
SNOW COVERED DAYS	48	-13	-13	-17	-25	-20	-32

*There were significant gaps in the daily data from some sites for the period 1980-2009. Instead, the historical values in these tables were derived from the downscaled GCM model output.