

Climate Atlas Report

Municipality: Lethbridge



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	390	281	417	571	287	434	602
Precipitation (mm)	spring	105	61	123	201	67	131	208
Precipitation (mm)	summer	154	67	155	263	63	155	275
Precipitation (mm)	fall	74	33	78	141	35	80	148
Precipitation (mm)	winter	57	33	61	95	37	68	103
Mean Temperature (°C)	annual	5.8	6	7.8	9.6	7.9	9.9	11.9
Mean Temperature (°C)	spring	5.3	4.3	7.3	10.2	5.9	9	12.1
Mean Temperature (°C)	summer	17.3	17.6	19.4	21.3	19.4	21.7	24
Mean Temperature (°C)	fall	6.4	5.7	8.2	10.4	7.8	10.3	12.8
Mean Temperature (°C)	winter	-6.1	-8.9	-4	0.5	-6.4	-1.8	2.7
Tropical Nights	annual	0	0	0	2	0	4	12
Very hot days (+30°C)	annual	17	14	33	54	30	54	78
Very cold days (-30°C)	annual	4	0	2	6	0	1	3
Date of Last Spring Frost	annual	May 10	April 12	April 30	May 15	April 3	April 22	May 10
Date of First Fall Frost	annual	Sep. 23	Sep. 17	Oct. 3	Oct. 22	Sep. 22	Oct. 12	Oct. 30
Frost-Free Season (days)	annual	133	130	152	178	141	169	200

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	391	285	413	570	279	421	592	
Precipitation (mm)	spring	105	62	121	193	60	122	196	
Precipitation (mm)	summer	155	70	154	261	68	154	267	
Precipitation (mm)	fall	74	32	77	139	32	79	145	
Precipitation (mm)	winter	57	33	61	94	35	65	101	
Mean Temperature (°C)	annual	5.8	5.8	7.6	9.4	6.8	8.7	10.6	
Mean Temperature (°C)	spring	5.4	4.2	7.2	10	5.1	8.1	10.9	
Mean Temperature (°C)	summer	17.3	17.4	19.1	21	18.1	20.2	22.3	
Mean Temperature (°C)	fall	6.4	5.5	8.1	10.3	6.4	9	11.2	
Mean Temperature (°C)	winter	-6.1	-8.5	-4.2	0	-7.2	-2.9	1.3	
Tropical Nights	annual	0	0	0	1	0	1	3	
Very hot days (+30°C)	annual	17	13	31	52	18	41	65	
Very cold days (-30°C)	annual	4	0	2	7	0	1	4	
Date of Last Spring Frost	annual	May 10	April 12	May 1	May 18	April 8	April 27	May 13	
Date of First Fall Frost	annual	Sep. 23	Sep. 13	Oct. 1	Oct. 20	Sep. 18	Oct. 6	Oct. 25	
Frost-Free Season (days)	annual	133	124	149	177	131	159	187	

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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