



Pembina Valley

Medium Carbon Emissions (RCP4.5)

Climate Variable	Season	1981-2010 (Baseline)	2021-2050			2051-2080		
			L	M	H	L	M	H
Mean Temperature	Annual	3.2 °C	4.4 °C	5.0 °C	5.7 °C	5.7 °C	6.2 °C	6.6 °C
	Winter	-14.1 °C	-12.9 °C	-11.8 °C	-10.6 °C	-11.3 °C	-10.2 °C	-9.1 °C
	Spring	3.1 °C	4.1 °C	4.8 °C	5.8 °C	5.1 °C	5.8 °C	6.5 °C
	Summer	18.5 °C	19.3 °C	19.9 °C	20.5 °C	20.4 °C	21.1 °C	21.6 °C
	Fall	4.9 °C	6.0 °C	6.6 °C	7.2 °C	7.1 °C	7.6 °C	8.2 °C
Precipitation	Annual	512.5 mm	505.9 mm	540.6 mm	575.7 mm	512.2 mm	540.3 mm	576.6 mm
	Winter	70.0 mm	70.7 mm	76.2 mm	85.1 mm	71.8 mm	80.5 mm	90.1 mm
	Spring	118.0 mm	112.3 mm	128.3 mm	143.9 mm	114.3 mm	134.0 mm	151.0 mm
	Summer	218.3 mm	196.4 mm	219.7 mm	247.5 mm	191.2 mm	208.8 mm	227.7 mm
	Fall	106.2 mm	104.3 mm	116.5 mm	133.4 mm	101.8 mm	117.0 mm	132.4 mm
Days ≥ 30 °C	Annual	13.2 days	17.3 days	23.8 days	30.3 days	26.8 days	34.0 days	40.5 days
Days ≤ -30 °C	Annual	6.1 days	0.0 days	2.6 days	5.7 days	0.0 days	1.1 days	2.6 days
Frost-Free Period	Annual	126.9 days	126.2 days	139.7 days	154.2 days	136.1 days	148.1 days	163.1 days
Date of First Fall Frost		Sep 23	Sep 17	Sep 29	Oct 11	Sep 23	Oct 02	Oct 10
Date of Last Spring Frost		May 19	May 03	May 12	May 21	Apr 26	May 07	May 16
5 °C Degree Days	Annual	17419.7	17446.2	17462.6	17474.4	17469.2	17479.6	17490.0
10 °C Degree Days	Annual	996.2	1133.7	1217.5	1296.1	1307.2	1395.8	1481.9
Freeze-Thaw Cycles	Annual	63.0 cycles	49.3 cycles	59.5 cycles	72.1 cycles	53.9 cycles	61.0 cycles	69.1 cycles
Days Precip ≥ 10 mm	Annual	12.5 days	11.7 days	13.6 days	15.4 days	12.1 days	13.9 days	15.4 days
Days Precip ≥ 20 mm	Annual	4.0 days	3.0 days	4.3 days	5.5 days	3.5 days	4.5 days	5.7 days

High Carbon Emissions (RCP8.5)

Climate Variable	Season	1981-2010 (Baseline)	2021-2050			2051-2080		
			L	M	H	L	M	H
Mean Temperature	Annual	3.1 °C	4.6 °C	5.3 °C	6.0 °C	6.4 °C	7.5 °C	8.8 °C
	Winter	-14.1 °C	-12.3 °C	-11.2 °C	-10.0 °C	-10.2 °C	-8.5 °C	-6.8 °C
	Spring	3.1 °C	4.1 °C	4.8 °C	5.7 °C	5.5 °C	6.6 °C	7.7 °C
	Summer	18.4 °C	19.9 °C	20.4 °C	20.9 °C	21.6 °C	22.6 °C	23.6 °C
	Fall	4.9 °C	6.1 °C	7.0 °C	7.7 °C	8.1 °C	9.1 °C	10.1 °C
Precipitation	Annual	513.5 mm	503.2 mm	543.4 mm	582.9 mm	522.0 mm	557.5 mm	588.9 mm
	Winter	70.6 mm	67.7 mm	76.7 mm	86.0 mm	73.7 mm	84.3 mm	94.7 mm
	Spring	118.0 mm	114.0 mm	131.9 mm	149.3 mm	131.2 mm	150.5 mm	168.3 mm
	Summer	217.8 mm	200.0 mm	215.0 mm	230.6 mm	183.9 mm	204.3 mm	223.1 mm
	Fall	107.0 mm	104.1 mm	119.7 mm	131.0 mm	103.5 mm	118.1 mm	133.3 mm
Days ≥ 30 °C	Annual	12.9 days	20.8 days	27.2 days	35.8 days	38.4 days	48.9 days	61.3 days
Days ≤ -30 °C	Annual	6.3 days	0.0 days	2.0 days	4.3 days	0.0 days	0.5 days	1.3 days
Frost-Free Period	Annual	126.9 days	127.9 days	142.6 days	155.9 days	145.2 days	159.9 days	177.3 days
Date of First Fall Frost		Sep 23	Sep 21	Oct 01	Oct 13	Sep 28	Oct 08	Oct 21
Date of Last Spring Frost		May 19	May 04	May 11	May 20	Apr 22	May 01	May 10
5 °C Degree Days	Annual	17420.2	17445.0	17464.9	17485.5	17499.3	17518.4	17538.4
10 °C Degree Days	Annual	993.9	1203.8	1279.8	1368.8	1470.3	1626.0	1802.4
Freeze-Thaw Cycles	Annual	62.8 cycles	51.4 cycles	60.1 cycles	68.8 cycles	50.3 cycles	58.0 cycles	65.5 cycles
Days Precip ≥ 10 mm	Annual	12.6 days	12.0 days	13.7 days	15.4 days	13.2 days	14.6 days	16.1 days
Days Precip ≥ 20 mm	Annual	4.0 days	3.2 days	4.4 days	5.4 days	3.9 days	4.9 days	5.9 days