Climate Atlas Report

Municipality: Fort McMurray

RCP 8.5: High Carbon climate future

GHG emissions continue to increase at current rates

Variable	Period	1976-2005	2021-2050			2051-2080		
		Mean	Low	Mean	High	Low	Mean	High
Precipitation (mm)	annual	442	358	469	593	375	492	632
Precipitation (mm)	spring	76	47	84	131	50	94	145
Precipitation (mm)	summer	202	122	208	303	119	211	319
Precipitation (mm)	fall	100	63	109	166	69	115	174
Precipitation (mm)	winter	64	47	69	92	48	73	100
Mean Temperature (°C)	annual	1	1.6	3.2	5	3.4	5.5	7.7
Mean Temperature (°C)	spring	2	1.1	4.1	7.3	2.6	5.9	9.6
Mean Temperature (°C)	summer	16	16.2	18	20	17.8	20.1	22.5
Mean Temperature (°C)	fall	1.9	1.7	4.1	6.2	4	6.3	8.6
Mean Temperature (°C)	winter	-16.3	-18	-13.6	-9.4	-15.1	-10.6	-6.4
Tropical Nights	annual	0	0	0	2	0	3	9
Very hot days (+30°C)	annual	6	2	14	29	7	28	52
Very cold days (-30°C)	annual	23	2	12	25	0	5	14
Date of Last Spring Frost	annual	May 18	April 21	May 9	May 26	April 11	May 3	May 20
Date of First Fall Frost	annual	Sep. 17	Sep. 11	Sep. 28	Oct. 18	Sep. 18	Oct. 7	Oct. 28
Frost-Free Season (days)	annual	118	114	138	164	126	154	184

RCP 4.5: Low Carbon climate future

GHG emissions much reduced

Variable	Period	1976-2005	2021-2050			2051-2080		
		Mean	Low	Mean	High	Low	Mean	High
Precipitation (mm)	annual	442	352	471	595	363	482	617
Precipitation (mm)	spring	76	46	83	131	47	90	142
Precipitation (mm)	summer	202	125	211	306	125	211	312
Precipitation (mm)	fall	100	64	108	160	66	111	165
Precipitation (mm)	winter	64	46	69	94	48	71	96
Mean Temperature (°C)	annual	1	1.2	2.9	4.7	2.2	4	5.9
Mean Temperature (°C)	spring	2	0.5	3.8	7	1.7	4.8	8.1
Mean Temperature (°C)	summer	16	15.9	17.7	19.5	16.6	18.6	20.6
Mean Temperature (°C)	fall	1.9	1.4	3.8	6	2.3	4.7	7
Mean Temperature (°C)	winter	-16.3	-18	-14	-10	-16.4	-12.3	-8.3
Tropical Nights	annual	0	0	0	1	0	1	3
Very hot days (+30°C)	annual	6	2	12	26	3	17	35
Very cold days (-30°C)	annual	23	4	14	27	1	9	20
Date of Last Spring Frost	annual	May 18	April 23	May 10	May 28	April 17	May 7	May 25
Date of First Fall Frost	annual	Sep. 18	Sep. 9	Sep. 27	Oct. 17	Sep. 11	Sep. 30	Oct. 22
Frost-Free Season (days)	annual	119	110	135	162	116	143	174

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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