

Appendix 6-B

Meteorology Baseline Report



NWP COAL CANADA LTD

Crown Mountain Coking Coal Project

Meteorology Baseline Report

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Acronyms, Abbreviations, Definitions

BC MOE	British Columbia Ministry of Environment
MOECC	British Columbia Ministry of Environment and Climate Change Strategy
BC MWLAP	British Columbia Ministry of Water, Lands, and Air Protection
°C	degrees Celsius
CRB	Columbia River Basin
Dillon	Dillon Consulting Limited
ECCC	Environment and Climate Change Canada
kPa	kilopascals
km	kilometres
km/hr	kilometers per hour
LSA	Local Study Area
m	metres
MSC	Meteorological Services of Canada
mASL	meters above sea level
mm	millimeters
PCIC	Pacific Climate Impacts Consortium
ROMt	run-of-mine tonnes
RSA	Regional Study Area
tpd	tonnes per day
W/m²	watts per square metre

Definitions

<i>Barometric pressure</i>	Force exerted by the atmosphere at a specific location on Earth.
<i>Climate normal</i>	Averaged meteorological data averaged over a certain time period (e.g., 1981 to 2010).
<i>Crown Mountain Project</i>	Referred to as “the project”.
<i>Precipitation</i>	The falling of any product of the condensation of atmospheric water vapour (e.g., rain, sleet, snow, hail).
<i>Precipitation rate</i>	The amount of precipitation falling within a defined period of time.
<i>Precipitation accumulation</i>	The amount of cumulative precipitation within a defined period of time.
<i>Relative humidity</i>	The percentage of water vapour that air holds relative to the maximum amount it can hold at a given temperature and pressure.
<i>Solar radiation</i>	Radiant energy emitted by the measured at a given location.

Executive Summary

NWP Coal Canada Ltd (NWP) is proposing to develop the Crown Mountain Coking Coal Project (“the Project”). The proposed Project is an open pit metallurgical coal mine in the Elk Valley coal field, located within the East Kootenay region of southeastern British Columbia (BC). The proposed Project is situated proximate to existing metallurgical coal mines; including Elkview (Teck Corporation) located 8 km to the southwest and Line Creek located 12 km to the north. The mine is expected to produce approximately 10,150 tonnes per day (tpd) and up to 4.0 million run-of-mine tonnes (M ROMt) per year for 15 years. The Project is located in the Front Ranges Rocky Mountains of BC, an area of steep terrain, and is accessed by numerous Forest Service Roads. The Project is in the Alexander and Grave Creek Watersheds, and is located within the asserted traditional territory of the Ktunaxa Nation and the Shuswap Indian Band.

To fulfill the Application Information Requirements (AIR) set out by the BC Environmental Assessment Office (BC EAO) and Environmental Impact Statement guidelines set out by the Government of Canada, Dillon Consulting Limited (Dillon) conducted a meteorology baseline study at the proposed Project site.

Baseline meteorological information will be applied to the environmental assessment process while determining the potential impacts of the proposed Project on local and regional air quality. Baseline meteorological conditions measured at the Crown Mountain climate station are summarized below.

Study Area

The study areas that were adopted for the meteorology baseline study define the spatial limits for which potential impacts related to the Project will ultimately be evaluated. The overall study area is further defined by a local and regional study area, as described below.

- **Project Footprint Area** – The Project footprint consists of the proposed mine infrastructure and support facilities, including the plant area (raw coal stockpile area and processing plant), clean coal transportation route, rail load-out facility and rail siding, and ancillary facilities (i.e., water supply, power supply, natural gas supply, water, sewage treatment, fuel storage and explosives storage).
- **Local Study Area (LSA)** – The LSA includes the Project footprint and the surrounding area where potential impacts associated with Project activities could be directly affected by meteorological conditions. The LSA covers an area of approximately 228.6 km², which encompasses the Project footprint and extends to the catchment boundaries for the Grave Creek and Alexander Creek watershed areas.
- **Regional Study Area (RSA)** – The RSA encompasses the full extent of the Elk River watershed and the portion of Lake Kocanusa located north of the Canada-USA border. The RSA extends beyond the LSA and covers a total geographic area of approximately 4,387.3 km².

Meteorology Baseline Study Methodology

The meteorology baseline study involved the compilation of available long-term regional climate records, together with the installation of a climate station at the project site to collect continuous measurements for a range of meteorological parameters (i.e., air temperature, barometric pressure, precipitation, relative humidity, solar radiation, and wind speed and direction). The climate station was in operation from January 1, 2014 to May 13, 2016.

Summary of Results

An overview of the results of the meteorology baseline study is provided below.

Air Temperature

The overall mean daily temperature during the baseline study was 1.4°C. The mean daily temperature ranged from a low of -13.4°C in February 2014 to a maximum of 16.6°C in June 2015. The mean daily minimum air temperature ranged from a low of -16.9°C in February 2014 to a high of 10.2°C in July 2015. The mean daily maximum air temperature ranged from a low of -9.0°C in February 2014 to a high of 24.6°C in July 2015. The extreme minimum temperature at the Crown Mountain station was -32.3°C on March 1, 2014 and the extreme maximum temperature was 35.2°C on June 7, 2015.

The results of the analysis indicate that air temperature conditions in the RSA are notably influenced by elevation and latitude, with mean annual and seasonal temperatures being the highest at Fernie and the lowest at Fording River Cominco. The data collected at the Crown Mountain climate station suggests that air temperatures at the project area are generally consistent with these trends. The Crown Mountain air temperature data is most closely aligned with the corresponding data for Fording River Cominco, which is the station that is nearest in elevation.

A review of historical climate data and available publications indicate that air temperatures have increased in the region over the past 50 years and are projected to rise further during the next 50 years.

Barometric Pressure

Barometric pressure measurements were recorded at the Crown Mountain climate station to be within a range of 78.3 to 82.5 kPa. Average daily and monthly barometric pressure was generally higher in the warmer, summer months and lower with greater variability in the colder winter months, which was anticipated as there are more active low pressure weather systems in the winter.

Precipitation

Although precipitation data was collected at the Crown Mountain climate station between January 2014 and May 2016, it was determined that a malfunction of the precipitation gauge resulted during periods of moderate to high winds, and accordingly some of the data that was collected was deemed to be inaccurate. To characterize the precipitation conditions for the Crown Mountain project area and LSA, a regression analysis was undertaken using data collected at nearby climate stations. Precipitation

conditions can vary spatially and temporally and is influenced significantly by altitude, topography, and wind.

The results of the regression analysis indicate that the mean summer precipitation at the Crown Mountain site (1,920 mASL) is 14.9 mm higher than at the Sparwood climate station (1,138 mASL), and the mean winter precipitation is 23.9 mm lower, respectively. The monthly precipitation varied throughout the assessment period, with the lowest values generally corresponding to the summer months and higher precipitation in the early winter months.

Based on recent publications and an assessment of historical climate trends undertaken for multiple climate stations in the RSA, precipitation has generally increased over the past 50 years while snowfall has decreased. Future climate projections predict continued increases in precipitation during winter months and a decrease in the summer months, with more extreme events occurring, over the next 50 years.

Snowpack

Historical snowpack records for snow stations located within the RSA indicate that there is considerable variability with respect to snow accumulation and distribution across the region. The data suggests that snowpack conditions are influenced by elevation; the highest average and maximum values were associated with the Morrissey Ridge station (1,860 mASL), and the lowest values were represented by the Upper Elk River station (1,340 mASL).

Relative Humidity

Over the course of the baseline assessment period, the average monthly relative humidity varied between 50.1% (August 2015) and 93.1% (January 2016). There is a significant variability in the average daily humidity measured at the Crown Mountain climate station. Relative humidity is typically higher in the winter and lower in the summer, which is consistent with the general trends in data collected at the Crown Mountain station. Average monthly humidity was typically lowest in the summer months and highest in the winter.

Solar Radiation

Daily average solar radiation ranged from 6.1 W/m² in December 2015 to 252.8 W/m² in July 2014. The highest recorded daily solar radiation during the study period was 1,273.0 W/m² on May 7, 2014. Typically, higher solar radiation occurred during summer months, whereas lower solar radiation occurred during winter months.

Wind Speed and Direction

Wind speeds between 2 and 6 km/h were most frequently recorded over the study period, occurring 48% of the time. Wind speeds below 3.6 km/h (i.e., calm winds) occurred 33.6% of the time, and wind speeds over 21.6 km/h (i.e., strong winds) occurred 1.4% of the time. The maximum wind speed was 58.4 km/h on February 6, 2016. The most frequent wind direction was traveling towards the west-

northwest (22.9% of the recorded entries). The maximum wind speed measured at the Crown Mountain station (58.4 km/h, or 16.2 m/s) was less strong than the maximum wind speed measured at the Sparwood climate station.

1.0

Introduction

1.1

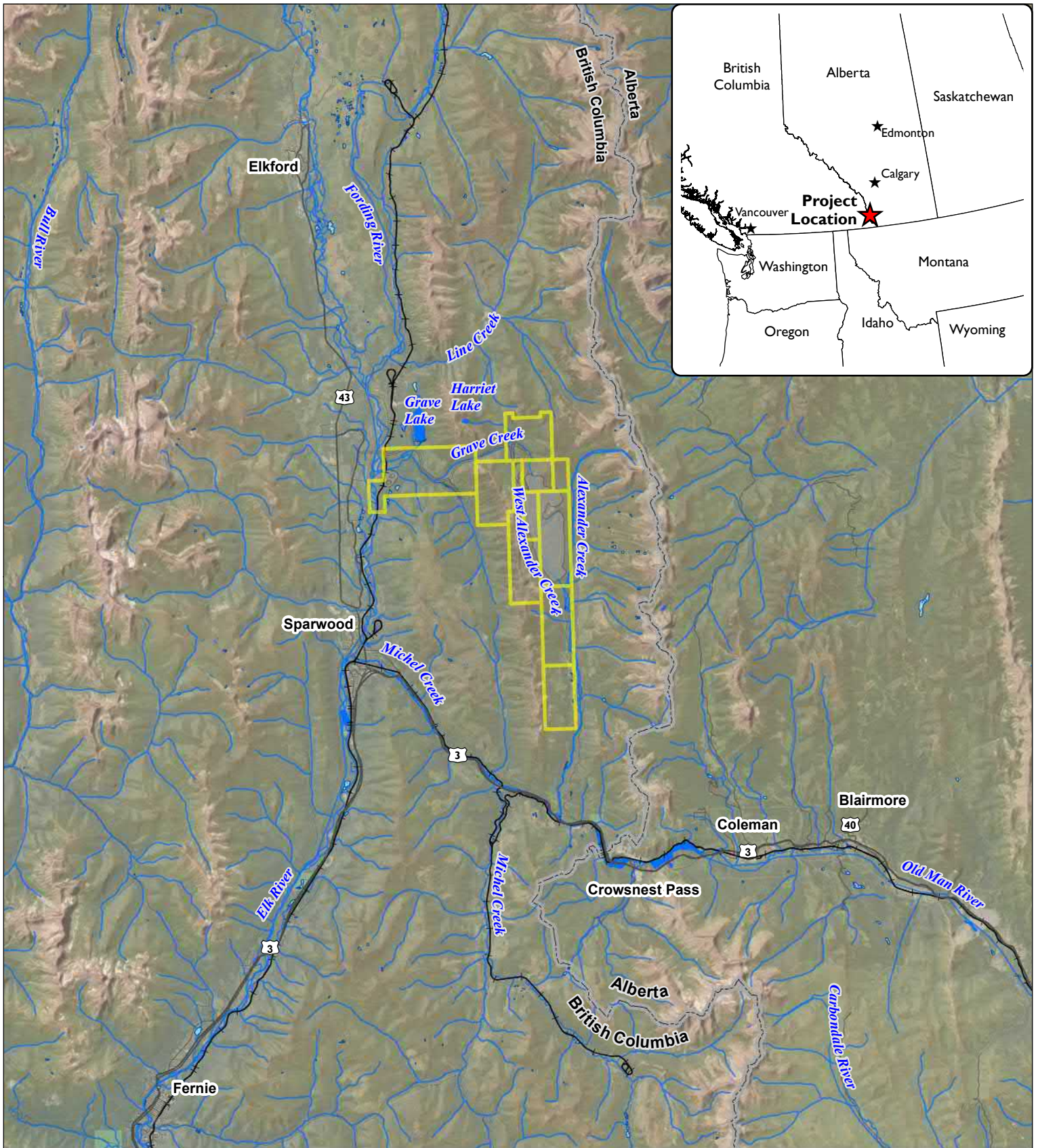
Project Overview

NWP Coal Canada Ltd (NWP) is proposing to develop the Crown Mountain Coking Coal Project (“the Project”) which is intended as an open pit metallurgical coal mine located within the Elk Valley coal field in the East Kootenay Region of southeastern British Columbia (BC) (**Figure 1**). NWP is a subsidiary of Jameson Resources Limited and Bathurst Resources Limited (Canada). The Project comprises ten coal licenses as shown on **Figure 1**. The Project is located between several existing metallurgical coal mines in the Elk Valley and Crowsnest coal fields, with Teck Corporation’s (Teck) Elkview mine located approximately 8 kilometres (km) southwest of the Project area and their Line Creek mine located approximately 12 km north of the Project area. The Project area is located approximately 30 km by road from Sparwood, BC and is accessible by several Forest Service Roads, including Grave Creek Road in the northwest and Alexander Creek Road from the south.

The anticipated production capacity of the Project is up to 4.0 million run-of-mine tonnes (M ROMt) per annum for a duration of approximately 15 years, not including site decommissioning. This equates to a coal production capacity of approximately 10,150 tonnes per day. Exploration activities have indicated that the coal at the Project site is typical of coking coals produced from existing mines in the Elk Valley. The high quality metallurgical coal would be transported via railway to coastal BC, where it would be shipped overseas to be used in steelmaking.

Key components of the proposed Project include, but are not limited to:

- Surface extraction areas (3 pits – north pit, east pit, and south pit);
- Waste rock management areas;
- Plant area (includes raw coal stockpile area, a processing plant, and site support facilities);
- Clean coal transportation route (via an overland conveyor and haul road);
- Rail load-out facility and rail siding (includes various auxiliary facilities such as a guard house, light vehicle wash, drug and alcohol testing/orientation building, and a small dry);
- Power supply;
- Natural gas supply;
- Explosives storage;
- Fuel storage;
- Sewage treatment; and
- Water supply.



Crown Mountain
Coking Coal Project

**Meteorology Baseline Report
Project Location**

Figure 1

LEGEND

- | | | | |
|--|-------------------|--|----------------------------|
| | Project Footprint | | Highways |
| | Coal Licences | | Arterial Roads |
| | Provincial Park | | Local/Resource Roads |
| | Waterbody | | Railway (Canadian Pacific) |
| | Wetland | | BC/Alberta Border |
| | Watercourse | | |

0 2.5 5 10 km
SCALE 1:300,000

MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia,
GeoBC and Open Data BC, BC Water Resource Atlas, CANVEC.

MAP CREATED BY: RBB
MAP CHECKED BY: JNW
MAP PROJECTION: NAD 1983 UTM Zone 11N



PROJECT: 12-6231
STATUS: FINAL
DATE: 2021-08-13

1.2 Purpose and Objectives

The Project is subject to both the *Canadian Environmental Assessment Act (CEAA) 2012* and the *British Columbia Environmental Assessment Act (BC EAA) 2002*. Provincially, the Project is considered a Reviewable Project given that the production capacity of the mine will be greater than 250,000 tonnes per year of clean coal and will result in a disturbance greater than 750 hectares (ha) that was not previously permitted for disturbance (*BC EAA, 2002*). Federally, the Project is considered a Designated Project under the *CEAA (2012) Regulations Designating Physical Projects*, as the mine will have a production capacity of more than 3,000 tonnes per day. Project-specific terms of reference were developed for the provincial EA process (EAO, 2018) and the federal EA process (CEAA, n.d.).

Under the project-specific provincial AIR and federal EIS guidelines for the Project's environmental assessment, characterization of baseline climatic conditions is required to assess potential effects on the Air Quality (provincial) and Atmospheric Environment (federal) Valued Components as a result of project activities. The purpose of the meteorology baseline program is to describe the existing baseline climate conditions within the Project study area, which can ultimately serve as the basis for which potential impacts related to the Project activities can be identified and evaluated. This baseline report presents a summary of the information on the meteorological conditions in the Project area and provides regional context based on publically available information.

This meteorology baseline report is organized into the following sections:

- **Section 2.0** describes the setting of the Project and relevant study areas;
- **Section 3.0** outlines the methodology adopted for the baseline study;
- **Section 4.0** presents the results of the baseline study; and,
- **Section 5.0** provides a summary of key baseline results.

1.3 Scope

An initial overview of the proposed climate station, focused on an overview of proposed climatic monitoring parameters and monitoring equipment, was provided to the British Columbia Ministry of Environment (MOE) in late March 2013. The initial submission was based on the Water and Air Quality Monitoring Guidance Document for Mine Proponents and Operators (MOE, 2012).

Following a review of the initial work plan, specific feedback was provided to the MOE (letter dated May 3, 2013). This updated work plan provided additional details to address specific items noted in the MOE letter, including details regarding the overall project and the proposed location of the climate station, as well as further details regarding proposed instrumentation, operation and maintenance procedures, data storage plans, QA/QC program, and data presentation and reporting plans.

The key objectives of the meteorological baseline study are as follows:

1. Collect continuous climate data for the Crown Mountain project area.
2. Produce daily and monthly climate data (minimum, average, and maximum) for the Crown Mountain project area.
3. Compile, review, and analyze available long-term climate records to identify existing characteristics and trends in the region.
4. Conduct statistical analyses using available regional climate data.

An outline of the methodology that was applied to accomplish each of the meteorology baseline study objectives is provided in **Section 3.0**.

1.4 Applicable Standards

The siting, installation, and collection of data hydrometric stations and development of discharge measurements and stage-discharge rating curves were performed in accordance with the Ministry of Environment's *Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators* (BC MOE Guideline, 2012) and the Ministry of Environment and Climate Change Strategy *Manual of British Columbia Hydrometric Standards Version 1.0* (BC MOECCS Manual, 2018).

2.0 Study Areas

The study areas that were adopted for the meteorology baseline assessment define the spatial limits for which potential environmental impacts related to the project will ultimately be evaluated. The overall study area is further defined by a local and regional study area, as described below. The local and regional study areas for the meteorology baseline study are consistent with the hydrology baseline study, given the interrelated nature of these components of the baseline assessment.

2.1 Project Footprint

The centre of the Project is positioned approximately 12 km northeast of the District of Sparwood and approximately 5 km west of the provincial boundary between BC and Alberta (**Figure 1**). The Project property is accessible by several Forest Service Roads, including Grave Creek Road in the northwest and Alexander Creek Road from the south. By road, the Project is situated approximately 30 km from Sparwood.

The Project footprint consists of the proposed mine infrastructure and support facilities, including the plant area (raw coal stockpile area and processing plant), clean coal transportation route, rail load-out facility and rail siding, and ancillary facilities (i.e., water supply, power supply, natural gas supply, water, sewage treatment, fuel storage and explosives storage).

The Project footprint is located within portions of two watersheds, Grave Creek and Alexander Creek. The characteristics of the two watersheds are described below. The majority of the Project footprint is located within the Alexander Creek watershed, while the access roads leading to the mine are generally located within the Grave Creek watershed.

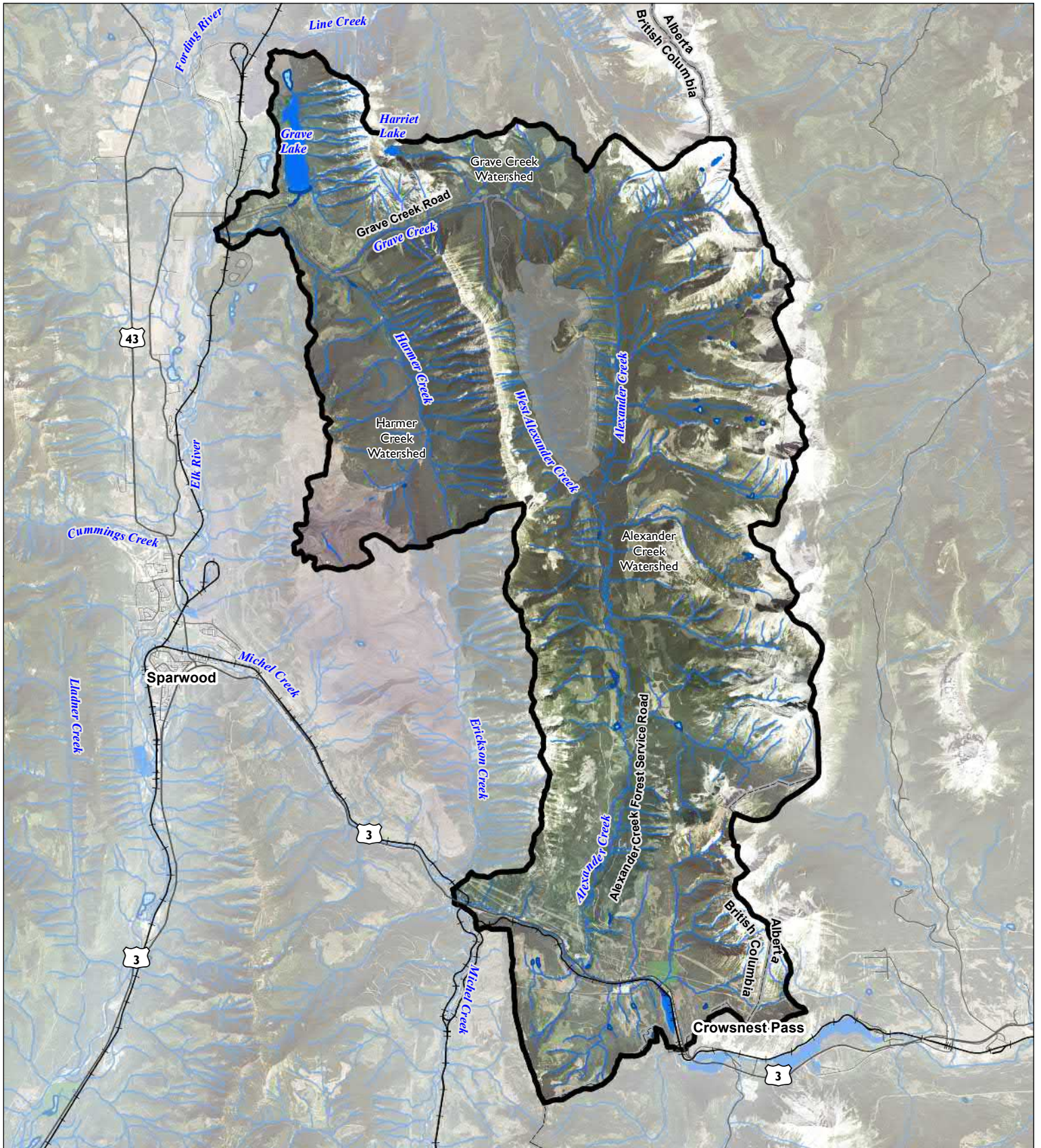
2.2 Local Study Area

The Local Study Area (LSA) includes the Project footprint and the surrounding area where potential impacts associated with Project activities could directly be affected by meteorological conditions. The LSA covers an area of approximately 228.6 km², which encompasses the Project footprint and extends to the catchment boundaries for the Grave Creek and Alexander Creek watershed areas (**Figure 2**).

2.3 Regional Study Area

The Regional Study Area (RSA) generally encompasses the full extent of the Elk River watershed and the portion of Lake Koochanusa located north of the Canada-USA border (**Figure 3**). The RSA extends beyond the LSA (described above) and covers a total geographic area of approximately 4,387.3 km². The Regional Study Area comprises the area where environmental conditions could potentially be indirectly impacted by the Project.

The headwaters of the Elk River watershed originate within Elk Lakes Provincial Park and the River flows in a southerly direction to its outlet into Lake Koochanusa, approximately 20 km north of the Canada-USA border. The Elk River has many significant tributaries, including the Fording River, Line Creek, Wigwam River, and Michel Creek. It is notable that streamflows in the lower reaches of the Elk River are regulated by a hydro-electric dam near Elko (Elko Dam), which is operated by BC Hydro.






Crown Mountain
Coking Coal Project

Meteorology Baseline Report
Local Study Area

Figure 2

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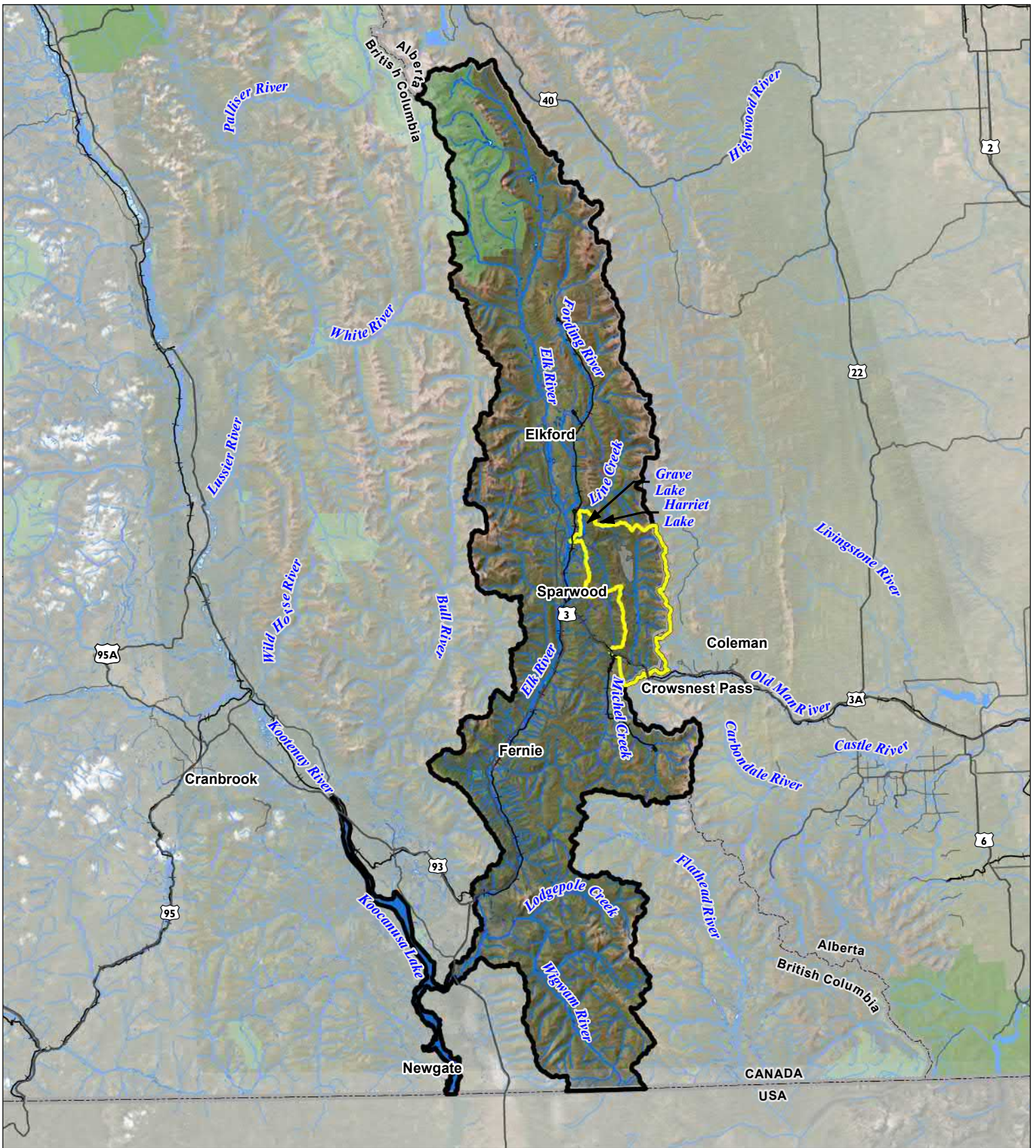
- | | | | |
|---|-------------------|---|----------------------------|
|  | Local Study Area |  | Highways |
|  | Project Footprint |  | Arterial Roads |
|  | Provincial Park |  | Local/Resource Roads |
|  | Waterbody |  | Railway (Canadian Pacific) |
|  | Wetland |  | BC/Alberta Border |
|  | Watercourse | | |



MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia GeoBC and Open Data BC, BC Water Resource Atlas, CANVEC.
MAP CREATED BY: RBB
MAP CHECKED BY: JNW
MAP PROJECTION: NAD 1983 UTM Zone 11N



PROJECT: 12-6231
STATUS: FINAL
DATE: 2021-08-13















Crown Mountain
Coking Coal Project

**Meteorology Baseline Report
Regional Study Area**

Figure 3

LEGEND

- | | | | |
|---|---------------------|---|----------------------------|
|  | Regional Study Area |  | Watercourse |
|  | Local Study Area |  | Highways |
|  | Project Footprint |  | Arterial Roads |
|  | National Park |  | Railway (Canadian Pacific) |
|  | Provincial Park |  | BC/Alberta Border |
|  | Waterbody | | |
|  | Wetland | | |

0 5 10 20 km
SCALE 1:875,000



MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia,
GeoBC and Open Data BC, BC Water Resource Atlas, CANVEC.

MAP CREATED BY: RBB
MAP CHECKED BY: JNW
MAP PROJECTION: NAD 1983 UTM Zone 11N



PROJECT: 12-6231
STATUS: FINAL
DATE: 2021-08-13

3.0 Methodology

An outline of the methodology that was applied for each of the hydrologic baseline study objectives, as described in the Scope (**Section 1.3**), is provided below.

3.1 Data Compilation and Review of Background Information

Existing information for use in this background review was compiled from a wide range of sources including, but not limited to:

- Federal databases and mapping sites (e.g., Environment and Climate Change Canada, 2019);
- Provincial databases and mapping sites (e.g., BC Water Resources Atlas by BC MOE, 2014);
- Scientific publications (e.g., climate change studies by PCIC, 2006, 2011, and 2014); and
- Other environmental assessments (EAs) and baseline reports for other projects in the area (e.g., Teck Coal Ltd., 2011).

Further details regarding the methodology for background data collection are discussed below.

3.2 Climate Data Sources

3.2.1 Project Footprint and Local Study Area

A climate station was installed at a location within the Crown Mountain Coal license area in the headwaters of the Alexander/West Alexander watershed. As shown on **Figure 4**, the climate station was installed at approximately 661597E/5521663N; UTM Zone 11U at an elevation of 1,920 mASL. This location was selected based on accessibility and suitability for installation and monitoring of climatic parameters that are representative of local conditions at the Project site and based on the BC MOE climate station installation guidelines and recommendations.

The following site selection factors were of particular relevance for determining a location for the Crown Mountain climate station, which are based on guidance provided in the *Air Monitoring Site Selection and Exposure Criteria* (BCMWLAP, 2013).

- For collection of temperature (T) and relative humidity (RH) data, surface drainage must be such that there is no pooling of water downhill of the sensors; there must be no standing water (flooding) within 100 m of the sensor; there must be no artificial heat source in the near vicinity; and a minimum distance of three times the diameter of a paved surface or 30 m (whichever is greater) from paved surfaces must be maintained.
- For collection of precipitation (PPT) data, the sampler must not be located where a topographical feature will influence the catch by creating deposition gradients or noticeable snow drifting (i.e., near the edge of a cliff, on a windswept hill top, or in the turbulent lee of a knoll); the sampler is to be located in a topographical area representative of the local flow

patterns and not on top of a local hill; and the site must be free from flooding and artificial sprinkler irrigation.

- For collection of Wind Speed (WS) and Wind Direction (WD) data:
 - Where there are obstructions in the area, the distance from any obstruction must be ten times the height of the obstruction; and
 - The tower location must avoid local topographic features that will influence the representative nature of the sample, such as eddy effects of small knolls, cliff faces, and the lee side of ridges.

The collection of meteorological data has followed guidelines set out in the *Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators* (BC MOE, 2012). Additionally, the BC MOE *Meteorological Data and Sensing Requirements* (BC MOE, 2011) were followed during collection of meteorological data from the station.

Photos of the Crown Mountain climate station are provided below in **Photo 1** and **Photo 2**.



Photo 1: Crown Mountain Climate Station Installation (November 29, 2013)

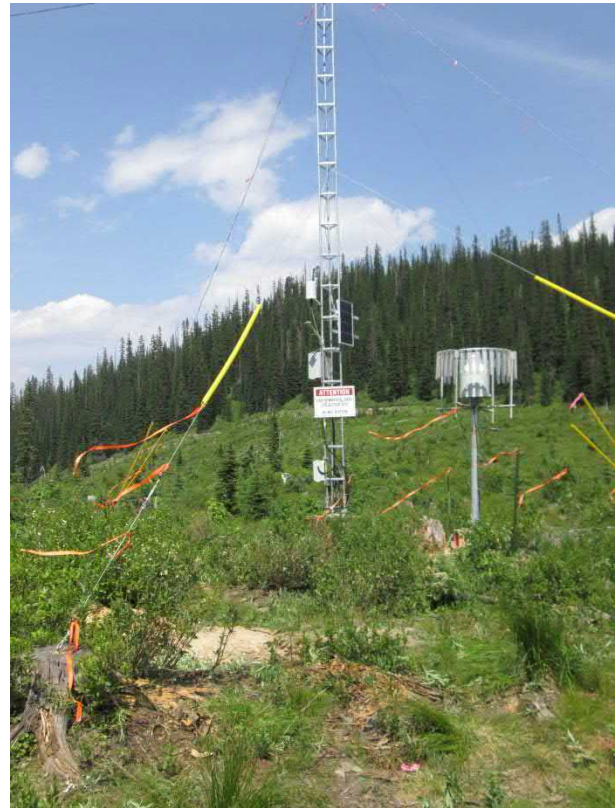


Photo 2: Crown Mountain Climate Station during Maintenance Trip (July 18, 2014)

The initial Crown Mountain climate station install was completed on November 28, 2013. The climate station was first operational on November 29, 2013. However, meteorological data analysed in the following sections exclude data collected prior to January 1, 2014.

The Crown Mountain climate station was comprised of a standard 10 m Golden Nugget tower equipped with instrumentation designed to measure the following meteorological parameters:

- Atmospheric temperature;
- Barometric pressure;
- Relative humidity;
- Solar radiation;
- Wind speed;
- Wind direction; and,
- Precipitation rate and accumulation.

The climate station included a satellite telemetry system (Iridium Satellite Telemetry provided by Data Garrison Satellite Weather Station Portal), which allowed for remote acquisition of data. A summary of sensors and configuration details for the climate station are listed in **Table 1**.

Table 1: Summary of Sensors and Configuration Details for Crown Mountain Climate Station

Item Description	Make/Manufacturer	Specifications
Iridium Climate Station	Sutron 9602 SBD	4 amp solar regulator with panel and battery Web Hosting: Data Garrison Download Frequency: every 6 hours
Data Logger	Sutron Xlite 9210B	RS232/485, SDI-12 32 MB on board storage Data Logger Scan of 1 sec interval
10 m Tower	GNT Golden Nugget Tower	18 gauge galvanized tower equipped with guy wires
Precipitation Gauge (rain and snow)	Ott Pluvio2	750 mm capacity 400cm ² collection area ± 0.1 mm/minute intensity 0.01 mm/m resolution
Air Temperature/ Relative Humidity (AT/RH) Sensor	Sutron 5600-0316	Operating range: 0 to 100% rh -40 to +85°C Accuracy at 23°C: ± 1.5% RH ± 0.2°C
Pyranometer	Apogee Sp-110	Absolute accuracy: ± 0.5% Sensitivity: 500 W/m ² per mv
Wind Speed and Direction	RMY Wind Monitor 05305-AQ	0-100 m/s operating range Start Threshold: 0.4 m/s Accuracy: ±0.2 m/s Accuracy: ± 3 degrees
Barometric Pressure	Sutron 5600-0120	500-1100 mB Resolution: .01 mB Accuracy: 0.5 mB

The accuracy on the sensors (Wind Monitor, Sutron 5600-0316 (Rotronic), Pluvio2, Sutron 5600-0120, SP-110) were confirmed to meet or exceed the requirements noted in the Water and Baseline Monitoring Guidance Document for Mine Proponents and Operators (*Guidelines for Air Quality Dispersion Modeling British Columbia* in addition to MSC and other provincial standards).

The thermometer, barometer, and logger/receiver were installed on the tower approximately 3 to 4.5 m above ground elevation. The anemometer was at the top of the 10 m tower. Details regarding the monitoring parameters and climate station equipment are provided in **Table 2**.

Table 2: Monitoring Parameters and Equipment Utilized at the Crown Mountain Climate Station

Parameter	Equipment	Model No.
Air Temperature & Relative Humidity	Sutron AT/RH Sensor*	E-A82-5600-0316
Barometric Pressure	Accubar Pressure Sensor*	E-A82-5600-0120
Solar Radiation	Apogee Precision Pyranometer	SP-110
Wind Speed and Direction	RMY Wind Monitor AQ	05305
Precipitation	OTT Pluvio Precipitation Gauge	E-653-70.020.000.0

* Sensor replaced with Onset HOBO U20 Series Data Logger when necessary during maintenance/repairs.

Measurements for the above-listed parameters were logged at a 15 minute interval. Meteorological data was uploaded via satellite connection at a 6 hour interval to a Data Garrison secure web-based portal maintained by Upward Innovations Inc.

A HOBO U20 Series data logger was installed in November 2014 in place of the original ambient air temperature and barometric pressure sensors during periods of maintenance to the original equipment.

3.2.2 Regional Meteorological Data

A review of long-term meteorological data available from ECCC (i.e., climate normals for temperature and precipitation from 1981-2010) was conducted for weather stations in the Crown Mountain regional area to compare with past meteorological averages. However, given that the Crown Mountain climate station was situated at a higher elevation on mountainous terrain, recorded climate data may not be directly comparable to long-term local and regional trends near the project site and the local and/or regional weather stations. Thus, it is important to consider both proximity and elevation of ECCC climate stations relative to the Crown Mountain station.

Details of Environment Canada weather stations located within 50 km of the Crown Mountain climate station are provided in **Table 3**. The locations of the local and regional climate stations are shown in **Figure 4** and **Figure 5**, respectively.

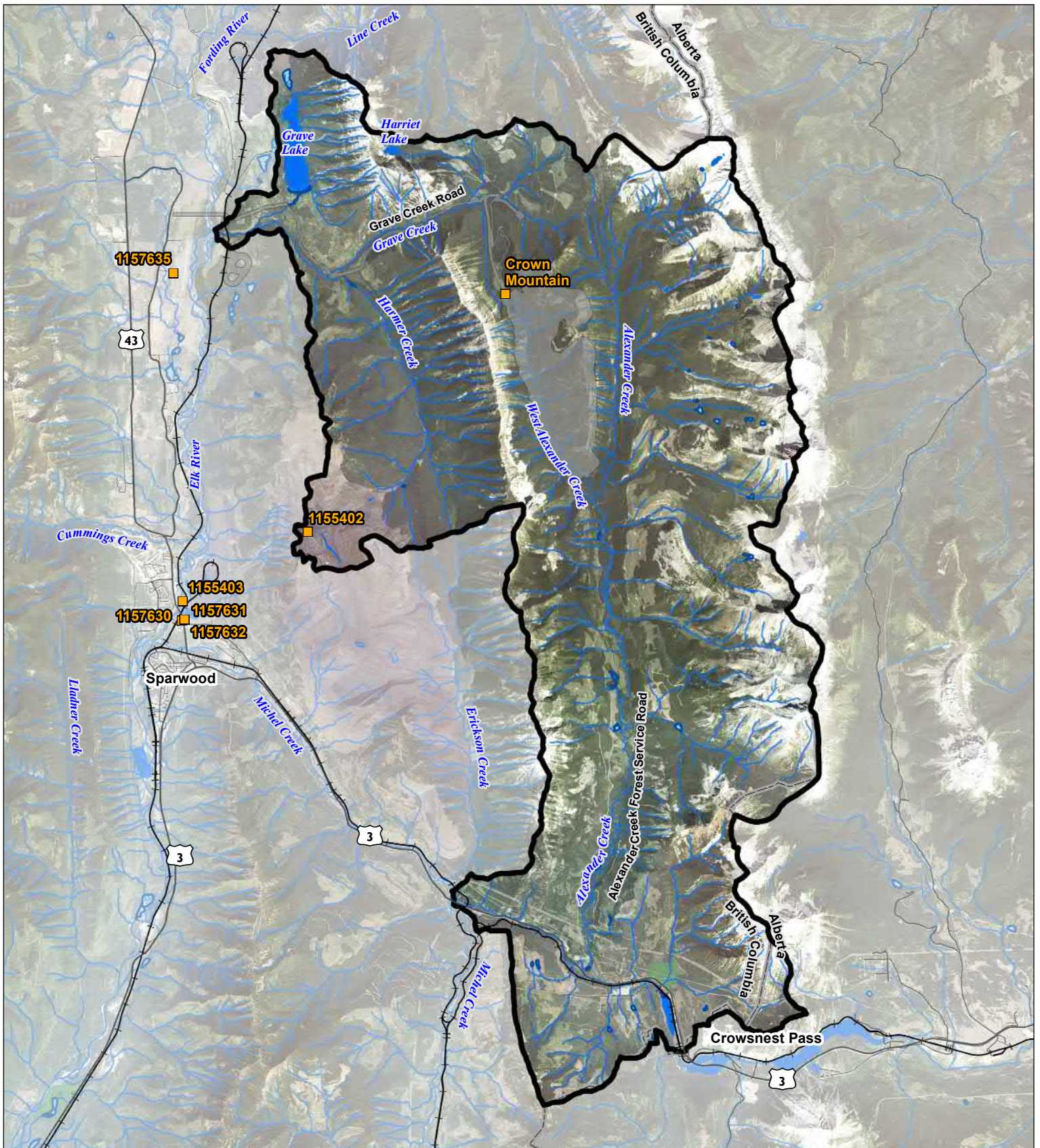
Table 3: Local and Regional Climate Stations

Climate Station Name	Station ID	Location (Lat/Long)	Elevation (mASL)	Distance (km) from Crown Mountain Station (Direction)	Period of Record	Meteorological Parameters			Climate Normals Available
						Temperature	Precipitation	Wind Speed & Direction	
Natal Harmer	1155402	49°46'00"N 114°50'00"W	1,890	8.7 (SW)	1971–1991	✓	✓		
Sparwood A	1157635	49°50'00"N 114°53'00"W	1,158	11.1 (W)	2014–present	✓	✓	✓	
Natal Kaiser Resources	1155403	49°45'00"N 114°53'00"W	1,128	12.6 (SW)	1969–1980	✓	✓		
Sparwood	1157630	49°44'00"N 114°53'00"W	1,138	13.0 (SW)	1980–present	✓	✓	✓	✓
Sparwood CS	1177631	49°44'00"N 114°53'00"W	1,137	13.0 (SW)	1992–present	✓	✓	✓	
Elkford	1152653	50°01'00"N 114°55'00"W	1,370	24.3 (NW)	1972–1993	✓	✓		
Fording River	1152899	50°09'00"N 114°51'00"W	1,585	37.0 (N)	1970–2017	✓	✓		✓
Fording River Clode	1152898	50°12'00"N 114°49'00"W	2,100	41.9 (N)	1976–1987				
Fernie	1152850	49°29'00"N 115°04'00"W	1,001	46.3 (SW)	1913–present	✓	✓		✓

Source: ECCC, 2019

Snowpack data were compiled from the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development Automated Snow Pillow and Manual Snow Course Survey Data. Data were obtained from five stations located within the RSA (Upper Elk River 2C06, Fernie East 2C07, Morrissey Ridge 2C09 and 2C09Q, and Mount Joffre 2C16) (**Figure 5**). The selection criteria for the snow survey stations included period of record (minimum 25 years) and the recency (no more than 20 years ago).

A summary of the snow survey stations utilized for the baseline study is provided in **Table 4**.



Crown Mountain
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**Meteorology Baseline Report
Local Climate Stations**

Figure 4

LEGEND

- | | | | |
|--|-------------------|--|----------------------------|
| | Local Study Area | | Highways |
| | Project Footprint | | Arterial Roads |
| | Provincial Park | | Local/Resource Roads |
| | Waterbody | | Railway (Canadian Pacific) |
| | Wetland | | BC/Alberta Border |
| | Watercourse | | Climate Station |

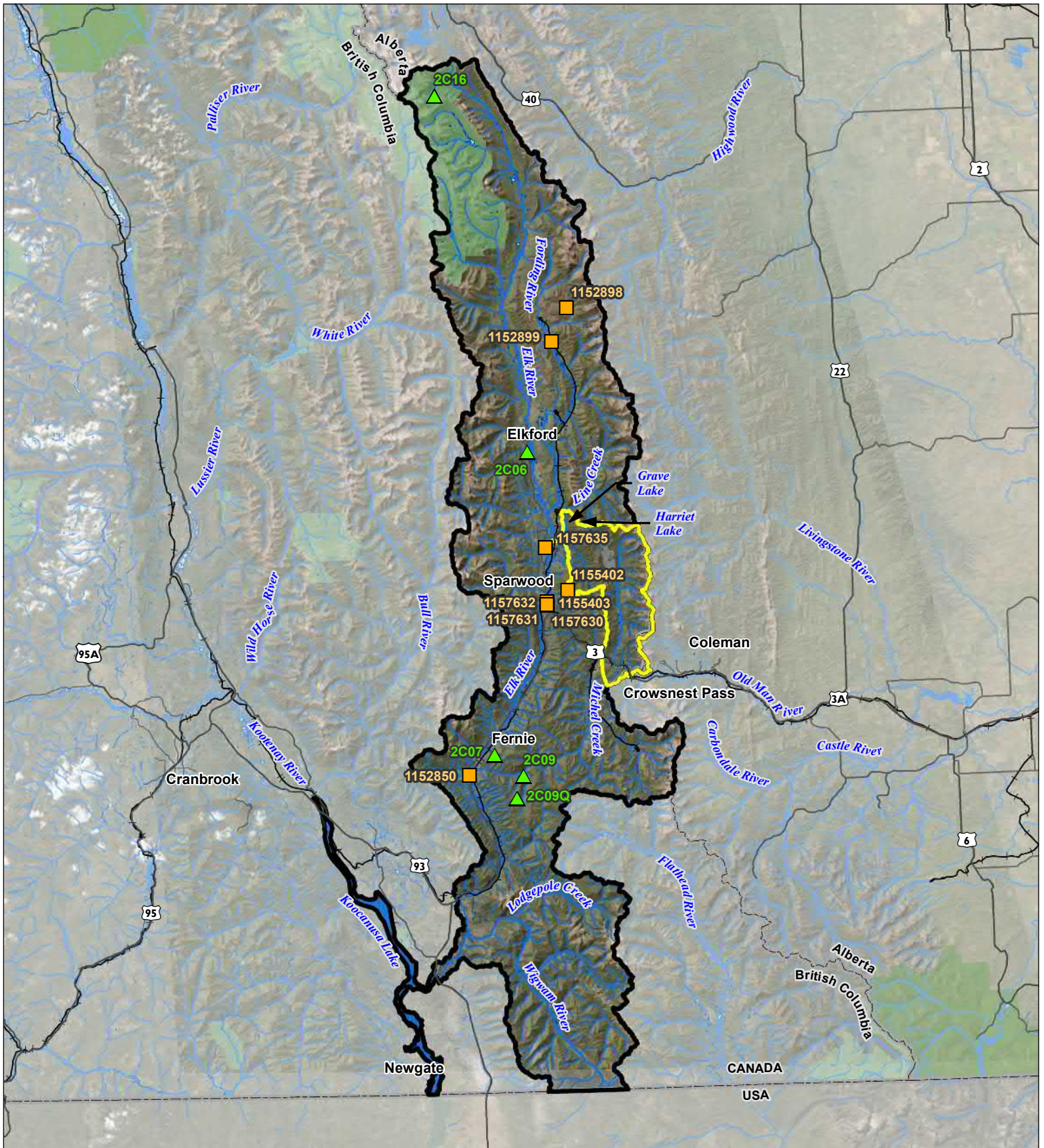


MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia GeoBC
and Open Data BC, BC Water Resource Atlas, CANVEC.

MAP CREATED BY: RBB
MAP CHECKED BY: JNW
MAP PROJECTION: NAD 1983 UTM Zone 11N



PROJECT: 12-6231
STATUS: FINAL
DATE: 2021-08-13



Crown Mountain
Coking Coal Project

**Meteorology Baseline Report
Regional Climate Stations**

Figure 5

LEGEND

- | | | | |
|---|---------------------|---|----------------------------|
|  | Regional Study Area |  | Watercourse |
|  | Local Study Area |  | Highways |
|  | Project Footprint |  | Arterial Roads |
|  | National Park |  | Railway (Canadian Pacific) |
|  | Provincial Park |  | BC/Alberta Border |
|  | Waterbody |  | Climate Station |
|  | Wetland |  | Snow Station |

0 5 10 20 km
SCALE 1:875,000



MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia GeoBC and Open Data BC, BC Water Resource Atlas, CANVEC.

MAP CREATED BY: RBB
MAP CHECKED BY: JNW
MAP PROJECTION: NAD 1983 UTM Zone 11N



PROJECT: 12-6231
STATUS: FINAL
DATE: 2021-08-13

Table 4: Regional Snow Stations

Station Name	Station ID	Elevation (m)	Latitude	Longitude	Period of Record
Upper Elk River	2C06	1,340	49°58'50"N	114°55'12"W	1948–2002
Fernie East	2C07	1,250	49°31'00"N	115°01'00"W	1951–2018
Morrissey Ridge	2C09	1,860	49°29'00"N	114°57'00"W	1961–1988
Morrissey Ridge	2C09Q	1,860	49°27'00"N	114°58'00"W	1983–2018
Mount Joffre	2C16	1,750	50°31'50"N	115°7'12"W	1961–1988

Source: BC MOECC, 2019

3.3 Climate Change

Several studies, reports, and publications have been undertaken in recent years to assess climate trends and variability in the Columbia River Basin, which includes the RSA. For the purpose of the meteorology baseline study, available documentation related to climate change was compiled and reviewed in an effort to identify historical and projected trends in the RSA, including the following publications:

- Preliminary Analysis of Climate Variability and Change in the Canadian Columbia River Basin: Focus on Water Resources (PCIC, 2006).
- Hydrologic Impacts of Climate Change on BC Water Resources – Summary Report for the Campbell, Columbia and Peace River Watersheds (PCIC, 2011).
- Climate Extremes in the Columbia Basin Summary Report (PCIC, 2014).

3.4 Quality Assurance & Quality Control

The data collection program for the meteorological baseline study was developed and conducted in general conformance with the *Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators* (MOE, 2016).

The following QA/QC activities were completed by the project team during the meteorological baseline data collection program:

- Routine inspection of the climate station was conducted periodically to confirm that all instrumentation was functioning properly;
- Station maintenance was undertaken in accordance with the manufacturer's specifications for all components of the climate station, including replacement of antifreeze in the precipitation gauge; and
- Review and filtering of data of anomalous readings.

4.0 Results

Baseline meteorological conditions for the LSA and RSA were characterized through an assessment of long-term historical climate data obtained from Environment and Climate Change Canada (ECCC, 2019) for stations located in the RSA, together with data collected at the Crown Mountain climate station.

A summary of the baseline meteorological data collected from January 1, 2014 to May 13, 2016 for air temperature, barometric pressure, relative humidity, solar radiation, wind speed, wind direction, and precipitation are presented and summarized in this section. Baseline meteorological information from the Crown Mountain climate station was compared to climate normal for the regional climate stations.

4.1 Project Footprint & Local Study Area

4.1.1 Air Temperature

Average monthly air temperature values were calculated for January 2014 to May 2016, and were derived from the continuous data collected at the Crown Mountain climate station (**Table 5**). A summary of average daily air temperature data is provided in **Appendix A**.

Table 5: Average Monthly Air Temperature (°C) at the Crown Mountain Climate Station

Date	2014	2015	2016	Average
January	-7.3	-7.8	-6.0	-7.0
February	-13.4	-4.6	-3.7	-7.3
March	-6.4	-0.9	-1.7	-3.0
April	-0.1	1.7	4.3	1.9
May	5.1	6.1	6.4	5.8
June	7.7	16.6	-	12.1
July	16.4	13.5	-	14.9
August	12.8	13.8	-	13.3
September	7.6	6.6	-	7.1
October	4.0	4.7	-	4.3
November	-7.7	-4.9	-	-6.3
December	-8.0	-8.2	-	-8.1
Minimum	-13.4	-8.2	-6.0	-9.2
Mean	0.9	3.0	-0.2	1.2
Maximum	16.4	16.6	6.4	13.0

Note: Meteorological data collection ended May 13, 2016.

A summary of the mean daily minimum, average, and maximum temperature data recorded at the Crown Mountain climate station is provided in **Table 6** and shown on **Figure 6** to **Figure 8**.

Table 6: Summary of Mean Monthly Temperature Data (oC) at the Crown Mountain Climate Station (1²)

Date	Mean Daily Minimum Temperature	Mean Daily Average Temperature	Mean Daily Maximum Temperature
January	-10.0	-7.0	-3.2
February	-10.8	-7.3	-2.8
March	-6.6	-3.0	1.5
April	-3.4	1.9	8.5
May	0.1	5.8	13.1
June	7.0	12.1	17.7
July ⁽²⁾	9.3	14.9	21.2
August	8.6	13.3	18.5
September	3.4	7.1	11.3
October	1.4	4.3	7.7
November	-9.2	-6.3	-3.1
December	-10.9	-8.1	-4.9
Minimum	-10.9	-8.1	-4.9
Mean	-1.8	2.3	7.1
Maximum	9.3	14.9	21.2

Notes: 1. Based on data collected at the Crown Mountain Climate Station (January 2014- May 2016).
2. Temperature measurements not available between July 17-24, 2014 and March 14-18, 2016.

A review of the 2014–2016 air temperature data indicated the following:

- Mean daily average temperature ranged from a low of -13.4 °C in February 2014 to a maximum of 16.6 °C in June 2015.
- Mean daily minimum air temperature ranged from a low of -16.9 °C in February 2014 to a high of 10.2 °C in July 2015.
- Mean daily maximum air temperature ranged from a low of -9.0 °C in February 2014 to a high of 23.9 °C in July 2014.
- The extreme minimum temperature at the Crown Mountain station was -32.3°C on March 1, 2014 and the extreme maximum temperature was 35.2°C on June 7, 2015.

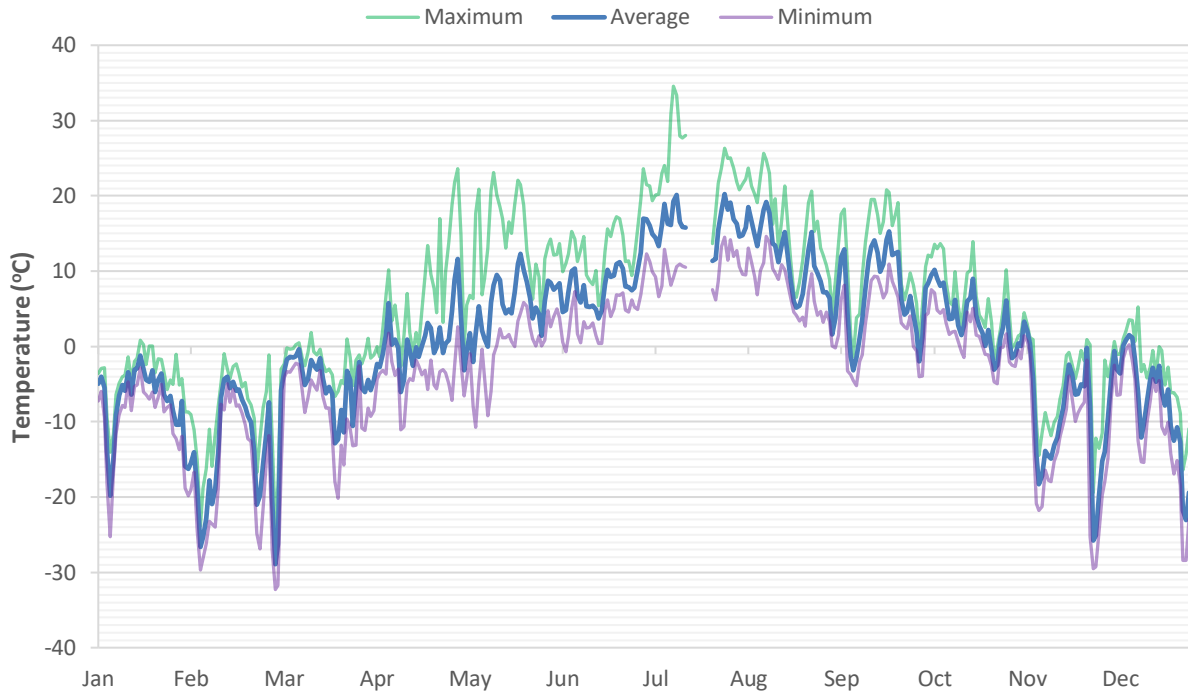


Figure 6: Daily Temperature Data at the Crown Mountain Climate Station (2014)

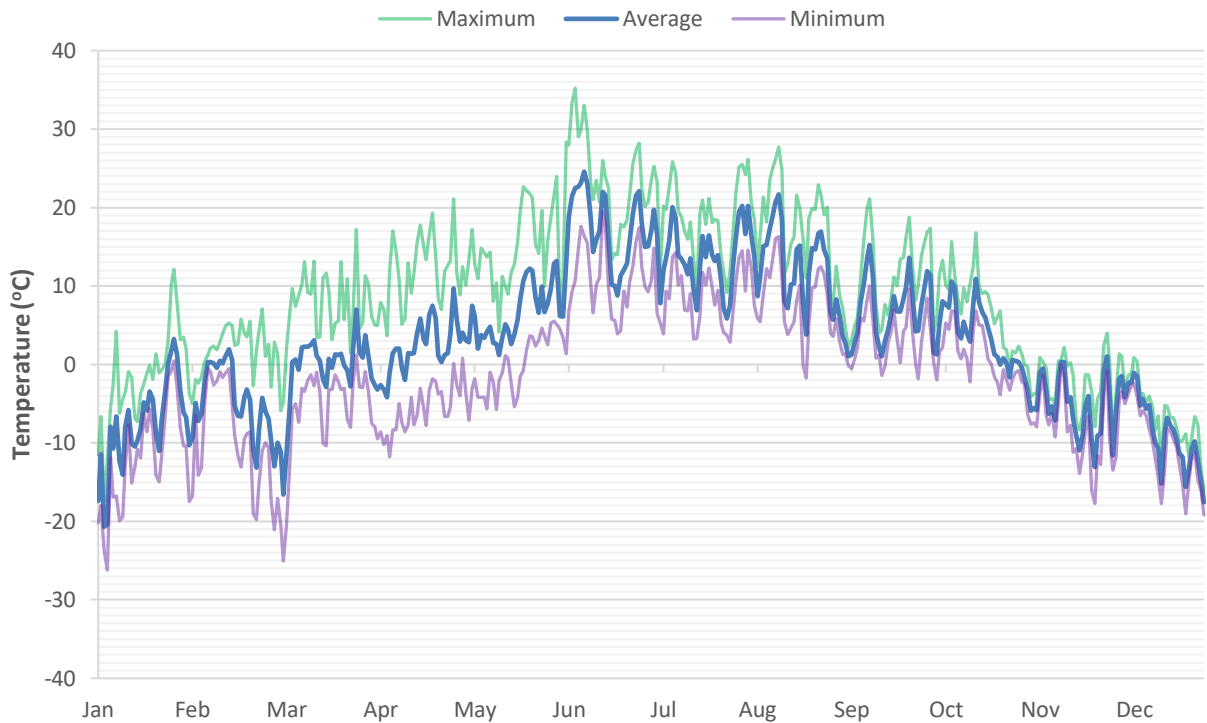


Figure 7: Daily Temperature Data at the Crown Mountain Climate Station (2015)

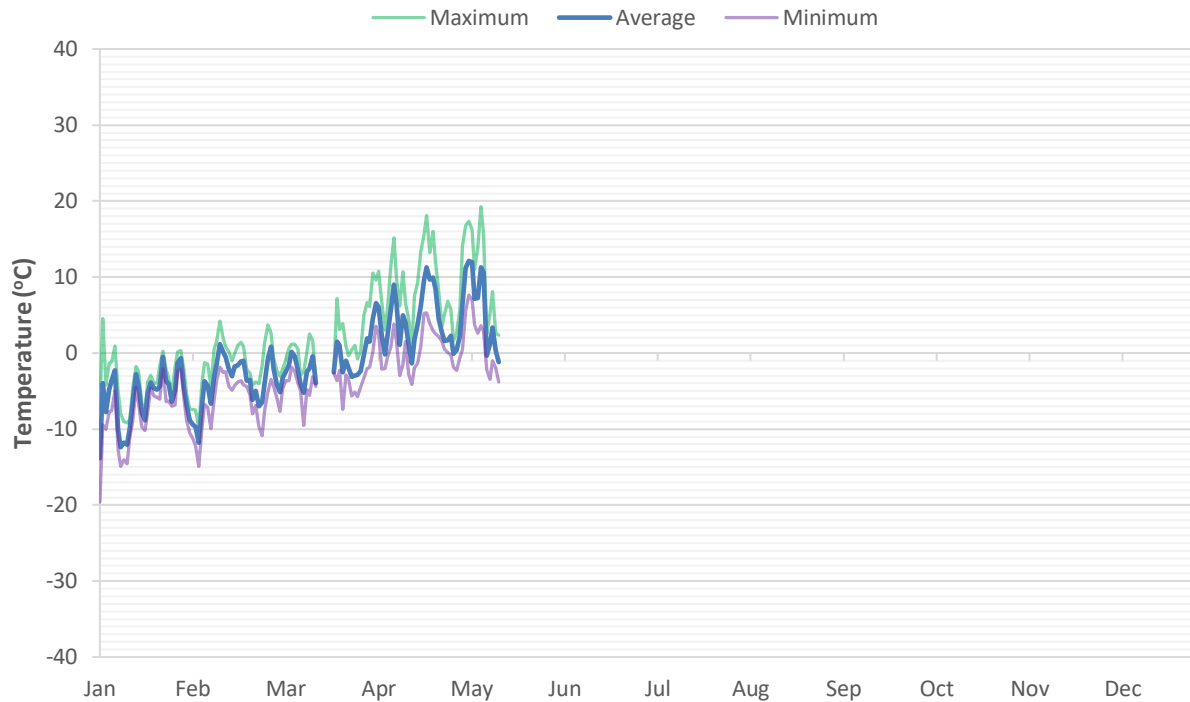


Figure 8: Daily Temperature Data at the Crown Mountain Climate Station (2016)

4.1.2 Barometric Pressure

Average monthly barometric pressure values were calculated based on the continuous measurements recorded at the Crown Mountain climate station for the duration of the baseline study. Where necessary, data gaps were filled using barometric pressure measurements collected at hydrometric stations, which was adjusted to account for the difference in elevation.

A summary of the average monthly barometric pressure data is presented in **Table 7**. Average daily barometric pressure data for the January 2014 to May 2016 monitoring period is provided in **Appendix A** and presented on **Figure 9** to **Figure 11**.

A review of the barometric pressure data recorded at the Crown Mountain climate station during the baseline monitoring period indicated the following:

- Barometric pressure measurements were recorded within a range of 78.3 to 82.5 kPa; and
- Average daily and monthly barometric pressure were generally higher in the warmer summer months, and lower with greater variability in the colder winter months, which was anticipated as there are typically more active low pressure weather systems in the winter.

Table 7: Average Monthly Barometric Pressure (kPa) at the Crown Mountain Climate Station

Date	2014	2015	2016	Average
January	80.6	80.8	80.1	80.5
February	80.2	80.7	80.4	80.4
March	80.2	80.5	80.0	80.2
April	80.2	80.3	80.6	80.4
May	80.6	80.7	80.8	80.7
June	80.4	80.8	-	80.6
July	81.0	80.8	-	80.9
August	81.0	80.8	-	80.9
September	80.8	80.5	-	80.7
October	80.4	80.6	-	80.5
November	80.5	80.2	-	80.3
December	80.4	79.7	-	80.0
Minimum	80.2	79.7	80.0	79.9
Mean	80.5	80.5	80.4	80.5
Maximum	81.0	80.8	80.8	80.9

Note: Meteorological data collection ended May 13, 2016.

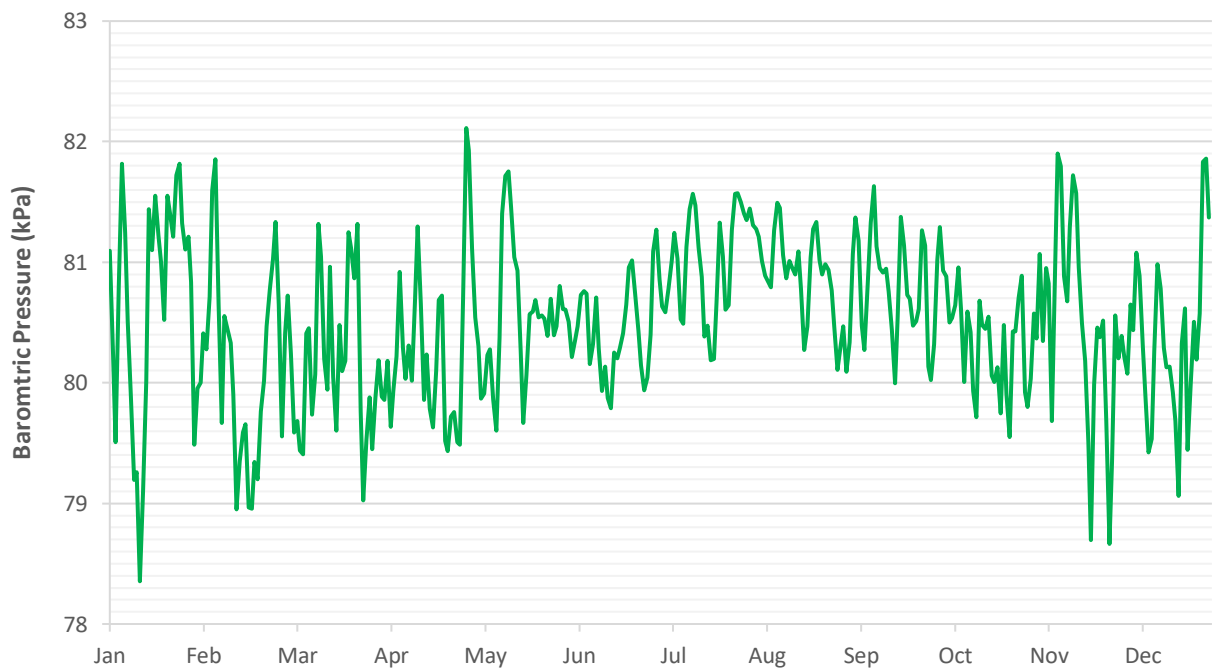


Figure 9: Average Daily Barometric Pressure (kPa) at the Crown Mountain Climate Station (2014)

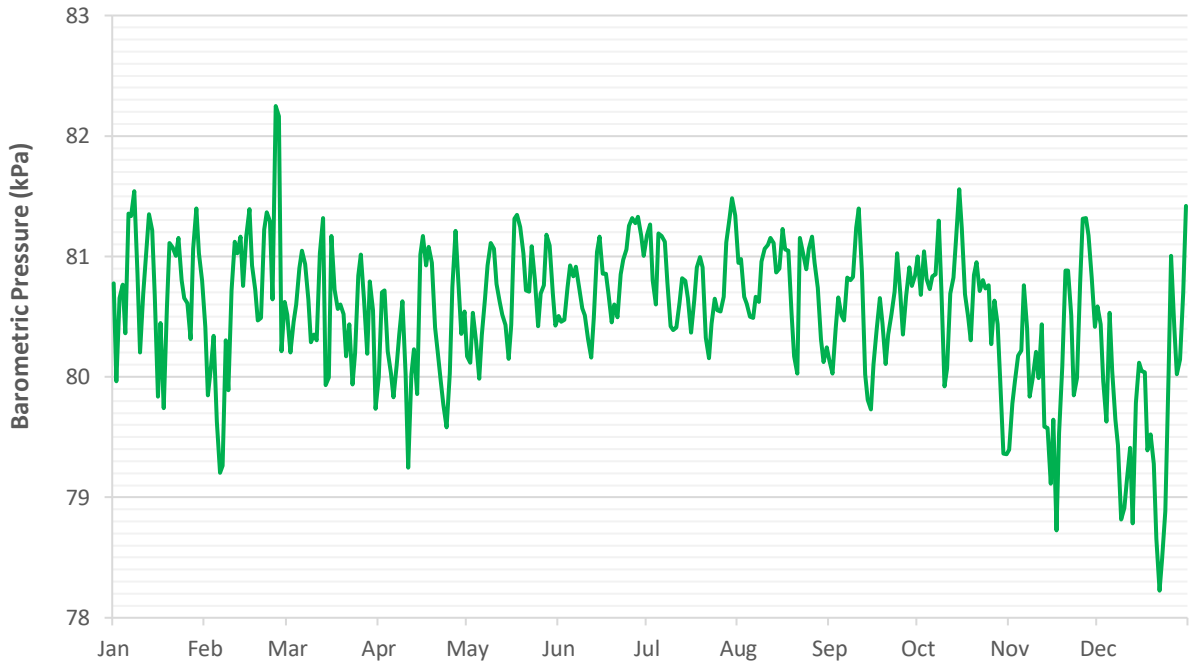


Figure 10: Average Daily Barometric Pressure (kPa) at the Crown Mountain Climate Station (2015)



Figure 11: Average Daily Barometric Pressure (kPa) at the Crown Mountain Climate Station (2016)

4.1.3 Precipitation

Precipitation data was collected at the Crown Mountain climate station between January 2014 and May 2016. However, due to a malfunction of the precipitation gauge caused by high winds, some of the data that was collected was deemed to be inaccurate.

To characterize the precipitation conditions for the Crown Mountain project area and LSA, a regression analysis was undertaken using data collected at nearby climate stations. Precipitation conditions can vary spatially and temporally and are influenced significantly by altitude, topography, and wind. The objective of the regression analysis was to identify a relationship for the mean summer (May-September) and mean winter (October-April) seasonal precipitation and the corresponding elevation at specific climate stations. The Sparwood (11557630) and Natal Harmer Ridge (1155402) climate stations were selected for the analysis, given their proximity to the Crown Mountain project area, elevation, and available period of record. For the purpose of the analysis, only the data for the common period of record for the two stations was utilized (1980-1990).

The results of the regression analysis are presented on **Figure 12**.

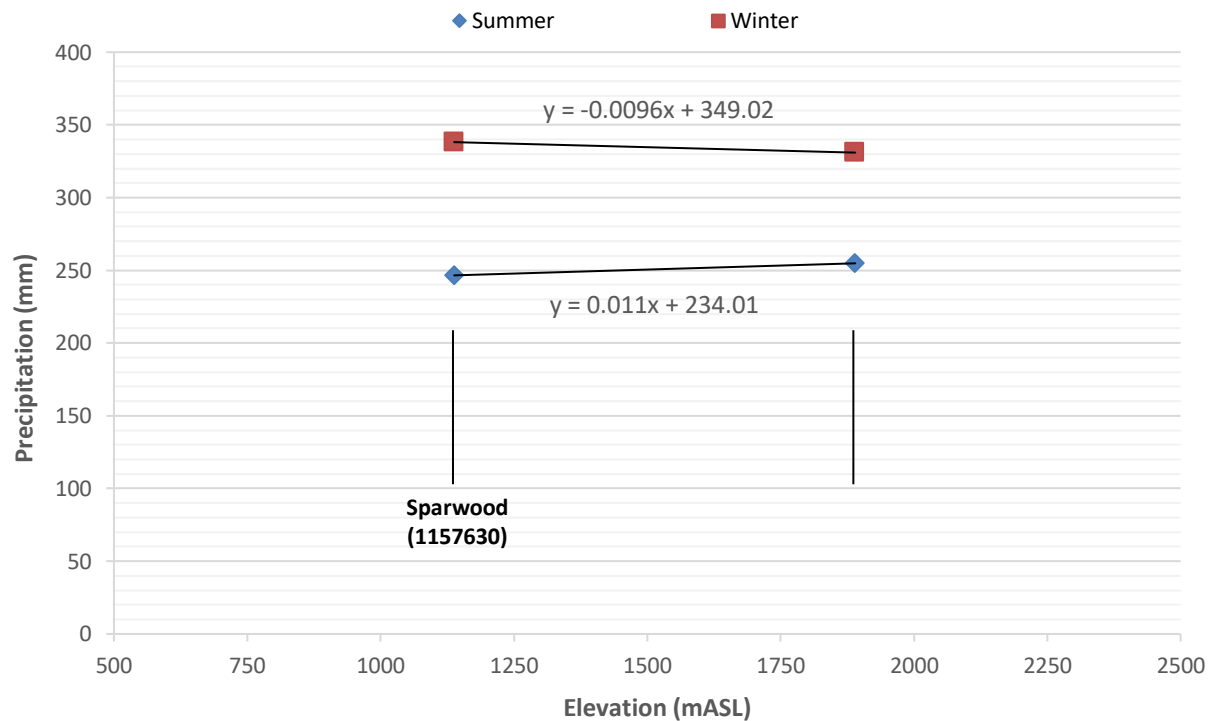


Figure 12: Regression Analysis for Mean Seasonal Precipitation (mm) from 1980-1990 at the Sparwood and Natal Harmer Ridge Climate Stations

A summary of the measured and derived mean seasonal precipitation for the Sparwood and Natal Harmer Ridge climate stations, in addition to the Crown Mountain project area, is provided in **Table 8**.

Table 8: Summary of Measured and Derived Mean Seasonal Precipitation for the Sparwood, Natal Harmer Ridge, and Crown Mountain Climate Stations

Season	Regression Equation	SPARWOOD Station 1157630 (1,138 mASL)		NATAL HARMER RIDGE Station 1155402 (1,890 mASL)		CROWN MOUNTAIN (1,920 mASL)
		Measured (1980-2019)	Derived	Measured (1971-1991)	Derived	Derived
Mean Summer (May-Sept)	$y = 0.011x + 234.01$	250.4	246.5	260.0	254.8	255.1
Mean Winter (Oct-April)	$y = -0.0096x + 349.02$	354.5	339.0	442.8	330.9	330.6

Note: x represents elevation (mASL)

The results of the regression analysis indicate that the mean summer precipitation at the Crown Mountain site (1,920 mASL) is 14.9 mm higher than at the Sparwood climate station (1,138 mASL), and the mean winter precipitation is 23.9 mm lower, respectively.

The seasonal relationships for mean summer and winter precipitation were applied to derive the monthly precipitation for the Crown Mountain project area. A summary of the total monthly precipitation at the project area for the period of January 2014 to May 2016 is provided in **Table 9** and illustrated on **Figure 13**.

Table 9: Total Monthly Precipitation (mm) Derived for the Crown Mountain Project Area

Month	Minimum	Mean	Maximum
January	4.3	62.4	140.1
February	2.9	48.1	151.2
March	5.1	62.5	216.0
April	9.5	50.5	109.9
May	11.3	61.9	150.0
June	19.2	69.2	178.2
July	2.8	45.5	124.9
August	5.4	35.4	118.2
September	3.0	49.6	151.5
October	10.9	65.9	154.8
November	7.6	89.6	221.2
December	7.0	69.2	268.6
Total	89	709.8	1,984.6

The monthly precipitation varied throughout the assessment period, with the lowest values generally corresponding to the summer months and higher precipitation in the early winter months.

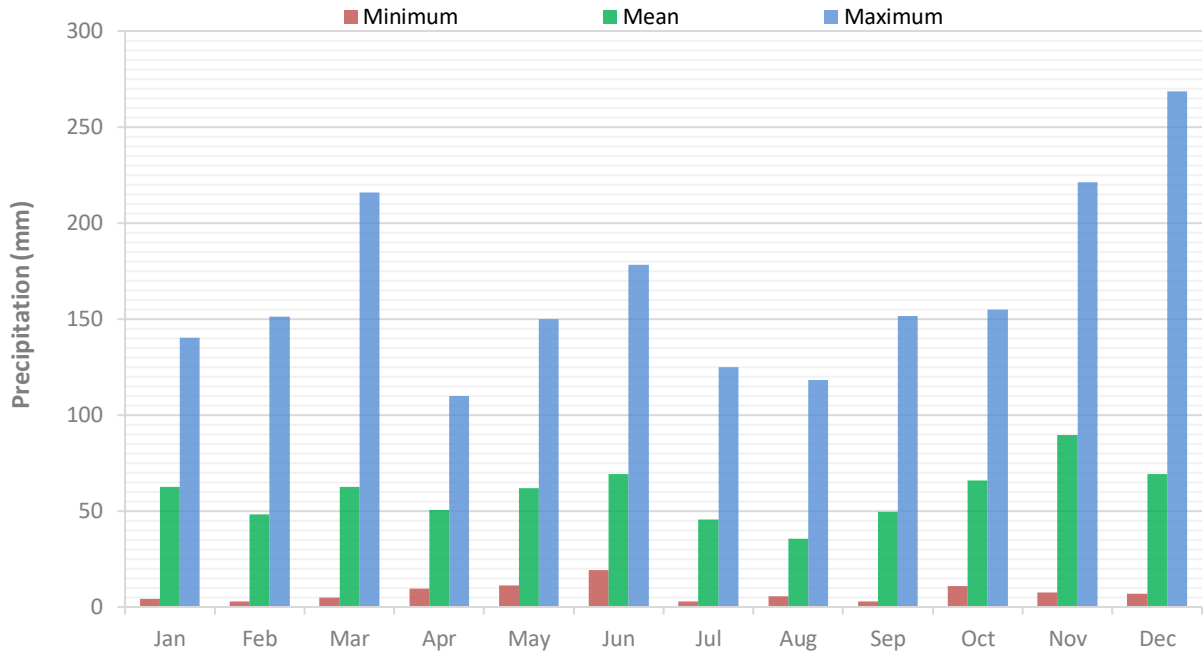


Figure 13: Monthly Precipitation (mm) Derived for the Crown Mountain Project Area

The derived daily precipitation data for the Crown Mountain project area is presented on

Figure 14 to Figure 16 for the period of 2014-2016. A summary of total daily precipitation data is provided in **Appendix A**.

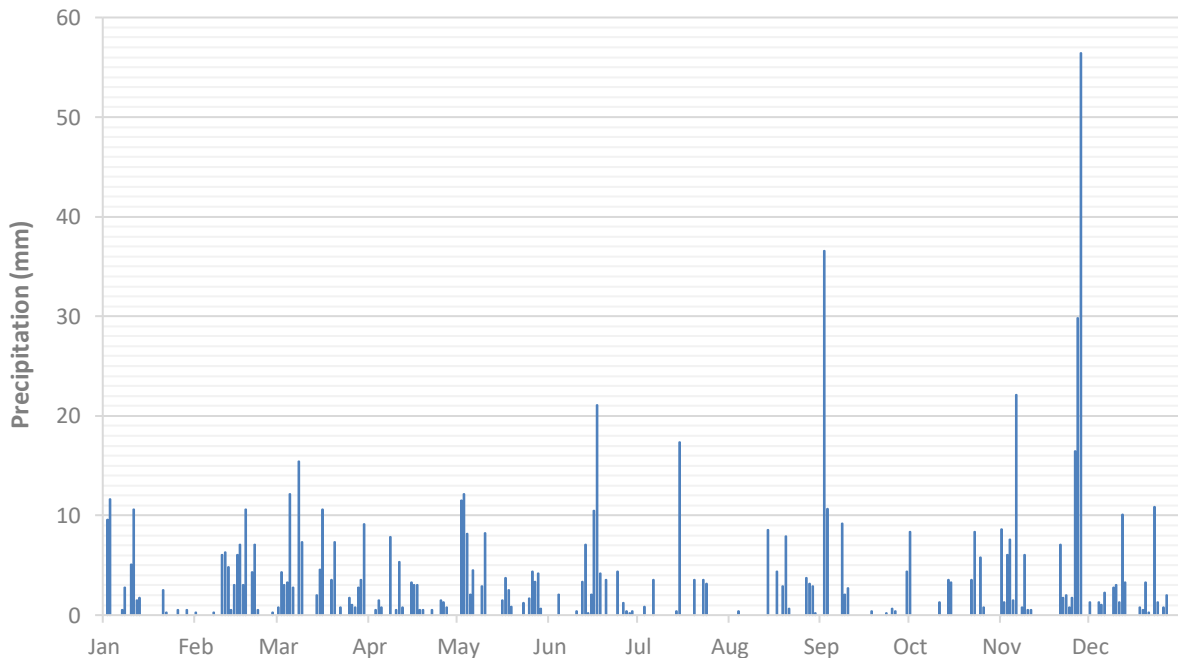


Figure 14: Daily Precipitation (mm) for the Crown Mountain Project Area (2014)

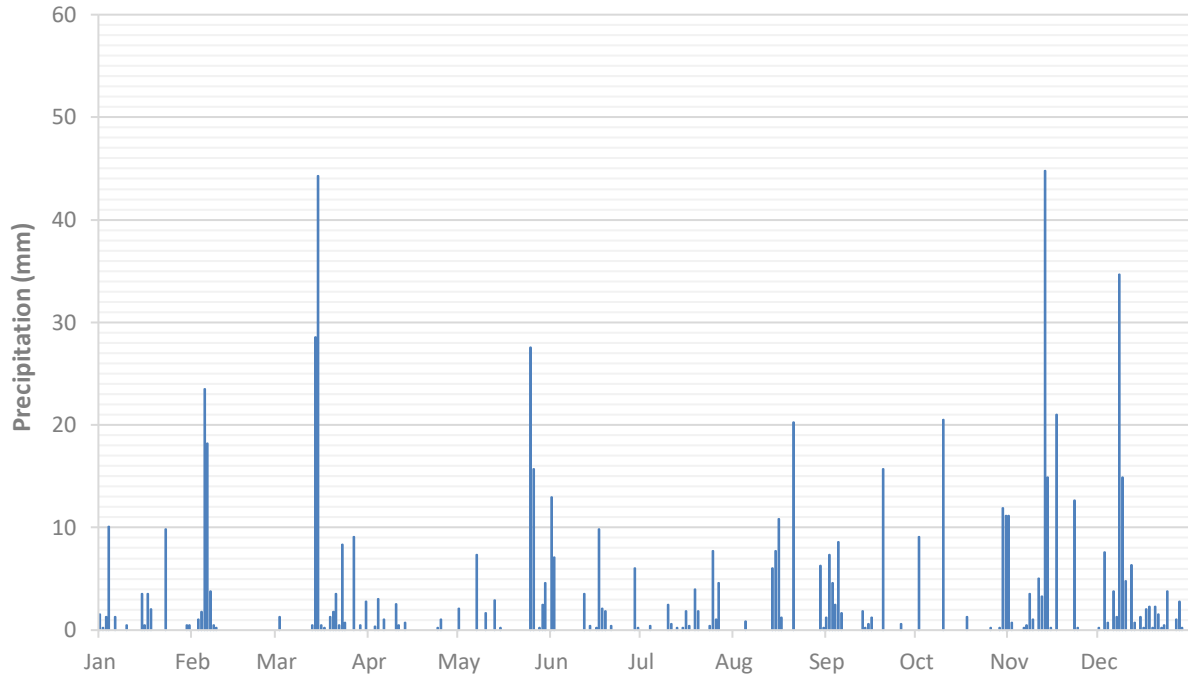


Figure 15: Daily Precipitation (mm) for the Crown Mountain Project Area (2015)

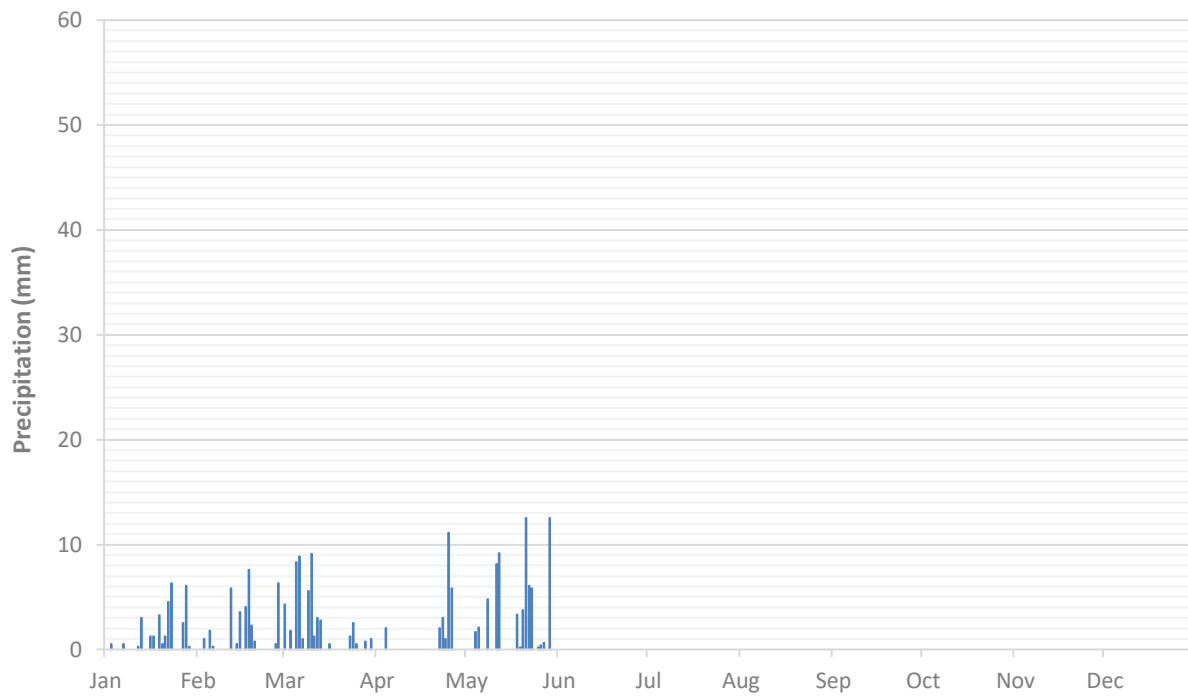


Figure 16: Daily Precipitation (mm) for the Crown Mountain Project Area (2016)

The cumulative precipitation data derived for the Crown Mountain Project Area for the period of January 2014 to May 2016 is presented on **Figure 17**.

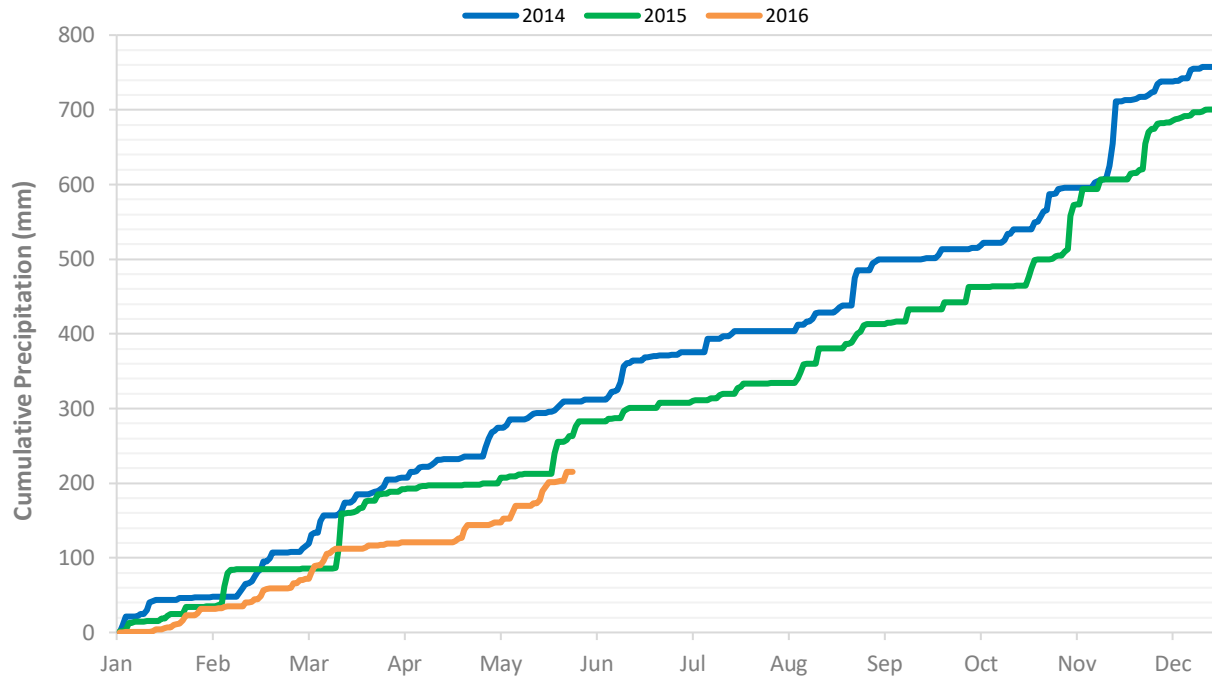


Figure 17: Cumulative Precipitation (mm) for the Crown Mountain Project Area

Notable highlights observed from the precipitation data presented above include:

- The total annual precipitation for the two complete years of the assessment period was approximately 760 mm (2014) and 700 mm (2015);
- The highest daily precipitation was 56.4 mm (November 28, 2014); and
- There were a total of five significant events (i.e., greater than 25 mm) in 2015 compared with three events in 2014, and zero in 2016 (January to May).

4.1.4 Snow Pack

There are no known snow survey stations located within the project footprint or LSA. Accordingly, an assessment of snow pack data was not completed for these areas.

4.1.5 Relative Humidity

The mean monthly relative humidity data collected for the duration of the baseline study period are summarized in **Table 10**.

Table 10: Average Monthly Relative Humidity (%) for the Crown Mountain Project Area

Date	2014	2015	2016
January	86.7	88.2	93.1
February	85.2	82.6	81.2
March	91.5	74.9	84.1
April	73.4	60.8	65.6
May	69.7	64.8	62.0
June	71.9	58.4	-
July	51.5	57.5	-
August	66.3	50.1	-
September	69.8	69.6	-
October	75.7	69.3	-
November	84.1	79.9	-
December	91.6	91.1	-
Minimum	51.5	50.1	62.0
Average	76.5	70.6	77.2
Maximum	91.6	91.1	93.1

Note: Meteorological data collection ended May 13, 2016.

Average daily relative humidity data is provided in **Appendix A** and illustrated on **Figure 18** to **Figure 20**. As shown, there was significant variability in the average daily humidity measured at the Crown Mountain climate station.

It is important to note that relative humidity data was not collected for the period of July 17-24, 2014 and March 13-19, 2016 due to an equipment malfunction and required maintenance.

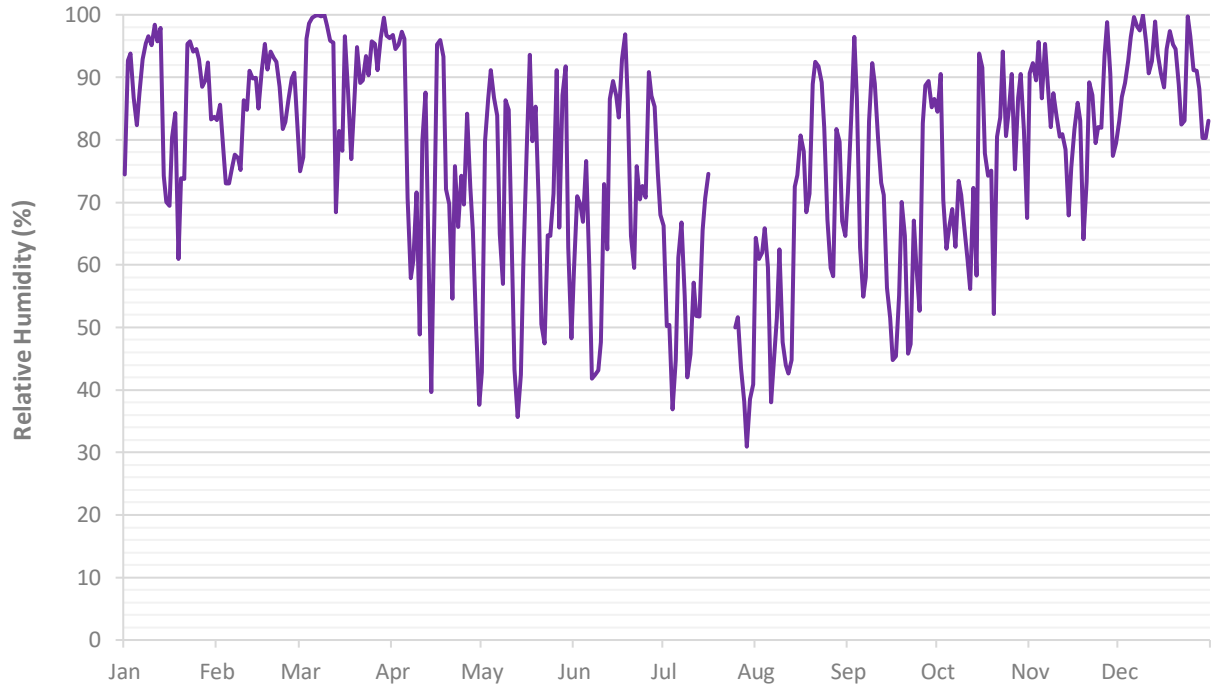


Figure 18: Average Daily Relative Humidity (%) at the Crown Mountain Climate Station (2014)

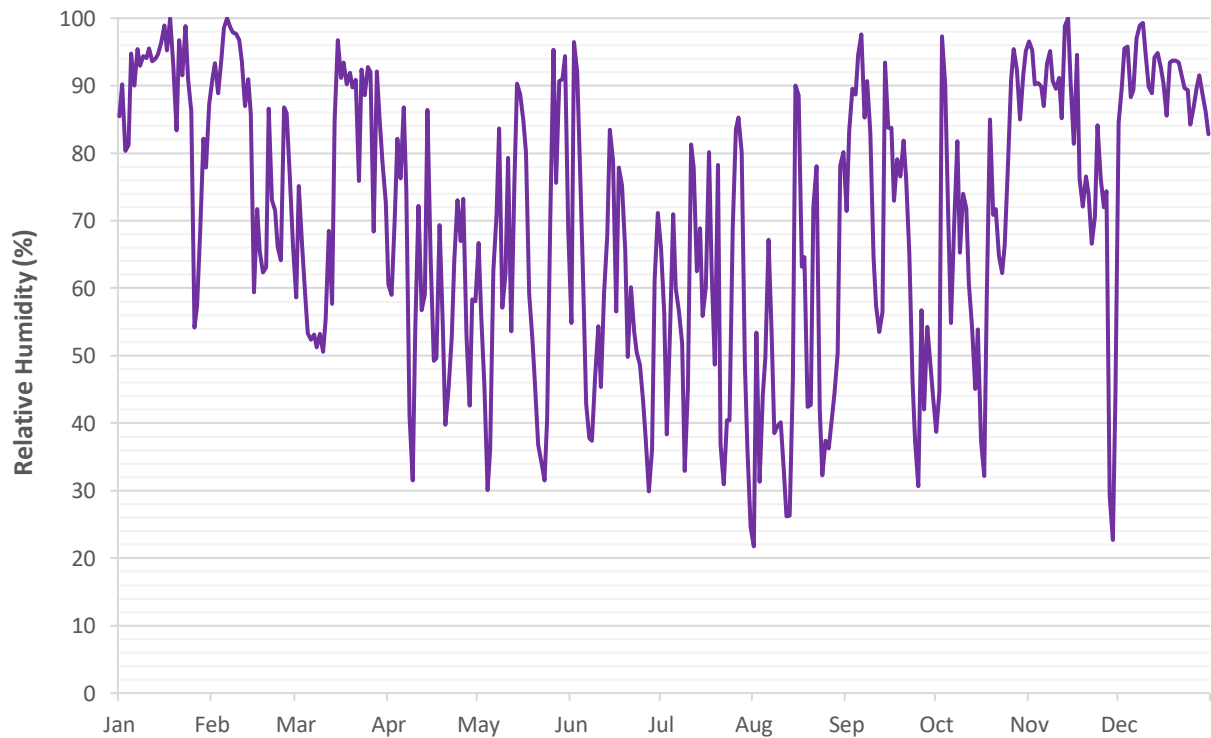


Figure 19: Average Daily Relative Humidity (%) at the Crown Mountain Climate Station (2015)

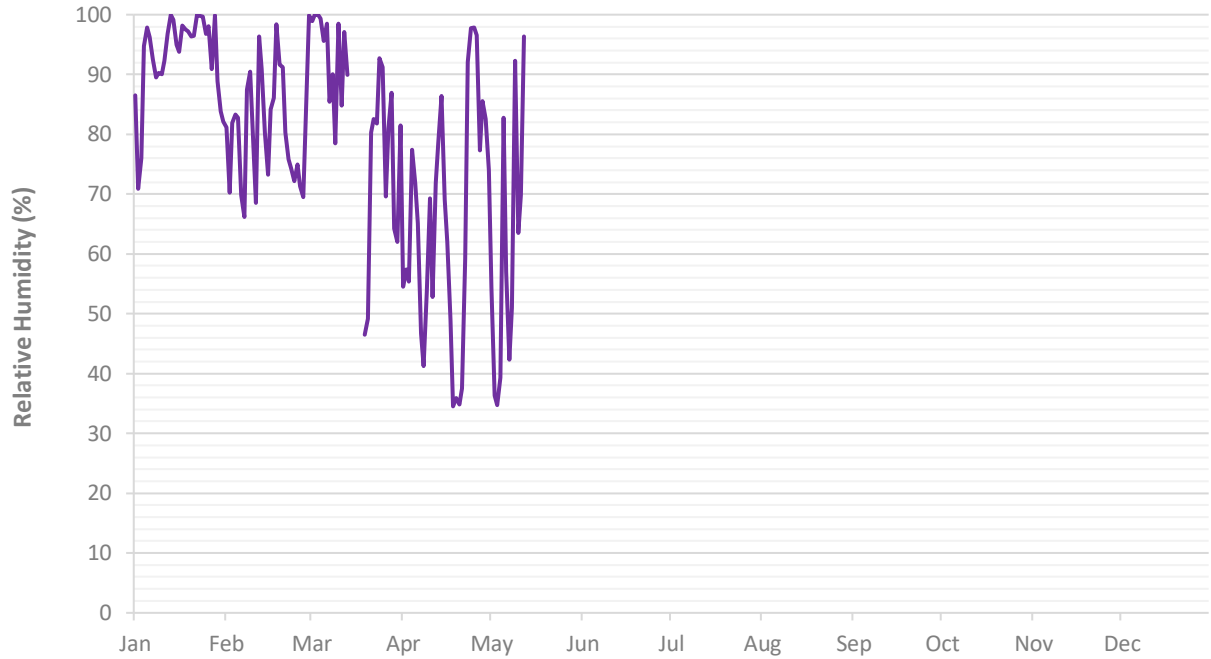


Figure 20: Average Daily Relative Humidity (%) at the Crown Mountain Climate Station (2016)

Over the course of the baseline assessment period, the average monthly relative humidity varied between 50.1% (August 2015) and 93.1% (January 2016). Average monthly humidity was typically lowest in the summer months and highest in the winter.

4.1.6 Solar Radiation

Mean daily solar radiation data collected throughout the duration of the baseline study is summarized in **Table 11**.

Table 11: Average Monthly Solar Radiation (W/m²) for the Crown Mountain Project Area

Date	2014	2015	2016
January	22.8	23.7	16.8
February	18.9	46.9	35.9
March	40.2	83.2	65.6
April	143.7	183.3	169.5
May	173.5	193.3	206.8
June	185.4	220.9	-
July	252.8	204.6	-
August	165.7	181.9	-
September	126.7	98.3	-
October	59.5	71.8	-
November	17.5	24.1	-
December	10.7	6.1	-
Minimum	10.7	6.1	16.8
Average	101.4	111.5	98.9
Maximum	252.8	220.9	206.8

Note: Meteorological data collection ended May 13, 2016.

The average monthly solar radiation at the Crown Mountain station ranged from a minimum of 6.1 W/m² in December 2015 to a maximum of 252.8 W/m² in July 2014. Varying solar radiation values are generally attributed to cloud cover. Typically, higher average solar radiation levels occurred during the summer months, whereas lower average values occurred during the winter months.

A summary of average daily solar radiation data is provided in **Appendix A** and shown on **Figure 21** to **Figure 23**.

Note that solar radiation data was not collected for the period of July 17-24, 2014 and March 13-19, 2016 due to an equipment malfunction and required maintenance.

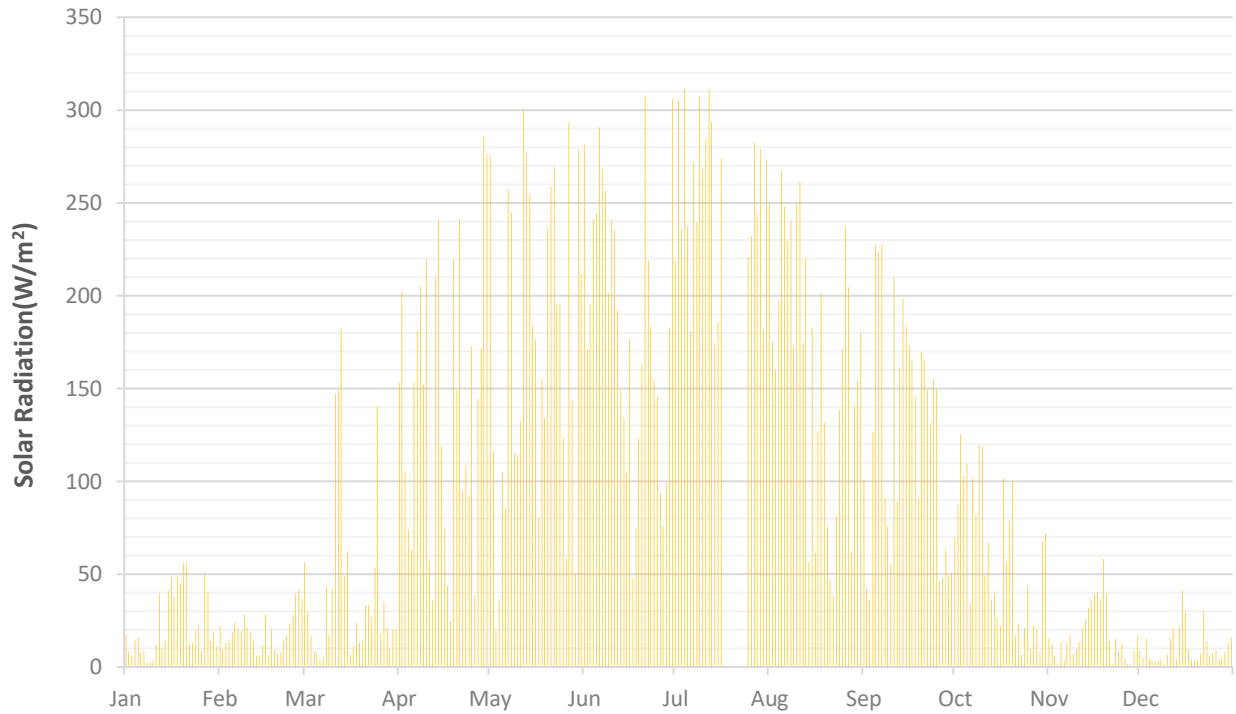


Figure 21: Average Daily Solar Radiation (W/m²) at the Crown Mountain Climate Station (2014)

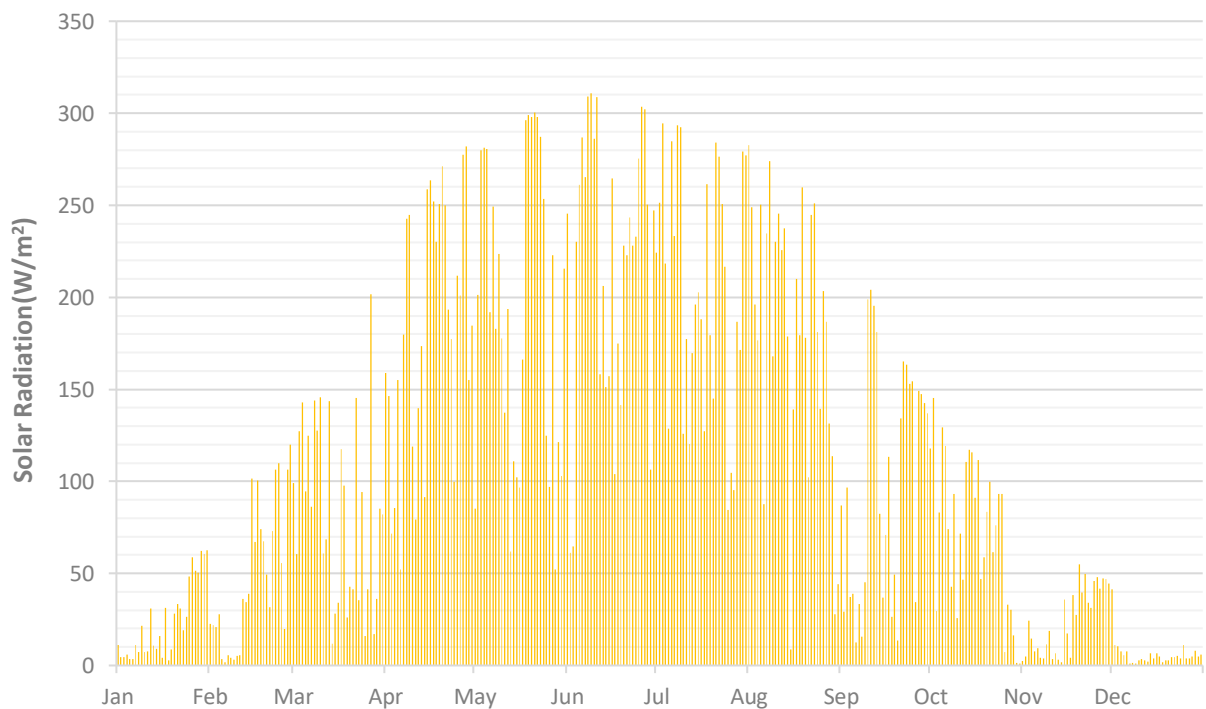


Figure 22: Average Daily Solar Radiation (W/m²) at the Crown Mountain Climate Station (2015)

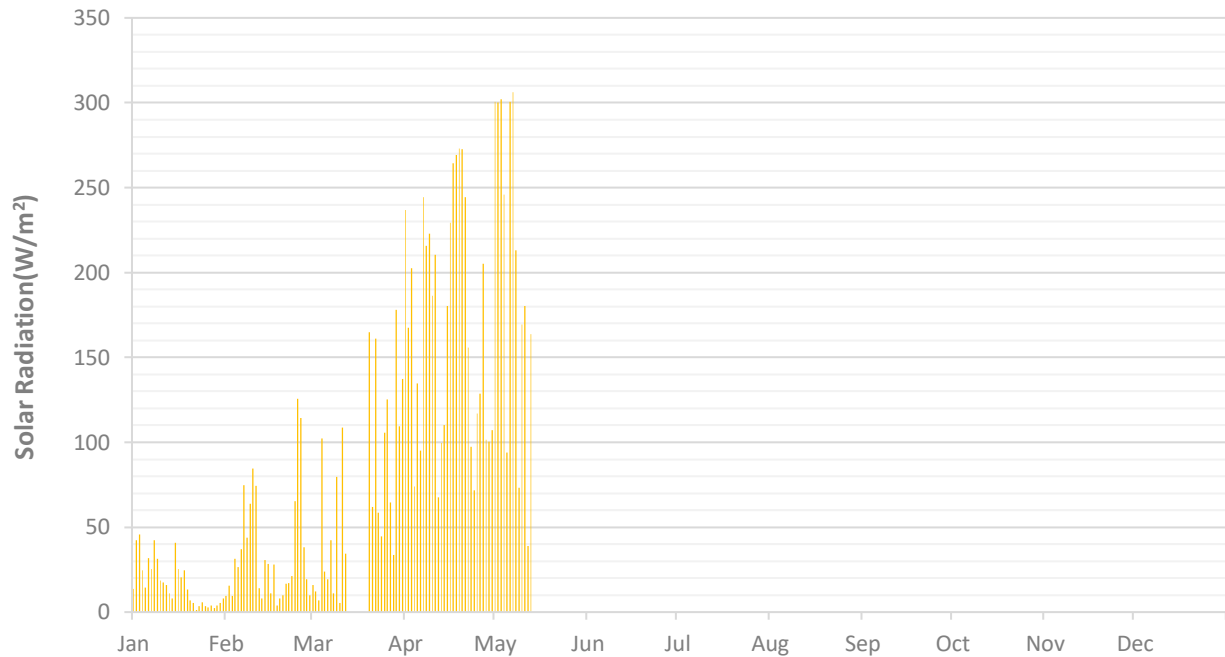


Figure 23: Average Daily Solar Radiation (W/m²) at the Crown Mountain Climate Station (2016)

4.1.7 Wind Speed and Direction

Mean monthly wind speed data for the Crown Mountain project area is summarized in **Table 12**.

Table 12: Average Monthly Wind Speed (km/hr) at the Crown Mountain Project Area

Date	2014	2015	2016
January	5.3	5.9	4.1
February	5.2	5.7	5.8
March	6.8	6.0	5.2
April	6.5	6.6	6.2
May	6.0	5.9	5.4
June	6.6	7.1	-
July	6.6	6.5	-
August	6.1	6.3	-
September	5.3	5.9	-
October	5.3	5.3	-
November	4.2	5.1	-
December	3.6	2.7	-
Minimum	3.6	2.7	4.1
Average	5.6	5.7	5.3
Maximum	6.8	7.1	6.2

Notes: Meteorological data collection ended May 13, 2016.

Wind speeds between 2 and 6 km/h were most frequently recorded over the study period, occurring 48% of the time. Wind speeds below 3.6 km/h or 1 m/s (i.e., calm winds) occurred 33.6% of the time, and wind speeds over 21.6 km/h or 6 m/s (i.e., strong winds) occurred 1.4% of the time. The maximum instantaneous wind speed was 58.4 km/h on February 6, 2016.

A wind direction distribution (wind rose) is presented on **Figure 24**. The most frequent wind direction was traveling west-northwestly (i.e., from the south-east), at approximately 22.9% of the recorded entries.

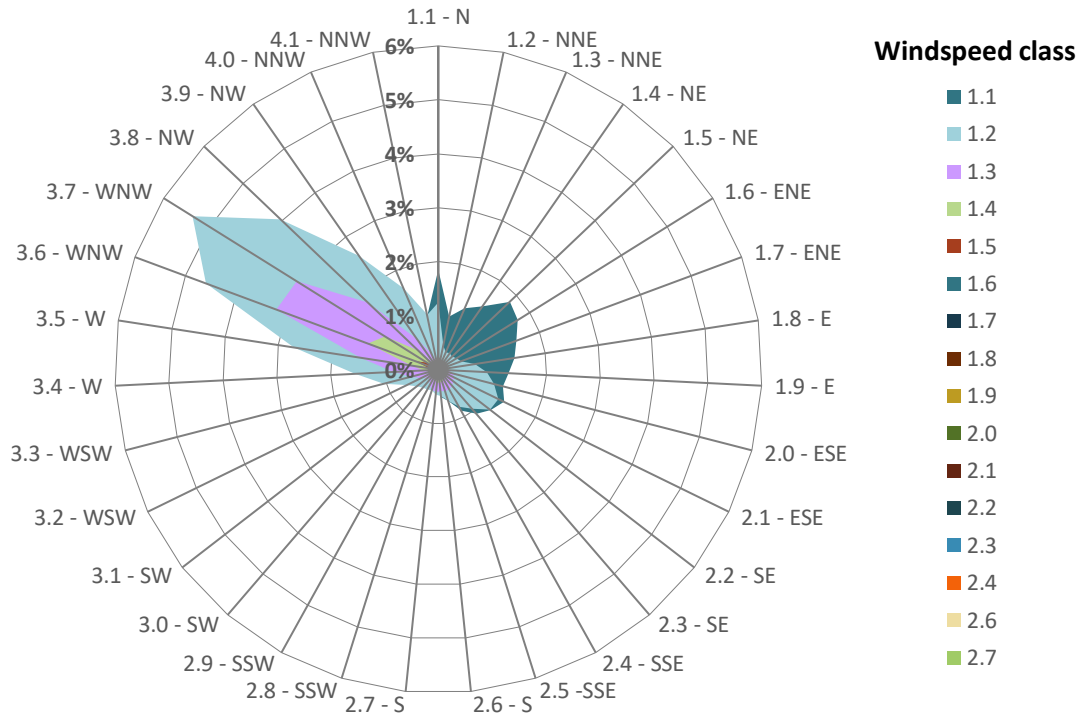


Figure 24: Crown Mountain Wind Direction Distribution

4.2 Regional Study Area

A review of available long-term meteorological data available from ECCC (i.e., climate normals for temperature and precipitation from 1981-2010) was conducted for weather stations in the RSA to compare with past meteorological averages.

There are three climate stations in the RSA for which climate normals data are available from ECCC, which are listed below and shown on **Figure 5**.

- Sparwood climate station (ID: 1157630);
- Fernie climate station (ID: 1152850); and
- Fording River Cominco (ID: 1152899).

A summary of the long-term climate data for these stations is presented in the following sections.

4.2.1 Air Temperature

A summary of mean monthly air temperature data for the RSA is provided in Table 13, together with Crown Mountain climate station data for January 2014 to May 2016.

Table 13: Summary of Mean Monthly Air Temperature Data (°C) for Regional and Local Study Areas

Month	CROWN MOUNTAIN Climate Station ⁽¹⁾ (1,920 mASL)	1981-2010 Climate Normals ⁽²⁾		
		SPARWOOD Station 1157630 (1138 mASL)	FERNIE Station 1152850 (1001 mASL)	FORDING RIVER COMINCO Station 1152899 (1585 mASL)
January	-7.0	-6.5	-5.2	-9.9
February	-7.3	-4.5	-3.8	-8.2
March	-3.0	0.2	0.8	-3.5
April	1.9	4.8	5.4	1.1
May	5.8	9.1	9.9	5.5
June	12.1	12.7	13.6	9.7
July	14.9	15.8	16.8	12.6
August	13.3	15.5	16.3	12.1
September	7.1	10.5	11.3	7.5
October	4.3	4.8	5.5	1.8
November	-6.3	-2	-1.1	-6.2
December	-8.1	-7.3	-6.1	-11.3
Average	1.2	4.4	5.3	0.9
Minimum	-9.2	-7.3	-6.1	-11.3
Maximum	13.0	15.8	16.8	12.6

Notes: 1. Based on data collected at the Crown Mountain Climate Station (January 2014 – May 2016).
2. Source: ECCC, 2019

A review of the mean monthly data at the regional and Crown Mountain climate stations indicated that air temperatures in the RSA are variable and influenced by various factors, including elevation, latitude, and local topography. Specifically, the air temperature data reveals the following:

- The minimum, average, and maximum mean monthly temperatures were lowest at Fording River Cominco, which is the regional station at the highest elevation.
- The minimum, average, and maximum mean monthly temperatures were highest at Fernie, which is the regional station at the lowest elevation.
- The Crown Mountain air temperature data is most closely aligned with the corresponding data for Fording River Cominco, which is the station that is nearest in elevation.

Figure 25 presents the distribution of mean monthly air temperature for the Crown Mountain climate station in comparison with the climate normals data for the regional stations.

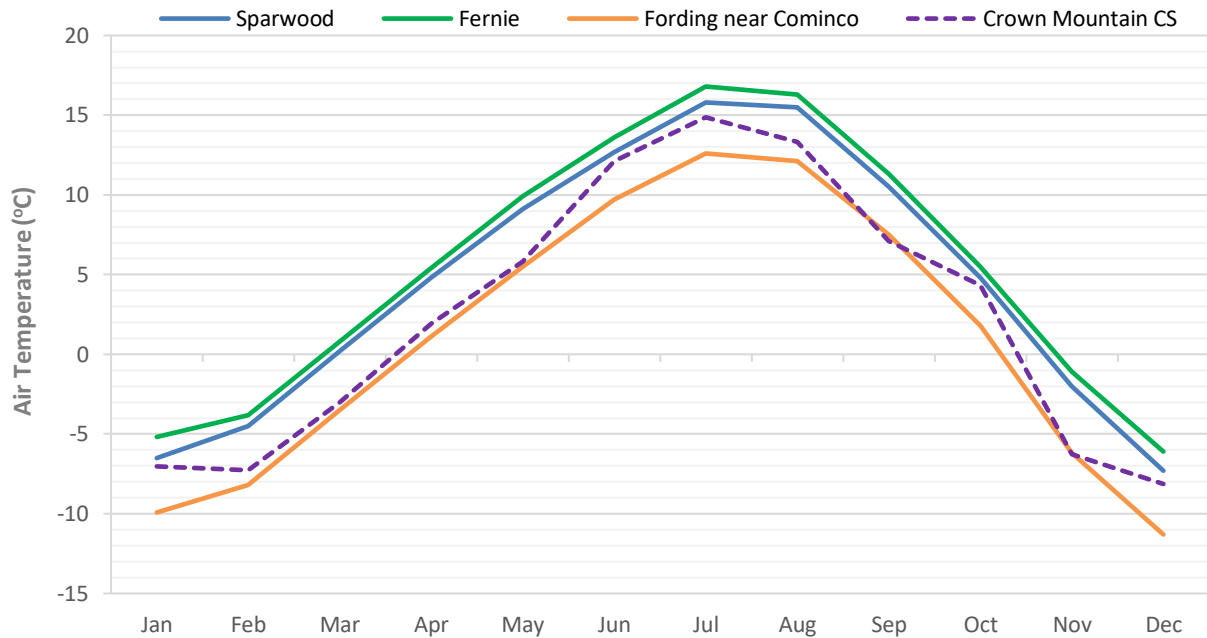


Figure 25: Mean Monthly Air Temperature (°C) Data for Climate Stations in the Regional Study Area

A breakdown of the mean annual and seasonal average air temperatures for the Crown Mountain climate station and regional stations is provided in **Table 14**.

Table 14: Mean Annual and Seasonal Air Temperatures (°C) for the Crown Mountain and Regional Climate Stations

Parameter ⁽¹⁾	CROWN MOUNTAIN Climate Station ⁽²⁾ (1,920 mASL)	1981-2010 Climate Normals ⁽³⁾		
		SPARWOOD Station 1157630 (1138 mASL)	FERNIE Station 1152850 (1001 mASL)	FORDING RIVER COMINCO Station 1152899 (1585 mASL)
Mean Annual Air Temperature (°C)	1.3	4.4	5.3	0.9
Mean Winter Temperature (°C)	-2.0	-1.5	-0.6	-5.2
Mean Summer Temperature (°C)	7.5	12.7	13.6	9.5

Notes: 1. Winter season defined as October—April; summer season defined as May—September.
 2. Based on data collected at the Crown Mountain Climate Station (January 2014—May 2016).
 3. Source: ECCC, 2019

Similar to the monthly data, the annual and seasonal averages generally follow a pattern where elevation and latitude significantly influence air temperatures in the region. The climate normals data indicates that the lowest mean annual, summer, and winter air temperatures were recorded at the northernmost and highest elevation station (Fording River Cominco), while the highest values occurred at the southernmost and lowest elevation station (Fernie).

Temperature data obtained from the Crown Mountain climate station was compared to temperature data from three regional climate stations using regression analysis for mean air temperature, mean winter air temperatures (October to April), and mean summer air temperatures (May to September).

The results are presented on **Figure 26** to **Figure 28**.

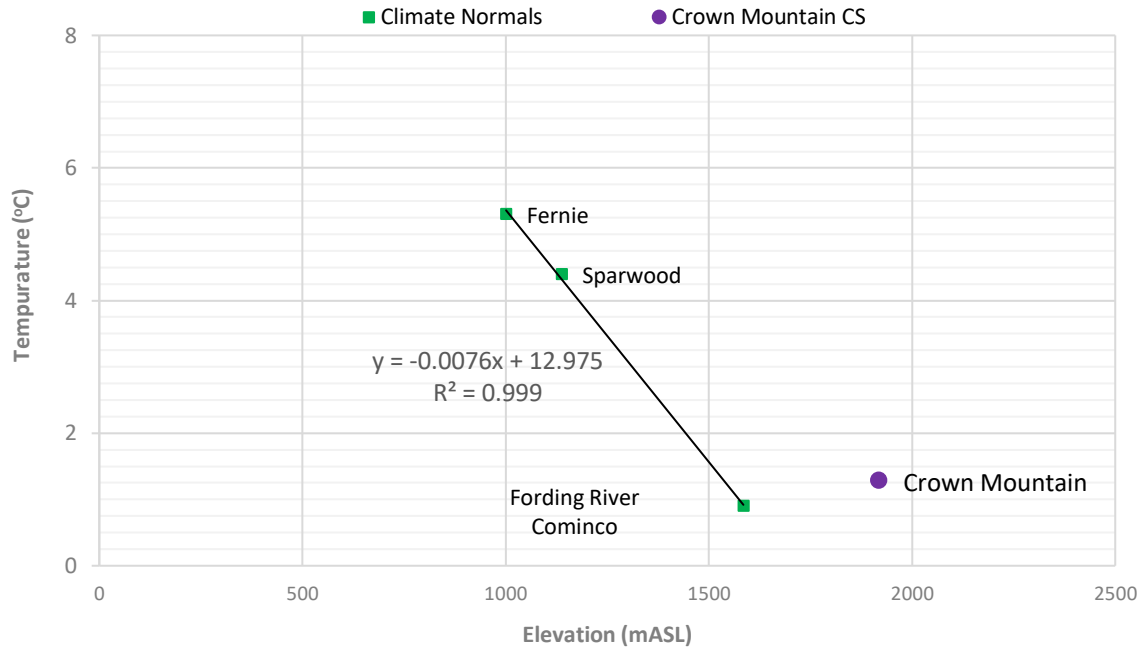


Figure 26: Regression Analysis of Mean Annual Air Temperature (°C) in the Regional Study Area

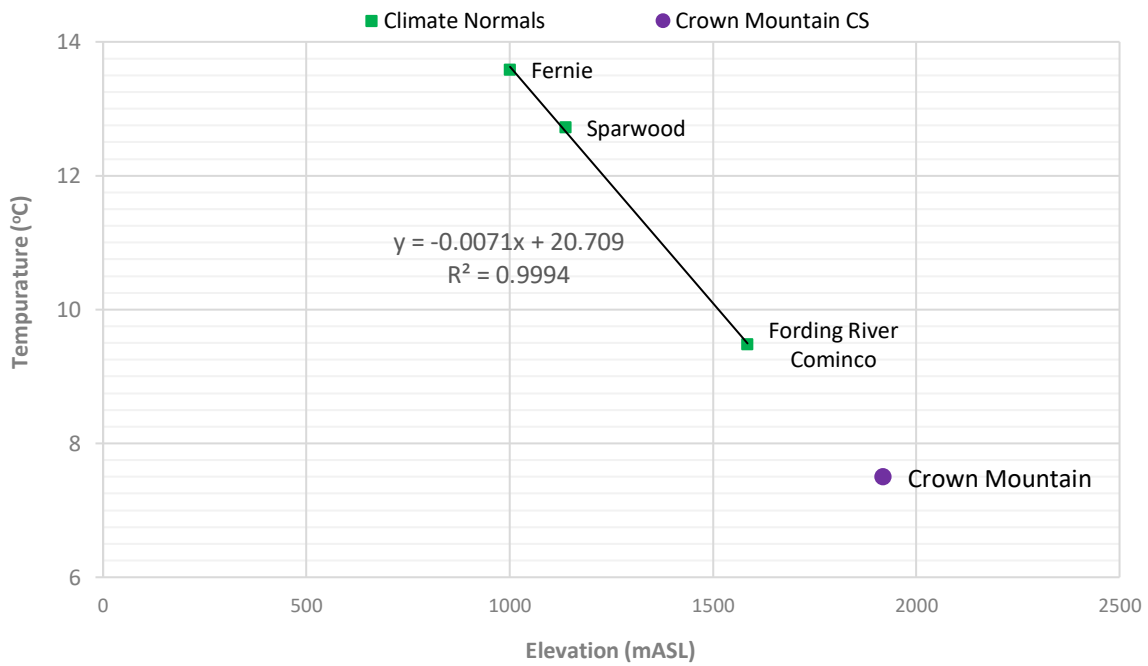


Figure 27: Regression Analysis of Mean Summer Air Temperature (°C) in the Regional Study Area

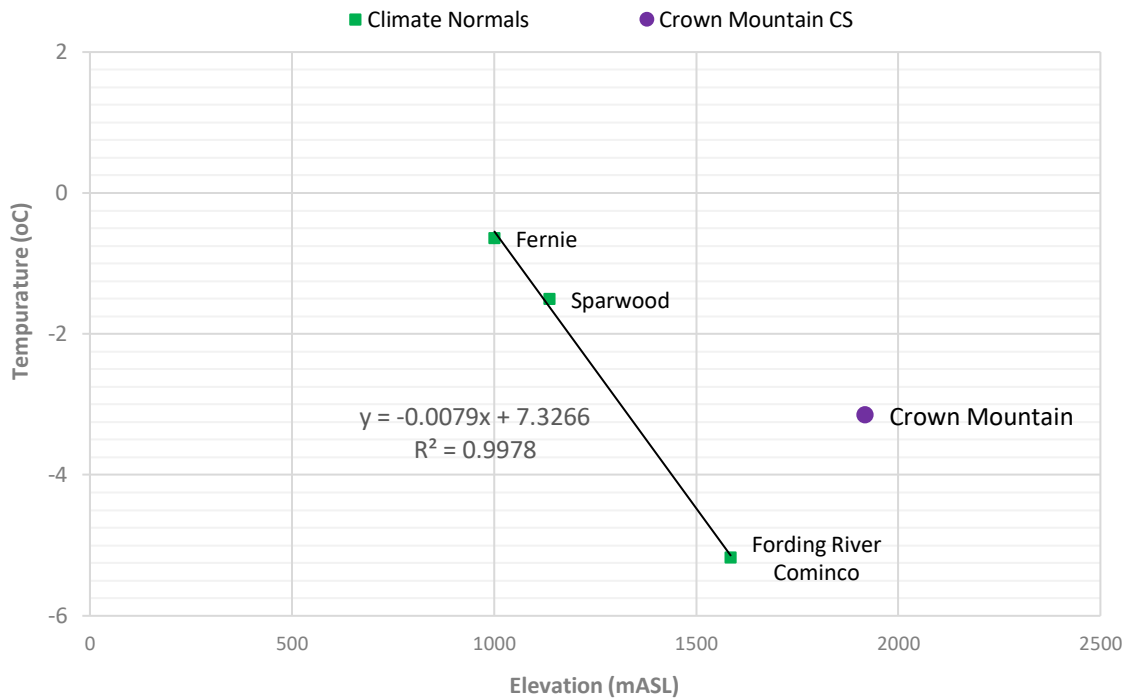


Figure 28: Regression Analysis of Mean Winter Air Temperature (°C) in the Regional Study Area

The results of the regression analysis indicate that air temperature conditions in the RSA are notably influenced by elevation and latitude, with mean annual and seasonal temperatures being the highest at

Fernie and the lowest at Fording River Cominco. The data collected at the Crown Mountain climate station suggests that air temperatures at the project area are generally consistent with these trends, with mean temperatures noted as lowest by elevation in the summer months and similar to Fording River Cominco in the winter months.

4.2.2 Precipitation

Table 15 provides a summary of mean monthly precipitation values (rain, snow, and total precipitation) for several climate stations at various locations and elevations within the RSA, together with the total monthly precipitation values derived for the Crown Mountain project area at the climate station elevation.

Table 15: Regional Study Area Mean Monthly and Annual Precipitation (mm)

Month	CROWN MOUNTAIN Climate Station ⁽¹⁾ (1,920 mASL)			1981-2010 Climate Normals ⁽²⁾								
				SPARWOOD Station 1157630 (1,138 mASL)			FERNIE Station 1152850 (1,001 mASL)			FORDING RIVER COMINCO Station 1152899 (1,585 mASL)		
	Rain	Snow	Total	Rain	Snow	Total	Rain	Snow	Total	Rain	Snow	Total
January	21.9	63.7	68.2	17.3	50.4	53.9	55.8	83.5	139.3	3.7	41.7	45.5
February	15.7	46.8	51.7	12.4	37.0	40.9	41.5	46.4	88.0	3.1	30.8	33.9
March	21.5	40.1	55.9	17.0	31.7	44.2	60.6	37.2	97.8	7.1	37.6	44.8
April	35.3	22.0	52.4	27.9	17.4	41.4	80.0	12.9	92.8	14.4	29.4	43.8
May	54.3	9.0	63.1	52.0	8.6	60.4	88.8	3.1	91.8	40.0	19.1	59.1
June	70.8	1.9	72.4	67.7	1.8	69.3	109.8	0.2	110.0	82.1	3.7	85.7
July	48.9	0.0	48.9	46.8	0.0	46.8	67.0	0.0	67.0	58.0	0.1	58.1
August	36.4	0.1	36.5	34.8	0.1	34.9	51.9	0.0	51.9	46.5	0.6	47.1
September	45.4	4.4	49.5	43.4	4.2	47.4	75.4	0.4	75.8	40.6	7.9	48.5
October	50.1	14.3	61.7	39.6	11.3	48.8	109.4	6.4	115.7	22.6	17.9	40.5
November	49.4	59.8	91.2	39.1	47.3	72.1	123.0	56.2	179.1	17.1	43.8	60.9
December	16.7	68.5	67.5	13.2	54.2	53.4	39.0	78.7	117.7	4.6	44.7	49.2
Total	466.3	330.6	719.0	411.2	264.0	613.5	902.2	325.0	1,226.9	339.8	277.3	617.1
Minimum	15.7	0.0	36.5	12.4	0.0	34.9	39.0	0.0	51.9	3.1	0.1	33.9
Average	38.9	27.6	59.9	34.3	22.0	51.1	75.2	27.1	102.2	28.3	23.1	51.4
Maximum	70.8	68.5	91.2	67.7	54.2	72.1	123.0	83.5	179.1	82.1	44.7	85.7

Notes: 1. Based on data derived for the Crown Mountain Climate Station for the period of January 2014 – May 2016.

2. Source: ECCC, 2019

The mean monthly data indicates that the greater amounts of precipitation typically occur in the late fall and early winter months (predominately snowfall), and lower amounts of precipitation are generally representative of the summer and early fall months (predominately rainfall). There is a notable

difference in the amount, type, and distribution of precipitation between the Fernie climate station, which is at a lower elevation located in the southern portion of the RSA, and the Sparwood and Fording River climate stations that are at higher elevations and further north (Table 15). A comparison of the data indicates that the precipitation conditions at the Crown Mountain correlate more closely with the Sparwood climate station as expected, given that this station is closest in proximity to the project area.

The mean monthly precipitation for the regional stations and Crown Mountain project area are illustrated on Figure 29 below.

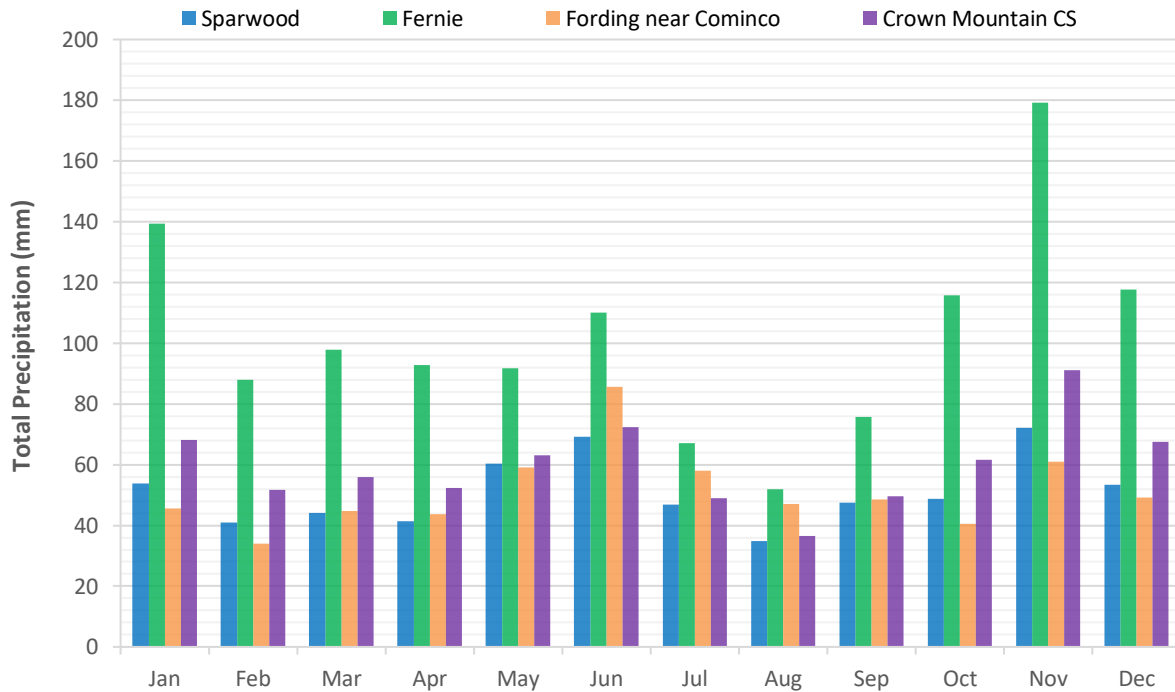


Figure 29: Mean Monthly Precipitation (mm) for the Regional Study Area and Crown Mountain Project Area

Regression analyses were completed for mean annual rainfall, snow, and total precipitation (per climate normals) by elevation at the regional climate stations and Crown Mountain project site, shown on Figure 30 to Figure 32.

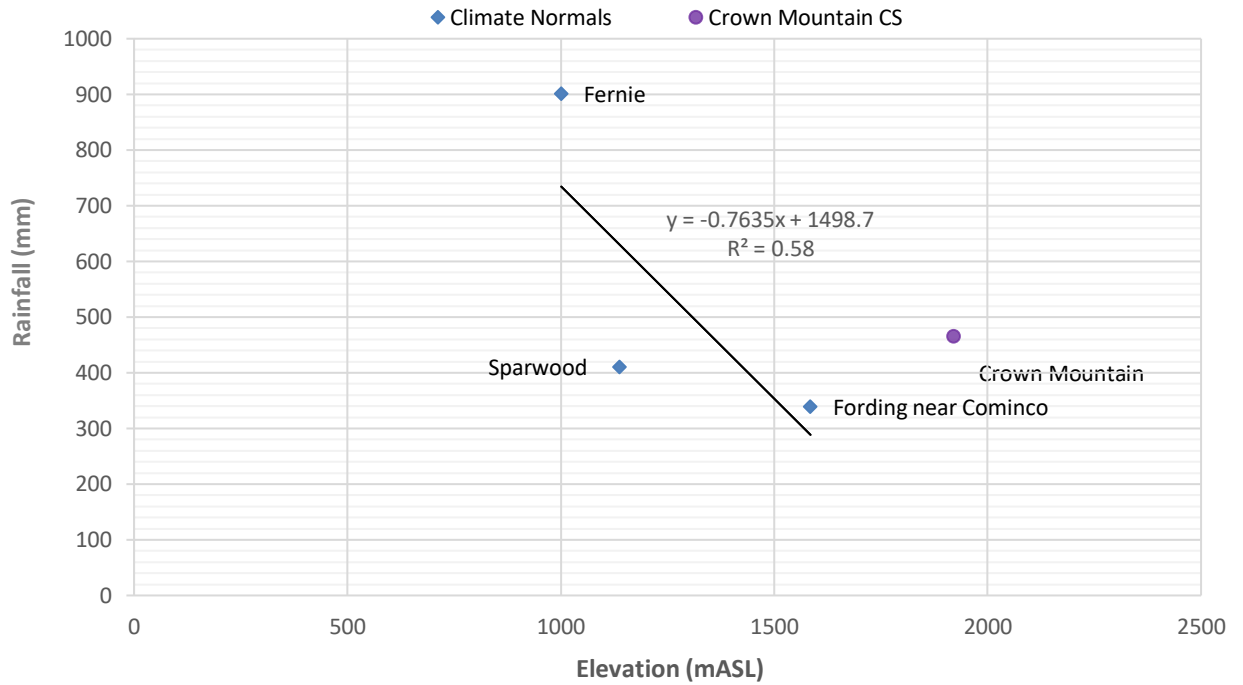


Figure 30: Regression Analysis of Mean Annual Rainfall (mm) in the Regional Study Area

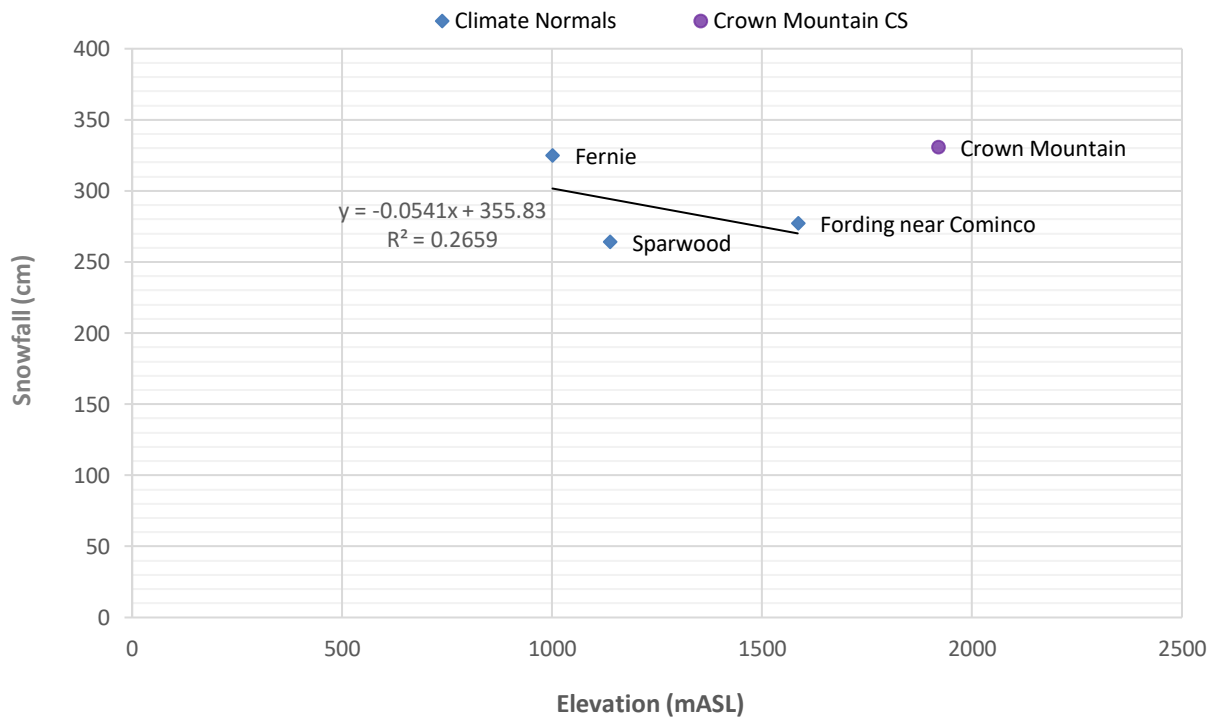


Figure 31: Regression Analysis of Mean Annual Snow (cm) in the Regional Study Area

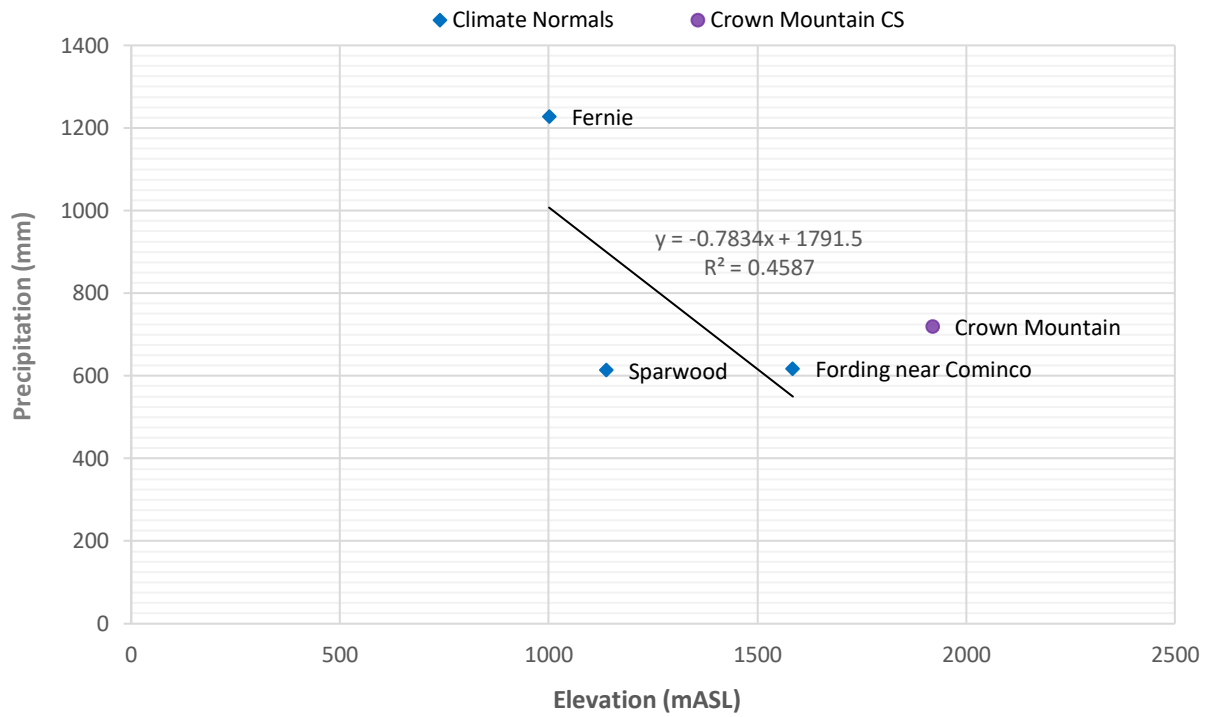


Figure 32: Regression Analysis of Mean Annual Total Precipitation (mm) in the Regional Study Area

A review of the historical data indicates that precipitation conditions in the RSA are influenced by elevation and latitude. Mean annual rainfall, snowfall, and total precipitation were the highest at Fernie, which is the most southerly station at the lowest elevation. Mean annual snowfall and total precipitation were the lowest at Sparwood. Mean annual total precipitation at Fording River Cominco (most northerly station) was slightly higher than Sparwood.

The data derived for the Crown Mountain Project area though the regression analysis suggests that mean annual rainfall is most similar to Sparwood, which is the closest geographical station. Mean annual snowfall at the Project Area aligns most closely with Fernie, while mean annual precipitation is slightly higher than Sparwood and Fording River Cominco.

4.2.3 Snowpack

A frequency analysis was undertaken for the snowpack data collected at the snow stations located within or in close proximity to the RSA. A summary of the historical snowpack data is presented in **Table 16**, including the average annual along with the maximum snow depth for a range of return periods.

Table 16: Summary of Average and Maximum Historical Snow Depth Data

Parameter	Upper Elk River (Station 2C06)	Fernie East (Station 2C07)	Morrissey Ridge (Station 2C09)	Morrissey Ridge (Station 2C09Q)	Mount Joffre (Station 2C16)
Period of Record	1948-2002	1951-2018	1969-2018	1983-2018	1961-1988
Elevation (mASL)	1,340.0	1,250.0	1,860.0	1,860.0	1,750.0
Average SD (cm)	37.1	67.3	136.8	-	103.5
2-Year SD (cm)	47.9	107.0	199.0	-	123.0
5-Year SD (cm)	76.0	138.0	216.0	-	147.0
10-Year SD (cm)	96.7	158.0	253.0	-	161.0
20-Year SD (cm)	118.0	176.0	272.0	-	173.0
50-Year SD (cm)	148.0	199.0	294.0	-	189.0
100-Year SD (cm)	172.0	217.0	309.0	-	200.0

Notes: 1. SD = Snow Depth (measured vertically).
 2. Source: BC MOECC, 2019.
 3. Frequency analysis was completed using a log-normal distribution (maximum likelihood).

The results of the frequency analysis for historical snow depth data are presented on **Figure 33**.

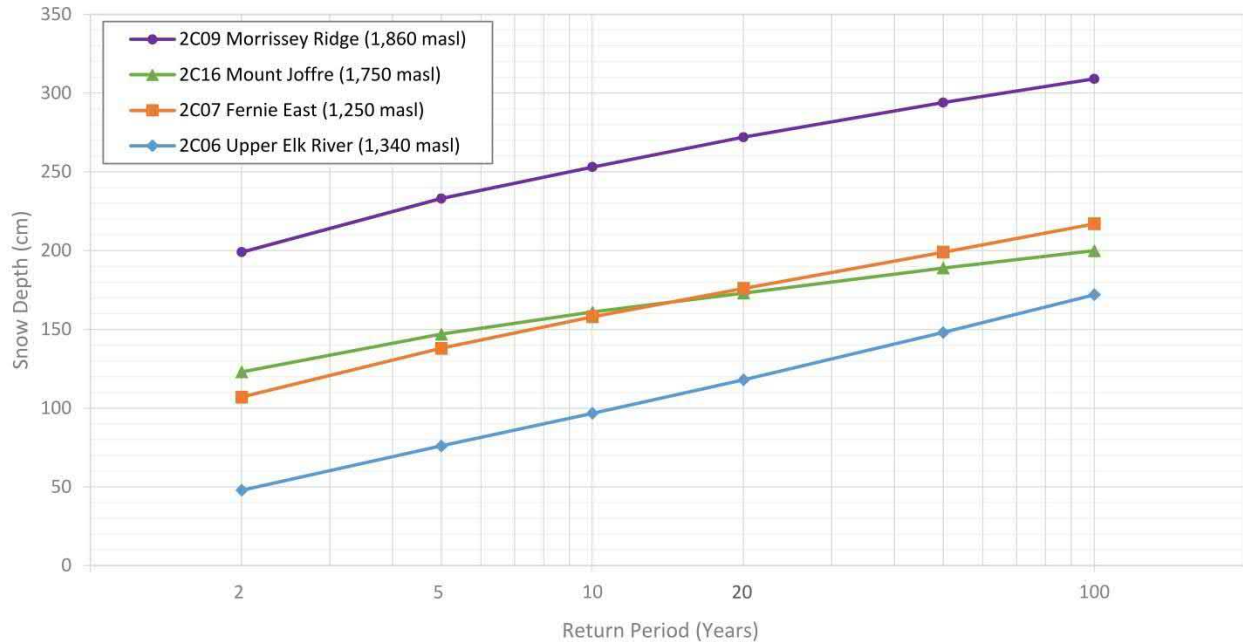


Figure 33: Frequency Analysis of Maximum Snow Depth (cm) at Regional Snow Stations

Table 17 provides a summary of historical snow water equivalent data collected at the snow stations located within the RSA, together with the results of a frequency analysis for a range of return periods.

Table 17: Summary of Average and Maximum Historical Snow Water Equivalent Data for the RSA

Parameter	Upper Elk River (Station 2C06)	Fernie East (Station 2C07)	Morrissey Ridge (Station 2C09)	Morrissey Ridge (Station 2C09Q)	Mount Joffre (Station 2C16)
Period of Record	1948-2002	1951-2018	1969-2018	1983-2018	1961-1988
Elevation (mASL)	1,340.0	1,250.0	1,860.0	1,860.0	1,750.0
Average SWE (mm)	105.6	205.1	503.1	319.8	303.2
2-Year SWE (mm)	131.0	328.0	729.0	742.0	376.0
5-Year SWE (mm)	223.0	434.0	891.0	979.0	481.0
10-Year SWE (mm)	293.0	503.0	990.0	1,130.0	548.0
20-Year SWE (mm)	369.0	567.0	1,080.0	1,280.0	610.0
50-Year SWE (mm)	477.0	650.0	1,190.0	1,460.0	688.0
100-Year SWE (mm)	566.0	712.0	1,270.0	1,600.0	745.0

Notes: 1. SWE = Snow Water Equivalent (amount of water contained within the snow pack).
 2. Source: BC MOECC, 2019.
 3. Frequency analysis was completed using a log-normal distribution (maximum likelihood).

The results of the frequency analysis completed for snow water equivalent at the regional snow stations are presented on **Figure 34**.

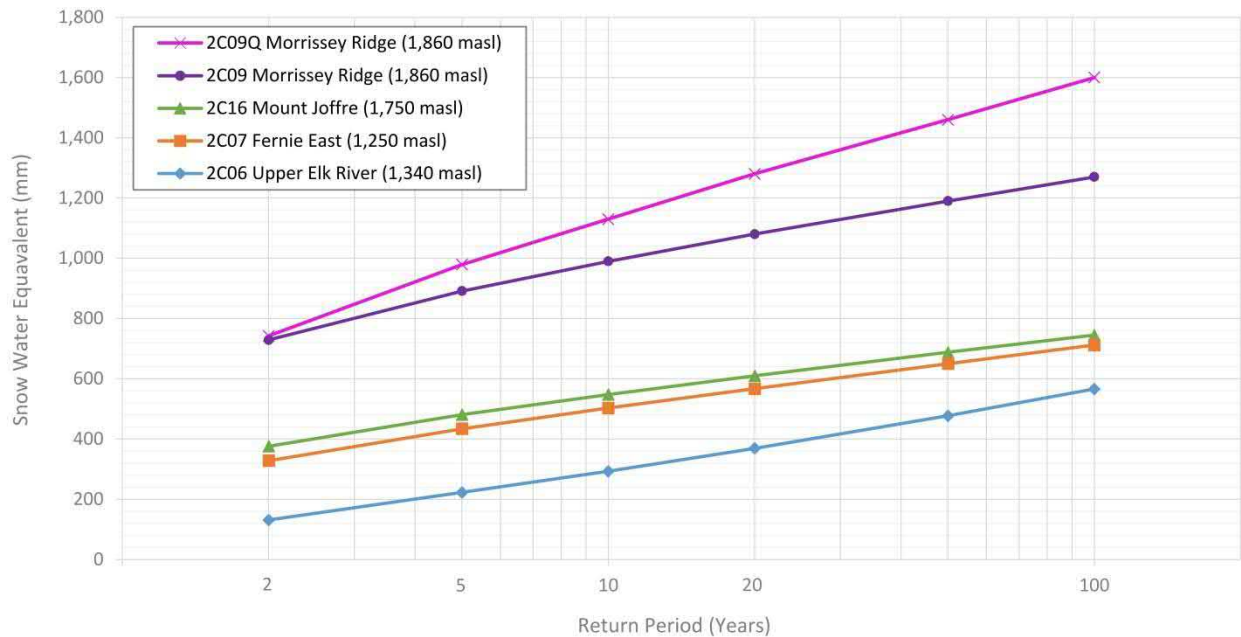


Figure 34: Frequency Analysis of Maximum Snow Water Equivalent Data at Regional Snow Stations

The processes and factors affecting snow accumulation and distribution generally include geographic location, climatic influences (temperature, moisture), topography (elevation, slope, and aspect), wind, and vegetative cover.

The historical snowpack data reveals the following notable findings:

- Snow depths in the RSA are influenced by elevation, with the highest average and maximum values associated with the Morrissey Ridge station (1,860 mASL) and the lowest values representing the Upper Elk River station (1,340 mASL).
- Available snow water equivalent data for the RSA indicates a similar trend, with the highest average and maximum values corresponding to the Morrissey Ridge station and the lowest at the Upper Elk River station.

4.3 Climate Change

Available documentation related to climate change was compiled and reviewed in an effort to identify historical and projected trends in the RSA. This included several studies, reports, and publications that have been undertaken in recent years to assess climate trends and variability in the region.

A summary of the historical and projected climate trends for the RSA is provided below.

4.3.1 Historical Trends

An assessment of historical climate trends was carried out for the Columbia River Basin (*Preliminary Analysis of Climate Variability and Change in the Canadian Columbia River Basin: Focus on Water Resources* (PCIC, 2006)). The assessment examined trends over the 90 year period from 1913 to 2002, based on historical data collected at five climate stations. The notable findings of the assessment are summarized below.

- Annual mean temperature rose by 1.4 oC, with increases occurring primarily in the winter season.
- Annual minimum and maximum temperatures increased by 1.6 and 0.9 oC, respectively.
- Annual precipitation rose by 26%, with annual rainfall increasing by 32% and annual snowfall decreasing by 6%.
- Snowpack is declining with increasing temperatures, particularly at lower elevations.

A review of historical data was undertaken for three climate stations in the RSA (Sparwood, Fernie, and Fording River Cominco) to identify trends in air temperature and precipitation since 1970 at various locations and elevations in the region (locations shown on **Figure 5**).

Sparwood Climate Station (1157630)

Figure 35 presents the mean daily air temperature data recorded at the Sparwood climate station (elevation 1,138 mASL) for the period of 1980-2019, which is the available period of record. The historical trend indicates that there has been a relatively small increase of approximately 0.02 °C per year on average in the mean daily air temperatures over this period at this location.

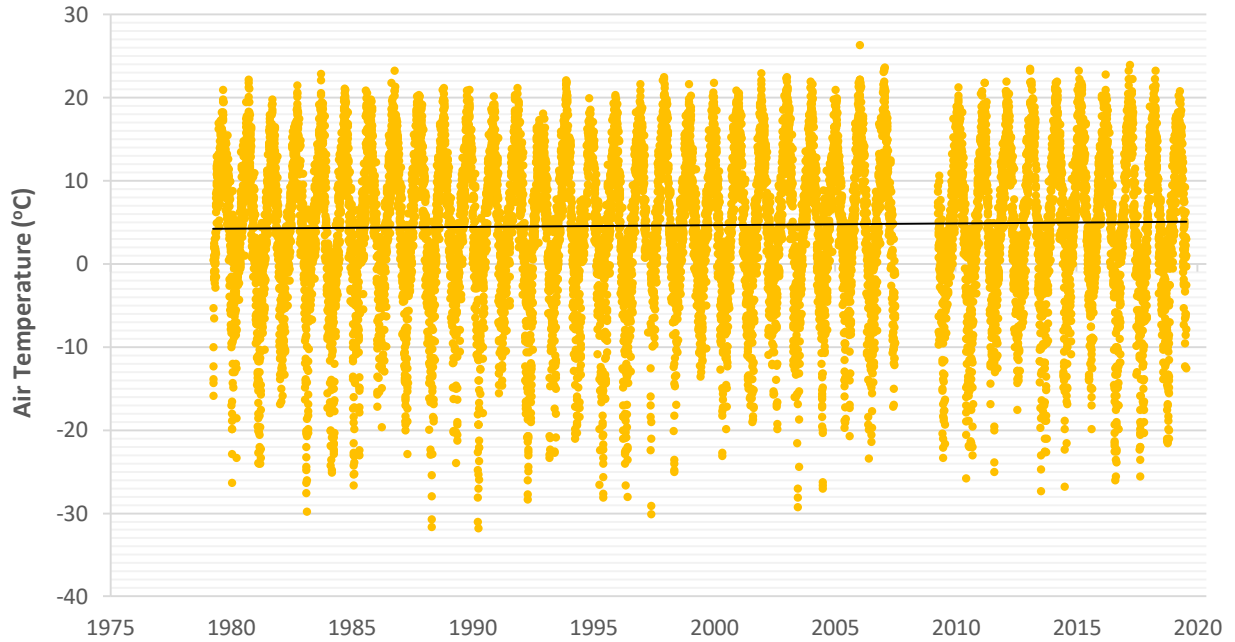


Figure 35: Mean Daily Air Temperature (°C) – Sparwood Climate Station (1980-2019)

Source: Daily air temperature data for Sparwood climate station 1157630 (ECCC, 2019).

Mean seasonal summer and winter air temperatures for the Sparwood climate station are shown on **Figure 36**. As illustrated, there was an upward trend in the summer temperatures (0.044 °C/year) and a slight downward trend in winter temperatures over the available period of record (1970-2019).

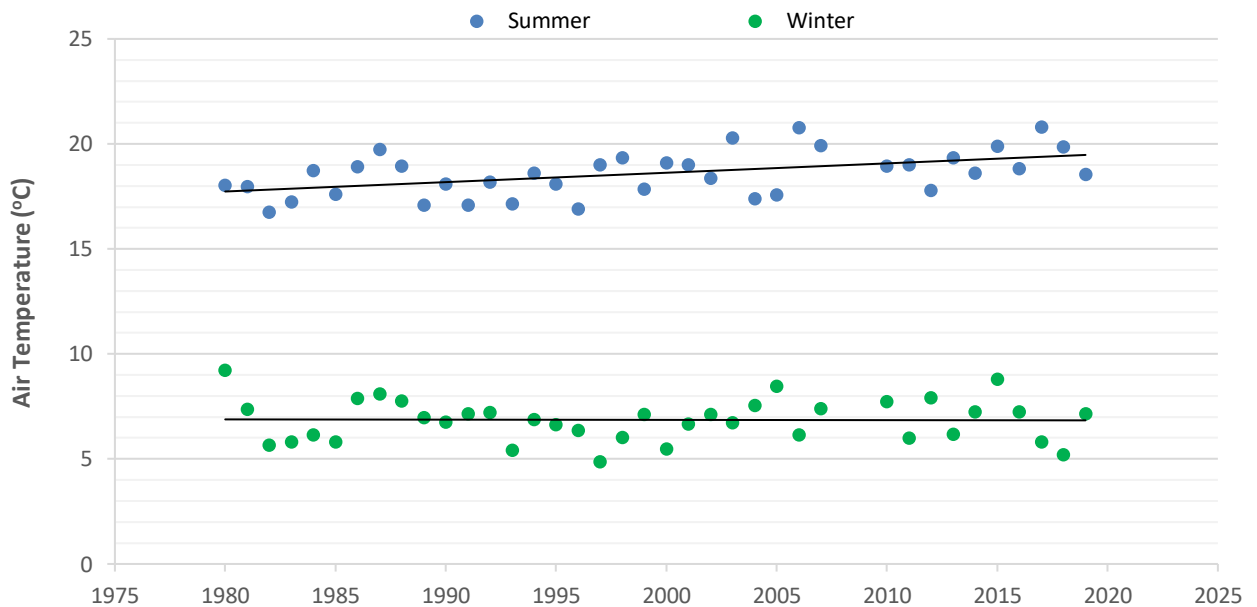


Figure 36: Mean Seasonal Summer & Winter Air Temperatures (°C) – Sparwood Climate Station (1980-2019)

Notes: 1. Seasonal air temperature data for Sparwood climate station 1157630 (ECCC, 2019).

2. Summer season defined as May – September, winter season defined as October—April.
3. 2009 was not included due to significant missing data.

The mean annual precipitation and rainfall for the Sparwood climate station is presented on **Figure 37** and **Figure 38**, respectively. The data shows an increasing trend in total precipitation (0.38 mm/year) and rainfall (0.55 mm/year) over the available period of record at this location.

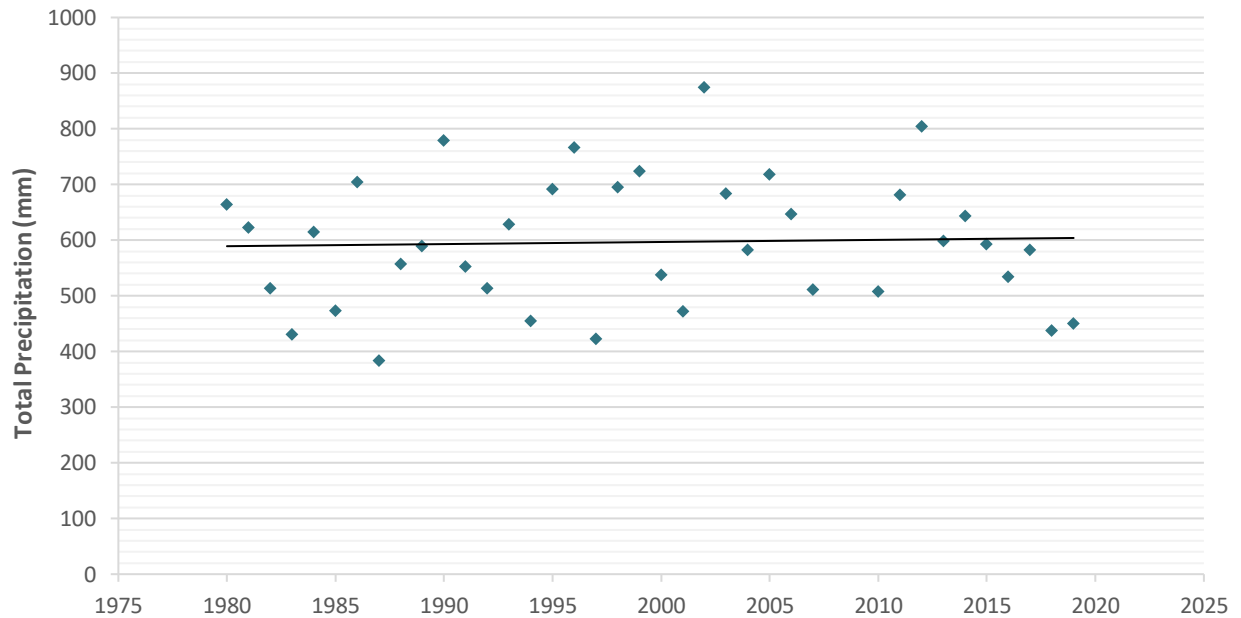


Figure 37: Mean Annual Precipitation (mm) – Sparwood Climate Station (1998-2019)

- Notes:
1. Annual precipitation data for Sparwood climate station 1157630 (ECCC, 2019).
 2. 2009 was not included due to significant missing data.

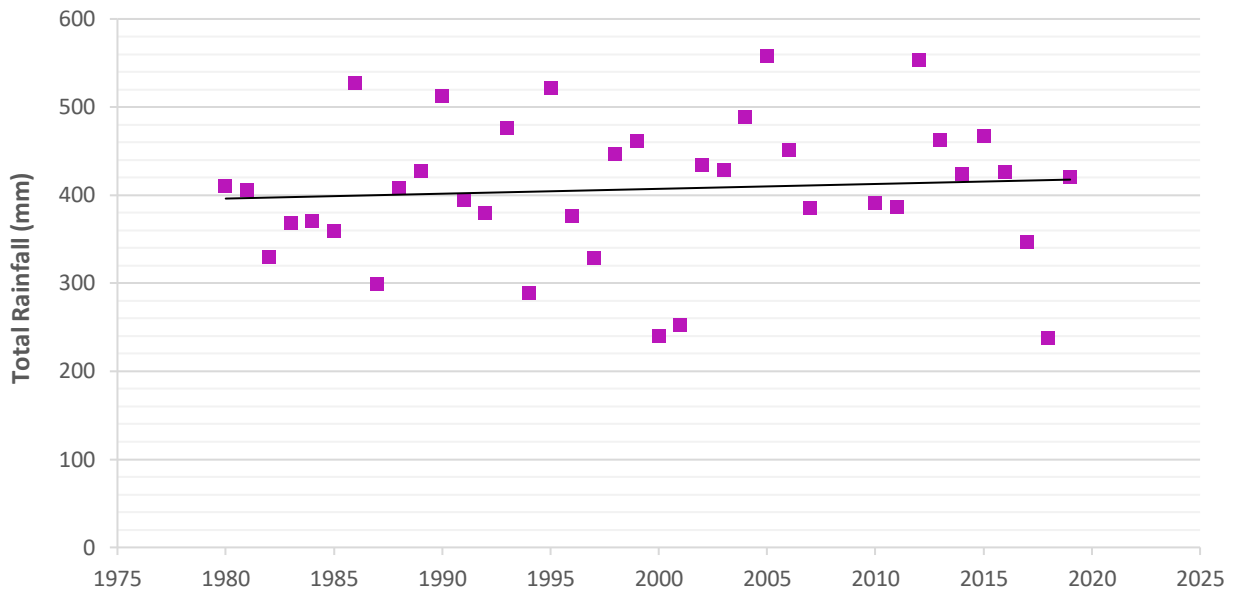


Figure 38: Mean Annual Rainfall (mm) – Sparwood Climate Station (1980-2019)

Notes: 1. Annual rainfall data for Sparwood climate station 1157630 (ECCC, 2019).
 2. 2009 was not included due to significant missing data.

Figure 39 presents the mean annual snow depth data for the Sparwood climate station. The data indicates that there has been an upward trend in the amount of snowfall (2.4 cm/year) over the period of record.

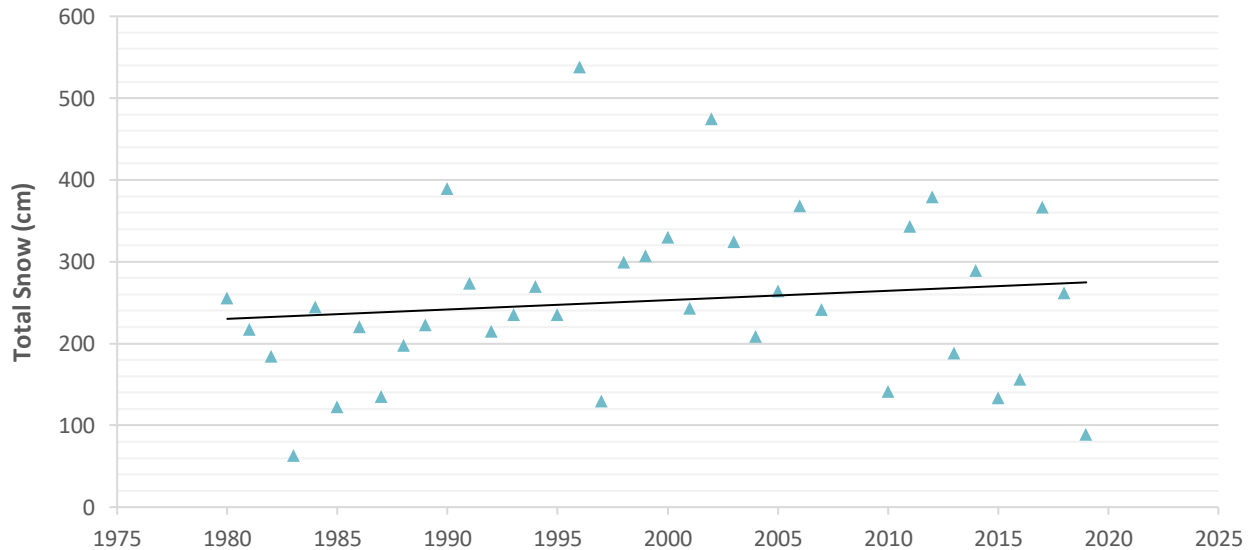


Figure 39: Total Annual Snowfall (cm) – Sparwood Climate Station (1980-2019)

Notes: 1. Annual snowfall data for Sparwood climate station 1157630 (ECCC, 2019).
 2. 2009 was not included due to significant missing data.

Fernie Climate Station (1152850)

The mean daily air temperature recorded at the Fernie climate station (1,001 mASL) is presented on **Figure 40**, which shows an increasing trend (approximately 0.04 °C/year) since 1970.

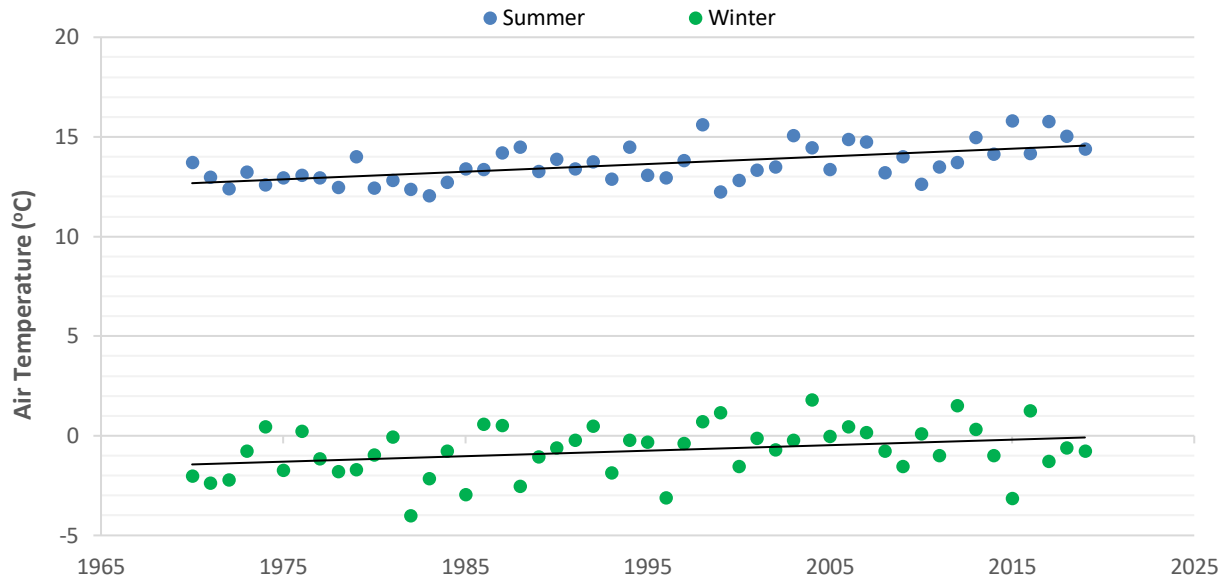


Figure 40: Mean Daily Air Temperature (°C) – Fernie Climate Station (1970-2017)

Source: Daily air temperature data for Fernie climate station 1152850 (ECCC, 2019).

Mean seasonal air temperatures for the Fernie climate station are shown on **Figure 41**, which show an increasing trend in summer and winter temperatures (0.05 and 0.04 °C/year, respectively) over the period of 1970 to 2017.

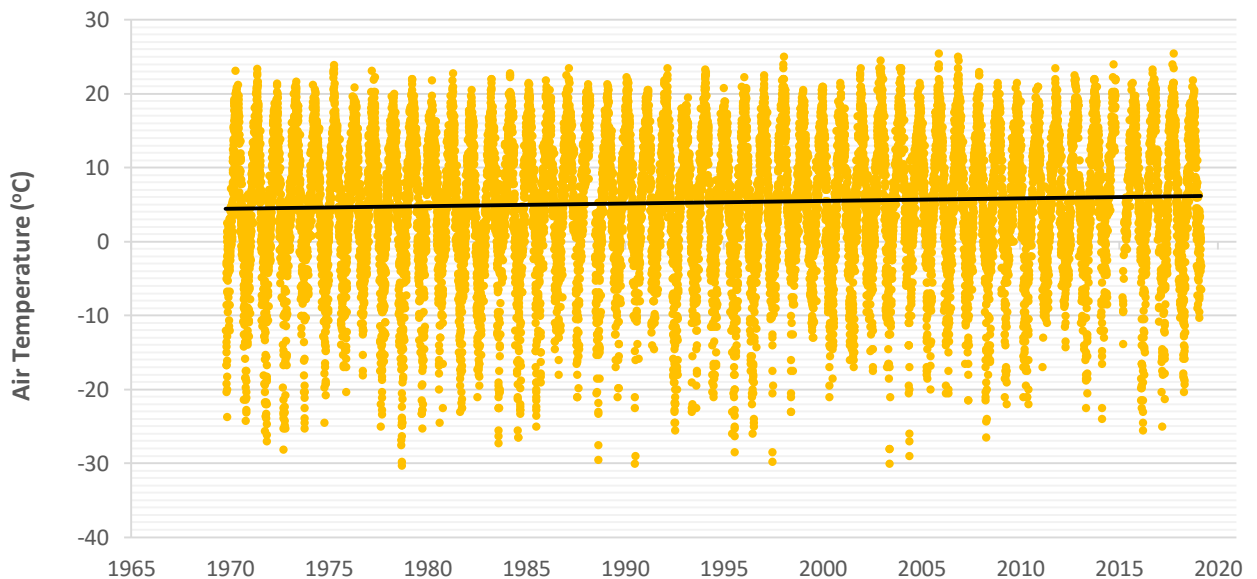


Figure 41: Mean Seasonal Summer & Winter Air Temperatures (°C) – Fernie Climate Station (1970-2017)

Notes: 1. Seasonal air temperature data for Fernie climate station 1152850 (ECCC, 2019).
 2. Summer season defined as May – September, winter season defined as October—April.

The mean annual precipitation for the Fernie climate station is presented on **Figure 42**, which shows an overall decreasing trend (3.8 mm/year) from 1970 to 2017.

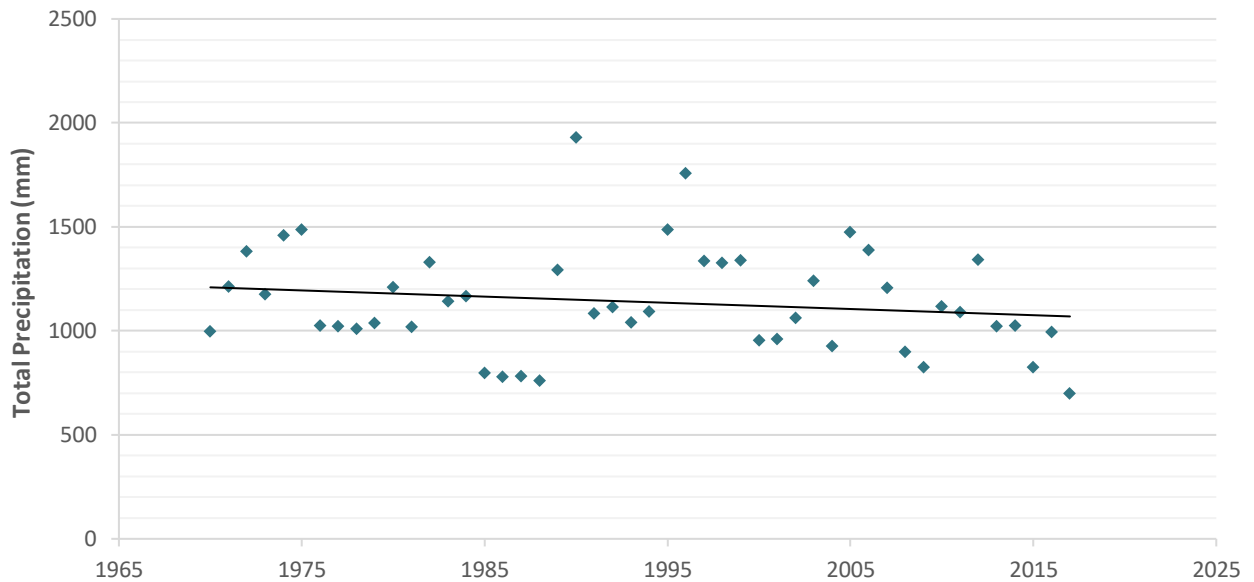


Figure 42: Total Annual Precipitation (mm) – Fernie Climate Station (1970-2017)

Notes: 1. Annual precipitation data for Fernie climate station 1152850 (ECCC, 2019).
 2. Summer season defined as May – September, winter season defined as October – April.

Mean annual rainfall and snowfall data for the Fernie climate station is shown on **Figure 43** and **Figure 44**, respectively. The data indicates that there has been an increasing trend in annual rainfall (1.5 mm/year) from 1970 to 2017 and a significant decrease in the amount of snowfall (5.4 cm/year) over this period.

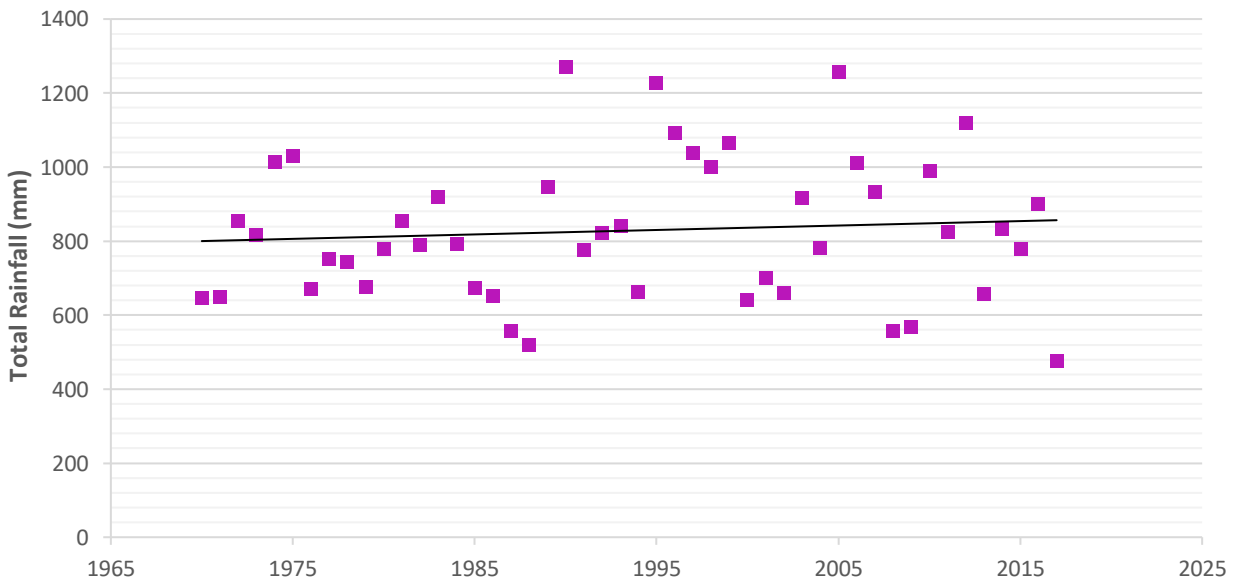


Figure 43: Total Annual Rainfall (mm) – Fernie Climate Station (1970-2017)

Notes: 1. Annual rainfall data for Fernie climate station 1152850 (ECCC, 2019).
 2. 2009 was not included due to significant missing data.

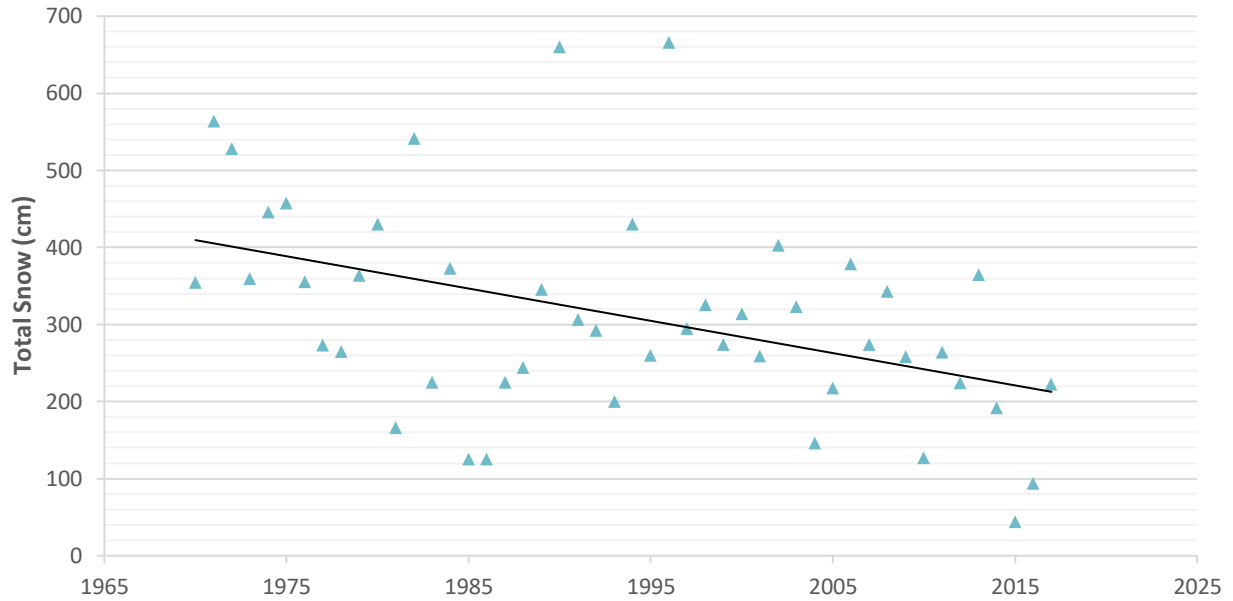


Figure 44: Total Annual Snowfall (cm) – Fernie Climate Station (1970-2017)

Notes: 1. Annual snowfall data for Fernie climate station 1152850 (ECCC, 2019).
 2. 2009 was not included due to significant missing data.

Fording River Cominco (1152899)

The mean daily air temperature data measured at the Fording River Cominco climate station (1,585 mASL) for the period of 1970 to 2016 is shown on **Figure 45**. As illustrated, there was an increasing trend in mean daily air temperature (0.02 °C/year) over this period.

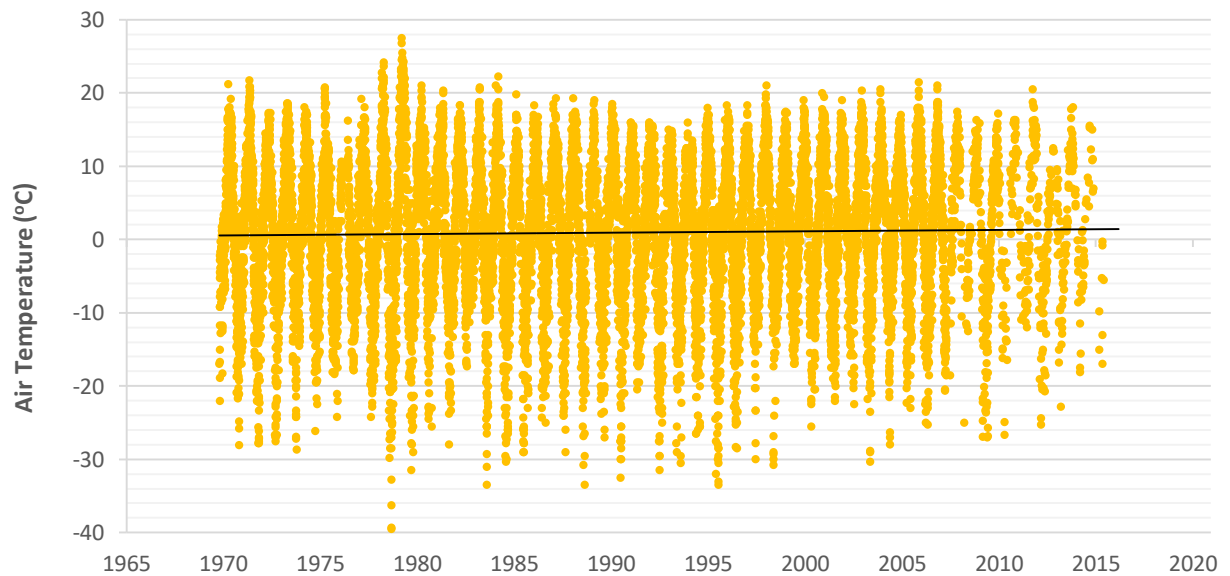


Figure 45: Mean Daily Air Temperature (°C) – Fording River Cominco Climate Station (1970-2016)

Source: Daily air temperature data for Fording River Cominco climate station 1152899 (ECCC, 2019).

As shown on **Figure 46**, the seasonal trends for mean air temperatures demonstrate a slight decrease in the summer ($0.007\text{ }^{\circ}\text{C}/\text{year}$) and a slight increase ($0.005\text{ }^{\circ}\text{C}/\text{year}$) in the winter.

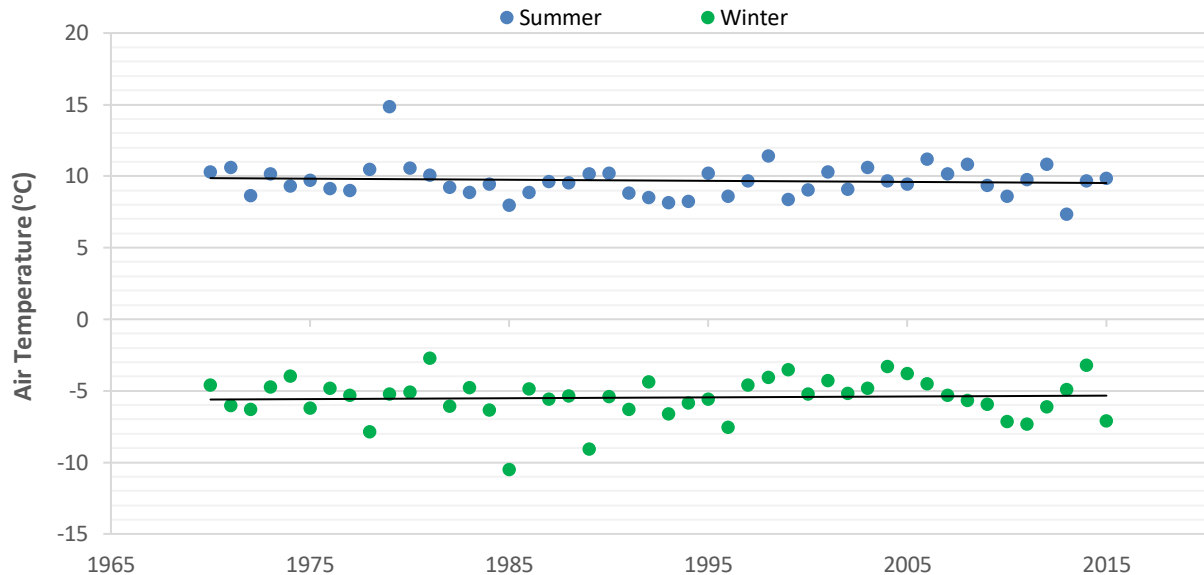


Figure 46: Mean Seasonal Summer & Winter Air Temperatures ($^{\circ}\text{C}$) – Fording River Cominco Climate Station (1970-2016)

Notes: 1. Annual air temperature data for Fording River Cominco climate station 1152899 (ECCC, 2019).
 2. Summer season defined as May – September, winter season defined as October—April.

Figure 47 presents the mean annual precipitation for the Fording River climate station, which shows an overall decreasing trend ($6.8\text{ mm}/\text{year}$) from 1970 to 2016.

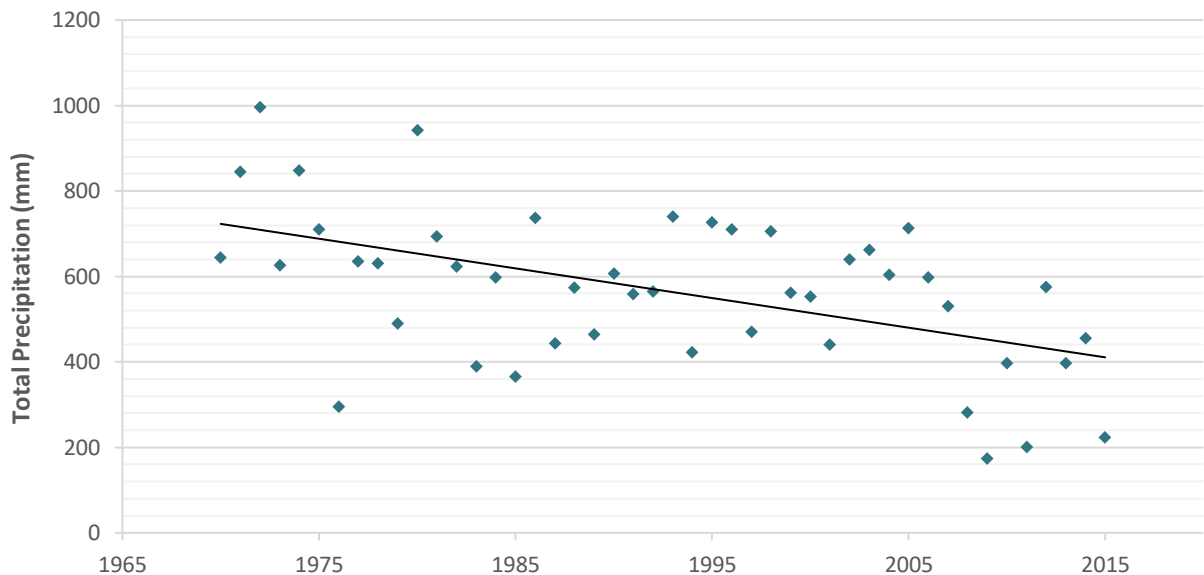


Figure 47: Total Annual Precipitation (mm) – Fording River Cominco Climate Station (1970-2016)

Notes: 1. Annual precipitation data for Fording River Cominco climate station 1152899 (ECCC, 2019).
 2. Summer season defined as May – September, winter season defined as October—April.

The mean annual rainfall and snow fall data for the Fording River Cominco climate station is shown on **Figure 48 and Figure 49**, respectively. The data illustrates a decreasing trend in mean annual rainfall (0.6 mm/year) and snowfall (6.2 cm/year) from 1970 to 2016.

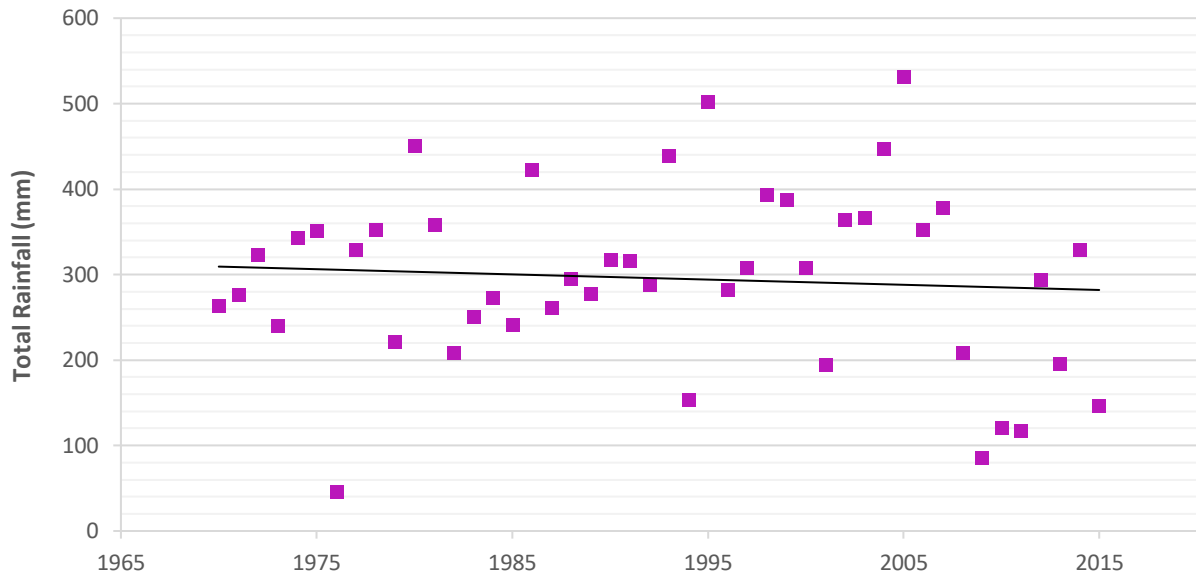


Figure 48: Total Annual Rainfall (mm) – Fording River Cominco Climate Station (1970-2016)

- Notes:
1. Annual rainfall data for Fording River Cominco climate station 1152899 (ECCC, 2019).
 2. Summer season defined as May – September, winter season defined as October—April.

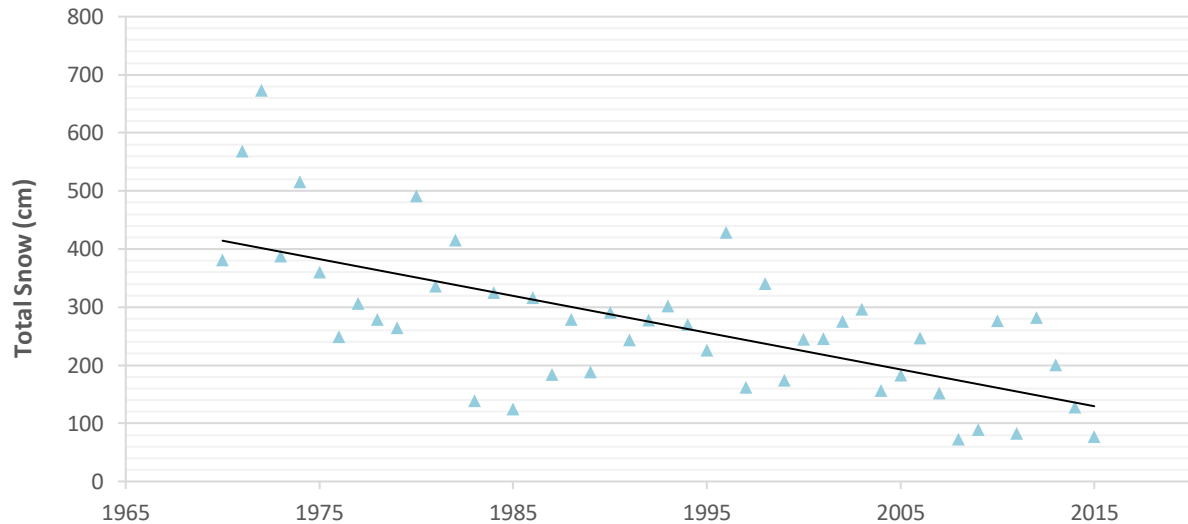


Figure 49. Mean Annual Snowfall (cm) – Fording River Cominco Climate Station (1970-2016)

Notes: 1. Annual snowfall data for Fording River Cominco climate station 1152899 (ECCC, 2019).
2. Summer season defined as May – September, winter season defined as October – April.

The historical data for the three subject climate stations located in the RSA generally indicate that there has been an overall increase in mean annual air temperatures over the assessment period, most notably at lower elevations. An increasing trend for rainfall occurred at the Sparwood and Fernie climate stations, while annual rainfall trended downwards at the Fording River Cominco climate station. Annual snowfall has decreased significantly at the Fernie and Fording River Cominco climate stations and increased at the Sparwood climate station. Overall, the historical climate data demonstrates that air temperatures have increased in the RSA and that there is considerable variability with respect to precipitation conditions.

4.3.2 Projected Trends

Future climate projections have been developed for the Columbia River Basin (CRB) by PCIC through detailed modelling using an ensemble of Global Climate Models. The climate projections are for the period of 2041–2070, relative to a baseline period of 1971–2000. The results of the projections are presented in the *Climate Extremes in the Columbia Basin Summary Report* (PCIC, 2014). A summary of the climate projections is provided below.

- Annual mean temperature is projected to increase by between 1.8 and 2.7°C, with temperature increases projected in all seasons.
- The frequency of warm days in the summer is projected to increase, while the frequency of cool nights in the winter is projected to decrease.
- The annual total basin-averaged precipitation is projected to increase by between 1 and 9% (PCIC, 2014).
- Most projections show an increase in precipitation in the winter months and decreased precipitation in the summer.
- Future projections indicate a potential increase in precipitation extremes.

5.0

Summary

A baseline meteorological study was conducted at the Crown Mountain Project location from January 1, 2014 to May 2016. The Climate Station installed for the study recorded data in 15 minute intervals for air temperature, barometric pressure, relative humidity, solar radiation, wind speed, wind direction, precipitation rate, and precipitation accumulation. A summary of the baseline assessment is provided below.

Air Temperature

The overall mean daily temperature during the baseline study was 1.4°C. The mean daily temperature ranged from a low of -13.4°C in February 2014 to a maximum of 16.6°C in June 2015. The mean daily minimum air temperature ranged from a low of -16.9°C in February 2014 to a high of 10.2°C in July 2015. The mean daily maximum air temperature ranged from a low of -9.0°C in February 2014 to a high of 24.6°C in July 2015. The extreme minimum temperature at the Crown Mountain station was -32.3°C on March 1, 2014 and the extreme maximum temperature was 35.2°C on June 7, 2015.

The results of the analysis indicate that air temperature conditions in the RSA are notably influenced by elevation and latitude, with mean annual and seasonal temperatures being the highest at Fernie and the lowest at Fording River Cominco. The data collected at the Crown Mountain climate station suggests that air temperatures at the project area are generally consistent with these trends. The Crown Mountain air temperature data is most closely aligned with the corresponding data for Fording River Cominco, which is the station that is nearest in elevation.

A review of historical climate data and available publications indicate that air temperatures have increased in the region over the past 50 years and are projected to rise further during the next 50 years.

Barometric Pressure

Barometric pressure measurements were recorded at the Crown Mountain climate station to be within a range of 78.3 to 82.5 kPa. Average daily and monthly barometric pressure were generally higher in the warmer, summer months and lower with greater variability in the colder winter months, which was would be anticipated as there are more active low pressure weather systems in the winter.

Precipitation

Although precipitation data was collected at the Crown Mountain climate station between January 2014 and May 2016, it was determined that a malfunction of the precipitation gauge resulted during periods of moderate to high winds, and accordingly some of the data that was collected was deemed to be inaccurate. To characterize the precipitation conditions for the Crown Mountain project area and LSA, a regression analysis was undertaken using data collected at nearby climate stations. Precipitation

conditions can vary spatially and temporally and are influenced significantly by altitude, topography, and wind.

The results of the regression analysis undertaken based on historical data collected in the RSA indicate that the mean summer precipitation at the Crown Mountain site (1,920 mASL) is 14.9 mm higher than at the Sparwood climate station (1,138 mASL), and the mean winter precipitation is 23.9 mm lower, respectively. The monthly precipitation varied throughout the assessment period, with the lowest values generally corresponding to the summer months and higher precipitation in the early winter months.

Based on recent publications and an assessment of historical climate trends undertaken for multiple climate stations in the RSA, precipitation has generally increased over the past 50 years while snowfall has decreased. Future climate projections predict continued increases in precipitation during winter months and a decrease in the summer months, with more extreme events occurring, over the next 50 years.

Snowpack

Historical snowpack records for snow stations located within the RSA indicate that there is considerable variability with respect to snow accumulation and distribution across the region. The data suggests that snowpack conditions are influenced by elevation; the highest average and maximum values were associated with the Morrissey Ridge station (1,860 mASL) and the lowest values were represented by the Upper Elk River station (1,340 mASL).

Relative Humidity

Over the course of the baseline assessment period, the average monthly relative humidity varied between 50.1% (August 2015) and 93.1% (January 2016). There was a significant variability in the average daily humidity measured at the Crown Mountain climate station. Relative humidity is typically higher in the winter and lower in the summer, which is consistent with the general trends in data collected at the Crown Mountain station. Average monthly humidity was typically lowest in the summer months and highest in the winter.

Solar Radiation

Daily average solar radiation ranged from 6.1 W/m² in December 2015 to 252.8 W/m² in July 2014. The highest recorded daily solar radiation during the study period was 1,273.0 W/m² on May 7, 2014. Typically, higher solar radiation occurred during summer months, whereas lower solar radiation occurred during winter months.

Wind Speed and Direction

Wind speeds between 2 and 6 km/h were most frequently recorded over the study period, occurring 48% of the time. Wind speeds below 3.6 km/h (i.e., calm winds) occurred 33.6% of the time, and wind speeds over 21.6 km/h (i.e., strong winds) occurred 1.4% of the time. The maximum wind speed was

58.4 km/h on February 6, 2016. The most frequent wind direction was towards the west-northwest (22.9% of the recorded entries). The maximum wind speed measured at the Crown Mountain station (58.4 km/h, or 16.2 m/s) was less strong than the maximum wind speed measured at the Sparwood climate station.

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Appendix A

Crown Mountain Climate Station Data

APPENDIX A - Crown Mountain Climate Station Data

TABLE 1a. 2014 Average Daily Temperature (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-5.0	-15.5	-28.9	-4.4	11.7	8.4	12.5	16.9	7.2	1.8	0.7	-19.7
2	-4.0	-14.0	-26.3	-5.8	4.0	7.6	17.0	16.3	6.5	-2.0	-1.5	-15.3
3	-5.5	-19.1	-5.8	-4.4	-3.2	8.0	16.9	14.6	1.6	1.2	-1.1	-13.9
4	-13.9	-26.6	-3.3	-2.3	-0.7	8.4	16.0	14.8	3.7	7.8	0.4	-9.4
5	-19.9	-25.3	-1.7	-2.8	1.8	4.5	14.9	15.8	8.4	8.4	0.1	-4.3
6	-14.8	-22.9	-1.4	-1.0	-2.1	4.8	14.4	18.5	11.9	9.5	3.3	-0.6
7	-9.1	-17.8	-1.5	1.7	1.6	7.3	13.3	16.7	12.9	10.2	2.0	-3.1
8	-6.5	-20.9	-1.3	5.7	5.4	10.0	16.1	14.8	4.3	9.1	0.4	-3.6
9	-5.1	-19.0	-0.4	0.2	2.1	10.3	18.9	13.3	-1.4	8.1	-4.3	0.2
10	-5.9	-13.8	-3.2	0.9	1.0	6.8	16.3	15.8	-3.2	8.5	-14.3	0.9
11	-3.4	-6.8	-5.2	-0.2	0.0	5.9	16.1	18.1	-1.4	6.3	-18.3	1.5
12	-6.4	-4.4	-4.4	-6.1	5.9	8.1	19.3	19.2	1.2	3.6	-17.2	1.1
13	-3.0	-4.0	-1.8	-4.4	8.1	5.3	20.1	17.8	3.5	3.7	-13.8	-1.7
14	-2.9	-5.5	-2.5	0.9	9.5	5.2	16.5	13.6	7.7	6.2	-14.6	-6.2
15	-1.2	-4.7	-3.1	-0.5	8.8	5.4	15.9	13.4	11.5	2.8	-14.9	-12.1
16	-3.0	-5.9	-1.5	-2.6	5.6	4.9	15.8	11.2	13.2	1.5	-13.1	-10.4
17	-4.4	-5.7	-4.1	-0.1	4.4	3.8	M	13.4	14.1	2.8	-12.1	-7.3
18	-4.7	-7.1	-6.2	-1.4	4.9	4.7	M	15.2	12.5	6.0	-10.0	-4.4
19	-3.1	-8.0	-5.3	0.0	4.4	8.2	M	12.5	9.9	6.4	-8.2	-2.8
20	-6.1	-9.2	-6.3	1.4	7.2	10.2	M	8.9	11.0	9.0	-4.8	-4.7
21	-4.4	-10.1	-12.9	3.1	10.9	9.2	M	6.0	14.2	4.2	-2.4	-2.6
22	-3.6	-14.0	-12.4	2.4	12.3	9.4	M	5.2	15.3	2.7	-3.7	-6.0
23	-6.4	-21.0	-8.4	-0.9	10.2	11.0	M	5.4	12.1	1.7	-6.4	-7.9
24	-7.3	-19.8	-11.4	-0.1	8.6	11.2	M	6.9	12.4	0.1	-6.3	-5.7
25	-6.6	-15.5	-3.3	2.6	6.5	10.4	11.3	9.6	12.5	2.2	-5.0	-10.6
26	-8.5	-11.4	-4.4	-0.9	3.7	8.0	11.7	12.8	6.3	-0.5	-5.3	-12.5
27	-10.4	-7.4	-10.6	0.4	5.1	7.9	15.4	15.2	4.2	-3.1	-0.2	-10.8
28	-10.4	-20.4	-5.6	0.8	4.3	7.4	18.0	10.7	4.6	-2.5	-8.0	-12.7
29	-7.3		-2.0	4.6	1.4	7.8	20.2	9.7	6.7	1.2	-25.8	-21.8
30	-15.9		-5.6	8.8	6.0	10.1	18.1	8.6	4.3	2.6	-25.1	-23.1
31	-16.2		-6.0		8.7		19.1	7.2		6.1		-19.4
Min	-19.9	-26.6	-28.9	-6.1	-3.2	3.8	11.3	5.2	-3.2	-3.1	-25.8	-23.1
Mean	-7.3	-13.4	-6.3	-0.1	5.1	7.7	16.3	12.8	7.6	4.0	-7.7	-8.0
Max	-1.2	-4.0	-0.4	8.8	12.3	11.2	20.2	19.2	15.3	10.2	3.3	1.5

M - missing

TABLE 1b. 2014 Average Daily Temperature (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-17.4	-9.3	-10.0	-1.8	4.1	13.2	15.1	20.2	8.3	11.9	-0.4	-11.6
2	-11.4	-5.0	-11.1	-2.7	3.0	6.2	17.1	16.6	6.2	11.4	-1.6	-5.9
3	-20.7	-7.2	-16.6	-3.2	2.8	6.1	19.7	20.2	3.6	1.5	-3.3	-1.8
4	-20.4	-6.3	-11.2	-2.6	7.4	13.1	16.5	16.6	2.8	1.3	-5.9	-1.5
5	-7.9	-2.2	-5.3	-3.2	6.2	18.9	7.8	13.6	1.1	5.1	-5.6	-4.2
6	-10.7	0.3	0.3	-4.2	2.0	21.4	12.0	8.7	1.2	8.1	-5.8	-2.4
7	-6.6	0.3	0.6	-1.1	3.8	22.5	13.5	11.2	3.0	7.6	-1.0	-2.3
8	-12.4	0.2	-0.7	1.4	3.4	22.7	15.8	15.1	4.1	7.2	-0.5	-1.1
9	-14.1	-0.5	2.1	2.0	4.2	23.2	20.1	15.2	8.0	10.5	-3.4	-1.5
10	-7.9	0.5	2.3	2.0	4.8	24.6	18.7	17.3	10.3	9.9	-6.3	-5.2
11	-5.8	0.1	2.3	-0.4	2.8	23.0	14.0	18.8	13.5	4.2	-5.3	-4.4
12	-10.1	1.1	2.5	-2.0	2.6	18.9	13.5	20.7	15.2	3.4	-7.2	-5.7
13	-10.5	1.9	3.1	1.5	1.2	14.3	12.7	21.7	11.4	5.4	-1.7	-5.2
14	-9.7	0.6	1.1	1.3	3.4	15.9	11.5	18.5	4.2	3.9	0.3	-8.2
15	-8.2	-5.2	0.4	1.5	5.1	17.0	13.5	8.0	2.2	2.9	0.3	-9.9
16	-4.8	-6.5	-1.9	4.0	4.4	22.0	9.5	7.1	1.1	7.7	-4.8	-10.7
17	-5.9	-6.6	-2.9	5.8	2.6	21.6	6.9	10.1	3.0	10.9	-4.2	-15.2
18	-3.4	-4.2	0.7	3.3	3.8	16.0	12.4	10.4	4.5	8.0	-7.0	-8.5
19	-4.5	-3.2	-0.4	2.5	5.7	10.2	16.3	14.7	6.5	6.7	-9.1	-6.8
20	-8.8	-4.5	1.3	6.3	8.2	10.0	13.7	15.1	8.7	5.9	-11.0	-7.8
21	-11.1	-11.0	1.2	7.5	10.7	8.8	16.4	8.0	6.8	4.7	-8.9	-8.3
22	-7.0	-13.2	1.4	5.9	11.8	11.3	14.0	3.8	6.7	3.2	-5.3	-9.6
23	-3.6	-8.2	-0.1	1.1	12.2	12.0	13.2	11.5	8.3	1.3	-4.0	-11.4
24	0.1	-4.3	-0.7	0.3	12.0	12.9	13.9	14.8	9.8	0.9	-9.6	-11.8
25	1.8	-6.0	-2.8	1.2	8.5	15.7	10.7	14.7	13.6	0.0	-13.1	-15.6
26	3.2	-7.0	2.0	1.5	6.5	19.2	7.1	16.7	8.9	0.8	-9.1	-13.4
27	1.2	-9.8	7.0	3.9	9.9	21.6	5.9	17.0	4.2	0.2	-8.9	-10.8
28	-3.4	-13.0	1.5	9.7	6.6	22.1	7.5	14.5	4.3	-1.7	-0.7	-9.8
29	-6.1		0.9	5.7	7.7	18.0	12.8	13.5	7.6	0.5	1.1	-12.3
30	-6.7		3.7	2.9	9.7	15.0	16.1	6.6	9.9	0.4	-3.7	-14.9
31	-10.3		1.0		12.8		19.4	5.7		0.3		-17.6
Min	-20.7	-13.2	-16.6	-4.2	1.2	6.1	5.9	3.8	1.1	-1.7	-13.1	-17.6
Mean	-7.8	-4.6	-0.9	1.7	6.1	16.6	13.5	13.8	6.6	4.7	-4.9	-8.2
Max	3.2	1.9	7.0	9.7	12.8	24.6	20.1	21.7	15.2	11.9	1.1	-1.1

M - missing

APPENDIX A - Crown Mountain Climate Station Data

TABLE 1c. 2014 Average Daily Temperature (kPa)

Date	Jan	Feb	Mar	Apr	May
1	-13.8	-9.4	-5.1	4.5	6.4
2	-3.9	-9.7	-3.3	6.6	11.2
3	-7.8	-11.8	-2.5	6.1	12.1
4	-4.8	-6.9	-1.5	2.3	11.9
5	-3.6	-3.7	0.2	-0.2	7.1
6	-2.3	-4.3	-0.4	2.4	7.2
7	-10.1	-6.6	-2.2	5.6	11.3
8	-12.4	-3.1	-4.1	9.0	10.6
9	-11.8	-1.4	-5.2	6.5	-0.4
10	-12.0	1.1	-2.4	1.1	1.2
11	-10.0	0.1	-2.0	5.0	3.3
12	-6.3	-0.6	-0.4	4.0	0.3
13	-2.8	-2.1	-4.0	1.0	-1.2
14	-4.3	-3.1	M	-1.4	
15	-7.8	-1.8	M	1.7	
16	-8.9	-1.6	M	3.8	
17	-5.3	-1.1	M	6.2	
18	-3.8	-1.0	M	9.6	
19	-4.7	-3.6	-2.6	11.3	
20	-4.8	-3.5	1.5	9.7	
21	-4.4	-6.2	1.0	9.9	
22	-0.6	-5.0	-2.5	8.4	
23	-3.8	-7.0	-1.0	4.5	
24	-4.0	-6.5	-2.0	2.7	
25	-6.4	-3.9	-3.1	1.6	
26	-4.9	-0.8	-2.9	1.7	
27	-1.2	0.9	-2.9	2.2	
28	-0.7	-2.1	-2.4	-0.1	
29	-4.6	-4.2	-0.3	0.4	
30	-6.9		1.9	2.3	
31	-8.8		1.5		
Min	-13.8	-11.8	-5.2	-1.4	-1.2
Mean	-6.0	-3.7	-1.8	4.3	6.2
Max	-0.6	1.1	1.9	11.3	12.1

M - missing



TABLE 2a. 2014 Average Monthly Barometric Pressure (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	81.1	80.4	80.7	79.9	81.1	80.6	81.3	81.4	80.5	80.3	79.8	80.2
2	80.3	80.3	80.2	79.9	80.5	80.5	80.9	81.3	80.1	81.0	80.0	80.4
3	79.5	80.7	79.6	80.2	80.3	80.2	80.6	81.3	80.3	81.3	80.6	80.2
4	80.8	81.6	79.7	79.6	79.9	80.4	80.6	81.2	81.1	80.9	80.4	80.1
5	81.8	81.9	79.4	79.9	79.9	80.5	80.8	81.0	81.4	80.9	81.1	80.6
6	81.2	80.6	79.4	80.2	80.2	80.7	81.0	80.9	81.2	80.5	80.3	80.4
7	80.5	79.7	80.4	80.9	80.3	80.8	81.2	80.8	80.5	80.5	81.0	81.1
8	79.9	80.6	80.5	80.3	79.9	80.7	81.0	80.8	80.3	80.6	80.8	80.9
9	79.2	80.4	79.7	80.0	79.6	80.2	80.5	81.3	80.8	81.0	79.7	80.3
10	79.3	80.3	80.1	80.3	80.4	80.3	80.5	81.5	81.3	80.6	80.9	79.9
11	78.4	79.9	81.3	80.0	81.4	80.7	81.1	81.4	81.6	80.0	81.9	79.4
12	79.1	79.0	81.0	80.7	81.7	80.3	81.4	81.1	81.1	80.6	81.8	79.5
13	80.0	79.4	80.2	81.3	81.8	79.9	81.6	80.9	81.0	80.4	80.9	80.3
14	81.4	79.6	79.9	80.7	81.5	80.1	81.5	81.0	80.9	79.9	80.7	81.0
15	81.1	79.7	81.0	79.9	81.0	79.9	81.1	81.0	80.9	79.7	81.3	80.8
16	81.6	79.0	80.0	80.2	80.9	79.8	80.9	80.9	80.8	80.7	81.7	80.3
17	81.2	79.0	79.6	79.8	80.3	80.3	80.4	81.1	80.4	80.5	81.6	80.1
18	81.0	79.3	80.5	79.6	79.7	80.2	80.5	80.8	80.0	80.4	81.0	80.1
19	80.5	79.2	80.1	80.1	80.1	80.3	80.2	80.3	80.5	80.5	80.5	79.9
20	81.6	79.8	80.2	80.7	80.6	80.4	80.2	80.5	81.4	80.1	80.2	79.7
21	81.4	80.0	81.3	80.7	80.6	80.6	80.7	81.0	81.1	80.0	79.5	79.1
22	81.2	80.5	81.1	79.5	80.7	81.0	81.3	81.3	80.7	80.1	78.7	80.3
23	81.7	80.8	80.9	79.4	80.5	81.0	81.0	81.3	80.7	79.7	80.0	80.6
24	81.8	81.0	81.3	79.7	80.6	80.7	80.6	81.0	80.5	80.5	80.5	79.4
25	81.3	81.3	79.8	79.8	80.5	80.4	80.6	80.9	80.5	79.9	80.4	80.0
26	81.1	80.7	79.0	79.5	80.4	80.1	81.3	81.0	80.6	79.6	80.5	80.5
27	81.2	79.6	79.5	79.5	80.7	79.9	81.6	80.9	81.3	80.4	79.7	80.2
28	80.8	80.4	79.9	80.7	80.4	80.0	81.6	80.8	81.1	80.4	78.7	80.6
29	79.5		79.4	82.1	80.5	80.4	81.5	80.5	80.1	80.7	79.3	81.8
30	80.0		79.9	81.9	80.8	81.1	81.4	80.1	80.0	80.9	80.6	81.9
31	80.0		80.2		80.6		81.3	80.3		79.9		81.4
Min	78.4	79.0	79.0	79.4	79.6	79.8	80.2	80.1	80.0	79.6	78.7	79.1
Mean	80.6	80.2	80.2	80.2	80.6	80.4	81.0	81.0	80.8	80.4	80.5	80.4
Max	81.8	81.9	81.3	82.1	81.8	81.1	81.6	81.5	81.6	81.3	81.9	81.9

M - missing

APPENDIX A - Crown Mountain Climate Station Data

TABLE 2b. 2015 Average Monthly Barometric Pressure (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	80.8	80.4	80.4	79.9	80.1	80.5	81.2	80.9	80.1	81.0	79.4	80.6
2	80.0	79.8	80.0	80.6	80.1	80.5	81.3	81.0	80.0	80.7	79.8	80.4
3	80.7	80.1	80.2	80.6	80.5	80.5	80.8	80.7	80.4	81.0	80.0	80.0
4	80.8	80.3	80.4	80.1	80.3	80.7	80.6	80.6	80.7	80.8	80.2	79.6
5	80.4	79.6	80.8	79.9	80.0	80.9	81.2	80.5	80.5	80.7	80.2	80.5
6	81.4	79.2	81.0	79.7	80.3	80.8	81.2	80.5	80.5	80.8	80.8	80.1
7	81.3	79.3	80.9	80.0	80.6	80.9	81.1	80.7	80.8	80.9	80.4	79.6
8	81.5	80.3	80.6	80.3	80.9	80.7	80.8	80.6	80.8	81.3	79.8	79.4
9	80.9	79.9	80.2	80.6	81.1	80.6	80.4	81.0	80.8	80.7	80.0	78.8
10	80.2	80.7	80.3	80.0	81.0	80.5	80.4	81.1	81.2	79.9	80.2	78.9
11	80.7	81.1	80.3	79.2	80.7	80.3	80.4	81.1	81.4	80.1	80.0	79.1
12	81.0	81.0	81.0	79.9	80.6	80.2	80.6	81.2	80.9	80.7	80.4	79.4
13	81.4	81.2	81.3	80.2	80.5	80.5	80.8	81.1	80.0	80.8	79.6	78.8
14	81.2	80.8	79.9	79.8	80.4	81.0	80.8	80.9	79.8	81.1	79.6	79.8
15	80.7	81.2	79.9	81.0	80.1	81.2	80.7	80.9	79.7	81.6	79.1	80.1
16	79.8	81.4	81.1	81.1	80.4	80.9	80.4	81.2	80.1	81.2	79.6	80.0
17	80.4	80.9	80.6	80.9	81.3	80.9	80.6	81.1	80.4	80.7	78.7	80.0
18	79.7	80.7	80.5	81.0	81.3	80.7	80.9	81.0	80.7	80.5	79.5	79.4
19	80.6	80.5	80.5	80.9	81.2	80.5	81.0	80.5	80.4	80.3	80.1	79.5
20	81.1	80.5	80.5	80.4	81.0	80.6	80.9	80.2	80.1	80.8	80.9	79.3
21	81.1	81.2	80.1	80.2	80.7	80.5	80.3	80.0	80.4	81.0	80.9	78.7
22	81.0	81.4	80.4	79.9	80.7	80.9	80.2	81.2	80.5	80.7	80.5	78.2
23	81.2	81.3	79.9	79.7	81.1	81.0	80.4	81.0	80.7	80.8	79.8	78.5
24	80.8	80.6	80.1	79.5	80.8	81.1	80.7	80.9	81.0	80.7	80.0	78.9
25	80.7	82.2	80.8	80.0	80.4	81.3	80.6	81.1	80.7	80.8	80.8	80.0
26	80.6	82.2	81.0	80.7	80.7	81.3	80.5	81.2	80.3	80.3	81.3	81.0
27	80.3	80.1	80.6	81.2	80.8	81.3	80.7	80.9	80.7	80.6	81.3	80.4
28	81.1	80.4	80.1	80.8	81.2	81.3	81.1	80.7	80.9	80.4	81.2	80.0
29	81.4		80.7	80.3	81.1	81.2	81.3	80.3	80.8	80.0	80.8	80.1
30	81.0		80.5	80.5	80.7	81.0	81.5	80.1	80.8	79.4	80.4	80.7
31	80.8		79.7		80.4		81.3	80.2		79.4		81.4
Min	79.7	79.2	79.7	79.2	80.0	80.2	80.2	80.0	79.7	79.4	78.7	78.2
Mean	80.8	80.7	80.5	80.3	80.7	80.8	80.8	80.8	80.5	80.6	80.2	79.7 Max
	81.5	82.2	81.3	81.2	81.3	81.3	81.5	81.2	81.4	81.6	81.3	81.4

M - missing



APPENDIX A - Crown Mountain Climate Station Data

TABLE 2c. 2016 Average Monthly Barometric Pressure (kPa)

Date	Jan	Feb	Mar	Apr	May
1	81.4	80.0	80.1	80.9	81.3
2	81.0	80.2	79.9	80.5	81.1
3	80.5	80.4	80.0	80.5	81.0
4	80.0	80.3	80.3	80.2	80.7
5	79.6	80.7	79.5	80.7	80.6
6	79.6	80.2	79.0	80.9	81.2
7	79.9	81.5	79.5	81.2	80.6
8	80.2	81.8	79.8	80.5	79.6
9	80.3	81.5	79.9	79.8	80.3
10	80.7	80.9	79.5	80.3	81.0
11	80.6	81.0	79.9	80.2	81.0
12	80.3	80.7	79.2	80.3	81.0
13	79.4	80.2	79.1	80.1	81.5
14	79.5	80.0	M	79.9	
15	79.7	79.8	M	80.7	
16	79.9	79.9	M	81.3	
17	80.0	79.5	M	81.7	
18	80.0	78.4	M	81.6	
19	79.9	79.4	80.8	81.0	
20	80.1	80.4	80.3	80.9	
21	80.6	80.8	79.6	80.5	
22	79.9	80.6	79.8	80.1	
23	79.8	80.9	80.3	80.1	
24	79.8	80.9	79.8	80.0	
25	80.6	81.0	80.2	80.2	
26	80.8	80.6	80.3	80.4	
27	80.9	79.9	79.8	80.5	
28	79.9	80.0	80.2	80.7	
29	79.3	80.1	80.7	80.4	
30	79.2		80.6	81.1	
31	79.7		80.8		
Min	79.2	78.4	79.0	79.8	79.6
Mean	80.1	80.4	80.0	80.6	80.8
Max	81.4	81.8	80.8	81.7	81.5

M - missing

APPENDIX A - Crown Mountain Climate Station Data

TABLE 3a. 2014 Total Daily Precipitation (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.0	0.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	8.3	8.6	1.3
2	9.6	0.0	4.3	0.0	11.5	0.0	0.0	0.0	36.6	0.0	1.3	0.0
3	11.6	0.0	3.0	0.5	12.1	0.0	0.8	0.0	10.7	0.0	6.1	0.0
4	0.0	0.0	3.3	1.5	8.2	2.1	0.0	0.4	0.0	0.0	7.6	1.3
5	0.0	0.0	12.1	0.8	2.1	0.0	0.0	0.0	0.0	0.0	1.5	1.0
6	0.0	0.0	2.8	0.0	4.5	0.0	3.6	0.0	0.0	0.0	22.1	2.3
7	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	2.8	0.0	15.4	7.8	0.0	0.0	0.0	0.0	9.2	0.0	0.8	0.0
9	0.0	0.0	7.3	0.0	2.9	0.0	0.0	0.0	2.1	0.0	6.1	2.8
10	5.1	6.1	0.0	0.5	8.3	0.4	0.0	0.0	2.7	0.0	0.5	3.0
11	10.6	6.3	0.0	5.3	0.0	0.0	0.0	0.0	0.0	1.3	0.5	1.3
12	1.5	4.8	0.0	0.8	0.0	3.3	0.0	0.0	0.0	0.0	0.0	10.1
13	1.8	0.5	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	3.3
14	0.0	3.0	2.0	0.0	0.0	0.2	0.4	8.6	0.0	3.5	0.0	0.0
15	0.0	6.1	4.6	3.3	0.0	2.1	17.3	0.0	0.0	3.3	0.0	0.0
16	0.0	7.1	10.6	3.0	1.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	3.0	0.0	3.0	3.8	21.1	0.0	4.4	0.0	0.0	0.0	0.0
18	0.0	10.6	0.0	0.5	2.5	4.2	0.0	0.0	0.4	0.0	0.0	0.8
19	0.0	0.0	3.5	0.5	0.8	0.0	0.0	2.9	0.0	0.0	0.0	0.5
20	0.0	4.3	7.3	0.0	0.0	3.6	3.6	7.9	0.0	0.0	0.0	3.3
21	2.5	7.1	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	7.1	0.3
22	0.3	0.5	0.8	0.5	0.0	0.0	0.0	0.0	0.0	3.5	1.8	0.0
23	0.0	0.0	0.0	0.0	1.3	0.0	3.6	0.0	0.2	8.3	2.0	10.9
24	0.0	0.0	0.0	0.0	0.0	4.4	3.1	0.0	0.0	0.0	0.8	1.3
25	0.0	0.0	1.8	1.5	1.7	0.0	0.0	0.0	0.6	5.8	1.8	0.0
26	0.5	0.0	1.0	1.3	4.4	1.3	0.0	0.0	0.4	0.8	16.4	0.8
27	0.0	0.3	0.8	0.8	3.3	0.4	0.0	3.8	0.0	0.0	29.8	2.0
28	0.0	0.0	2.8	0.0	4.2	0.2	0.0	3.1	0.0	0.0	56.4	0.0
29	0.5	0.0	3.5	0.0	0.6	0.4	0.0	2.9	0.0	0.0	0.0	0.0
30	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.2	4.4	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	47.3	60.2	96.9	31.6	73.6	61.2	32.4	34.9	67.3	34.9	171.1	46.0



TABLE 3b. 2015 Total Daily Precipitation (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1.5	0.0	0.0	0.0	2.1	13.0	0.0	0.0	1.3	0.0	11.1	0.3
2	0.3	0.0	1.3	0.0	0.0	7.1	0.0	0.0	7.3	9.1	0.8	0.0
3	1.3	1.0	0.0	0.4	0.0	0.0	0.0	0.0	4.6	0.0	0.0	7.6
4	10.1	1.8	0.0	3.0	0.0	0.0	0.4	0.0	2.5	0.0	0.0	0.8
5	0.0	23.5	0.0	0.0	0.0	0.0	0.0	0.8	8.6	0.0	0.0	0.0
6	1.3	18.2	0.0	1.0	0.0	0.0	0.0	0.0	1.7	0.0	0.3	3.8
7	0.0	3.8	0.0	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.5	1.3
8	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	34.6
9	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	14.9
10	0.5	0.0	0.0	2.5	1.7	0.0	2.5	0.0	0.0	20.5	0.0	4.8
11	0.0	0.0	0.0	0.5	0.0	0.0	0.6	0.0	0.0	0.0	5.1	0.0
12	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	3.3	6.3
13	0.0	0.0	0.5	0.8	2.9	0.0	0.2	0.0	1.9	0.0	44.8	0.8
14	0.0	0.0	28.6	0.0	0.0	0.4	0.0	6.1	0.2	0.0	14.9	0.0
15	3.5	0.0	44.3	0.0	0.2	0.0	0.2	7.7	0.6	0.0	0.3	1.3
16	0.5	0.0	0.5	0.0	0.0	0.2	1.9	10.9	1.3	0.0	0.0	0.3
17	3.5	0.0	0.3	0.0	0.0	9.8	0.4	1.3	0.0	0.0	21.0	2.0
18	2.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	1.3	0.0	2.3
19	0.0	0.0	1.3	0.0	0.0	1.9	4.0	0.0	0.0	0.0	0.0	0.3
20	0.0	0.0	1.8	0.0	0.0	0.0	1.9	0.0	15.7	0.0	0.0	2.3
21	0.0	0.0	3.5	0.0	0.0	0.4	0.0	20.3	0.0	0.0	0.0	1.5
22	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
23	9.9	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	0.5
24	0.0	0.0	0.8	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.3	3.8
25	0.0	0.0	0.0	1.0	27.6	0.0	7.7	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	15.7	0.0	1.0	0.0	0.6	0.3	0.0	0.0
27	0.0	0.0	9.1	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	1.0
28	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.8
29	0.0	0.0	0.5	0.0	2.5	6.1	0.0	0.0	0.0	0.3	0.0	0.3
30	0.5	0.0	0.0	0.0	4.6	0.2	0.0	6.3	0.0	11.9	0.0	0.0
31	0.5	0.0	2.8	0.0	0.0	0.0	0.0	0.2	0.0	11.1	0.0	0.0
Total	35.4	49.1	103.9	9.5	78.4	54.1	31.4	64.7	55.9	54.4	119.4	93.6

APPENDIX A - Crown Mountain Climate Station Data

TABLE 3c. 2016 Total Daily Precipitation (kPa)

Date	Jan	Feb	Mar	Apr	May
1	0.0	0.0	4.3	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0
3	0.5	1.0	1.8	0.0	0.0
4	0.0	0.0	0.0	2.0	1.7
5	0.0	1.8	8.3	0.0	2.1
6	0.0	0.3	8.9	0.0	0.0
7	0.5	0.0	1.0	0.0	0.0
8	0.0	0.0	0.0	0.0	4.8
9	0.0	0.0	5.6	0.0	0.0
10	0.0	0.0	9.1	0.0	0.0
11	0.0	0.0	1.3	0.0	8.2
12	0.3	5.8	3.0	0.0	9.2
13	3.0	0.0	2.8	0.0	0.0
14	0.0	0.5	0.0	0.0	0.0
15	0.0	3.5	0.0	0.0	0.0
16	1.3	0.0	0.5	0.0	0.0
17	1.3	4.0	0.0	0.0	0.0
18	0.0	7.6	0.0	0.0	3.3
19	3.3	2.3	0.0	0.0	0.2
20	0.5	0.8	0.0	0.0	3.8
21	1.3	0.0	0.0	0.0	12.5
22	4.6	0.0	0.0	2.0	6.1
23	6.3	0.0	1.3	3.0	5.9
24	0.0	0.0	2.5	1.0	0.0
25	0.0	0.0	0.5	11.1	0.2
26	0.0	0.0	0.0	5.8	0.4
27	2.5	0.5	0.0	0.0	0.6
28	6.1	6.3	0.8	0.0	0.0
29	0.3	0.0	0.0	0.0	12.5
30	0.0	0.0	1.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0
Total	31.6	34.4	52.6	25.0	86.5

TABLE 4a. 2014 Average Daily Relative Humidity (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	74.4	83.2	75.0	96.7	42.9	59.3	66.3	64.4	71.6	84.5	90.6	83.0
2	92.6	85.7	77.2	94.6	79.8	70.9	50.2	60.9	83.1	90.6	92.3	86.9
3	93.9	78.5	96.2	95.2	86.6	69.6	50.4	61.9	96.5	70.3	89.6	89.1
4	86.8	73.0	98.6	97.3	91.1	66.9	36.9	65.9	86.6	62.6	95.7	92.7
5	82.3	73.0	99.6	96.2	86.8	76.6	44.7	59.7	62.8	66.5	86.7	96.5
6	87.5	75.7	99.9	70.7	83.9	59.4	61.1	38.0	54.9	69.0	95.4	99.7
7	92.9	77.7	99.9	57.8	65.0	41.9	66.8	44.1	58.0	62.9	89.3	98.2
8	95.5	77.1	99.7	60.8	57.0	42.4	55.0	51.5	82.9	73.4	82.0	97.4
9	96.6	75.1	100.0	71.6	86.4	43.2	42.0	62.5	92.3	71.2	87.4	100.0
10	95.1	86.4	98.3	48.9	84.8	47.7	45.7	47.6	88.9	65.8	83.8	95.5
11	98.4	84.8	95.9	79.7	61.9	72.9	57.2	44.0	80.4	60.8	80.5	90.7
12	95.8	91.0	95.6	87.6	43.2	62.5	51.8	42.6	73.1	56.1	80.9	92.6
13	97.9	89.8	68.4	60.2	35.6	86.5	51.7	44.8	71.1	72.3	78.4	99.0
14	74.3	89.9	81.4	39.7	42.4	89.4	65.6	72.5	56.3	58.3	67.9	93.8
15	70.1	85.0	78.2	68.8	60.8	87.1	70.6	74.4	51.5	93.8	75.5	90.6
16	69.5	91.0	96.6	95.3	78.0	83.5	74.6	80.7	44.8	91.5	81.8	88.4
17	80.4	95.3	87.6	96.0	93.6	92.9	M	78.1	45.4	77.9	86.0	94.6
18	84.3	91.3	76.9	93.3	79.7	96.9	M	68.4	55.1	74.3	83.1	97.4
19	61.0	94.1	84.6	72.1	85.3	86.4	M	71.4	70.0	75.1	64.1	95.3
20	73.8	93.0	94.9	69.7	69.6	64.7	M	88.9	64.7	52.2	73.3	94.5
21	73.8	92.5	89.1	54.6	50.5	59.5	M	92.5	45.8	80.5	89.2	88.8
22	95.3	88.5	89.5	75.8	47.4	75.8	M	91.8	47.3	83.6	87.1	82.4
23	95.8	81.7	93.4	66.0	64.7	70.5	M	89.2	67.1	94.1	79.5	83.1
24	94.1	82.9	90.3	74.3	64.6	72.6	M	81.9	59.7	80.6	82.0	99.7
25	94.6	86.6	95.7	69.6	71.4	70.8	50.0	67.2	52.7	85.4	81.9	96.6
26	92.8	89.8	95.4	84.2	91.2	90.8	51.6	59.5	82.7	90.5	93.5	91.1
27	88.5	90.7	91.1	72.4	66.0	87.1	43.4	58.2	88.7	75.3	98.9	91.1
28	89.5	82.0	96.2	65.4	87.2	85.3	38.1	81.7	89.4	86.7	90.6	88.2
29	92.4		99.5	50.3	91.8	74.7	30.9	79.7	85.2	90.5	77.4	80.3
30	83.3		96.6	37.6	62.8	68.0	38.5	67.0	86.6	81.6	79.5	80.2
31	83.6		96.2		48.2		40.9	64.7		67.5		83.1
Min	61.0	73.0	68.4	37.6	35.6	41.9	30.9	38.0	44.8	52.2	64.1	80.2
Mean	86.7	85.2	91.5	73.4	69.7	71.9	51.5	66.3	69.8	75.7	84.1	91.6
Max	98.4	95.3	100.0	97.3	93.6	96.9	74.6	92.5	96.5	94.1	98.9	100.0

M - missing

TABLE 4b. 2015 Average Daily Relative Humidity (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	85.4	91.0	58.6	60.6	66.7	54.8	66.0	21.7	71.5	38.7	96.6	84.5
2	90.2	93.4	75.1	59.0	56.0	96.4	56.2	53.4	83.2	44.8	95.3	89.8
3	80.4	88.9	66.6	70.5	45.5	92.0	38.3	31.3	89.6	97.3	90.2	95.6
4	81.2	93.9	59.0	82.2	30.1	75.9	53.5	44.2	88.7	90.1	90.4	95.8
5	94.7	98.6	53.4	76.2	36.0	62.1	71.0	49.7	94.6	69.5	89.9	88.3
6	90.0	100.0	52.3	86.8	62.6	42.9	59.9	67.2	97.6	54.9	87.0	89.4
7	95.4	98.6	53.2	74.5	70.8	37.8	56.5	52.6	85.3	69.3	93.2	97.0
8	92.9	97.9	51.2	41.1	83.6	37.4	51.8	38.6	90.7	81.8	95.1	98.9
9	94.4	97.7	53.2	31.5	57.1	46.9	32.9	39.5	83.1	65.3	90.7	99.3
10	94.1	96.8	50.6	54.0	62.1	54.4	45.2	40.1	64.7	74.0	89.5	94.8
11	95.5	93.6	55.4	72.2	79.3	45.4	81.3	32.7	57.4	71.8	91.1	89.8
12	93.6	86.9	68.5	56.7	53.6	59.3	77.8	26.2	53.5	60.6	85.2	88.8
13	94.0	90.9	57.7	59.1	76.1	67.8	62.5	26.3	56.4	54.2	98.8	94.1
14	94.7	85.9	84.9	86.4	90.3	83.5	68.9	46.5	93.4	45.0	100.0	94.9
15	96.3	59.4	96.8	64.4	88.7	78.9	55.9	90.0	83.8	53.9	90.4	92.6
16	98.9	71.7	91.2	49.3	84.7	56.5	60.1	88.6	83.8	37.4	81.4	90.4
17	95.2	65.5	93.4	49.6	80.0	77.8	80.2	63.2	72.9	32.1	94.6	85.6
18	100.0	62.3	90.2	69.3	59.1	75.3	62.8	64.6	79.1	58.8	76.2	93.4
19	92.8	63.1	91.9	54.5	52.5	65.7	48.6	42.4	76.5	85.0	72.1	93.7
20	83.4	86.6	89.7	39.8	45.8	49.8	78.3	42.7	81.8	70.9	76.5	93.7
21	96.7	73.0	90.9	45.0	36.8	60.1	36.8	72.0	76.1	71.7	74.0	93.4
22	91.5	71.5	75.9	52.8	34.3	53.6	31.0	78.1	65.0	64.8	66.6	91.7
23	98.8	66.1	92.4	64.2	31.5	50.5	40.4	42.0	46.1	62.2	70.6	89.6
24	91.0	64.1	88.6	73.0	40.6	48.7	40.4	32.2	37.3	66.4	84.1	89.4
25	86.2	86.7	92.8	67.0	70.4	43.2	68.8	37.4	30.6	78.1	76.2	84.2
26	54.1	86.0	92.0	73.2	95.3	37.7	83.6	36.2	56.7	90.9	72.0	86.7
27	57.3	76.4	68.4	53.0	75.6	29.9	85.2	39.8	42.0	95.4	74.4	89.7
28	68.6	66.1	92.1	42.6	90.6	36.2	80.1	44.4	54.3	92.4	29.3	91.6
29	82.1		85.4	58.3	90.9	61.2	48.8	50.4	48.6	85.0	22.7	88.8
30	77.9		78.3	58.0	94.3	71.1	36.0	78.2	43.9	91.6	44.1	86.1
31	87.3		72.7		68.6		24.6	80.1		95.1		82.8
Min	54.1	59.4	50.6	31.5	30.1	29.9	24.6	21.7	30.6	32.1	22.7	82.8
Mean	88.2	82.6	74.9	60.8	64.8	58.4	57.5	50.1	69.6	69.3	79.9	91.1
Max	100.0	100.0	96.8	86.8	95.3	96.4	85.2	90.0	97.6	97.3	100.0	99.3

M - missing

APPENDIX A - Crown Mountain Climate Station Data

TABLE 4c. 2016 Average Daily Relative Humidity (kPa)

Date	Jan	Feb	Mar	Apr	May
1	86.5	81.2	98.9	54.5	54.3
2	70.9	70.3	100.0	57.4	36.4
3	76.1	81.9	100.0	55.4	34.7
4	94.7	83.3	99.4	77.4	39.3
5	97.9	82.8	95.6	71.8	82.7
6	96.3	69.9	98.5	65.1	57.0
7	92.5	66.2	85.5	46.7	42.3
8	89.5	87.5	90.0	41.3	51.0
9	90.2	90.4	78.5	53.7	92.3
10	90.0	78.1	98.5	69.3	63.5
11	92.3	68.5	84.8	52.8	69.8
12	96.8	96.4	97.1	71.9	96.4
13	100.0	90.9	90.0	78.6	86.4
14	99.1	80.3	M	86.5	
15	95.0	73.3	M	69.1	
16	93.8	84.2	M	62.0	
17	98.2	86.0	M	49.1	
18	97.6	98.4	M	34.5	
19	97.2	91.6	46.5	36.0	
20	96.4	91.3	49.1	34.8	
21	96.5	80.3	80.3	37.6	
22	100.0	75.9	82.6	59.3	
23	99.8	74.4	81.9	92.1	
24	99.7	72.2	92.8	97.8	
25	96.8	74.9	91.2	97.8	
26	98.0	71.3	69.6	96.5	
27	90.9	69.5	80.9	77.3	
28	99.9	83.1	87.0	85.5	
29	88.9	99.9	64.3	82.6	
30	83.9		62.0	74.0	
31	82.2		81.5		
Min	70.9	66.2	46.5	34.5	34.7
Mean	93.1	81.2	84.1	65.6	62.0
Max	100.0	99.9	100.0	97.8	96.4

M - missing



TABLE 5a. 2014 Average Daily Solar Radiation (Wm²)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	17.2	22.0	56.3	152.9	275.4	281.3	219.0	248.8	100.6	70.0	15.5	8.6
2	8.4	9.5	29.8	202.0	116.3	171.4	305.7	175.1	41.7	87.3	12.3	5.1
3	5.8	12.8	17.1	105.3	19.2	195.6	235.9	159.8	36.2	125.2	6.3	15.7
4	14.5	14.5	8.3	74.1	36.5	241.3	311.4	197.4	126.7	103.2	1.3	4.6
5	15.9	18.8	7.1	63.0	104.9	244.5	237.2	267.6	227.2	109.7	13.1	3.7
6	7.7	24.1	3.8	153.1	85.1	290.7	181.0	248.1	223.3	34.6	3.4	2.4
7	8.6	20.6	5.4	180.9	257.6	268.8	272.1	229.5	228.0	102.0	12.9	3.6
8	2.4	19.5	43.1	204.7	244.7	256.4	239.3	240.4	90.8	82.3	17.4	4.2
9	2.4	28.4	17.3	152.1	115.0	201.3	307.2	172.6	75.6	119.3	7.1	1.3
10	3.6	21.4	42.3	219.8	113.8	241.1	268.3	249.6	55.6	118.9	9.4	6.8
11	11.8	18.7	147.2	57.1	132.5	235.5	284.1	261.7	210.1	49.3	13.4	15.5
12	39.2	14.1	149.3	35.9	300.0	192.2	311.1	174.7	88.8	67.1	21.2	20.7
13	10.0	6.2	182.3	210.3	277.0	149.4	293.6	220.4	161.1	36.3	25.3	4.3
14	15.0	6.2	48.9	240.7	253.9	134.1	174.6	56.8	198.1	40.2	32.2	21.8
15	41.0	11.6	62.3	118.7	184.5	104.5	185.7	182.4	183.9	26.2	36.4	41.5
16	48.5	28.2	6.8	75.1	176.4	176.5	274.2	61.5	173.0	22.1	39.3	30.0
17	37.5	6.7	11.2	43.9	80.1	47.8	M	127.1	165.7	101.8	40.5	9.5
18	48.2	20.5	23.9	24.7	154.8	75.0	M	201.5	145.7	56.6	36.9	4.3
19	45.3	9.4	13.0	219.3	133.9	123.2	M	131.8	90.5	78.7	58.2	4.0
20	55.8	7.3	14.5	149.1	236.4	162.7	M	75.6	169.7	100.5	39.5	3.7
21	57.0	7.6	33.3	240.9	258.8	307.9	M	47.1	165.8	16.5	13.7	7.3
22	12.0	14.1	33.3	94.4	269.4	218.9	M	38.2	149.3	23.1	1.6	30.1
23	13.3	16.9	26.8	108.7	195.2	183.4	M	80.9	131.6	7.1	15.3	13.7
24	19.8	23.1	53.5	92.7	196.0	154.6	M	138.5	154.8	21.1	8.2	5.6
25	22.5	27.9	140.5	172.8	123.5	145.7	220.7	171.4	149.8	43.7	12.7	7.6
26	8.8	39.8	17.9	38.6	58.6	93.7	232.5	237.8	45.8	9.6	4.6	9.1
27	49.9	41.8	35.3	144.5	293.5	75.8	282.8	204.5	48.1	22.5	1.6	3.8
28	40.7	36.7	21.4	171.6	143.4	99.3	244.3	62.3	63.7	20.3	1.6	5.2
29	13.7		10.1	285.8	50.5	182.8	278.8	140.2	48.5	8.3	8.2	8.2
30	18.6		20.2	276.6	278.7	306.1	181.6	154.1	50.8	67.9	16.7	13.0
31	11.3		20.2		211.7		273.3	180.0		71.9		15.7
Min	2.4	6.2	3.8	24.7	19.2	47.8	174.6	38.2	36.2	7.1	1.3	1.3
Mean	22.8	18.9	42.0	143.7	173.5	185.4	252.8	165.7	126.7	59.5	17.5	10.7
Max	57.0	41.8	182.3	285.8	300.0	307.9	311.4	267.6	228.0	125.2	58.2	41.5

M - missing

TABLE 5b. 2015 Average Daily Solar Radiation (Wm²)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	11.1	22.6	99.1	158.7	85.2	245.6	224.3	282.6	87.1	117.8	2.3	41.4
2	4.5	22.0	60.5	146.4	201.2	61.1	251.2	249.1	29.1	145.2	4.8	11.1
3	4.7	20.9	127.2	71.5	280.0	64.7	294.6	196.2	96.7	29.5	24.3	10.3
4	5.8	28.0	142.8	85.5	281.3	230.3	218.5	176.5	37.1	83.1	14.8	7.6
5	3.4	3.6	94.6	154.9	280.6	261.1	128.6	250.3	38.9	129.5	7.7	5.4
6	3.5	1.8	125.0	52.2	191.8	286.7	284.7	87.7	12.5	119.2	9.2	7.8
7	11.1	5.6	86.4	179.8	249.4	265.4	233.3	234.9	33.4	74.1	4.1	1.1
8	7.2	4.1	143.8	242.7	182.9	309.2	293.4	274.0	15.5	42.9	4.0	1.5
9	21.6	3.1	127.6	244.7	223.7	310.7	292.5	167.8	45.3	93.0	11.6	1.1
10	7.2	5.1	145.7	119.0	177.6	286.0	125.9	230.1	198.9	25.6	18.7	2.7
11	7.7	5.5	60.9	79.2	137.4	308.7	177.2	245.6	204.0	71.6	3.4	3.6
12	31.0	36.3	68.6	139.8	193.7	158.3	120.1	225.5	195.4	46.6	6.6	2.9
13	10.6	34.4	143.5	173.6	61.8	206.3	169.8	237.5	181.1	110.6	3.2	2.0
14	9.2	38.8	12.0	91.4	110.9	151.3	196.1	178.6	82.3	117.0	1.8	6.7
15	16.2	101.4	28.1	258.6	102.3	157.0	202.6	8.7	36.9	115.9	35.7	3.7
16	4.2	67.0	34.1	263.6	96.8	264.5	188.1	139.1	71.0	91.0	17.3	6.4
17	31.3	100.5	117.6	252.1	166.3	104.0	127.3	210.0	113.4	111.5	4.0	5.0
18	2.6	74.2	97.8	230.0	296.3	175.0	261.6	179.3	26.5	46.9	38.3	1.6
19	8.6	67.5	26.0	250.6	299.0	141.7	179.4	259.6	49.4	58.9	27.6	2.7
20	28.3	49.5	42.8	271.1	298.1	228.2	145.1	178.1	13.4	83.6	54.8	3.0
21	33.2	31.5	41.5	250.0	300.5	222.9	284.2	102.2	134.3	99.7	39.7	4.5
22	31.0	73.0	145.3	193.5	298.1	243.4	276.4	244.9	165.0	61.6	49.9	4.4
23	19.2	106.4	35.5	177.4	287.3	228.0	250.9	251.1	163.6	76.0	34.0	5.2
24	26.5	109.9	94.2	99.8	253.4	233.1	216.7	181.2	153.0	93.3	31.5	4.0
25	48.5	55.5	16.1	211.7	124.8	275.5	84.5	139.4	154.3	93.1	45.8	11.0
26	58.6	19.8	41.2	201.1	97.0	303.4	104.7	203.4	34.5	7.5	48.1	4.0
27	51.3	106.5	201.8	277.4	223.0	302.0	95.3	186.7	149.1	32.9	41.7	3.8
28	50.5	119.8	16.9	281.9	52.2	250.2	186.8	131.4	147.4	30.3	47.4	4.9
29	62.1		36.0	154.9	121.5	106.2	171.5	113.6	142.5	16.3	46.9	8.0
30	60.4		85.1	184.5	103.1	247.2	279.3	28.0	137.0	1.3	44.4	5.0
31	62.5		82.0		215.4		277.3	44.2		1.0		5.9
Min	2.6	1.8	12.0	52.2	52.2	61.1	84.5	8.7	12.5	1.0	1.8	1.1
Mean	23.7	46.9	83.2	183.3	193.3	220.9	204.6	181.9	98.3	71.8	24.1	6.1
Max	62.5	119.8	201.8	281.9	300.5	310.7	294.6	282.6	204.0	145.2	54.8	41.4

M - missing

APPENDIX A - Crown Mountain Climate Station Data

TABLE 5c. 2016 Average Daily Solar Radiation (Wm²)

Date	Jan	Feb	Mar	Apr	May
1	13.7	9.7	15.9	236.7	300.4
2	42.3	15.6	12.4	167.5	300.0
3	45.7	9.5	6.8	202.6	302.0
4	24.6	31.3	102.3	74.1	245.9
5	14.5	26.5	24.0	134.7	94.2
6	32.0	37.1	19.2	95.1	300.7
7	25.3	74.8	42.2	244.5	306.3
8	42.4	44.0	11.1	215.6	213.0
9	31.4	63.7	79.5	223.0	73.4
10	18.8	84.6	5.3	186.2	169.5
11	17.5	74.5	108.6	210.3	180.2
12	15.9	14.2	34.2	67.5	38.8
13	11.1	8.1	M	99.5	163.8
14	8.0	30.5	M	110.0	
15	40.7	28.3	M	180.4	
16	25.4	11.0	M	229.3	
17	20.5	28.1	M	264.4	
18	24.6	3.8	M	269.2	
19	13.2	7.8	M	272.9	
20	7.0	10.0	164.7	272.6	
21	5.5	16.8	62.0	244.4	
22	1.4	17.2	161.2	155.9	
23	3.5	21.2	58.5	97.3	
24	5.6	65.3	44.7	71.7	
25	3.5	125.7	105.5	116.9	
26	2.7	114.5	125.1	128.6	
27	3.9	38.1	64.7	205.1	
28	2.2	19.2	33.8	101.6	
29	4.0	9.9	178.0	100.3	
30	5.2		109.4	107.3	
31	8.0		137.4		
Min	1.4	3.8	5.3	67.5	38.8
Mean	16.8	35.9	71.1	169.5	206.8
Max	45.7	125.7	178.0	272.9	306.3

M - missing



TABLE 6a. 2014 Average Daily Wind Speed (km/hr)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	7.1	2.1	8.6	6.2	6.6	6.0	6.6	6.0	5.9	5.7	4.9	0.0
2	6.0	2.0	13.3	7.0	8.9	5.4	5.1	6.0	4.2	2.9	5.3	0.0
3	5.5	5.1	8.1	7.4	7.2	6.0	6.5	5.2	3.2	3.7	4.1	0.0
4	10.2	4.6	4.8	4.5	9.1	5.4	10.4	6.9	3.9	8.8	4.2	0.0
5	6.3	3.8	4.3	3.9	6.5	8.3	7.2	7.8	4.3	5.7	3.2	0.0
6	2.9	4.0	5.5	15.2	6.0	6.9	5.6	7.1	4.7	5.8	5.2	2.4
7	3.7	3.8	5.1	5.7	3.9	9.6	6.1	8.5	4.4	4.9	6.7	4.5
8	4.3	7.2	6.6	8.2	6.2	6.7	7.3	9.4	10.2	5.6	5.6	3.5
9	4.1	4.5	3.9	9.3	5.7	13.0	5.8	7.8	4.1	4.6	8.6	5.2
10	7.1	5.0	5.0	8.7	5.3	8.6	8.2	6.1	7.2	3.6	6.3	6.0
11	7.8	5.9	5.4	7.0	5.5	5.7	6.7	7.1	4.7	8.9	5.3	5.8
12	10.1	4.9	5.8	5.7	5.5	5.6	7.2	4.6	3.4	6.9	3.6	6.1
13	11.8	4.0	8.2	5.4	4.6	5.2	6.9	6.6	6.7	3.5	3.6	5.5
14	9.1	4.6	4.9	5.3	11.7	4.8	6.3	3.8	5.5	7.8	4.7	4.3
15	11.9	4.5	7.0	6.8	7.2	6.7	4.3	6.6	4.9	6.2	3.7	1.7
16	4.2	6.5	4.2	8.2	7.3	5.2	4.2	6.5	4.0	4.7	3.0	1.0
17	3.7	5.0	6.7	4.0	5.1	6.6	M	4.6	4.7	3.6	3.9	2.5
18	4.3	4.6	8.8	6.0	7.2	7.0	M	4.7	6.3	6.5	2.2	2.3
19	6.1	6.3	4.2	5.4	5.5	6.3	M	6.7	4.7	4.1	2.1	4.0
20	2.6	4.9	5.3	4.8	4.1	7.3	M	5.3	6.3	6.3	3.4	4.3
21	2.7	5.7	7.4	4.5	4.9	7.4	M	4.4	5.2	4.5	4.7	11.7
22	3.4	6.0	7.1	5.4	5.0	6.5	M	4.9	3.5	4.7	6.4	10.0
23	4.6	8.0	6.7	6.7	4.7	4.9	M	4.4	6.3	5.2	7.7	6.7
24	4.7	4.5	9.7	5.7	6.1	5.5	M	4.1	6.7	3.7	6.1	3.5
25	1.5	5.4	5.0	5.2	6.2	5.9	11.8	6.1	6.8	6.5	5.1	1.8
26	4.3	4.4	11.8	5.6	5.5	6.2	8.2	5.1	6.1	6.0	4.1	1.2
27	1.7	4.4	11.3	6.2	4.7	3.7	5.8	6.4	4.7	5.6	2.1	0.8
28	2.6	8.7	5.0	9.8	4.8	6.1	5.0	7.0	5.9	5.2	1.3	3.2
29	1.6		5.7	6.2	5.7	8.7	5.9	5.8	4.6	4.0	0.0	3.9
30	5.4		11.4	6.6	5.6	6.1	6.2	5.1	6.3	4.1	0.0	4.8
31	2.2		6.1		4.5		5.8	8.0		6.0		6.3
Min	1.5	2.0	3.9	3.9	3.9	3.7	4.2	3.8	3.2	2.9	0.0	0.0
Mean	5.3	5.0	6.9	6.5	6.0	6.6	6.7	6.1	5.3	5.3	4.2	3.6
Max	11.9	8.7	13.3	15.2	11.7	13.0	11.8	9.4	10.2	8.9	8.6	11.7

M - missing

TABLE 6b. 2015 Average Daily Wind Speed (km/hr)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	4.0	3.2	4.8	12.6	6.0	6.0	5.9	5.3	6.3	3.3	6.4	3.0
2	6.1	5.1	5.2	11.4	12.7	6.0	6.2	6.7	6.1	5.4	4.7	6.2
3	10.7	11.5	7.5	4.3	5.8	5.1	7.2	6.0	4.4	5.4	4.1	5.8
4	7.5	4.6	4.5	4.9	5.6	5.6	7.7	7.8	4.3	6.6	4.8	8.0
5	4.1	3.7	5.4	5.3	10.0	5.9	6.7	8.4	3.7	4.6	3.6	5.2
6	13.2	6.8	12.1	5.0	6.9	9.8	5.2	10.5	2.4	5.1	3.8	5.8
7	5.5	2.3	7.9	4.6	6.5	8.1	5.8	8.4	6.2	6.6	6.0	4.5
8	8.5	1.1	9.0	4.8	5.4	6.9	6.2	4.8	3.9	4.5	4.8	4.3
9	2.1	2.2	7.0	4.3	4.6	10.1	6.7	6.7	5.1	5.7	4.8	3.0
10	2.7	7.0	6.5	6.1	4.4	7.5	5.2	5.4	5.1	7.3	3.8	3.2
11	2.4	4.7	5.4	6.5	5.0	7.5	6.1	6.3	4.8	8.0	3.7	4.0
12	4.9	5.8	5.2	5.9	7.2	11.2	5.0	3.7	3.1	5.2	7.5	3.9
13	5.1	6.5	5.9	5.5	5.2	8.6	6.2	6.3	9.0	7.2	5.2	3.2
14	5.8	7.7	5.6	7.9	4.6	5.4	5.2	7.1	10.0	4.5	0.1	1.8
15	3.0	7.5	6.2	6.8	4.9	5.7	5.3	7.5	6.6	6.2	3.1	1.0
16	10.6	5.4	6.0	7.1	5.0	6.6	8.4	6.0	5.5	2.0	7.0	0.3
17	7.4	4.4	8.4	9.2	6.1	6.8	7.7	6.6	5.2	3.0	8.4	0.1
18	5.1	4.7	5.4	7.7	6.8	5.9	4.8	5.7	3.9	4.1	15.3	0.5
19	5.9	7.3	5.1	6.4	6.4	6.6	6.8	6.4	6.0	5.2	4.2	0.0
20	5.4	4.9	5.6	5.5	5.8	7.2	6.7	8.3	6.3	5.5	7.4	2.3
21	3.0	7.4	5.1	5.8	5.3	9.7	7.8	6.7	7.5	6.1	5.4	1.0
22	3.8	3.0	6.0	7.0	5.2	7.1	8.4	2.6	9.0	5.1	5.2	1.0
23	5.7	5.4	4.2	7.1	6.1	8.1	6.5	4.9	7.3	4.8	7.2	1.0
24	7.3	5.4	5.5	7.2	5.4	6.1	6.4	4.8	5.5	7.4	5.7	3.0
25	7.1	10.3	3.3	5.6	4.9	6.1	8.0	5.2	5.9	7.8	3.3	3.0
26	8.0	13.2	5.3	5.3	4.5	5.4	5.3	4.9	8.0	4.8	2.8	2.2
27	7.9	7.1	6.6	9.7	5.1	5.5	5.2	4.1	13.6	6.1	5.4	1.8
28	5.8	6.9	4.6	4.0	4.4	5.4	8.8	5.9	5.9	3.0	2.6	0.7
29	3.4		5.8	8.4	6.7	6.5	9.5	9.1	3.4	5.3	3.0	0.8
30	3.5		4.2	5.9	5.5	10.5	4.5	6.2	3.3	4.4	4.2	0.8
31	7.9		6.6		5.2		5.4	7.3		3.2		0.2
Min	2.1	1.1	3.3	4.0	4.4	5.1	4.5	2.6	2.4	2.0	0.1	0.0
Mean	5.9	5.9	6.0	6.6	5.9	7.1	6.5	6.3	5.9	5.3	5.1	2.6
Max	13.2	13.2	12.1	12.6	12.7	11.2	9.5	10.5	13.6	8.0	15.3	8.0

M - missing



APPENDIX A - Crown Mountain Climate Station Data

TABLE 6c. 2016 Average Daily Wind Speed (km/hr)

Date	Jan	Feb	Mar	Apr	May
1	1.9	4.0	3.6	4.0	5.3
2	2.2	8.3	4.9	8.2	4.1
3	3.9	3.3	4.7	8.1	4.2
4	2.3	7.5	5.3	7.9	5.0
5	4.5	5.5	5.7	10.6	7.0
6	2.9	14.2	4.1	10.5	6.6
7	10.0	6.0	2.1	5.0	5.5
8	2.5	2.6	4.3	4.1	6.2
9	1.5	3.3	4.8	9.5	5.5
10	0.7	5.4	5.3	7.1	5.2
11	1.2	7.7	4.6	4.8	6.1
12	3.6	6.1	5.3	5.8	5.4
13	6.7	6.0	10.0	6.5	4.3
14	4.8	8.9	M	4.8	
15	5.1	10.4	M	5.2	
16	3.6	3.9	M	7.0	
17	3.5	4.7	M	4.6	
18	5.3	3.8	M	3.5	
19	2.7	3.7	0.2	6.4	
20	4.6	7.8	3.9	6.6	
21	4.1	4.7	6.4	4.6	
22	5.3	8.4	8.1	6.3	
23	4.4	5.8	6.6	6.0	
24	4.9	3.5	6.1	7.8	
25	3.5	3.6	4.3	5.0	
26	5.4	3.8	5.3	5.4	
27	8.4	7.4	4.6	5.6	
28	3.8	4.6	7.2	4.4	
29	4.7	4.5	6.3	5.0	
30	4.3		5.2	4.4	
31	4.6		6.2		
Min	0.7	2.6	0.2	3.5	4.1
Mean	4.1	5.8	5.2	6.2	5.4
Max	10.0	14.2	10.0	10.6	7.0

M - missing



TABLE 3a. 2014 Total Daily Precipitation (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.0	0.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	8.3	8.6	1.3
2	9.6	0.0	4.3	0.0	11.5	0.0	0.0	0.0	36.6	0.0	1.3	0.0
3	11.6	0.0	3.0	0.5	12.1	0.0	0.8	0.0	10.7	0.0	6.1	0.0
4	0.0	0.0	3.3	1.5	8.2	2.1	0.0	0.4	0.0	0.0	7.6	1.3
5	0.0	0.0	12.1	0.8	2.1	0.0	0.0	0.0	0.0	0.0	1.5	1.0
6	0.0	0.0	2.8	0.0	4.5	0.0	3.6	0.0	0.0	0.0	22.1	2.3
7	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	2.8	0.0	15.4	7.8	0.0	0.0	0.0	0.0	9.2	0.0	0.8	0.0
9	0.0	0.0	7.3	0.0	2.9	0.0	0.0	0.0	2.1	0.0	6.1	2.8
10	5.1	6.1	0.0	0.5	8.3	0.4	0.0	0.0	2.7	0.0	0.5	3.0
11	10.6	6.3	0.0	5.3	0.0	0.0	0.0	0.0	0.0	1.3	0.5	1.3
12	1.5	4.8	0.0	0.8	0.0	3.3	0.0	0.0	0.0	0.0	0.0	10.1
13	1.8	0.5	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	3.3
14	0.0	3.0	2.0	0.0	0.0	0.2	0.4	8.6	0.0	3.5	0.0	0.0
15	0.0	6.1	4.6	3.3	0.0	2.1	17.3	0.0	0.0	3.3	0.0	0.0
16	0.0	7.1	10.6	3.0	1.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	3.0	0.0	3.0	3.8	21.1	0.0	4.4	0.0	0.0	0.0	0.0
18	0.0	10.6	0.0	0.5	2.5	4.2	0.0	0.0	0.4	0.0	0.0	0.8
19	0.0	0.0	3.5	0.5	0.8	0.0	0.0	2.9	0.0	0.0	0.0	0.5
20	0.0	4.3	7.3	0.0	0.0	3.6	3.6	7.9	0.0	0.0	0.0	3.3
21	2.5	7.1	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	7.1	0.3
22	0.3	0.5	0.8	0.5	0.0	0.0	0.0	0.0	0.0	3.5	1.8	0.0
23	0.0	0.0	0.0	0.0	1.3	0.0	3.6	0.0	0.2	8.3	2.0	10.9
24	0.0	0.0	0.0	0.0	0.0	4.4	3.1	0.0	0.0	0.0	0.8	1.3
25	0.0	0.0	1.8	1.5	1.7	0.0	0.0	0.0	0.6	5.8	1.8	0.0
26	0.5	0.0	1.0	1.3	4.4	1.3	0.0	0.0	0.4	0.8	16.4	0.8
27	0.0	0.3	0.8	0.8	3.3	0.4	0.0	3.8	0.0	0.0	29.8	2.0
28	0.0	0.0	2.8	0.0	4.2	0.2	0.0	3.1	0.0	0.0	56.4	0.0
29	0.5	0.0	3.5	0.0	0.6	0.4	0.0	2.9	0.0	0.0	0.0	0.0
30	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.2	4.4	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	47.3	60.2	96.9	31.6	73.6	61.2	32.4	34.9	67.3	34.9	171.1	46.0

TABLE 3b. 2015 Total Daily Precipitation (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1.5	0.0	0.0	0.0	2.1	13.0	0.0	0.0	1.3	0.0	11.1	0.3
2	0.3	0.0	1.3	0.0	0.0	7.1	0.0	0.0	7.3	9.1	0.8	0.0
3	1.3	1.0	0.0	0.4	0.0	0.0	0.0	0.0	4.6	0.0	0.0	7.6
4	10.1	1.8	0.0	3.0	0.0	0.0	0.4	0.0	2.5	0.0	0.0	0.8
5	0.0	23.5	0.0	0.0	0.0	0.0	0.0	0.8	8.6	0.0	0.0	0.0
6	1.3	18.2	0.0	1.0	0.0	0.0	0.0	0.0	1.7	0.0	0.3	3.8
7	0.0	3.8	0.0	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.5	1.3
8	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	34.6
9	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	14.9
10	0.5	0.0	0.0	2.5	1.7	0.0	2.5	0.0	0.0	20.5	0.0	4.8
11	0.0	0.0	0.0	0.5	0.0	0.0	0.6	0.0	0.0	0.0	5.1	0.0
12	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	3.3	6.3
13	0.0	0.0	0.5	0.8	2.9	0.0	0.2	0.0	1.9	0.0	44.8	0.8
14	0.0	0.0	28.6	0.0	0.0	0.4	0.0	6.1	0.2	0.0	14.9	0.0
15	3.5	0.0	44.3	0.0	0.2	0.0	0.2	7.7	0.6	0.0	0.3	1.3
16	0.5	0.0	0.5	0.0	0.0	0.2	1.9	10.9	1.3	0.0	0.0	0.3
17	3.5	0.0	0.3	0.0	0.0	9.8	0.4	1.3	0.0	0.0	21.0	2.0
18	2.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	1.3	0.0	2.3
19	0.0	0.0	1.3	0.0	0.0	1.9	4.0	0.0	0.0	0.0	0.0	0.3
20	0.0	0.0	1.8	0.0	0.0	0.0	1.9	0.0	15.7	0.0	0.0	2.3
21	0.0	0.0	3.5	0.0	0.0	0.4	0.0	20.3	0.0	0.0	0.0	1.5
22	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
23	9.9	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	0.5
24	0.0	0.0	0.8	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.3	3.8
25	0.0	0.0	0.0	1.0	27.6	0.0	7.7	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	15.7	0.0	1.0	0.0	0.6	0.3	0.0	0.0
27	0.0	0.0	9.1	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	1.0
28	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.8
29	0.0	0.0	0.5	0.0	2.5	6.1	0.0	0.0	0.0	0.3	0.0	0.3
30	0.5	0.0	0.0	0.0	4.6	0.2	0.0	6.3	0.0	11.9	0.0	0.0
31	0.5	0.0	2.8	0.0	0.0	0.0	0.0	0.2	0.0	11.1	0.0	0.0
Total	35.4	49.1	103.9	9.5	78.4	54.1	31.4	64.7	55.9	54.4	119.4	93.6

APPENDIX A - Crown Mountain Climate Station Data

TABLE 3c. 2016 Total Daily Precipitation (kPa)

Date	Jan	Feb	Mar	Apr	May
1	0.0	0.0	4.3	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0
3	0.5	1.0	1.8	0.0	0.0
4	0.0	0.0	0.0	2.0	1.7
5	0.0	1.8	8.3	0.0	2.1
6	0.0	0.3	8.9	0.0	0.0
7	0.5	0.0	1.0	0.0	0.0
8	0.0	0.0	0.0	0.0	4.8
9	0.0	0.0	5.6	0.0	0.0
10	0.0	0.0	9.1	0.0	0.0
11	0.0	0.0	1.3	0.0	8.2
12	0.3	5.8	3.0	0.0	9.2
13	3.0	0.0	2.8	0.0	0.0
14	0.0	0.5	0.0	0.0	0.0
15	0.0	3.5	0.0	0.0	0.0
16	1.3	0.0	0.5	0.0	0.0
17	1.3	4.0	0.0	0.0	0.0
18	0.0	7.6	0.0	0.0	3.3
19	3.3	2.3	0.0	0.0	0.2
20	0.5	0.8	0.0	0.0	3.8
21	1.3	0.0	0.0	0.0	12.5
22	4.6	0.0	0.0	2.0	6.1
23	6.3	0.0	1.3	3.0	5.9
24	0.0	0.0	2.5	1.0	0.0
25	0.0	0.0	0.5	11.1	0.2
26	0.0	0.0	0.0	5.8	0.4
27	2.5	0.5	0.0	0.0	0.6
28	6.1	6.3	0.8	0.0	0.0
29	0.3	0.0	0.0	0.0	12.5
30	0.0	0.0	1.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0
Total	31.6	34.4	52.6	25.0	86.5

TABLE 4a. 2014 Average Daily Relative Humidity (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	74.4	83.2	75.0	96.7	42.9	59.3	66.3	64.4	71.6	84.5	90.6	83.0
2	92.6	85.7	77.2	94.6	79.8	70.9	50.2	60.9	83.1	90.6	92.3	86.9
3	93.9	78.5	96.2	95.2	86.6	69.6	50.4	61.9	96.5	70.3	89.6	89.1
4	86.8	73.0	98.6	97.3	91.1	66.9	36.9	65.9	86.6	62.6	95.7	92.7
5	82.3	73.0	99.6	96.2	86.8	76.6	44.7	59.7	62.8	66.5	86.7	96.5
6	87.5	75.7	99.9	70.7	83.9	59.4	61.1	38.0	54.9	69.0	95.4	99.7
7	92.9	77.7	99.9	57.8	65.0	41.9	66.8	44.1	58.0	62.9	89.3	98.2
8	95.5	77.1	99.7	60.8	57.0	42.4	55.0	51.5	82.9	73.4	82.0	97.4
9	96.6	75.1	100.0	71.6	86.4	43.2	42.0	62.5	92.3	71.2	87.4	100.0
10	95.1	86.4	98.3	48.9	84.8	47.7	45.7	47.6	88.9	65.8	83.8	95.5
11	98.4	84.8	95.9	79.7	61.9	72.9	57.2	44.0	80.4	60.8	80.5	90.7
12	95.8	91.0	95.6	87.6	43.2	62.5	51.8	42.6	73.1	56.1	80.9	92.6
13	97.9	89.8	68.4	60.2	35.6	86.5	51.7	44.8	71.1	72.3	78.4	99.0
14	74.3	89.9	81.4	39.7	42.4	89.4	65.6	72.5	56.3	58.3	67.9	93.8
15	70.1	85.0	78.2	68.8	60.8	87.1	70.6	74.4	51.5	93.8	75.5	90.6
16	69.5	91.0	96.6	95.3	78.0	83.5	74.6	80.7	44.8	91.5	81.8	88.4
17	80.4	95.3	87.6	96.0	93.6	92.9	M	78.1	45.4	77.9	86.0	94.6
18	84.3	91.3	76.9	93.3	79.7	96.9	M	68.4	55.1	74.3	83.1	97.4
19	61.0	94.1	84.6	72.1	85.3	86.4	M	71.4	70.0	75.1	64.1	95.3
20	73.8	93.0	94.9	69.7	69.6	64.7	M	88.9	64.7	52.2	73.3	94.5
21	73.8	92.5	89.1	54.6	50.5	59.5	M	92.5	45.8	80.5	89.2	88.8
22	95.3	88.5	89.5	75.8	47.4	75.8	M	91.8	47.3	83.6	87.1	82.4
23	95.8	81.7	93.4	66.0	64.7	70.5	M	89.2	67.1	94.1	79.5	83.1
24	94.1	82.9	90.3	74.3	64.6	72.6	M	81.9	59.7	80.6	82.0	99.7
25	94.6	86.6	95.7	69.6	71.4	70.8	50.0	67.2	52.7	85.4	81.9	96.6
26	92.8	89.8	95.4	84.2	91.2	90.8	51.6	59.5	82.7	90.5	93.5	91.1
27	88.5	90.7	91.1	72.4	66.0	87.1	43.4	58.2	88.7	75.3	98.9	91.1
28	89.5	82.0	96.2	65.4	87.2	85.3	38.1	81.7	89.4	86.7	90.6	88.2
29	92.4		99.5	50.3	91.8	74.7	30.9	79.7	85.2	90.5	77.4	80.3
30	83.3		96.6	37.6	62.8	68.0	38.5	67.0	86.6	81.6	79.5	80.2
31	83.6		96.2		48.2		40.9	64.7		67.5		83.1
Min	61.0	73.0	68.4	37.6	35.6	41.9	30.9	38.0	44.8	52.2	64.1	80.2
Mean	86.7	85.2	91.5	73.4	69.7	71.9	51.5	66.3	69.8	75.7	84.1	91.6
Max	98.4	95.3	100.0	97.3	93.6	96.9	74.6	92.5	96.5	94.1	98.9	100.0

M - missing

TABLE 4b. 2015 Average Daily Relative Humidity (kPa)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	85.4	91.0	58.6	60.6	66.7	54.8	66.0	21.7	71.5	38.7	96.6	84.5
2	90.2	93.4	75.1	59.0	56.0	96.4	56.2	53.4	83.2	44.8	95.3	89.8
3	80.4	88.9	66.6	70.5	45.5	92.0	38.3	31.3	89.6	97.3	90.2	95.6
4	81.2	93.9	59.0	82.2	30.1	75.9	53.5	44.2	88.7	90.1	90.4	95.8
5	94.7	98.6	53.4	76.2	36.0	62.1	71.0	49.7	94.6	69.5	89.9	88.3
6	90.0	100.0	52.3	86.8	62.6	42.9	59.9	67.2	97.6	54.9	87.0	89.4
7	95.4	98.6	53.2	74.5	70.8	37.8	56.5	52.6	85.3	69.3	93.2	97.0
8	92.9	97.9	51.2	41.1	83.6	37.4	51.8	38.6	90.7	81.8	95.1	98.9
9	94.4	97.7	53.2	31.5	57.1	46.9	32.9	39.5	83.1	65.3	90.7	99.3
10	94.1	96.8	50.6	54.0	62.1	54.4	45.2	40.1	64.7	74.0	89.5	94.8
11	95.5	93.6	55.4	72.2	79.3	45.4	81.3	32.7	57.4	71.8	91.1	89.8
12	93.6	86.9	68.5	56.7	53.6	59.3	77.8	26.2	53.5	60.6	85.2	88.8
13	94.0	90.9	57.7	59.1	76.1	67.8	62.5	26.3	56.4	54.2	98.8	94.1
14	94.7	85.9	84.9	86.4	90.3	83.5	68.9	46.5	93.4	45.0	100.0	94.9
15	96.3	59.4	96.8	64.4	88.7	78.9	55.9	90.0	83.8	53.9	90.4	92.6
16	98.9	71.7	91.2	49.3	84.7	56.5	60.1	88.6	83.8	37.4	81.4	90.4
17	95.2	65.5	93.4	49.6	80.0	77.8	80.2	63.2	72.9	32.1	94.6	85.6
18	100.0	62.3	90.2	69.3	59.1	75.3	62.8	64.6	79.1	58.8	76.2	93.4
19	92.8	63.1	91.9	54.5	52.5	65.7	48.6	42.4	76.5	85.0	72.1	93.7
20	83.4	86.6	89.7	39.8	45.8	49.8	78.3	42.7	81.8	70.9	76.5	93.7
21	96.7	73.0	90.9	45.0	36.8	60.1	36.8	72.0	76.1	71.7	74.0	93.4
22	91.5	71.5	75.9	52.8	34.3	53.6	31.0	78.1	65.0	64.8	66.6	91.7
23	98.8	66.1	92.4	64.2	31.5	50.5	40.4	42.0	46.1	62.2	70.6	89.6
24	91.0	64.1	88.6	73.0	40.6	48.7	40.4	32.2	37.3	66.4	84.1	89.4
25	86.2	86.7	92.8	67.0	70.4	43.2	68.8	37.4	30.6	78.1	76.2	84.2
26	54.1	86.0	92.0	73.2	95.3	37.7	83.6	36.2	56.7	90.9	72.0	86.7
27	57.3	76.4	68.4	53.0	75.6	29.9	85.2	39.8	42.0	95.4	74.4	89.7
28	68.6	66.1	92.1	42.6	90.6	36.2	80.1	44.4	54.3	92.4	29.3	91.6
29	82.1		85.4	58.3	90.9	61.2	48.8	50.4	48.6	85.0	22.7	88.8
30	77.9		78.3	58.0	94.3	71.1	36.0	78.2	43.9	91.6	44.1	86.1
31	87.3		72.7		68.6		24.6	80.1		95.1		82.8
Min	54.1	59.4	50.6	31.5	30.1	29.9	24.6	21.7	30.6	32.1	22.7	82.8
Mean	88.2	82.6	74.9	60.8	64.8	58.4	57.5	50.1	69.6	69.3	79.9	91.1
Max	100.0	100.0	96.8	86.8	95.3	96.4	85.2	90.0	97.6	97.3	100.0	99.3

M - missing

APPENDIX A - Crown Mountain Climate Station Data

TABLE 4c. 2016 Average Daily Relative Humidity (kPa)

Date	Jan	Feb	Mar	Apr	May
1	86.5	81.2	98.9	54.5	54.3
2	70.9	70.3	100.0	57.4	36.4
3	76.1	81.9	100.0	55.4	34.7
4	94.7	83.3	99.4	77.4	39.3
5	97.9	82.8	95.6	71.8	82.7
6	96.3	69.9	98.5	65.1	57.0
7	92.5	66.2	85.5	46.7	42.3
8	89.5	87.5	90.0	41.3	51.0
9	90.2	90.4	78.5	53.7	92.3
10	90.0	78.1	98.5	69.3	63.5
11	92.3	68.5	84.8	52.8	69.8
12	96.8	96.4	97.1	71.9	96.4
13	100.0	90.9	90.0	78.6	86.4
14	99.1	80.3	M	86.5	
15	95.0	73.3	M	69.1	
16	93.8	84.2	M	62.0	
17	98.2	86.0	M	49.1	
18	97.6	98.4	M	34.5	
19	97.2	91.6	46.5	36.0	
20	96.4	91.3	49.1	34.8	
21	96.5	80.3	80.3	37.6	
22	100.0	75.9	82.6	59.3	
23	99.8	74.4	81.9	92.1	
24	99.7	72.2	92.8	97.8	
25	96.8	74.9	91.2	97.8	
26	98.0	71.3	69.6	96.5	
27	90.9	69.5	80.9	77.3	
28	99.9	83.1	87.0	85.5	
29	88.9	99.9	64.3	82.6	
30	83.9		62.0	74.0	
31	82.2		81.5		
Min	70.9	66.2	46.5	34.5	34.7
Mean	93.1	81.2	84.1	65.6	62.0
Max	100.0	99.9	100.0	97.8	96.4

M - missing

TABLE 5a. 2014 Average Daily Solar Radiation (Wm²)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	17.2	22.0	56.3	152.9	275.4	281.3	219.0	248.8	100.6	70.0	15.5	8.6
2	8.4	9.5	29.8	202.0	116.3	171.4	305.7	175.1	41.7	87.3	12.3	5.1
3	5.8	12.8	17.1	105.3	19.2	195.6	235.9	159.8	36.2	125.2	6.3	15.7
4	14.5	14.5	8.3	74.1	36.5	241.3	311.4	197.4	126.7	103.2	1.3	4.6
5	15.9	18.8	7.1	63.0	104.9	244.5	237.2	267.6	227.2	109.7	13.1	3.7
6	7.7	24.1	3.8	153.1	85.1	290.7	181.0	248.1	223.3	34.6	3.4	2.4
7	8.6	20.6	5.4	180.9	257.6	268.8	272.1	229.5	228.0	102.0	12.9	3.6
8	2.4	19.5	43.1	204.7	244.7	256.4	239.3	240.4	90.8	82.3	17.4	4.2
9	2.4	28.4	17.3	152.1	115.0	201.3	307.2	172.6	75.6	119.3	7.1	1.3
10	3.6	21.4	42.3	219.8	113.8	241.1	268.3	249.6	55.6	118.9	9.4	6.8
11	11.8	18.7	147.2	57.1	132.5	235.5	284.1	261.7	210.1	49.3	13.4	15.5
12	39.2	14.1	149.3	35.9	300.0	192.2	311.1	174.7	88.8	67.1	21.2	20.7
13	10.0	6.2	182.3	210.3	277.0	149.4	293.6	220.4	161.1	36.3	25.3	4.3
14	15.0	6.2	48.9	240.7	253.9	134.1	174.6	56.8	198.1	40.2	32.2	21.8
15	41.0	11.6	62.3	118.7	184.5	104.5	185.7	182.4	183.9	26.2	36.4	41.5
16	48.5	28.2	6.8	75.1	176.4	176.5	274.2	61.5	173.0	22.1	39.3	30.0
17	37.5	6.7	11.2	43.9	80.1	47.8	M	127.1	165.7	101.8	40.5	9.5
18	48.2	20.5	23.9	24.7	154.8	75.0	M	201.5	145.7	56.6	36.9	4.3
19	45.3	9.4	13.0	219.3	133.9	123.2	M	131.8	90.5	78.7	58.2	4.0
20	55.8	7.3	14.5	149.1	236.4	162.7	M	75.6	169.7	100.5	39.5	3.7
21	57.0	7.6	33.3	240.9	258.8	307.9	M	47.1	165.8	16.5	13.7	7.3
22	12.0	14.1	33.3	94.4	269.4	218.9	M	38.2	149.3	23.1	1.6	30.1
23	13.3	16.9	26.8	108.7	195.2	183.4	M	80.9	131.6	7.1	15.3	13.7
24	19.8	23.1	53.5	92.7	196.0	154.6	M	138.5	154.8	21.1	8.2	5.6
25	22.5	27.9	140.5	172.8	123.5	145.7	220.7	171.4	149.8	43.7	12.7	7.6
26	8.8	39.8	17.9	38.6	58.6	93.7	232.5	237.8	45.8	9.6	4.6	9.1
27	49.9	41.8	35.3	144.5	293.5	75.8	282.8	204.5	48.1	22.5	1.6	3.8
28	40.7	36.7	21.4	171.6	143.4	99.3	244.3	62.3	63.7	20.3	1.6	5.2
29	13.7		10.1	285.8	50.5	182.8	278.8	140.2	48.5	8.3	8.2	8.2
30	18.6		20.2	276.6	278.7	306.1	181.6	154.1	50.8	67.9	16.7	13.0
31	11.3		20.2		211.7		273.3	180.0		71.9		15.7
Min	2.4	6.2	3.8	24.7	19.2	47.8	174.6	38.2	36.2	7.1	1.3	1.3
Mean	22.8	18.9	42.0	143.7	173.5	185.4	252.8	165.7	126.7	59.5	17.5	10.7
Max	57.0	41.8	182.3	285.8	300.0	307.9	311.4	267.6	228.0	125.2	58.2	41.5

M - missing

TABLE 5b. 2015 Average Daily Solar Radiation (Wm^2)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	11.1	22.6	99.1	158.7	85.2	245.6	224.3	282.6	87.1	117.8	2.3	41.4
2	4.5	22.0	60.5	146.4	201.2	61.1	251.2	249.1	29.1	145.2	4.8	11.1
3	4.7	20.9	127.2	71.5	280.0	64.7	294.6	196.2	96.7	29.5	24.3	10.3
4	5.8	28.0	142.8	85.5	281.3	230.3	218.5	176.5	37.1	83.1	14.8	7.6
5	3.4	3.6	94.6	154.9	280.6	261.1	128.6	250.3	38.9	129.5	7.7	5.4
6	3.5	1.8	125.0	52.2	191.8	286.7	284.7	87.7	12.5	119.2	9.2	7.8
7	11.1	5.6	86.4	179.8	249.4	265.4	233.3	234.9	33.4	74.1	4.1	1.1
8	7.2	4.1	143.8	242.7	182.9	309.2	293.4	274.0	15.5	42.9	4.0	1.5
9	21.6	3.1	127.6	244.7	223.7	310.7	292.5	167.8	45.3	93.0	11.6	1.1
10	7.2	5.1	145.7	119.0	177.6	286.0	125.9	230.1	198.9	25.6	18.7	2.7
11	7.7	5.5	60.9	79.2	137.4	308.7	177.2	245.6	204.0	71.6	3.4	3.6
12	31.0	36.3	68.6	139.8	193.7	158.3	120.1	225.5	195.4	46.6	6.6	2.9
13	10.6	34.4	143.5	173.6	61.8	206.3	169.8	237.5	181.1	110.6	3.2	2.0
14	9.2	38.8	12.0	91.4	110.9	151.3	196.1	178.6	82.3	117.0	1.8	6.7
15	16.2	101.4	28.1	258.6	102.3	157.0	202.6	8.7	36.9	115.9	35.7	3.7
16	4.2	67.0	34.1	263.6	96.8	264.5	188.1	139.1	71.0	91.0	17.3	6.4
17	31.3	100.5	117.6	252.1	166.3	104.0	127.3	210.0	113.4	111.5	4.0	5.0
18	2.6	74.2	97.8	230.0	296.3	175.0	261.6	179.3	26.5	46.9	38.3	1.6
19	8.6	67.5	26.0	250.6	299.0	141.7	179.4	259.6	49.4	58.9	27.6	2.7
20	28.3	49.5	42.8	271.1	298.1	228.2	145.1	178.1	13.4	83.6	54.8	3.0
21	33.2	31.5	41.5	250.0	300.5	222.9	284.2	102.2	134.3	99.7	39.7	4.5
22	31.0	73.0	145.3	193.5	298.1	243.4	276.4	244.9	165.0	61.6	49.9	4.4
23	19.2	106.4	35.5	177.4	287.3	228.0	250.9	251.1	163.6	76.0	34.0	5.2
24	26.5	109.9	94.2	99.8	253.4	233.1	216.7	181.2	153.0	93.3	31.5	4.0
25	48.5	55.5	16.1	211.7	124.8	275.5	84.5	139.4	154.3	93.1	45.8	11.0
26	58.6	19.8	41.2	201.1	97.0	303.4	104.7	203.4	34.5	7.5	48.1	4.0
27	51.3	106.5	201.8	277.4	223.0	302.0	95.3	186.7	149.1	32.9	41.7	3.8
28	50.5	119.8	16.9	281.9	52.2	250.2	186.8	131.4	147.4	30.3	47.4	4.9
29	62.1		36.0	154.9	121.5	106.2	171.5	113.6	142.5	16.3	46.9	8.0
30	60.4		85.1	184.5	103.1	247.2	279.3	28.0	137.0	1.3	44.4	5.0
31	62.5		82.0		215.4		277.3	44.2		1.0		5.9
Min	2.6	1.8	12.0	52.2	52.2	61.1	84.5	8.7	12.5	1.0	1.8	1.1
Mean	23.7	46.9	83.2	183.3	193.3	220.9	204.6	181.9	98.3	71.8	24.1	6.1
Max	62.5	119.8	201.8	281.9	300.5	310.7	294.6	282.6	204.0	145.2	54.8	41.4

M - missing

APPENDIX A - Crown Mountain Climate Station Data

TABLE 5c. 2016 Average Daily Solar Radiation (Wm²)

Date	Jan	Feb	Mar	Apr	May
1	13.7	9.7	15.9	236.7	300.4
2	42.3	15.6	12.4	167.5	300.0
3	45.7	9.5	6.8	202.6	302.0
4	24.6	31.3	102.3	74.1	245.9
5	14.5	26.5	24.0	134.7	94.2
6	32.0	37.1	19.2	95.1	300.7
7	25.3	74.8	42.2	244.5	306.3
8	42.4	44.0	11.1	215.6	213.0
9	31.4	63.7	79.5	223.0	73.4
10	18.8	84.6	5.3	186.2	169.5
11	17.5	74.5	108.6	210.3	180.2
12	15.9	14.2	34.2	67.5	38.8
13	11.1	8.1	M	99.5	163.8
14	8.0	30.5	M	110.0	
15	40.7	28.3	M	180.4	
16	25.4	11.0	M	229.3	
17	20.5	28.1	M	264.4	
18	24.6	3.8	M	269.2	
19	13.2	7.8	M	272.9	
20	7.0	10.0	164.7	272.6	
21	5.5	16.8	62.0	244.4	
22	1.4	17.2	161.2	155.9	
23	3.5	21.2	58.5	97.3	
24	5.6	65.3	44.7	71.7	
25	3.5	125.7	105.5	116.9	
26	2.7	114.5	125.1	128.6	
27	3.9	38.1	64.7	205.1	
28	2.2	19.2	33.8	101.6	
29	4.0	9.9	178.0	100.3	
30	5.2		109.4	107.3	
31	8.0		137.4		
Min	1.4	3.8	5.3	67.5	38.8
Mean	16.8	35.9	71.1	169.5	206.8
Max	45.7	125.7	178.0	272.9	306.3

M - missing

TABLE 6a. 2014 Average Daily Wind Speed (km/hr)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	7.1	2.1	8.6	6.2	6.6	6.0	6.6	6.0	5.9	5.7	4.9	0.0
2	6.0	2.0	13.3	7.0	8.9	5.4	5.1	6.0	4.2	2.9	5.3	0.0
3	5.5	5.1	8.1	7.4	7.2	6.0	6.5	5.2	3.2	3.7	4.1	0.0
4	10.2	4.6	4.8	4.5	9.1	5.4	10.4	6.9	3.9	8.8	4.2	0.0
5	6.3	3.8	4.3	3.9	6.5	8.3	7.2	7.8	4.3	5.7	3.2	0.0
6	2.9	4.0	5.5	15.2	6.0	6.9	5.6	7.1	4.7	5.8	5.2	2.4
7	3.7	3.8	5.1	5.7	3.9	9.6	6.1	8.5	4.4	4.9	6.7	4.5
8	4.3	7.2	6.6	8.2	6.2	6.7	7.3	9.4	10.2	5.6	5.6	3.5
9	4.1	4.5	3.9	9.3	5.7	13.0	5.8	7.8	4.1	4.6	8.6	5.2
10	7.1	5.0	5.0	8.7	5.3	8.6	8.2	6.1	7.2	3.6	6.3	6.0
11	7.8	5.9	5.4	7.0	5.5	5.7	6.7	7.1	4.7	8.9	5.3	5.8
12	10.1	4.9	5.8	5.7	5.5	5.6	7.2	4.6	3.4	6.9	3.6	6.1
13	11.8	4.0	8.2	5.4	4.6	5.2	6.9	6.6	6.7	3.5	3.6	5.5
14	9.1	4.6	4.9	5.3	11.7	4.8	6.3	3.8	5.5	7.8	4.7	4.3
15	11.9	4.5	7.0	6.8	7.2	6.7	4.3	6.6	4.9	6.2	3.7	1.7
16	4.2	6.5	4.2	8.2	7.3	5.2	4.2	6.5	4.0	4.7	3.0	1.0
17	3.7	5.0	6.7	4.0	5.1	6.6	M	4.6	4.7	3.6	3.9	2.5
18	4.3	4.6	8.8	6.0	7.2	7.0	M	4.7	6.3	6.5	2.2	2.3
19	6.1	6.3	4.2	5.4	5.5	6.3	M	6.7	4.7	4.1	2.1	4.0
20	2.6	4.9	5.3	4.8	4.1	7.3	M	5.3	6.3	6.3	3.4	4.3
21	2.7	5.7	7.4	4.5	4.9	7.4	M	4.4	5.2	4.5	4.7	11.7
22	3.4	6.0	7.1	5.4	5.0	6.5	M	4.9	3.5	4.7	6.4	10.0
23	4.6	8.0	6.7	6.7	4.7	4.9	M	4.4	6.3	5.2	7.7	6.7
24	4.7	4.5	9.7	5.7	6.1	5.5	M	4.1	6.7	3.7	6.1	3.5
25	1.5	5.4	5.0	5.2	6.2	5.9	11.8	6.1	6.8	6.5	5.1	1.8
26	4.3	4.4	11.8	5.6	5.5	6.2	8.2	5.1	6.1	6.0	4.1	1.2
27	1.7	4.4	11.3	6.2	4.7	3.7	5.8	6.4	4.7	5.6	2.1	0.8
28	2.6	8.7	5.0	9.8	4.8	6.1	5.0	7.0	5.9	5.2	1.3	3.2
29	1.6		5.7	6.2	5.7	8.7	5.9	5.8	4.6	4.0	0.0	3.9
30	5.4		11.4	6.6	5.6	6.1	6.2	5.1	6.3	4.1	0.0	4.8
31	2.2		6.1		4.5		5.8	8.0		6.0		6.3
Min	1.5	2.0	3.9	3.9	3.9	3.7	4.2	3.8	3.2	2.9	0.0	0.0
Mean	5.3	5.0	6.9	6.5	6.0	6.6	6.7	6.1	5.3	5.3	4.2	3.6
Max	11.9	8.7	13.3	15.2	11.7	13.0	11.8	9.4	10.2	8.9	8.6	11.7

M - missing

TABLE 6b. 2015 Average Daily Wind Speed (km/hr)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	4.0	3.2	4.8	12.6	6.0	6.0	5.9	5.3	6.3	3.3	6.4	3.0
2	6.1	5.1	5.2	11.4	12.7	6.0	6.2	6.7	6.1	5.4	4.7	6.2
3	10.7	11.5	7.5	4.3	5.8	5.1	7.2	6.0	4.4	5.4	4.1	5.8
4	7.5	4.6	4.5	4.9	5.6	5.6	7.7	7.8	4.3	6.6	4.8	8.0
5	4.1	3.7	5.4	5.3	10.0	5.9	6.7	8.4	3.7	4.6	3.6	5.2
6	13.2	6.8	12.1	5.0	6.9	9.8	5.2	10.5	2.4	5.1	3.8	5.8
7	5.5	2.3	7.9	4.6	6.5	8.1	5.8	8.4	6.2	6.6	6.0	4.5
8	8.5	1.1	9.0	4.8	5.4	6.9	6.2	4.8	3.9	4.5	4.8	4.3
9	2.1	2.2	7.0	4.3	4.6	10.1	6.7	6.7	5.1	5.7	4.8	3.0
10	2.7	7.0	6.5	6.1	4.4	7.5	5.2	5.4	5.1	7.3	3.8	3.2
11	2.4	4.7	5.4	6.5	5.0	7.5	6.1	6.3	4.8	8.0	3.7	4.0
12	4.9	5.8	5.2	5.9	7.2	11.2	5.0	3.7	3.1	5.2	7.5	3.9
13	5.1	6.5	5.9	5.5	5.2	8.6	6.2	6.3	9.0	7.2	5.2	3.2
14	5.8	7.7	5.6	7.9	4.6	5.4	5.2	7.1	10.0	4.5	0.1	1.8
15	3.0	7.5	6.2	6.8	4.9	5.7	5.3	7.5	6.6	6.2	3.1	1.0
16	10.6	5.4	6.0	7.1	5.0	6.6	8.4	6.0	5.5	2.0	7.0	0.3
17	7.4	4.4	8.4	9.2	6.1	6.8	7.7	6.6	5.2	3.0	8.4	0.1
18	5.1	4.7	5.4	7.7	6.8	5.9	4.8	5.7	3.9	4.1	15.3	0.5
19	5.9	7.3	5.1	6.4	6.4	6.6	6.8	6.4	6.0	5.2	4.2	0.0
20	5.4	4.9	5.6	5.5	5.8	7.2	6.7	8.3	6.3	5.5	7.4	2.3
21	3.0	7.4	5.1	5.8	5.3	9.7	7.8	6.7	7.5	6.1	5.4	1.0
22	3.8	3.0	6.0	7.0	5.2	7.1	8.4	2.6	9.0	5.1	5.2	1.0
23	5.7	5.4	4.2	7.1	6.1	8.1	6.5	4.9	7.3	4.8	7.2	1.0
24	7.3	5.4	5.5	7.2	5.4	6.1	6.4	4.8	5.5	7.4	5.7	3.0
25	7.1	10.3	3.3	5.6	4.9	6.1	8.0	5.2	5.9	7.8	3.3	3.0
26	8.0	13.2	5.3	5.3	4.5	5.4	5.3	4.9	8.0	4.8	2.8	2.2
27	7.9	7.1	6.6	9.7	5.1	5.5	5.2	4.1	13.6	6.1	5.4	1.8
28	5.8	6.9	4.6	4.0	4.4	5.4	8.8	5.9	5.9	3.0	2.6	0.7
29	3.4		5.8	8.4	6.7	6.5	9.5	9.1	3.4	5.3	3.0	0.8
30	3.5		4.2	5.9	5.5	10.5	4.5	6.2	3.3	4.4	4.2	0.8
31	7.9		6.6		5.2		5.4	7.3		3.2		0.2
Min	2.1	1.1	3.3	4.0	4.4	5.1	4.5	2.6	2.4	2.0	0.1	0.0
Mean	5.9	5.9	6.0	6.6	5.9	7.1	6.5	6.3	5.9	5.3	5.1	2.6
Max	13.2	13.2	12.1	12.6	12.7	11.2	9.5	10.5	13.6	8.0	15.3	8.0

M - missing

APPENDIX A - Crown Mountain Climate Station Data

TABLE 6c. 2016 Average Daily Wind Speed (km/hr)

Date	Jan	Feb	Mar	Apr	May
1	1.9	4.0	3.6	4.0	5.3
2	2.2	8.3	4.9	8.2	4.1
3	3.9	3.3	4.7	8.1	4.2
4	2.3	7.5	5.3	7.9	5.0
5	4.5	5.5	5.7	10.6	7.0
6	2.9	14.2	4.1	10.5	6.6
7	10.0	6.0	2.1	5.0	5.5
8	2.5	2.6	4.3	4.1	6.2
9	1.5	3.3	4.8	9.5	5.5
10	0.7	5.4	5.3	7.1	5.2
11	1.2	7.7	4.6	4.8	6.1
12	3.6	6.1	5.3	5.8	5.4
13	6.7	6.0	10.0	6.5	4.3
14	4.8	8.9	M	4.8	
15	5.1	10.4	M	5.2	
16	3.6	3.9	M	7.0	
17	3.5	4.7	M	4.6	
18	5.3	3.8	M	3.5	
19	2.7	3.7	0.2	6.4	
20	4.6	7.8	3.9	6.6	
21	4.1	4.7	6.4	4.6	
22	5.3	8.4	8.1	6.3	
23	4.4	5.8	6.6	6.0	
24	4.9	3.5	6.1	7.8	
25	3.5	3.6	4.3	5.0	
26	5.4	3.8	5.3	5.4	
27	8.4	7.4	4.6	5.6	
28	3.8	4.6	7.2	4.4	
29	4.7	4.5	6.3	5.0	
30	4.3		5.2	4.4	
31	4.6		6.2		
Min	0.7	2.6	0.2	3.5	4.1
Mean	4.1	5.8	5.2	6.2	5.4
Max	10.0	14.2	10.0	10.6	7.0

M - missing

TABLE 7a. 2014 Average Daily Wind Direction (deg)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	215.4	115.5	293.4	215.4	151.3	171.3	249.4	292.0	236.6	212.1	220.5	82.6
2	205.8	206.1	286.9	191.4	294.3	212.9	197.9	211.5	218.3	247.5	127.4	138.7
3	242.4	315.6	245.3	262.7	287.1	219.7	276.1	213.9	167.3	178.8	224.6	53.7
4	287.3	290.5	214.7	184.1	284.1	241.1	270.2	273.7	163.2	207.3	232.1	86.1
5	215.9	208.4	194.6	202.2	259.7	273.3	252.2	211.3	170.0	219.8	199.4	166.3
6	143.3	91.8	281.7	175.9	282.8	239.3	192.2	256.4	213.0	222.6	261.7	204.4
7	223.0	199.3	247.6	206.8	208.6	183.0	263.2	271.7	228.8	224.5	242.2	185.8
8	199.4	284.9	232.8	253.5	236.4	196.9	267.7	265.6	290.4	252.0	243.6	113.6
9	193.3	161.7	225.6	220.3	260.1	216.6	264.4	272.3	298.6	252.4	288.3	246.3
10	217.7	138.5	173.2	210.6	220.7	201.5	242.2	224.9	161.8	165.5	259.2	260.4
11	287.0	224.8	174.3	206.4	186.0	274.7	291.1	262.6	213.1	184.2	215.2	235.7
12	245.4	184.0	176.3	293.9	163.5	269.1	196.6	194.2	174.2	185.6	197.9	218.6
13	221.6	226.1	230.5	158.7	168.8	231.9	224.3	233.4	277.3	209.3	203.2	151.2
14	199.0	224.7	243.5	188.2	162.0	189.3	284.5	214.7	181.9	269.7	239.2	255.7
15	209.1	218.3	197.9	207.5	239.2	263.7	173.3	255.6	186.9	276.7	139.8	103.3
16	188.6	229.6	198.7	285.5	295.7	214.9	120.2	218.9	207.3	245.8	98.1	86.1
17	142.4	203.5	121.3	259.1	235.6	96.7	M	223.4	266.7	192.8	92.5	75.0
18	134.9	209.1	173.8	261.6	234.2	104.4	M	184.0	263.2	237.2	95.9	96.7
19	226.1	208.6	190.8	219.4	208.3	206.4	M	229.0	220.3	208.3	109.2	219.6
20	115.2	223.6	272.5	217.7	184.1	208.2	M	260.2	225.7	267.0	148.7	225.3
21	185.3	271.5	294.9	227.8	202.2	200.0	M	293.4	229.7	241.5	195.9	202.1
22	191.1	293.0	284.1	251.1	186.4	278.6	M	249.6	179.1	237.3	210.7	150.2
23	105.9	292.4	272.3	223.1	227.9	254.7	M	269.3	256.0	217.2	191.2	212.5
24	97.9	178.6	292.2	228.3	224.5	251.8	M	245.2	261.4	235.2	246.8	200.1
25	63.1	169.8	236.1	222.5	240.6	209.7	172.7	196.9	232.8	265.7	209.2	132.1
26	205.1	105.5	283.2	293.4	256.6	278.4	187.6	225.5	243.5	226.4	271.1	151.0
27	112.9	186.7	291.4	227.1	209.0	207.7	228.2	226.3	270.6	235.4	138.4	46.7
28	83.5	298.7	226.4	169.4	218.6	197.5	231.5	267.8	289.8	210.5	293.2	151.0
29	129.8		259.7	123.1	257.5	202.0	196.4	241.7	186.0	205.4	261.7	141.0
30	237.6		290.0	131.0	199.2	191.2	190.5	232.5	218.6	247.0	182.6	80.0
31	128.5		254.8		200.8		218.6	216.4		245.8		79.4
Min	63.1	91.8	121.3	123.1	151.3	96.7	120.2	184.0	161.8	165.5	92.5	46.7
Mean	182.4	212.9	237.4	217.3	225.3	216.2	225.7	239.8	224.4	226.7	201.3	153.3
Max	287.3	315.6	294.9	293.9	295.7	278.6	291.1	293.4	298.6	276.7	293.2	260.4

M - missing

TABLE 7b. 2015 Average Daily Wind Direction (deg)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	80.3	159.7	230.4	200.3	218.0	246.0	243.8	260.8	262.9	179.0	247.8	122.6
2	197.2	235.4	241.4	219.6	206.2	270.4	269.2	267.6	253.4	177.4	230.1	214.6
3	292.3	287.4	234.1	227.0	212.9	252.3	195.3	241.4	204.3	217.2	179.7	214.1
4	255.6	198.4	217.5	275.5	248.9	215.5	282.4	232.5	239.2	256.8	186.3	271.7
5	267.8	205.6	208.5	268.7	270.0	161.3	281.6	273.6	215.4	184.4	172.2	254.3
6	291.8	218.6	242.7	310.3	263.3	147.6	216.2	221.0	228.5	260.9	160.6	212.7
7	249.6	177.2	209.3	197.8	246.2	163.2	242.5	193.4	253.9	253.3	261.5	238.0
8	269.0	224.0	186.7	180.5	225.0	211.7	231.1	229.8	207.3	218.1	245.7	180.1
9	89.3	238.4	250.9	199.2	162.8	297.2	229.7	256.7	206.1	255.9	292.7	109.8
10	155.4	292.3	248.2	265.2	175.6	295.2	227.5	272.3	155.1	267.3	174.6	129.3
11	172.8	270.2	242.8	246.3	291.6	264.0	179.3	201.3	153.5	250.9	202.3	146.2
12	126.2	234.5	222.2	242.2	290.5	239.6	220.5	203.2	210.4	234.3	220.5	116.4
13	102.6	238.7	230.2	226.9	292.8	183.3	206.6	257.6	277.1	196.8	184.6	116.5
14	98.9	264.7	174.3	224.6	271.3	265.2	203.6	290.4	298.1	182.6	134.2	94.4
15	99.8	161.0	271.3	166.2	290.2	290.3	213.4	253.0	279.6	287.2	252.9	87.4
16	237.8	251.4	300.4	164.7	234.7	223.0	212.1	269.7	225.7	138.4	259.4	48.0
17	243.4	198.9	265.9	211.1	276.1	242.2	136.4	170.9	231.3	172.9	253.6	50.0
18	194.5	218.3	170.2	277.1	289.6	248.7	186.6	232.2	204.4	234.0	225.5	43.3
19	203.1	213.0	241.1	230.2	295.8	229.9	165.3	199.1	216.6	168.4	210.4	82.8
20	148.6	270.4	248.4	167.8	295.9	272.9	233.2	272.8	265.7	219.4	232.2	73.3
21	126.7	208.0	249.7	265.3	269.8	237.3	276.6	231.4	281.8	226.4	209.7	52.1
22	175.6	134.7	255.8	273.5	225.3	234.8	267.9	223.3	250.0	267.2	180.2	55.7
23	191.3	120.7	211.1	263.2	236.7	207.7	242.8	231.1	241.2	239.3	267.0	48.8
24	200.0	197.4	257.2	255.8	276.9	203.2	260.9	260.0	283.1	255.2	294.7	151.4
25	276.2	288.0	148.9	257.6	225.6	208.4	268.8	239.2	249.7	297.3	203.6	152.0
26	240.9	295.1	185.4	231.5	169.7	234.1	235.4	227.7	257.9	261.7	180.2	75.7
27	261.9	309.8	248.8	216.7	193.3	198.4	179.6	238.2	168.8	254.4	119.5	50.0
28	241.2	229.5	208.5	236.1	241.4	256.4	159.6	263.3	217.2	168.4	131.9	52.3
29	155.2		207.0	263.4	246.9	272.7	184.4	279.3	195.9	195.3	128.1	53.0
30	145.8		222.0	257.7	216.3	175.7	216.5	261.8	184.1	218.4	120.0	68.2
31	289.1		267.6		246.7		218.2	241.1		232.7		74.2
Min	80.3	120.7	148.9	164.7	162.8	147.6	136.4	170.9	153.5	138.4	119.5	43.3
Mean	196.1	226.5	229.0	234.1	245.3	231.6	222.2	241.8	230.6	224.9	205.4	117.4
Max	292.3	309.8	300.4	310.3	295.9	297.2	282.4	290.4	298.1	297.3	294.7	271.7

M - missing



APPENDIX A - Crown Mountain Climate Station Data

TABLE 7c. 2016 Average Daily Wind Direction (deg)

Date	Jan	Feb	Mar	Apr	May
1	83.6	176.8	217.9	197.9	191.2
2	131.0	163.1	225.4	192.9	188.1
3	193.2	201.4	252.4	267.3	195.9
4	97.3	172.0	207.4	278.4	262.1
5	231.6	205.5	266.6	192.8	285.2
6	166.0	259.0	248.6	218.6	271.3
7	301.9	237.2	215.8	201.7	211.8
8	145.6	165.7	213.2	247.7	248.8
9	146.5	139.7	246.5	310.8	152.5
10	72.3	257.0	213.2	321.2	259.3
11	73.9	232.3	214.7	228.1	269.4
12	128.1	248.3	249.9	272.9	285.2
13	257.9	231.3	323.5	210.0	306.3
14	208.1	253.9	M	186.4	
15	229.1	205.8	M	228.1	
16	259.4	232.9	M	232.7	
17	169.8	241.3	M	193.5	
18	189.4	189.2	M	213.1	
19	174.6	218.3	287.8	140.8	
20	260.9	250.5	234.7	266.6	
21	250.3	226.4	272.6	234.6	
22	235.4	155.6	296.3	292.2	
23	250.1	205.0	258.3	229.6	
24	198.8	212.0	226.2	294.3	
25	171.4	175.1	223.8	249.8	
26	180.3	202.5	211.3	285.4	
27	245.7	238.1	260.0	267.3	
28	205.5	225.4	185.5	307.7	
29	230.3	214.1	153.4	302.0	
30	217.7		174.9	251.0	
31	157.3		228.5		
Min	72.3	139.7	153.4	140.8	152.5
Mean	189.1	211.6	234.9	243.8	240.5
Max	301.9	259.0	323.5	321.2	306.3

M - missing

Appendix B

Regional Climate Station Normals Data

APPENDIX B - 1981-2010 Climate Normals

STATION NAME SPARWOOD
CLIMATE ID 1157630
PROVINCE BC
LATITUDE 49°44'43.000" N
LONGITUDE 114°52'58.000" W
ELEVATION 1137.7 m

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE													
Daily Average (°C)	-6.5	-4.5	0.2	4.8	9.1	12.7	15.8	15.5	10.5	4.8	-2	-7.3	4.4
Standard Deviation	3.1	3.1	2.1	1.3	1.4	1.3	1.6	1.3	1.7	1.2	3.2	3.1	2.3
Daily Maximum (°C)	-2.2	0.5	5.4	10.9	15.9	19.6	23.8	24.2	18.2	10.7	1.7	-3.4	10.4
Daily Minimum (°C)	-10.7	-9.6	-5.1	-1.3	2.3	5.8	7.7	6.7	2.9	-1.1	-5.6	-11.3	-1.6
Extreme Maximum (°C)	11.9	13.8	20.6	25.6	31.3	32.5	34.9	36.5	34.2	27.2	16.9	10.5	
Date (yyyy/dd)	2005/24	1995/24	2004/30	1987/27	1986/30	1992/23	Dec-02	Dec-81	Feb-88	Feb-92	Feb-81	1980/16	
Extreme Minimum (°C)	-37.9	-34.6	-29.9	-15	-6.7	-3.3	0	-3.5	-8.5	-22.2	-34	-39.8	
Date (yyyy/dd)	Dec-98	Mar-89	2002/21	Mar-82	Aug-02	Jan-00	1982/23	1992/24	2000/23	1991/29	1985/27	1990/29	
Days with Maximum Temperature													
<= 0 °C	16.6	10.3	3.7	0.46	0	0	0	0	0	1	9	20.2	61.3
> 0 °C	14.4	17.9	27.4	29.5	31	30	31	31	30	30	21	10.8	304
> 10 °C	0.15	0.44	5.1	16.3	25.8	29.1	31	30.8	26.7	16.6	1.5	0	183.6
> 20 °C	0	0	0.04	1.6	7.5	13.7	23.1	24.3	12.3	1.5	0	0	84
> 30 °C	0	0	0	0	0.16	0.31	3.4	3.2	0.62	0	0	0	7.6
> 35 °C	0	0	0	0	0	0	0	0.04	0	0	0	0	0.04
Days with Minimum Temperature													
> 0 °C	2.5	2.7	4.4	10.2	22.2	28.9	31	30.7	22.6	12.2	6.1	1.6	175.1
<= 2 °C	30.3	27.7	29.4	24.8	15.1	4.3	0.92	2.4	13.3	23.2	27.3	30.8	229.5
<= 0 °C	28.4	25.6	26.7	19.9	8.8	1.1	0.04	0.32	7.4	18.8	23.9	29.4	190.1
< -2 °C	25	22.4	21.1	12.2	3.4	0.08	0	0.04	2.8	12.8	18.4	26.4	144.7
< -10 °C	14.4	11.7	5	0.54	0	0	0	0	0	0.92	6.9	15.8	55.3
< -20 °C	5.3	3.3	0.69	0	0	0	0	0	0	0.12	1.4	5.1	15.9
< -30 °C	0.89	0.67	0	0	0	0	0	0	0	0	0.16	0.72	2.4
Degree Days													
Above 24 °C	0	0	0	0	0	0	0.1	0	0	0	0	0	0.1
Above 18 °C	0	0	0	0	0.2	1.8	13.7	9.9	0.4	0	0	0	25.9
Above 15 °C	0	0	0	0	2.5	14.9	52.9	47.7	5.6	0.1	0	0	123.7
Above 10 °C	0	0	0.1	2.8	33.7	91.4	180.7	172.4	55.5	5.4	0.1	0	542.1
Above 5 °C	0.6	0.6	4.6	39.4	134	231.5	334.5	325.4	170.4	46.6	5.6	0	1293.1
Above 0 °C	14.7	19.1	58.4	151	283	381.1	489.5	480.2	316	161.2	40	8.1	2402.2
Below 0 °C	215.4	146.9	53.5	6.4	0.2	0	0	0	0	11.8	99.3	235.1	768.5
Below 5 °C	356.3	269.4	154.6	44.8	6.2	0.4	0	0.2	4.3	52.3	214.9	382	1485.4
Below 10 °C	510.7	409.9	305.1	158.2	60.9	10.3	1.2	2.3	39.5	166	359.4	537	2560.5
Below 15 °C	665.7	551.1	460	305.4	184.7	83.8	28.5	32.6	139.6	315.7	509.3	692	3968.3
Below 18 °C	758.7	635.7	553	395.4	275.4	160.7	82.2	87.7	224.4	408.6	599.3	785	4966.2

APPENDIX B - 1981-2010 Climate Normals

PRECIPITATION													
Rainfall (mm)	17.3	12.4	17	27.9	52	67.7	46.8	34.8	43.4	39.6	39.1	13.2	411
Snowfall (cm)	50.4	37	31.7	17.4	8.6	1.8	0	0.1	4.2	11.3	47.3	54.2	264
Precipitation (mm)	53.9	40.9	44.2	41.4	60.4	69.3	46.8	34.9	47.4	48.8	72.1	53.4	613.3
Average Snow Depth (cm)	16	14	5	0	0	0	0	0	0	0	5	13	4
Median Snow Depth (cm)	16	14	4	0	0	0	0	0	0	0	3	13	4
Snow Depth at Month-end (cm)	15	11	1	0	0	0	0	0	0	1	9	17	4
Extreme Daily Rainfall (mm)	27.8	35.8	15.8	27.1	43.5	45.2	27.2	22.1	33.6	38.4	47	29	
Date (yyyy/dd)	Apr-84	1986/24	Dec-03	1996/23	2002/21	Jun-95	1990/25	2005/17	2005/29	Apr-90	Dec-99	Oct-04	
Extreme Daily Snowfall (cm)	24	24.4	27	32	32.4	15	0	1	47.2	21	41	65	
Date (yyyy/dd)	2004/26	1986/15	Apr-02	Feb-01	Feb-02	1981/13	Jan-80	1992/21	Oct-05	2006/29	1990/24	Mar-80	
Extreme Daily Precipitation (mm)	31.7	35.8	27	32.3	49.1	45.2	27.2	22.1	60.2	38.4	47	65	
Date (yyyy/dd)	1986/18	1986/24	Apr-02	2003/26	2002/21	Jun-95	1990/25	2005/17	Oct-05	Apr-90	Dec-99	Mar-80	
Extreme Snow Depth (cm)	56	64	40	26	27	7	0	0	34	18	44	133	
Date (yyyy/dd)	Jan-97	1982/13	Jun-02	Mar-01	May-81	Jul-05	Jan-81	Jan-80	Nov-05	1991/26	1993/22	May-80	
Days with Rainfall													
>= 0.2 mm	3.6	2.6	5.8	8.8	14	16.3	11.4	10.3	10.1	9.7	6.6	3	102.3
>= 5 mm	1.2	0.78	0.85	1.8	3.1	4.2	3.4	2.4	2.9	2.4	2.4	0.8	26.1
>= 10 mm	0.48	0.33	0.31	0.5	1.2	1.6	1.2	0.76	1.2	0.88	1.2	0.4	10.1
>= 25 mm	0.07	0.04	0	0.04	0.24	0.19	0.04	0	0.08	0.12	0.24	0.04	1.1
Days With Snowfall													
>= 0.2 cm	13.5	9.1	8.7	5	1.6	0.23	0	0.08	0.81	3.1	10.1	13.4	65.6
>= 5 cm	3.2	2.3	2.1	1.1	0.44	0.15	0	0	0.08	0.88	3.1	3.6	17
>= 10 cm	1.4	1.1	0.62	0.38	0.28	0.08	0	0	0.08	0.23	1.3	1.4	6.9
>= 25 cm	0	0	0.04	0.08	0.08	0	0	0	0.08	0	0.16	0.16	0.6
Days with Precipitation													
>= 0.2 mm	14.7	10.3	12.2	11.9	14.7	16.3	11.4	10.4	10.3	11.5	15	14.4	153
>= 5 mm	3.4	2.8	2.9	2.8	3.4	4.3	3.4	2.5	2.9	3.2	4.4	3.4	39.2
>= 10 mm	1.3	0.96	1.1	0.88	1.5	1.7	1.2	0.76	1.3	1.1	2.1	1.3	15.1
>= 25 mm	0.07	0.16	0.04	0.08	0.32	0.23	0.04	0	0.15	0.15	0.32	0.12	1.7
WIND													
Maximum Hourly Speed (km/h)	67	83	59	52	48	44	37	44	44	63	59	74	83
Date (yyyy/dd)	1989/31	1994/23	Apr-91	Apr-91	2009/18	1992/23	1981/14	1984/26	1996/30	1984/30	1982/20	1992/22	1994/23
Direction of Maximum Hourly Speed	SE	SE	SE	S	SE	S	SW	S	SE	SE	SE	SE	SE
Maximum Gust Speed (km/h)								0			54	54	
Date (yyyy/dd)								Oct-95			1997/28	1997/26	
Direction of Maximum Gust	CALM	CALM	CALM	CALM	CALM	CALM	CALM	N	CALM	CALM	S	S	CALM
Days with Winds >= 52 km/h											2		
Days with Winds >= 63 km/h											0		
Wind Chill													
Extreme Wind Chill	-45.6	-47.5	-37.4	-23	-9	-4.8	0	-3.8	-10.5	-27.1	-41.4	-48.6	
Date (yyyy/dd)	Dec-98	Mar-89	Aug-02	Feb-02	Aug-02	Jan-00	Jan-80	2000/28	2000/23	1984/31	1985/27	1990/29	
HUMIDITY													
Avg. Relative Humidity - 0600LST (%)				84.2	85.5	87.4	87.8	89	88.5	86			
Avg. Relative Humidity - 1500LST (%)	72.7	62.7	54.8	46	44.5	46.9	39.4	38.3	44.3	52.2	69.8	74	53.8
Extreme Humidex	11.4	13	20.2	25.2	32.2	35.3	36.9	35.6	32.6	26.5	16.5	10.4	
Date (yyyy/dd)	2005/24	1995/24	2004/30	1987/27	1986/28	2008/30	2002/13	2006/22	Feb-88	Feb-92	Feb-81	1980/16	

Source: ECCC, 2019



APPENDIX B - 1981-2010 Climate Normals

STATION NAME FERNIE
 CLIMATE ID 1152850
 PROVINCE BC
 LATITUDE 49°29'19.4" N
 LONGITUDE 115°04'23.9" W
 ELEVATION 1001.0 m

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE													
Daily Average (°C)	-5.2	-3.8	0.8	5.4	9.9	13.6	16.8	16.3	11.3	5.5	-1.1	-6.1	5.3
Standard Deviation	2.9	2.9	2	1.6	1.5	1.3	1.7	1.3	1.8	1.2	3.3	2.9	2.3
Daily Maximum (°C)	-0.7	1.6	6.5	11.9	16.9	20.6	25.1	25.1	19.3	11.6	2.9	-1.9	11.6
Daily Minimum (°C)	-9.6	-9.2	-4.9	-1.1	2.8	6.6	8.4	7.4	3.3	-0.7	-5	-10.1	-1
Extreme Maximum (°C)	15	15.5	21	28.9	33	36.1	36	36	33	28	18.3	12.5	
Date (yyyy/dd)	2005/23	1995/24	2004/30	1977/24	1986/26	1933/15	2003/22	Apr-97	Feb-98	Jul-80	May-75	1980/16	
Extreme Minimum (°C)	-39.4	-40	-32.8	-20	-11	-2.2	0	-2	-18.3	-24.4	-32.2	-41.7	
Date (yyyy/dd)	1935/20	Oct-39	Nov-56	Feb-35	1983/13	Mar-18	Apr-18	1992/24	1926/24	1935/31	1959/16	1968/30	
Days with Maximum Temperature													
<= 0 °C	15	9.5	2.9	0.25	0	0	0	0	0	0.91	7.3	18.7	54.6
> 0 °C	16	18.7	28.1	29.8	31	30	31	31	30	30.1	22.7	12.4	310.7
> 10 °C	0.48	0.73	5.4	17.6	27.2	29.5	30.9	30.9	28.1	18	1.6	0	190.5
> 20 °C	0	0	0.04	1.9	8.3	16.1	24.8	25.1	14.6	1.6	0	0	92.4
> 30 °C	0	0	0	0	0.32	0.74	5	4.4	0.64	0	0	0	11.1
> 35 °C	0	0	0	0	0	0	0.22	0.09	0	0	0	0	0.31
Days with Minimum Temperature													
> 0 °C	2.2	1.9	3.9	10.3	22.7	29.2	30.8	30.9	23.3	12.4	5.9	1.5	174.8
<= 2 °C	29.9	27.8	29.8	24.6	14	2.8	0.41	1.4	12.1	23	26.7	30.3	222.8
<= 0 °C	28.5	26.3	27.1	19.4	8.2	0.7	0	0.05	6.5	18.5	23.9	29.1	188.2
< -2 °C	22.7	21.2	19.9	10.2	2.4	0	0	0	1.4	11.6	16	24.6	130.1
< -10 °C	11.9	10.9	4.4	1	0.04	0	0	0	0.04	0.61	5.4	12.6	46.9
< -20 °C	3.8	2.8	0.44	0	0	0	0	0	0	0	0.61	3.9	11.6
< -30 °C	0.78	0.44	0	0	0	0	0	0	0	0	0.13	0.45	1.8

APPENDIX B - 1981-2010 Climate Normals

PRECIPITATION													
Rainfall (mm)	55.8	41.5	60.6	80	88.8	109.8	67	51.9	75.4	109.4	123	39	902.2
Snowfall (cm)	83.5	46.4	37.2	12.9	3.1	0.2	0	0	0.4	6.4	56.2	78.7	324.9
Precipitation (mm)	139.3	88	97.8	92.8	91.8	110	67	51.9	75.8	115.7	179.1	117.7	1227.1
Snow Depth at Month-end (cm)	43	39	8	0	0	0	0	0	0	1	17	34	12
Extreme Daily Rainfall (mm)	64	81.8	65.6	70	45.6	78.4	87.4	44.7	78	105.7	159.4	106.2	
Date (yyyy/dd)	2005/18	1932/26	1997/19	2005/17	1994/15	Jun-95	1983/13	Apr-24	2005/29	1922/26	Sep-90	Feb-41	
Extreme Daily Snowfall (cm)	49	48.3	33	31.8	40	4	0	0	28.4	20.3	52	63.5	
Date (yyyy/dd)	1982/17	1927/16	1936/27	Apr-17	Jul-96	Jul-05	Jan-14	Jan-14	1926/22	1935/29	1996/17	Oct-22	
Extreme Daily Precipitation (mm)	64	81.8	65.6	70	45.6	78.4	87.4	44.7	78	105.7	159.4	106.2	
Date (yyyy/dd)	2005/18	1932/26	1997/19	2005/17	1994/15	Jun-95	1983/13	Apr-24	2005/29	1922/26	Sep-90	Feb-41	
Extreme Snow Depth (cm)	120	112	107	52	25	0	0	0	0	11	64	140	
Date (yyyy/dd)	1997/24	1982/13	Jun-97	Jan-02	Aug-96	Jan-81	Jan-81	Jan-80	Jan-81	1991/25	1996/28	1996/30	
Days with Rainfall													
>= 0.2 mm	4.9	4.4	8.6	11.2	14.2	16.1	10	9.2	9.2	11.7	9.2	3.6	112.1
>= 5 mm	3	2.6	4	5.1	6.2	7.2	4.8	3.4	4.7	6.1	5.2	2.4	54.6
>= 10 mm	1.8	1.6	1.9	2.6	2.9	3.2	2.4	1.6	2.5	3.7	3.4	1.4	29
>= 25 mm	0.58	0.35	0.42	0.46	0.35	0.68	0.17	0.28	0.57	0.84	1.4	0.36	6.5
Days With Snowfall													
>= 0.2 cm	12	8.2	6.4	2.7	0.65	0.04	0	0	0.09	1.6	7.7	11.4	50.7
>= 5 cm	6.1	3.3	2.9	0.85	0.15	0	0	0	0.04	0.44	3.9	5.8	23.5
>= 10 cm	2.7	1.2	1.2	0.42	0.04	0	0	0	0	0.24	2	2.8	10.5
>= 25 cm	0.42	0.23	0.12	0	0.04	0	0	0	0	0	0.29	0.28	1.4
Days with Precipitation													
>= 0.2 mm	15	11	12.8	12.5	14.5	16.1	10	9.2	9.2	12.5	15	13.3	151
>= 5 mm	9	5.7	6.9	6.2	6.4	7.2	4.8	3.4	4.7	6.5	9.2	7.9	77.8
>= 10 mm	4.6	2.9	3.3	3.2	2.9	3.2	2.4	1.6	2.5	4	5.6	4.4	40.5
>= 25 mm	1.2	0.65	0.58	0.46	0.42	0.68	0.17	0.28	0.61	0.84	1.8	0.76	8.4

Source: ECCC, 2019

APPENDIX B - 1981-2010 Climate Normals

STATION NAME FORDING RIVER COMINCO
 CLIMATE ID 1152850
 PROVINCE BC
 LATITUDE 50°08'55.000" N
 LONGITUDE 114°51'18.000" W
 ELEVATION 1585.0 m

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE													
Daily Average (°C)	-9.9	-8.2	-3.5	1.1	5.5	9.7	12.6	12.1	7.5	1.8	-6.2	-11.3	0.9
Standard Deviation	3.2	2.8	2.3	1.4	1.3	1.3	1.7	1.5	2	1.6	3.3	2.9	2.4
Daily Maximum (°C)	-5.4	-2.7	1.6	6.3	11.5	16	20	20	14.6	7.2	-2.5	-7.2	6.6
Daily Minimum (°C)	-14.2	-13.6	-8.6	-4.1	-0.5	3.3	5.1	4.1	0.4	-3.7	-9.9	-15.3	-4.7
Extreme Maximum (°C)	10.6	12	16.5	24.4	28	35	37.5	36.7	32.5	25.5	13.3	10	
Date (yyyy/dd)	1975/22	Mar-80	2004/30	1977/25	1979/23	1979/29	1979/19	Sep-78	Jul-79	Feb-92	Jan-70	1980/16	
Extreme Minimum (°C)	-41	-39	-33	-26.1	-15	-6.1	-3	-6	-12.2	-25.6	-36.5	-49	
Date (yyyy/dd)	1996/30	Aug-94	2002/21	Jan-75	Apr-70	Dec-78	Jun-89	1992/24	1972/27	1971/28	1985/27	1978/31	
Days with Maximum Temperature													
<= 0 °C	25.3	19.1	11.4	4.3	0.79	0	0	0.04	0.3	3.9	20.4	28.1	113.6
> 0 °C	5.7	9.2	19.6	25.7	30.2	30	31	31	29.7	27.1	9.6	2.9	251.7
> 10 °C	0	0.04	0.96	6.9	17.2	26.1	29.4	29.4	21.8	9.5	0.36	0	141.6
> 20 °C	0	0	0	0.17	2.8	6.9	15.2	16.8	6.6	0.92	0	0	49.4
> 30 °C	0	0	0	0	0	0	0.23	0.08	0.04	0	0	0	0.35
> 35 °C	0	0	0	0	0	0	0	0	0	0	0	0	0
Days with Minimum Temperature													
> 0 °C	0.38	0.42	1	2.6	11.9	23.7	28.5	26.6	14	5.3	0.92	0.08	115.4
<= 2 °C	30.7	28	30.6	29.1	24.6	12.6	7.2	10	21	28.7	29.5	31	282.9
<= 0 °C	30.5	27.8	30	27.4	19.1	6.3	2.3	4.4	15.9	25.7	29.1	30.9	249.4
< -2 °C	29	26.5	27.2	19.3	9.2	1.2	0.09	0.88	6.5	18.6	26.4	29.9	194.7
< -10 °C	19	17.2	10.4	2.2	0.04	0	0	0	0.09	2.5	12.4	21.8	85.5
< -20 °C	8.3	4.9	1.6	0	0	0	0	0	0	0.21	2.5	7.9	25.3
< -30 °C	1.6	1	0.08	0	0	0	0	0	0	0	0.36	1.4	4.5
Degree Days													
Above 24 °C	0	0	0	0	0	0	0	0	0	0	0	0	0
Above 18 °C	0	0	0	0	0	0.3	0.9	0.8	0.2	0	0	0	2.2
Above 15 °C	0	0	0	0	0.2	3.2	11.5	8.9	1.8	0	0	0	25.6
Above 10 °C	0	0	0	0.3	8.4	38.1	88.3	83.5	21.6	0.7	0	0	240.9
Above 5 °C	0.1	0.2	0.5	9.3	58	146.6	228.3	221.1	99.9	17.8	0.6	0	782.4
Above 0 °C	2.7	3.5	15.1	66.4	176.2	293.2	382.8	375	231.1	88.6	9.4	0.7	1644.7
Below 0 °C	308.3	223.7	124.1	34.3	3.8	0	0	0.2	1.7	33.9	195.2	350.3	1275.5
Below 5 °C	460.7	361.7	264.6	127.2	40.6	3.4	0.5	1.3	20.5	118.1	336.5	504.6	2239.5
Below 10 °C	615.6	502.7	419.1	268.2	146	44.9	15.4	18.7	92.2	256	485.9	659.6	3524.2
Below 15 °C	770.6	644	574.1	417.9	292.8	159.9	93.7	99.1	222.4	410.3	635.9	814.6	5135.2
Below 18 °C	863.6	728.7	667.1	507.9	385.6	247	176.1	184	310.8	503.3	725.9	907.6	6207.5

PRECIPITATION													
Rainfall (mm)	3.7	3.1	7.1	14.4	40	82.1	58	46.5	40.6	22.6	17.1	4.6	339.8
Snowfall (cm)	41.7	30.8	37.6	29.4	19.1	3.7	0.1	0.6	7.9	17.9	43.8	44.7	277.2
Precipitation (mm)	45.5	33.9	44.8	43.8	59.1	85.7	58.1	47.1	48.5	40.5	60.9	49.2	617
Extreme Daily Rainfall (mm)	27.8	15.8	38.1	27.9	33.8	42.2	27	31.8	24.6	45.7	24.4	28.8	
Date (yyyy/dd)	Apr-84	1986/24	Sep-72	1971/25	1971/20	Jun-05	1999/17	1973/30	Dec-85	Apr-74	2003/18	1979/17	
Extreme Daily Snowfall (cm)	45.7	30	38.1	63.5	42	25.4	2.5	8.6	36.1	38	22.9	50.8	
Date (yyyy/dd)	1972/20	1986/15	1977/13	1974/26	Apr-81	1981/13	Jun-71	1992/22	1971/29	1991/24	1974/21	1971/24	
Extreme Daily Precipitation (mm)	45.7	30	38.1	63.5	42	50.4	27	31.8	36.1	46.7	28.2	50.8	
Date (yyyy/dd)	1972/20	1986/15	Sep-72	1974/26	Apr-81	1981/13	1999/17	1973/30	1971/29	Apr-74	1974/21	1971/24	
Extreme Snow Depth (cm)	82	70	100	34	44	3	0	0	17	45	58	80	
Date (yyyy/dd)	1997/28	Jan-97	May-90	Mar-01	Jul-03	Jul-04	Jan-81	Jan-80	Nov-05	1991/25	1990/26	1996/31	
Days with Rainfall													
>= 0.2 mm	0.85	0.92	1.8	4.7	10	15.6	11.5	10.1	8.6	6	2.8	0.6	73.5
>= 5 mm	0.26	0.24	0.42	0.78	2.9	5.3	4.1	3.2	3.1	1.3	1.2	0.24	23
>= 10 mm	0.07	0.08	0.13	0.3	0.96	2.4	1.8	1.2	1.1	0.5	0.61	0.2	9.3
>= 25 mm	0.04	0	0	0	0.04	0.5	0.12	0.12	0.04	0	0	0.04	0.9
Days With Snowfall													
>= 0.2 cm	11	8.9	10.2	6.7	3.5	0.58	0.04	0.16	1.6	5	10.6	11.1	69.5
>= 5 cm	2.7	2.3	2.4	2.2	1	0.19	0	0.04	0.64	1.4	3.1	3	18.9
>= 10 cm	0.7	0.5	0.78	0.7	0.56	0.12	0	0	0.2	0.33	1.1	1.2	6.2
>= 25 cm	0.19	0.04	0	0.04	0.12	0.08	0	0	0	0.04	0.05	0.04	0.6
Days with Precipitation													
>= 0.2 mm	11.4	9.3	11.4	9.9	12.4	15.6	11.5	10.2	9.4	10	12.4	11.4	134.7
>= 5 mm	3	2.5	3	3.1	4	5.4	4.1	3.4	3.6	2.7	4.1	3.3	42.2
>= 10 mm	0.85	0.63	0.96	1.2	1.6	2.4	1.8	1.2	1.4	1	1.9	1.4	16.4
>= 25 mm	0.22	0.04	0	0.04	0.2	0.62	0.12	0.12	0.08	0.04	0.09	0.08	1.7

Source: ECCC, 2019