

Climate Atlas Report

Municipality: St. Catharines



RCP 8.5: High Carbon climate future

GHG emissions continue to increase at current rates

Variable	Period	1976-2005 Mean	2021-2050			2051-2080		
			Low	Mean	High	Low	Mean	High
Precipitation (mm)	annual	823	699	874	1047	730	900	1084
Precipitation (mm)	spring	211	157	233	319	167	246	335
Precipitation (mm)	summer	208	124	210	304	120	208	311
Precipitation (mm)	fall	216	141	223	313	138	223	318
Precipitation (mm)	winter	189	140	208	283	150	223	304
Mean Temperature (°C)	annual	9.3	10.2	11.4	12.7	12.1	13.5	15.1
Mean Temperature (°C)	spring	7.3	7.1	9.1	11.2	8.9	11	13.3
Mean Temperature (°C)	summer	20.9	21.6	23	24.5	23.4	25.2	27
Mean Temperature (°C)	fall	11.3	11.9	13.5	15.1	13.7	15.4	17.2
Mean Temperature (°C)	winter	-2.3	-2.4	0	2.5	-0.2	2.3	4.9
Tropical Nights	annual	13	18	32	48	37	57	79
Very hot days (+30°C)	annual	16	17	37	56	38	63	88
Very cold days (-30°C)	annual	0	0	0	0	0	0	0
Date of Last Spring Frost	annual	April 15	March 19	April 7	April 22	Feb. 28	March 27	April 16
Date of First Fall Frost	annual	Nov. 3	Oct. 22	Nov. 14	Dec. 7	Nov. 5	Nov. 29	Dec. 22
Frost-Free Season (days)	annual	198	190	218	247	212	244	278

RCP 4.5: Low Carbon climate future

GHG emissions much reduced

Variable	Period	1976-2005 Mean	2021-2050			2051-2080		
			Low	Mean	High	Low	Mean	High
Precipitation (mm)	annual	824	698	863	1035	702	885	1075
Precipitation (mm)	spring	211	151	226	309	158	233	317
Precipitation (mm)	summer	208	128	212	310	122	211	317
Precipitation (mm)	fall	216	140	221	315	145	229	325
Precipitation (mm)	winter	188	136	205	281	141	212	286
Mean Temperature (°C)	annual	9.3	10	11.2	12.5	10.7	12.2	13.7
Mean Temperature (°C)	spring	7.3	7.1	9	11	7.9	9.9	12.1
Mean Temperature (°C)	summer	20.8	21.2	22.6	24	21.9	23.7	25.6
Mean Temperature (°C)	fall	11.3	11.6	13.3	14.8	12.3	14.1	15.8
Mean Temperature (°C)	winter	-2.3	-2.6	-0.2	2.2	-1.6	1	3.5
Tropical Nights	annual	13	14	28	43	20	39	61
Very hot days (+30°C)	annual	15	15	33	54	22	45	69
Very cold days (-30°C)	annual	0	0	0	0	0	0	0
Date of Last Spring Frost	annual	April 15	March 23	April 8	April 22	March 16	April 4	April 21
Date of First Fall Frost	annual	Nov. 3	Oct. 23	Nov. 14	Dec. 5	Oct. 26	Nov. 20	Dec. 13
Frost-Free Season (days)	annual	198	191	217	244	195	227	256

Where did this data come from?

Global Climate Models (GCMs) are used to depict how the climate is likely to change in the future. Since no one climate model can be considered 'correct', it is important to use many GCMs to capture a range of possible conditions. The GCM data we used were obtained from the Pacific Climate Impacts Consortium (PCIC). PCIC collected temperature and precipitation data produced by 24 different models and used advanced statistical techniques to create high-resolution (daily, 10km) versions of the data for all of Canada (for more information visit pacificclimate.org).

What are the RCP 8.5 and RCP 4.5 future climate scenarios?

One of the most important inputs into GCM simulations of the future climate is the expected concentration of greenhouse gases (GHGs; especially carbon dioxide) in the atmosphere as a result of human activity. In the scientific literature these future GHG concentrations are used to calculate Representative Concentration Pathways (RCPs). The High Carbon scenario (RCP8.5) assumes that we continue to emit very large amounts of carbon dioxide from the burning of fossil fuels; the Low Carbon scenario (RCP4.5) assumes that drastic reductions of emissions in the coming decades will stabilize the concentration of GHGs in the atmosphere by the end of this century. We did not use RCP2.6, an even lower emissions scenario.

How are the minimum, mean, and maximum calculated?

We used an ensemble of 24 different GCMs to analyze the future climate. The mean values are the average values of this ensemble over the 1976-2005, 2021-2050 and 2051-2080 periods. The range of values in each time period is indicated by the High (90th percentile) and Low (10th percentile) values in the tables. This means about 10% of the predicted values are above the "High" value, and 10% are lower than the "Low" value.

The Climate Atlas of Canada

The Climate Atlas of Canada (climateatlas.ca) is an interactive tool for citizens, researchers, businesses, and community and political leaders to learn about climate change in Canada. It combines climate science, mapping and storytelling to bring the global issue of climate change closer to home, and is designed to inspire local, regional, and national action and solutions.

Source

Prairie Climate Centre (2019). Climate Atlas of Canada, version 2 (July 10, 2019). <https://climateatlas.ca>

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