Climate Action Initiative
BC AGRICULTURE & FOOD

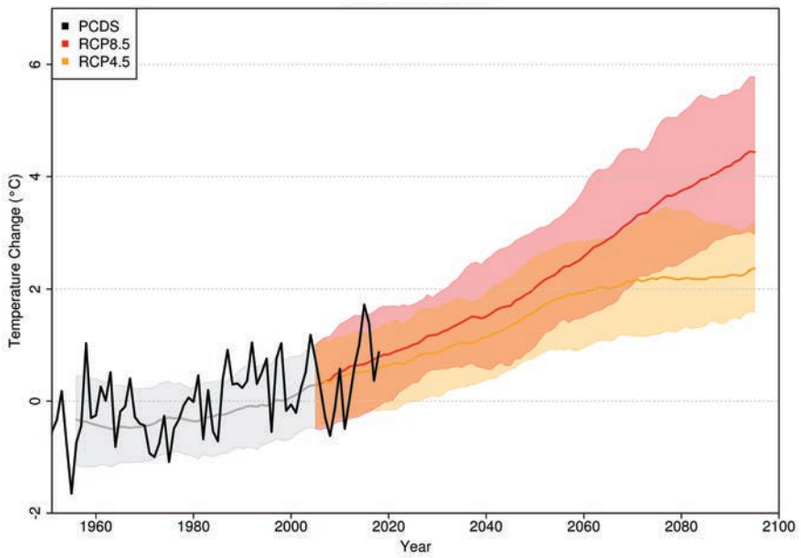
Capital Regional District and
Cowichan Valley Regional District (CCV)

Climate Change Scenarios: 2020s, 2050s & 2080s

Temperature

Annual average temperature is **1.5°C warmer** in 2020s
(+2.5°C by 2050s) (+4.5°C by 2080s) (CCV Regional baseline[1]: 8°C)

Change in Annual Average Temperature (Vancouver Island)



RCP (Representative Concentration Pathways) 8.5 is a high GHG (greenhouse gas) emissions model. RCP 4.5 is a medium GHG emissions model. The bold coloured lines indicate the mid-point of the models, shading indicates the projected model range. The black line represents PCDS (Provincial Climate Data Set) and is the historic climate data collected from BC.

Average **summer maximum** temperature
(i.e. hottest day of the year)
+ 1.5°C warmer by 2020s
+3.5°C warmer by 2050s

CCV Regional baseline: 30°C
Capital baseline: 29°C
Cowichan Valley baseline: 30°C

Average **winter minimum** temperature
(i.e. coldest day of the year)
+ 2.5°C warmer by 2020s
+ 4.0°C warmer by 2050s

CCV Regional baseline: -8°C
Capital baseline: -8°C
Cowichan Valley baseline: -9°C

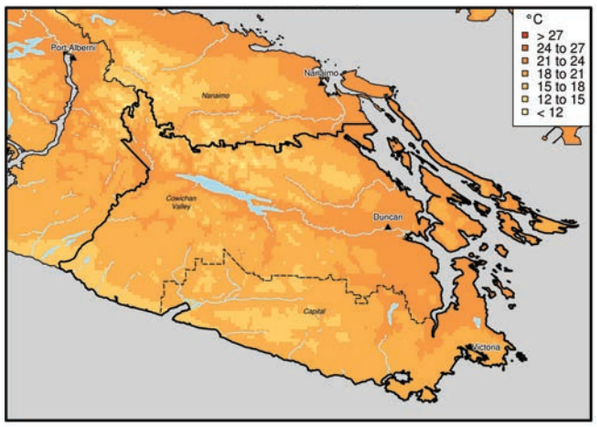
- **Growing Season Length[2] extended by 30 days in 2020s**
  (+55 days by 2050s) (+85 days by 2080s)
  CCV Regional baseline: 250 days
- **25 more Frost Free Days annually in 2020s**
  (+45 days by 2050s) (+60 days by 2080s)
  CCV Regional baseline: 292 days
- **345 more Growing Degree Days[3] annually in 2020s**
  (+740 days by 2050s) (+1285 days by 2080s)
  CCV Regional baseline: 1580 days

[1] Baseline (for all variables) is the period from 1971 to 2000.

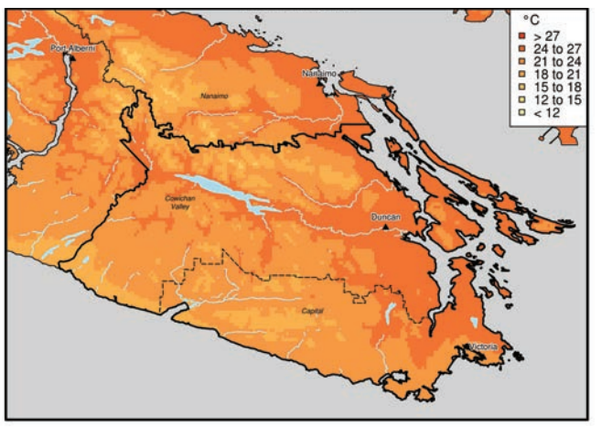
[2] Growing Season Length (GSL) represents the number of days between the first span of six consecutive days with a daily mean temperature above 6°C and the last day with a daily mean temperature above 6°C.

[3] Growing Degree Days (GDD) is a weather-based indicator for assessing crop development. GDD are calculated by taking the average of the daily maximum and minimum temperatures compared to a base temperature 5°C. GDDs accumulate over the growing season.

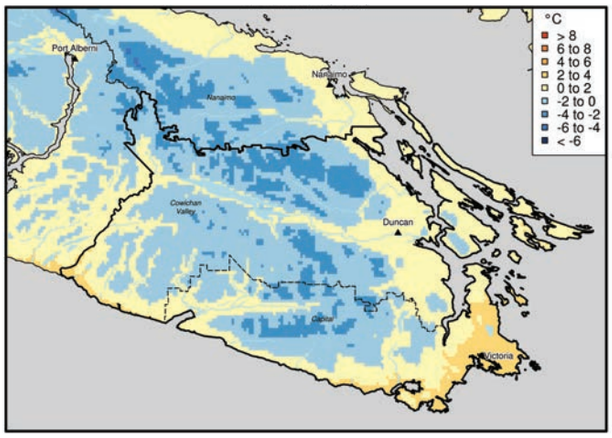
Climate change projections provided by the Pacific Climate Impacts Consortium.
Additional information at https://pacificclimate.org/data/statistically-downscaled-climate-scenarios



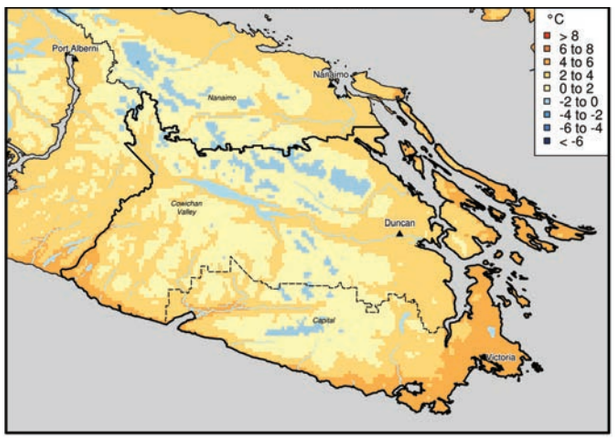
Average Summer Temperature Past (1971-2000)



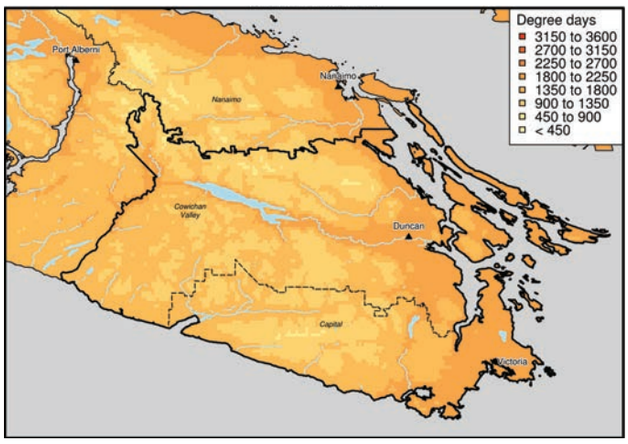
Average Summer Temperature Projections (2041-2070)



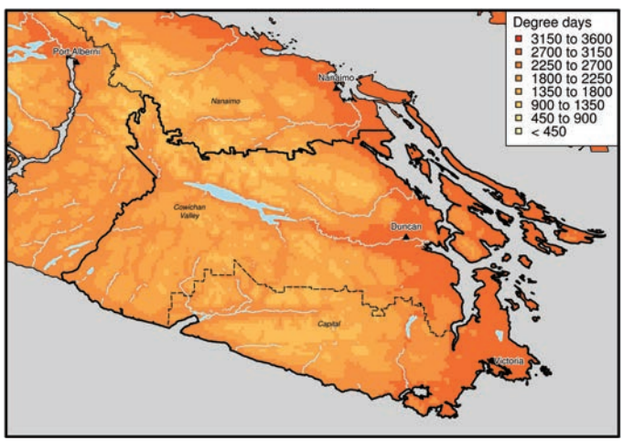
Winter Minimum Temperature Past (1971-2000)



Winter Minimum Temperature Projections (2041-2070)



Growing Degree Days Past (1971-2000)



Growing Degree Days Projections (2041-2070)

Extreme Heat

More than twice the number of days over 25°C by 2050s

CCV Regional baseline: 16 days (+24 days by 2050s) (+44 days by 2080s)

Capital baseline: 12 days (+24 days by 2050s) (+36 days by 2080s)

Cowichan Valley baseline: 18 days (+23 days by 2050s) (+43 days by 2080s)

More than 4 times the number of days over 30°C by 2050s

CCV Regional baseline: 2 days (+7 days by 2050s) (+17 days by 2080s)

Capital baseline: 1 day (+6 days by 2050s) (+15 days by 2080s)

Cowichan Valley baseline: 3 days (+8 days by 2050s) (+18 days by 2080s)

Hydrology

- Substantial projected **decrease in spring snowfall** and an overall decrease in snowpack
- **Increased peak streamflows in fall and winter** due to increased precipitation
- **Decreased streamflows in summer**
- River **flooding and ocean storm surge events** may i**ncrease in frequency and magnitude**

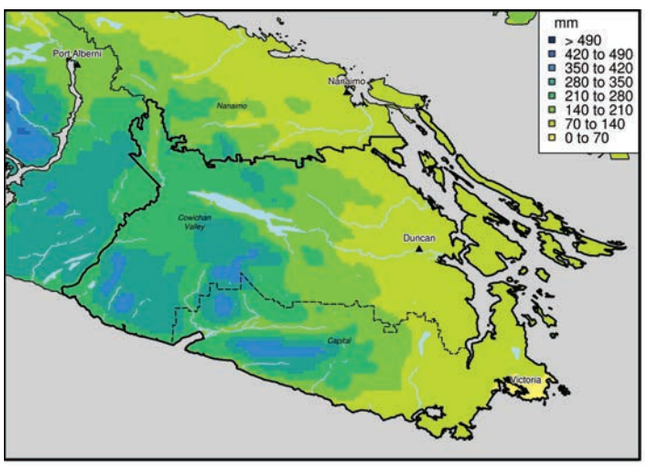
Seasonal Precipitation

Capital Regional District: Seasonal Average Precipitation (2020s and 2050s)

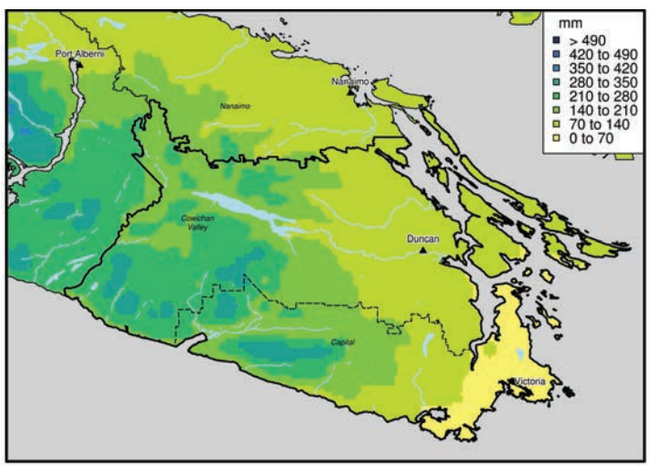
Season	Change	Range	Baseline
Winter 2020s	+35mm (+4%)	-19mm to +88mm	839mm
Winter 2050s	+29mm (+3%)	-29mm to +85mm	
Spring 2020s	+4mm (+1%)	-26mm to +39mm	439mm
Spring 2050s	+13mm (+3%)	-32mm to +44mm	
Summer 2020s	-14mm (-9%)	-53mm to +18mm	164mm
Summer 2050s	-29mm (-17%)	-64mm to +6mm	
Fall 2020s	+12mm (+2%)	-40mm to +78mm	665mm
Fall 2050s	+60mm (+9%)	-33mm to +157mm	

Cowichan Valley Regional District: Seasonal Average Precipitation (2020s and 2050s)

Season	Change	Range	Baseline
Winter 2020s	+46mm (+5%)	-13mm to +115mm	1,037mm
Winter 2050s	+39mm (+4%)	-33mm to +108mm	
Spring 2020s	+4mm (+1%)	-40mm to +47mm	546mm
Spring 2050s	+16mm (+3%)	-38mm to +50mm	
Summer 2020s	-18mm (-9%)	-61mm to +21mm	201mm
Summer 2050s	-35mm (-17%)	-80mm to +5mm	
Fall 2020s	+16mm (+2%)	-52mm to +91mm	777mm
Fall 2050s	+75mm (+10%)	-28mm to +187mm	



Average Summer Precipitation Past (1971-2000)



Average Summer Precipitation Projections (2041-2070)

Extreme Rainfall

Increased frequency and magnitude of extreme rainfall events

+22% more rain falling on "wet days"[4] by 2050s

+44% more rain falling on "wet days" by 2080s

CCV Regional baseline: 538mm

Capital baseline: 486mm

Cowichan Valley baseline: 572mm

[4] "Wet Days" references annual total precipitation that falls on days where precipitation exceeds the 95th / 99th percentile of precipitation

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Climate Change Projections for Vancouver Island and the Gulf Islands

Climate change projections for the **2050s**

Climate Variable	Time of Year	Projected Change from 1971-2000 Baseline	
		VI (range)	VI (average)
Mean Temperature (°C)	Annual	+2°C to +4°C	+2°C
Precipitation (%)	Spring	-5% to +11%	+2%
	Summer	-32% to +6%	-13%
	Fall	+3% to +25%	+12%
	Winter	-2% to +10%	+4%
Growing Degree Days*	Annual	+390 to +940 GDD	+660 GDD
Frost Free Days*	Annual	+35 to +60 days	+48 days
Growing Season Length*	Annual	+35 to +70 days	+57 days

Climate change projections for the **2080s**

Climate Variable	Time of Year	Projected Change from 1971-2000 Baseline	
		VI (range)	VI (average)
Mean Temperature (°C)	Annual	+3°C to +6°C	+4°C
Precipitation (%)	Spring	-4% to +13%	+5%
	Summer	-48% to -3%	- 22%
	Fall	+7% to +33%	+20%
	Winter	+1% to + 24%	+12%
Growing Degree Days*	Annual	+7530 to +1590 GDD	+1154 GDD
Frost Free Days*	Annual	+55 to +75 days	+67 days
Growing Season Length*	Annual	+65 to +100 days	+88 days

Baseline is the average of all values during the period of 1971-2000.

* **Growing Degree-Days (GDD)** are a measure of heat accumulation, and represent the cumulative number of degrees that the average daily temperature is above a base temperature of 5°C, for all days of the year.

* **Frost Free Days (FFD)** represents the number of days in a calendar year that remain above 0°C.

* **Growing Season Length (GSL)** represents the number of days between the first span of six consecutive days with a daily mean temperature above 6°C and the last day with a daily mean temperature above 6°C.