Climate Research Lab

Prince Edward Island Annual Climate Summary 2017

Figure 1–Parabolic dunes at PEI National Park, Greenwich, 2017

Background

The UPEI Climate Research Lab has established a meso-network of climate stations located in key locations across the province. This can help reduce model uncertainties in temperature and precipitation variances and to provide reference ground truth data to aid in the evaluation of climate model simulations and to enable assessment of micro-climate environments in the province. More localized data from these stations will be of assistance to farm groups, tourism operators and others who depend on high quality climate data to make more informed decisions.

In June, 2017 the UPEI Climate Research Lab expanded its network of climate monitoring stations by adding 1 new station in Savage Harbour in conjunction with the Abegweit Conservation Society

Table 1 – UPEI Climate Lab Climate Stations including some PEI Dept. of Agriculture Stations

ID Code	Map ID	Community	Lat.	Long.	Date Installed	Equipment
IPRINCEE4	UP20	Millcove	46.37400	-63.03508	24-Apr-12	Davis Vantage Vue
IPRINCEE11	UP9	Winsloe South	46.229	-63.177	13-Sep-13	Davis Vantage Pro 2
IPRINCEE13	UP12	Flat River	46.9836	-62.851	06-Nov-13	Davis Vantage Pro 2
IPRINCEE14	UP11	Orwell Cove	46.131	-62.867	13-Nov-13	Davis Vantage Pro 2
IPRINCEE15	UP2	Foxley River	46.7208	-64.0356	20-Nov-13	Davis Vantage Pro 2
IPRINCEE16	UP15	Dingwells Mills	46.359	-62.431	14-Nov-13	Davis Vantage Pro 2
IPRINCEE17	UP14	Cardigan Head	46.2461	-62.66833	01-Nov-14	Davis Vantage Pro 2
IPRINCEE19	UP17	White Sands	45.970	-62.558	25-Nov-14	Davis Vantage Pro2+
IPRINCEE21	UP8	St. Catherine's	46.182	-63.286	25-Jun-15	Davis Vantage Vue
IPRINCEE22	UP13	Alliston	46.052	-62.638	25-Jun-15	Davis Vantage Vue
IPRINCEE26	UP4	Cape Egmont	46.4067	-64.118742	10-Sep-15	Davis Vantage Pro 2+
IPRINCEE27	UP7	Hampton	46.2003	-63.4652	11-Sep-15	Davis Vantage Pro 2+
IPRINCEE28	UP1	Brockton	46.80649	-64.21685	23-Sep-15	Davis Vantage Pro 2+
IPRINCEE30	UP5	Glen Valley	46.34884	-63.439941	06-Oct-15	Davis Vantage Pro 2+
IPRINCEE31	UP16	East Point	46.43554	-62.018632	16-Jul-15	Davis Vantage Vue
IPRINCEE32	UP10	Fanning Brook	46.32419	-62.8141	05-Nov-15	Davis Vantage Pro 2+
IPEBORDE2	UP6	Borden - Carleton	46.248	-63.687	26-Jan-95	Davis Vantage Pro 2+
IPRINCEE 35	UP19	Hope River	46.43816	-63.40707	10-May-16	Ambient Weather WS-1001
IPRINCEE36	UP18	Tignish	46.9453	-64.0516	02-May-16	Davis Vantage Pro2+
Remote	UP3	Arlington	46.52964	-63.927503	30-Jun-15	Davis Vantage Vue
ISAVAGEH2	UP21	Savage Harbour	46.42587	-62.85565	30-Jun-17	Davis Vantage Pro 2+

The location of all stations listed on tables 1 and 2 is provided on the map labelled figure 2. As shown on the map, the stations are located throughout the province and can be expected to provide a reasonable distribution of climate conditions across the province. There are still some gaps in the network such at the West Point / West Cape area. The stations at North Cape operated by Environment Canada and a private station at Cardigan Head had temperature instrumentation problems during the months of November and December

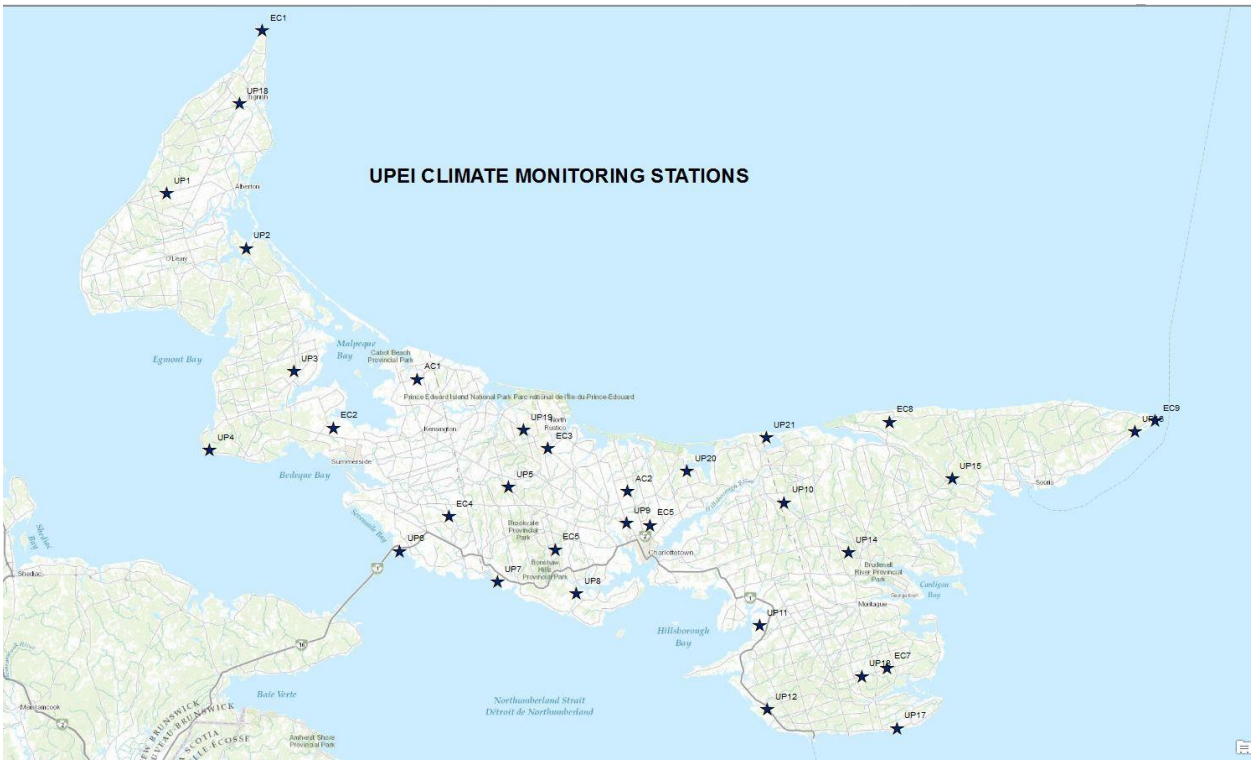

Figure 2 - Map showing locations of climate stations as of Dec. 31, 2017

Data Summary

Data was compiled from the 21 Climate Stations listed on table 1, managed or monitored by the UPEI Climate Research Lab and from eleven (11) other climate stations in the province. The data from the eleven other stations was obtained from the Environment Canada Climate Archives website or from the Agriculture Canada, AgWeather Atlantic website. A summary of the data obtained is provided in table 2.

Table 2 – UPEI 2017 Annual Climate Station Summary for 32 Stations across PEI

Climate Station Name	Map ID	Type of Site	Tmean ^{0}C	Tmax ^{0}C	Tmin ^{0}C	Annual PPT (mm)	Avg. Wind Speed kn/h	Max. Wind Speed km/h	Max. Daily PPT (mm)	Max. PPT Date
Alliston/Peters Road	EC7	manual	7.5	29.0	-19.0	1079.9			41.0	Jan. 25
Alliston (CNP)	UP13	auto	7.1	29.4	-19.7	669.1	6.0	67.6	29.0	Aug. 6
Arlington	UP3	auto	6.6	30.4	-22.8	502.5	2.7	53.1	34.4	June 9
Baltic	AC1	auto	6.7	29.7	-20.5	569.6	14.7	53.9	50.2	June 9
Borden	UP6	auto	7.3	29.8	-18.7	766.8	13.5	93.3	36.6	Nov. 23
Brockton	UP1	auto	6.4	30.7	-23.1	515.2	5.8	69.2	21.2	Oct. 8
Cape Egmont	UP4	auto	6.6	28.2	-20.8	722.8	12.5	75.6	24.6	Sept. 6
Cardigan Head	UP14	auto		30.2	-28.2	867.7	3.4	57.9	45.2	Jan. 25
Ch'town Airport	EC6	auto	6.4	28.6	-23.9	1060.3		102.0	45.2	July 21
Dingwells	UP15	auto	6.7	*29.7*	-26.7	810.2	6.6	90.1	38.6	Jan. 25
East Point	EC9	auto	7.0	27.6	-19.4	775.4		113.0	30.2	Jan. 25
East Point (N)	UP16	remote	6.7	29.7	-20.2	672.3	9.4	88.5	30.6	Jan. 25
Elmwood	EC5	auto	6.7	28.6	-22.8	767.1	7.8	61.1	34.0	Sept. 27

Fanning Brook	UP10	auto	7.0	28.7	-24.8	745.0	8.7	77.2	37.1	Jan. 25
Flat River	UP12	auto	7.3	29.1	-20.8	528.3	9.0	91.7	24.1	Jan. 25
Foxley River	UP2	auto	7.1	30.2	-24.4	851.3	7.1	93.3	53.1	Jan. 25
Glen Valley	UP5	auto	6.4	28.2	-19.6	817.4	14.6	94.9	35.1	June 9
Hampton	UP7	auto	6.4	27.9	-20.7	686.7	13.8	93.3	48.5	Aug. 6
Harrington	AC2	auto	6.5	28.5	-21.1	911.5	14.9	135.0	47.9	Aug. 6
Hope River	UP19	auto		29.7	-20.8		11.7	156.9	43.4	Jan. 25
Maple Plains	EC4	auto	5.9	29.9	-28.9	640.2	12.2	53.5	35.2	Nov. 23
Mill Cove	UP20		7.0	30.2	-24.9	727.5	4.6	57.9	43.4	Aug. 6
New Glasgow	EC3	manual	6.5	29.0	-28.0	1131.4			39.6	Aug. 6
North Cape	EC1	auto		28.0	-18.8	983.9	22.7	113.0	50.5	Oct. 8
Orwell Cove	UP11	auto	7.5	29.3	-18.1	665.5	8.9	80.4	31.0	Jan. 25
Savage Harbour*	UP21	auto		29.9	-19.6		12.5	85.3	33.2	Nov. 23
St. Catherines	UP8	auto	6.9	28.9	-19.8	716.5	7.3	67.6	37.8	Jan. 25
St. Peter's	EC9	auto	6.9	29.3	-20.8	838.1	15.4	102.0	46.6	Jan. 25
Summerside	EC2	auto	6.5	29.4	-26.6	790.5	18.9	93.0	37.1	Sept. 27
Tignish	UP18	auto	6.4	30.9	-28.2	770.4	5.4	66.0	49.6	Oct. 8
White Sands	UP17	auto	7.4	28.3	-17.7	567.8	14.9	105.6	30.5	Jan. 25
Winsloe South	UP9	auto	6.9	29.4	-19.1	856.3	4.0	54.7	32.2	July 22

Na = Not available; * began operation in June, 2017

The mean monthly temperature variation from the 30 year normal for 32 climate stations is provided in table 6 in appendix A. The colour scheme shows the months when the temperature varied from 30 year climate normal values. The normal for each station were taken from the nearest station listed on the Environment Canada weather archive website. The average annual temperature for 2017 for all 32 stations in this report was 1.1^{0}C above normal with a range of 0.2 degrees Celsius above normal at Maple Plains to 1.9 degrees Celsius above normal at Orwell Cove. January was 3.6 ^{0}C above normal when averaged across all stations and October was a close second with a Tmean of 3.4 ^{0}C above normal. The coldest months when compared to the 1981 to 2010 normals were March and December at -0.6 ^{0}C.

The mean or average annual temperature for 30 climate stations on PEI is plotted on Figure 3. Data from the PEI Department of Agriculture and Fisheries stations at Dover and Souris Line Road are included on this figure. There was a 1.6 degree Celsius range for the reporting stations as displayed on this figure. This map reveals that the eastern Queens and Southern Kings and Queens Areas were somewhat warmer than the rest of the province with a few exceptions at Borden-Carleton and Foxley River areas.

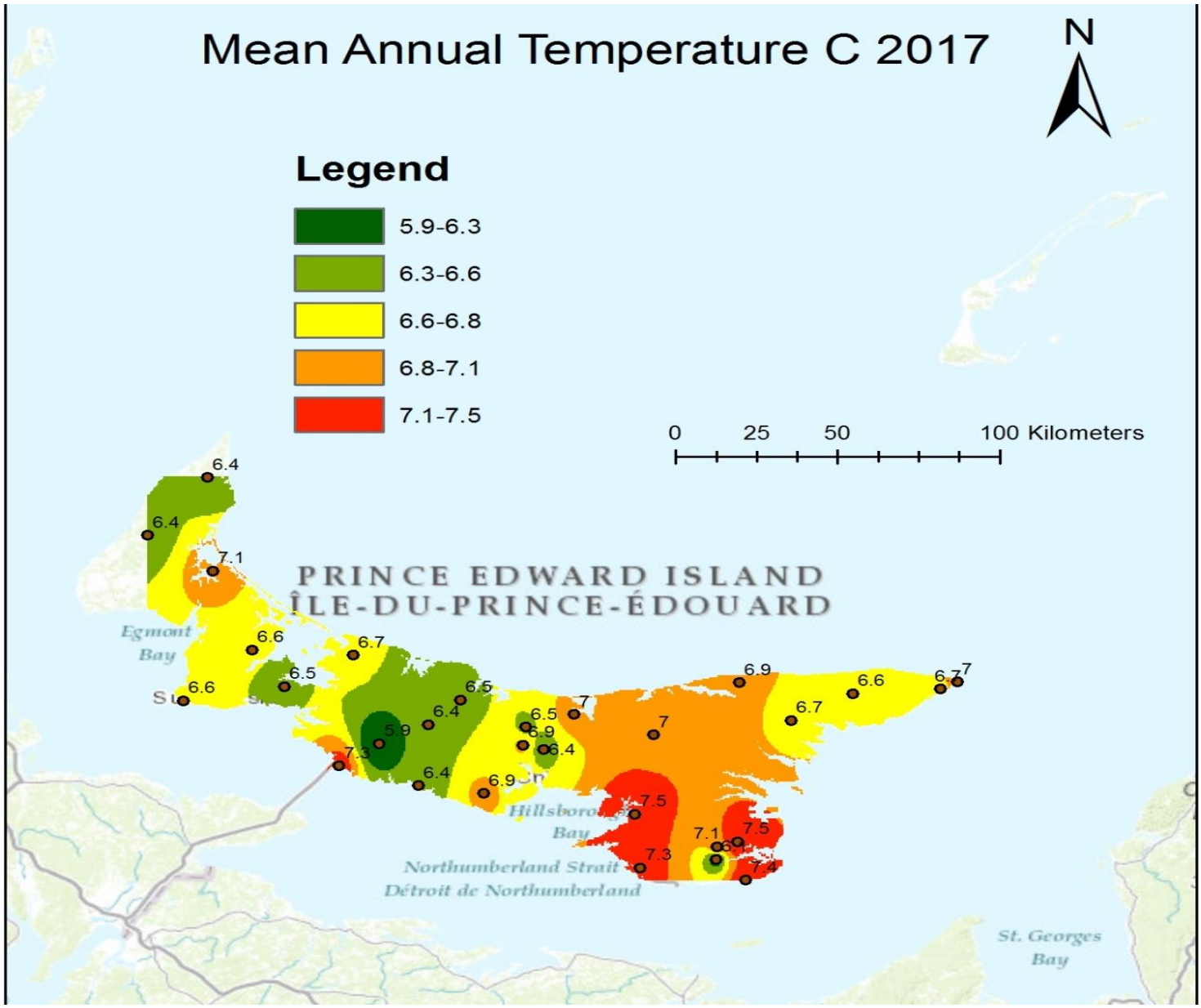

Figure 3 - PEI Mean Annual Temperature, 2017- in ^{0}C

The climate normal data used in table 5 to determine the variation in 2017 was derived from Environment Canada data from sites on PEI. The values used to calculate variation from the 30 year normal is provided in Table 3.

Table 3 – Climate Normal Data for PEI Climate Stations (1981 to 2010)

Site	Normal Mean Temp. C	Normal Annual Precip. mm	Reference stations
Charlottetown	5.6	1158.3	AC2, EC6, EC7, UP8-13, UP17, UP20, UP21
Summerside	5.7	1072.9	AC1, EC2, EC4, UP4, UP6, UP7
Monticello	5.8	1170.2	EC9, UP10, UP14, UP15
O'Leary	5.5	1147.8	UP2, UP3
East Baltic	5.6	1272.0	EC3, UP16
Alberton	5.5	1053.1	EC1, UP1, UP18
New Glasgow	5.8	1257.9	EC3, UP5, UP19

The monthly precipitation variation from the 30 year normal for stations which reported data during the year across PEI is provided in table 7 in appendix A. Months which have below normal precipitation are shown with a minus sign and the colour varies from yellow to red with yellow being below normal and red being above normal. Months which are blank either had incomplete data or the heater on the rain gauge was not working during the winter months thus snow and ice pellet water equivalent amounts are not included in the totals. This included the stations at Alliston (CNP), Arlington, Baltic, Cardigan Head, East Point (N), Maple Plains, and St. Catherines so the total annual precipitation at these stations is low due to frozen rain gauges and tipping buckets during the winter months and precipitation amounts could not be recorded using the equipment available.

The month of May had above normal rainfall at almost all reporting stations but June and July were below normal in precipitation. Figure 4 displays the rainfall totals for the growing season from May 1 to August 31st. There were areas in West Prince, northern and eastern Kings and Queens's counties which had below normal total rainfall during the summer months and this would have put some stress on crops like potatoes which require a regular supply of water. Contrarily, there were areas in East Prince, Central Queens, Southern Queens and Kings Counties, where a sufficient supply of water was available during the growing season. There may have been some extended dry periods particularly in the month of July where crops where in need of water and this may have caused stress to some crops.

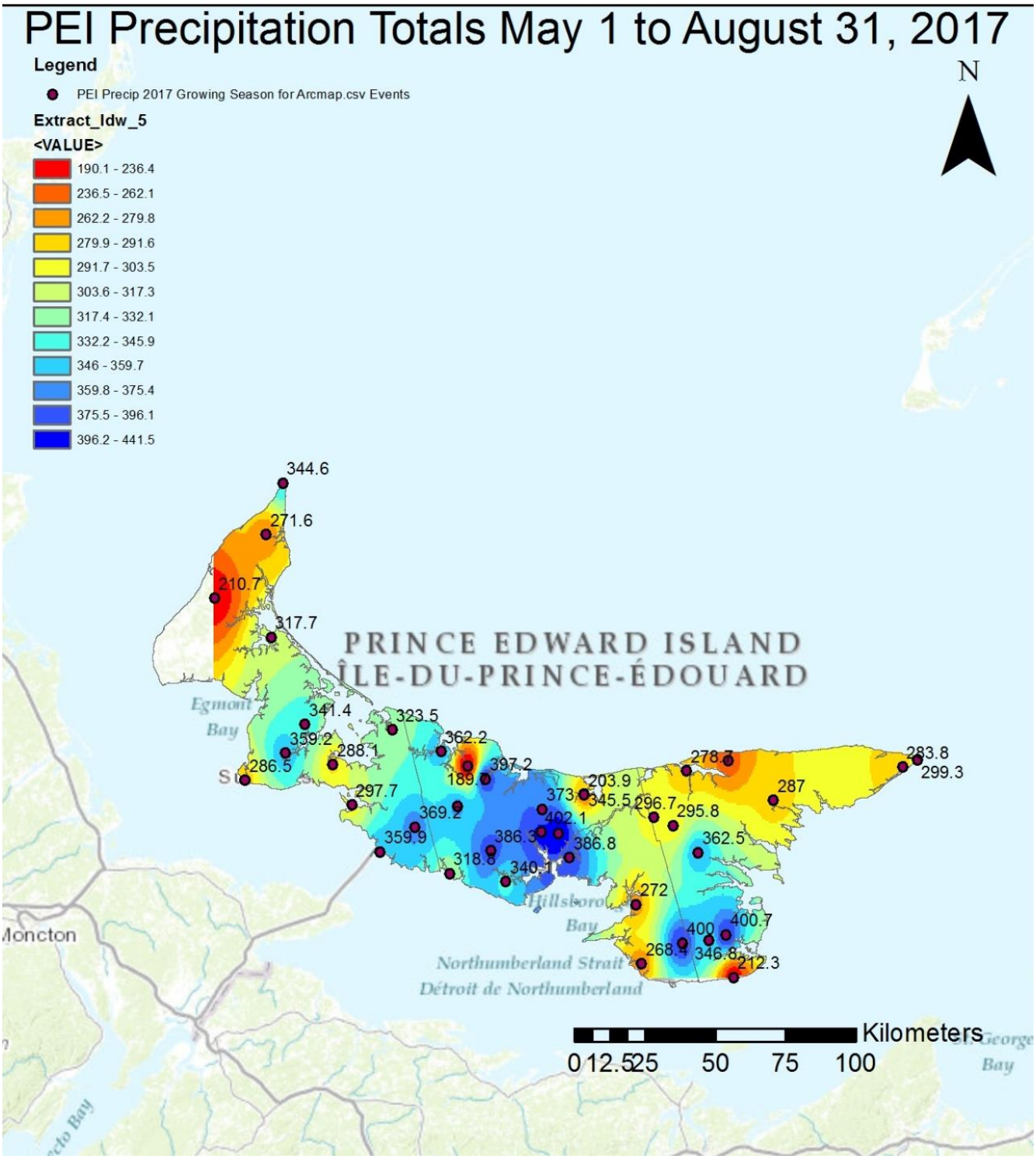

Figure 4: Precipitation Distribution During Growing Season: May 1 to August 31, 2017

Total precipitation amounts were calculated for nine (9), Community Collaborative Rain, Hail & Snow Network (CoCoRaHS) stations in the province. These stations are operated by volunteers who collect and record observations using manual methods. These amounts are provided in table 4 and the results included on the distribution map shown on figure 4.

Table 4 - CoCoRaHS Stations – 2017 Measured Annual Precipitation in mm.

Station ID	Locality	Latitude	Longitude	Total Precipitation in mm
CAN-PE-1	Stratford	46.235766	-63.989196	877.3
CAN-PE-3	Wellington	46.466721	-63.989196	1025.1
CAN-PE-7	Morell	46.427407	-62.708696	829.8
CAN-PE-10	New London	46.469849	-63.492019	934.2
CAN-PE-13	Bedeque	46.352066	-63.777329	767.1
CAN-PE-19	Winsloe South	46.2923584	-63.1727104	1006.3
CAN-PE-20	Elmwood	46.2508	-63.3342	1040.9
CAN-PE-23	Borden-Carleton	46.248177	-63.68515	953.3
CAN-PE-25	Caledonia	46.045939	-62.711665	1047.5

Vegetable and fruit growers are interested in the number of frost free days in various regions of the province and a few apple and grape growing farms have climate stations and these are included in summary table 5, which shows the number of frost free days, where the temperature was equal to or below 0 degrees Celsius. Data from two (2) PEI Department of Agriculture and Fisheries climate stations at Dover and Souris Line Road has also been included. There is an interest in growing more alternative crops in the province and access to good climate data is key to helping growers make decisions on crops which would thrive in the micro climate in their areas. Table 5 provides a summary of the number of frost free days at 33 climate stations across the province. The stations with the lowest number of frost free days are located in valleys or low lying areas such as Maple Plains and Cardigan Head. On the other hand, stations located near the coast have their temperature moderated due to being located in proximity to large water bodies such as Northumberland Strait or the Gulf of St. Lawrence. This also moderates the time of an autumn frost occurring and this is evident at North Cape, East Point, Borden-Carleton and White Sands.

Table 5 -Prince Edward Island Climate Stations Frost Free Period – 2017 (Temp. =<0^{0}C)

Station	Date of Last Spring Frost	Date of First Fall Frost	Frost Free Days
Alliston CNP	May 21	Oct. 17	149
Arlington	May 13	Sept. 30	140
Baltic	April 25	Oct. 22	149
Borden-Carleton	April 25	Nov. 5	194
Brockton	April 25	Oct. 13	140
Cape Egmont	April 25	Oct. 13	140
Cardigan Head	June 16	Sept. 30	106
Charlottetown Airport	May 30	Oct. 21	144
Dingwells Mills	June 15	Oct. 2	109
Dover – PEI Agr.	June 15	Sept. 30	107
East Point (EC)	April 25	Oct. 22	179
East Point (Newman)	May 1	Oct. 22	174
Elmwood	May 1	Oct. 1	153
FanningBrook	May 30	Oct. 13	136
Flat River	May 22	Oct. 1	132
Foxley River	April 25	Nov. 5	194
Glen Valley	May 1	Nov. 5	189
Hampton	April 25	Oct. 13	141
Harrington CDA	May 30	Oct. 22	143
Hope River	April 30	Oct. 22	173
Maple Plains	May 22	Sept. 30	131

Mill Cove	May 30	Oct. 17	148
New Glasgow	May 13	Oct. 1	141
North Cape	April 24	Nov. 11	201
Orwell Cove	April 25	Oct. 13	141
Peters Road	April 25	Oct. 23	175
Souris Line Road – PEI Agr.	May 1	Oct. 22	174
St. Catherines	April 25	Oct. 22	149
St. Peters	May 1	Oct. 22	174
Summerside	April 25	Oct. 13	140
Tignish	June 6	Sept. 30	116
White Sands	April 25	Oct. 22	149
Winsloe South	April 25	Oct. 22	149

The data from Table 5 was plotted on a base map of Prince Edward Island using ArcMap 10.4 GIS program and the results are provided on Figure 5. The growing season ranged from 106 days at Cardigan Head to 201 days at North Cape The map suggests that several areas had over 170 frost free days and these were located in the northwest section of Queens County, East Prince area, Foxley River and North Cape. Areas located in valleys or low lying areas tend to have the shortest frost free time period. Figure 5 also revealed an area between O'Leary and West Cape where there currently isn't a climate station where the number of frost free days could not calculated using the interpolation method in ArcMap 10.4.

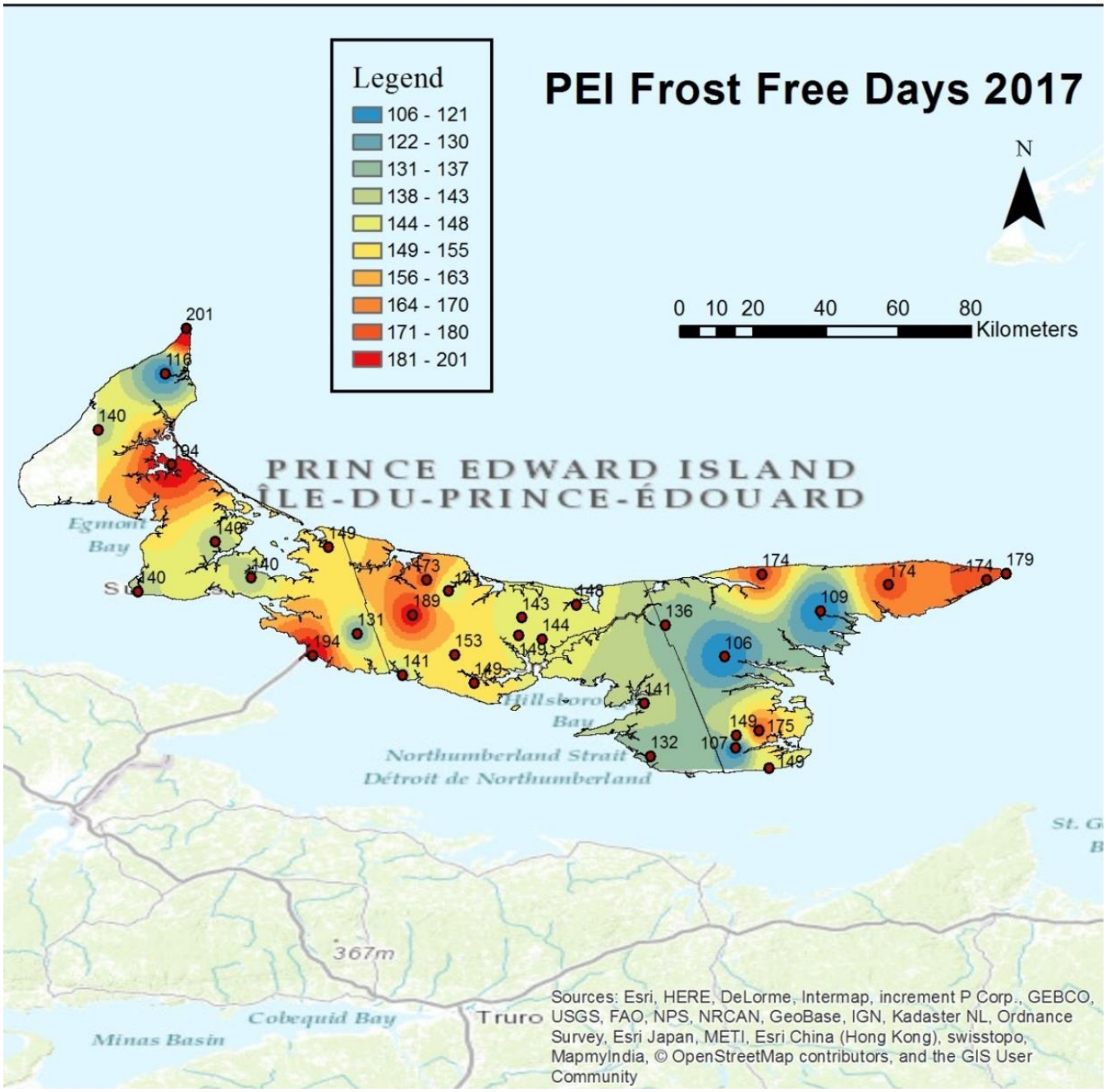

Figure 5 - PEI Frost Free Days 2017

Growing Degree Days

An Important index of heat which can be used to predict when a crop will reach maturity is the number of growing degree days compared to a reference temperature below which plant growth slows or stops. The growing degree graphs provided in figures 6 and 7 use a reference temperature of 5.0 ^{0}C. Crops have varying requirements for reaching maturity. A higher number of growing degree days in a region will offer more choices for the types and varieties of crops which can be grown. The figures show that the number of growing degree days has been trending upward in recent years giving more crop options for small fruits, vegetables, tree fruits and field crops.

The linear trend line in Figure 6 reveals in steady increase in growing degree days from the 1970s to the present. The normal value for growing degree days from 1971 to 2000 at Charlottetown was 1651 days and this has increased to over

1871 days in 2017 which is a 13% increase over a 30 year period. Climate change projections indicate that this increasing trend will continue.

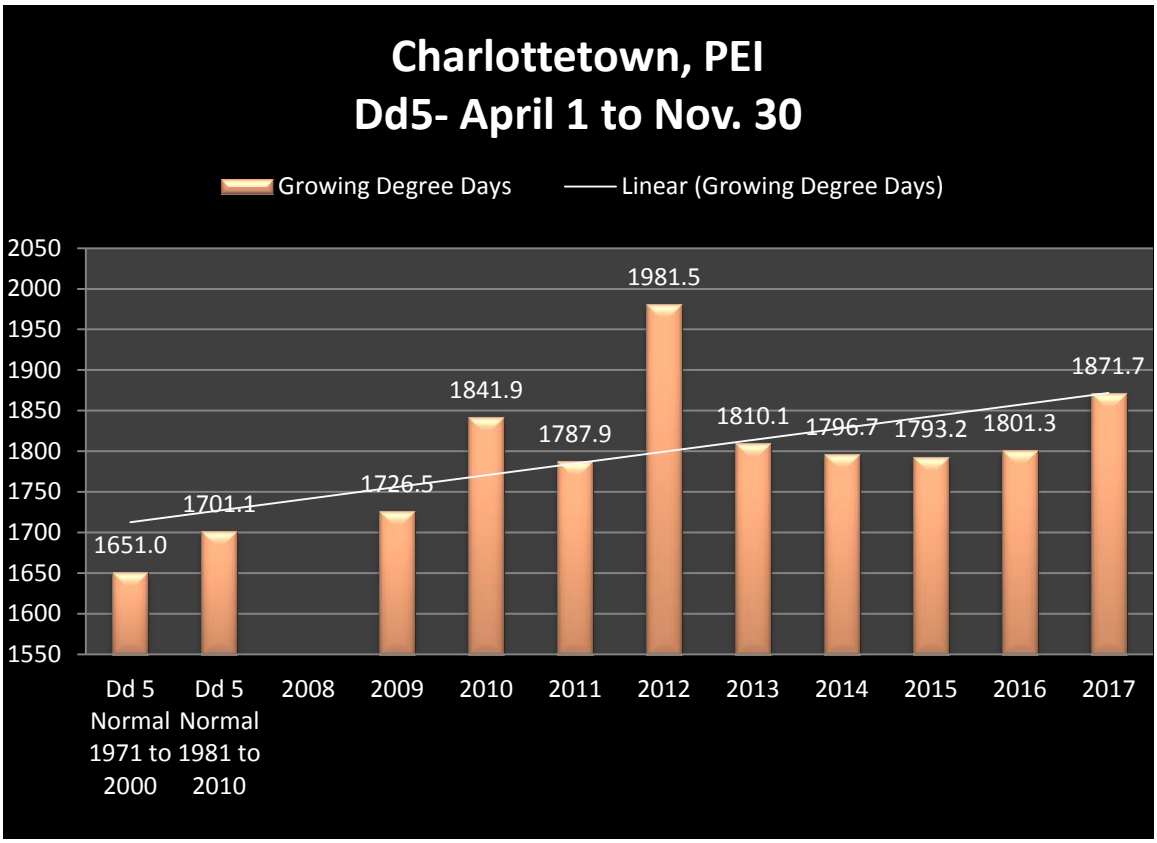

Figure 6 : Growing Degree Days at Charlottetown Compared to Historical Climate Normals

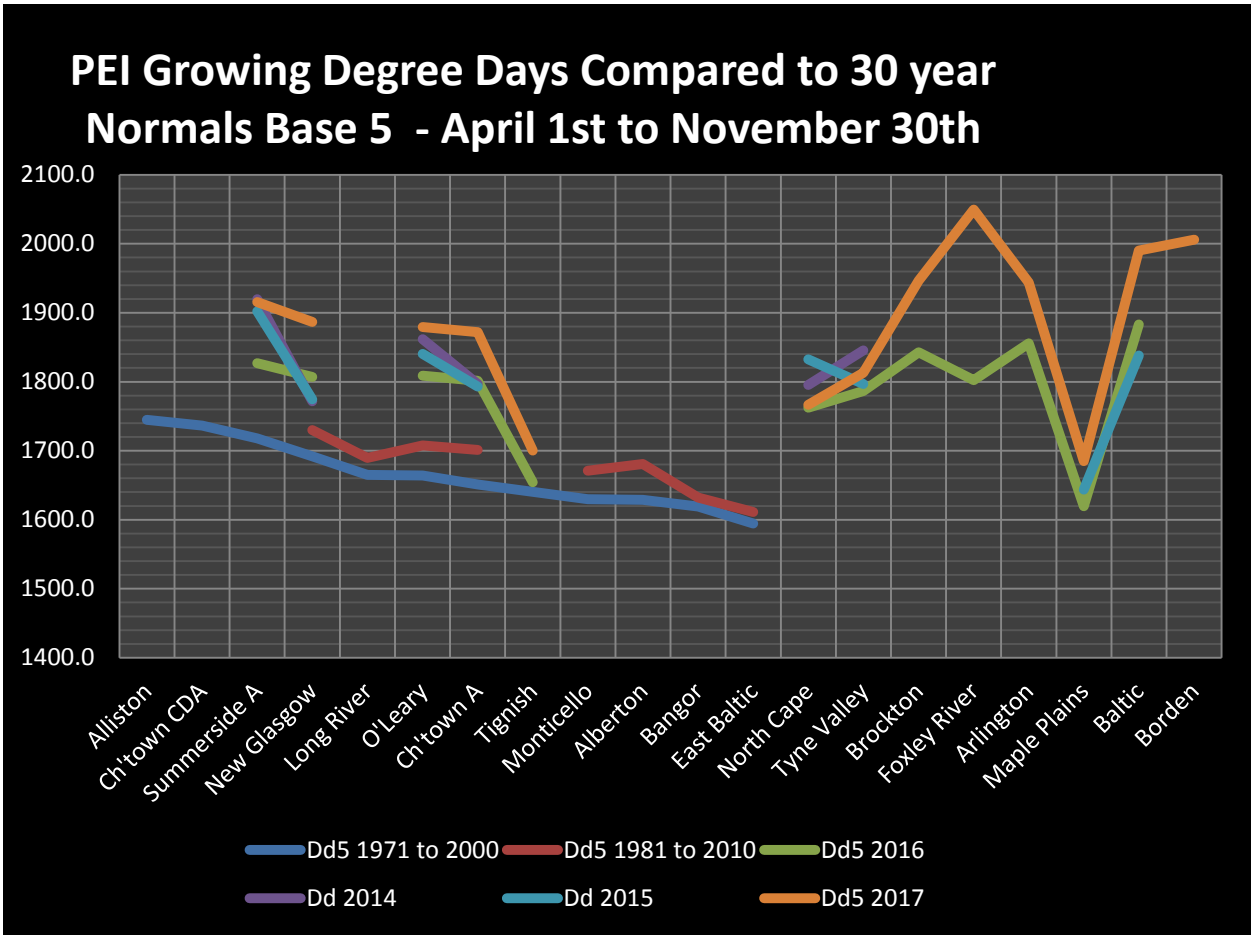

Figure 7 : Growing degree days at Select PEI Locations

Solar Radiation

There has been some renewal of interest in solar energy in the province. The City of Summerside has a new solar energy system at Credit Union Place which was launched in November 2017 under a partnership with Samsung Renewal Energy. During the first 4 months of operation, the system produced 93,000 KWh of electricity and the city estimates it will pay for itself in approximately 10 years. The system consists of 1,404 solar panels installed on the ground outside Credit Union Place with an additional 144 panels on special stands to allow cars to park under them. Lithium ion batteries are used to store the power. The system is expected to reduce the electricity bill at Credit Union Place by $100,000 annually and it had a price tag of $3 Million. There are plans to expand the solar capacity in the near future.

Acadian Machine Works Ltd, Pine Tree Lane in Tignish installed 35 solar panels on a south facing roof on one of their main buildings in May, 2016 and Jimmy Doucette, president of the company, is very pleased with the performance of the system. The system has produced an average of 1140 KWh per month since installation, which is sufficient to supply the annual energy needs for the equivalent of one home. The system requires little or no maintenance and during the past winter it didn't require any snow removal from the panels. The system was installed by Chris Randall of West Prince Solar Inc.

Figure 8 : Solar Panels at Acadian Machine Works, Tignish

With help from West Prince Solar Inc. (Chris Randall), Roger Dunn, a farmer at Elmsdale installed a bank of 72 solar panels on his farm on the Dock Road (Route 150) in 2017 and is reaping the benefits of the greenhouse gas free source sun energy. The panels began operating on September 13, 2017 and generate 20 kW per hour when in full operation. When the sun is shining the solar panels are capable of displacing 100 % of the farm's monthly power bill. The panels generate more than the power needs during the summer months and less in the winter. Credits can be accumulated for up to a one year period by sending power to the electric grid. The estimated payback for the system is 10 years.

Figure 9: Roger and Linda Dunn Solar Panels, Elmsdale, PEI

There are at least two other installations of solar panels in the Tignish area in recent years. The Tignish Legion installed solar panels as well as Gaudet's Electrical Services Ltd on the Hogan Road.

Figure 10 provides the daily average solar radiation from 9 locations on the UPEI monitoring network. As expected, solar energy is at its lowest during the winter months and highest during the summer.

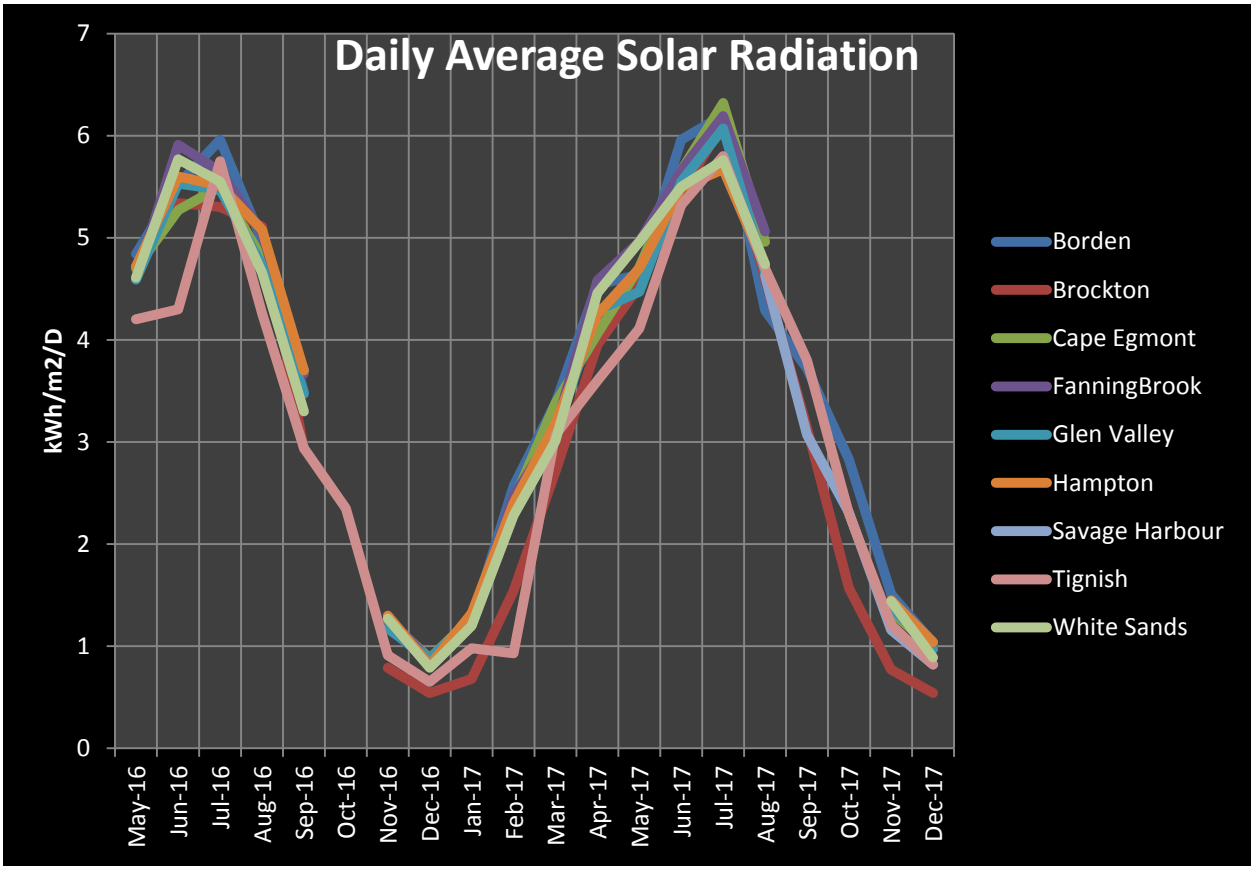

Figure 10: Average Daily Solar Radiation at Select PEI Locations

There were a number of significant storm and phenological events recorded during the year which are reported on table 8. Storm events can result in significant damage and the table outlines some of the damage which occurred during the year.

Table 8- Significant Weather or Phenological Events in 2017

Date	Event	Measurement	Winds	Damage	Areas Impacted
January 7	Snow storm	Up to 40cm	Gusting to 70 k/h		Entire province
January 25	Freezing rain, rain and snow	Up to 53 mm of rain		Freezing rain caused power outages	West Prince had freezing rain, entire province rain
February 13	Snow storm and Blizzard	20 cm of snow	Winds over 80 k/h	Schools, Holland College, UPEI, Gov't offices closed	Entire province
February 16	Snow storm and Blizzard		Winds over 82 k/h	Schools, Holland College, UPEI,	Entire province

				Gov't offices closed	
May 6	Heavy rain	33.5 mm		Delayed peat harvest operations	Foxley River
May 7	Heavy rain	33.6 mm			Baltic
May 9	Heavy Rain	31.0 mm			New Glasgow
May 26	Heavy Rain	34.0 mm			Cape Egmont
June 7	Record Low Temp	-1.6 C			Cardigan Head
June 9	Heavy rain		Strong winds		Across PEI
June 11	High Temp.	+30.9 C			Record high temperature at Tignish for this date.
June 15	Record Low Temp.	-2.7 C			Record Extreme low for this date. Cardigan Head
July 5	Record low Temp.	3.7 and 3.8 C			Recorded at Cardigan Head and Maple Plains
July 21/22	Severe thunderstorm		High wind gusts of 113 k/h at North Cape	20,000 customers without power, damage to equipment at Brackley Drive Inn	Brackley Beach, Dingwell's Mills
August 6	Heavy rain	61 mm			Caledonia
Sept. 14	Daily High Temp	27.9 C			Arlington
Sept. 26	Daily high Temp.	30.2 C			Mill Cove
Oct. 1	Widespread frost				Entire province
Oct. 8	Daily High Temp.	24..0 C			New Glasgow
Oct. 22	Widespread frost				Entire province
Oct. 23	Daily High Temp.	23.0 C			New Glasgow
Oct. 24	Daily High Temp.	22.2 C			Summerside
Oct. 25	Daily High Temp.	22.8 C			Summerside
Oct. 26	Daily High Temp.	24.4 C			Baltic
Nov. 23	First major snow Storm fall of 2017		Wind gust of 147 km/h reported on Confederation Bridge	Some power outages	Various areas.
Dec. 13	Wind storm		Wind gust of 111 k/h at Harrington		Harrington and other locations

Discussion

The year started out with above normal temperatures for the first two months. The winter was mild with normal snowfall amounts. The spring months were normal in temperature with below normal precipitation up to the month of July. This resulted in near drought conditions in some areas although crop yields for the most part were not severely impacted. Many farmers expected their potato crop yields to be below average but it appears that much needed rain in August and September resulted in a higher yield than expected. The precipitation totals for the year were all below normal at all locations as shown on table 6 with some locations accumulating over 400 mm less than normal.

December was slightly cooler than normal with several days with a mean daily temperature below 0 Celsius.

Top Three PEI Weather Stories of 2017 by Adam Fenech.

Another year has gone by and it's time to talk about Prince Edward Island's top three weather stories of 2017. This past year continues to remind us of the important part weather plays in our everyday lives. Every year brings stories of weather no matter where you are, and Prince Edward Island is no different.

And while I am tempted to speak about the wild temperature swings of early February where temperatures changed an average of a degree Celsius per hour over a 36-hour period, or the poor visibility from the "redouts" some drivers experienced in June around Summerside when wind gusts of up to 70 km/h kicked up red Island soil, I will focus on my top three weather stories for 2017, and how they affected Prince Edward Island.

Number 3 – Severe Summer Thunderstorm

A severe summer thunder and lightning storm on July 21 knocked out power to 20,000 Maritime Electric customers during the height of the storm. Blamed on the higher than normal water temperatures in the Gulf of St. Lawrence – three to five degrees above normal for that time of year – the massive thunderstorm rolled over Prince Edward Island causing marble-sized hail stones to chip the paint from the siding of the house of Maureen Campbell-Hanley at Dingwells' Mills, uprooting a large tree in her backyard. The Brackley Drive-In movie theatre was hit by lightning before 10 p.m. and had to close due to the damage to the $14,000 computer that manages the digital movies. "It was a little shocking," said owner Bob Boyle. The torrential rainfall turned ponds, rivers and streams bright red from silt run-off, and led to a fish kill in Campbellton. (Prince Co.)

Number 2 – Beach Day Temperatures in Late October

Summer did not want to say goodbye in 2017 with new record high temperatures across PEI on October 24 and 25 fit for a day at the beach. A "conveyor belt of warm, southerly air" brought temperatures averaging 11.4 degrees Celsius above normal in Charlottetown and 12.1 degrees Celsius above normal in Summerside. Those October temperatures were similar to PEI summer temperatures – about 1.5 degrees below the average August temperature in Charlottetown and less than a degree below the Summerside August average. Even a white-sided dolphin was seen in October around the Hillsborough River in Mount Stewart due to the warm weather.

Number 1 – Dry Summer

The dry summer climate affected everything from potatoes to berries – strawberry, raspberry and cranberry. Warmer and drier than normal weather in October led to a quicker potato harvest as it was easier to get them dug out of the ground, but the drier climate during the summer growing season led to a lower yield for many potato farmers on the Island. In 2017, PEI produced 23.66 million hundredweight (cwt.) of potatoes, down eight percent, or two million cwt., from 2016. Part of the lower yield can be blamed on the drier climate. Between June and September, Charlottetown normally receives 373.3 millimetres of rain, but in 2017, rainfall was down to 323.4 millimetres, with three of four months being below normal. Some crops like potatoes, in an ideal world, need about 25 millimetres of rainfall per week. An eight percent decline in potato production and

growing demand in 2017 forced PEI French fry processing plants to buy potatoes from Alberta, a distance of about 4,575 kilometres, which is unusual. The last time this happened was back in 2001 when PEI had a severe drought; potatoes were shipped from as far as Saskatchewan.

The dry weather also affected the size of PEI berries. Normally 15 to 20 strawberries will fill a box for market, but in 2017 it took double that number requiring farmers to go over their fields twice as often to getting the quantity needed. Some PEI raspberry growers had yields in 2017 about a quarter of what it was last year due to the weather with its winter freeze-thaw cycles, the damp spring and the dry summer which all had a negative impact on the raspberry canes. Cranberry growers on PEI use several millions gallons of water to flood one field and allow the berries to float to the top and be harvested. The lack of rain was hard on cranberry growers in 2017 as even water reservoirs were low after the dry summer. Many growers were unable to harvest a crop in 2017 because there was not enough rain for the plants, or to float the berries during harvest.

Climate Extremes for 2017

The climate extremes for the year for all reporting stations listed in this summary are shown on Table 9. As reported in table 8 a number of daily high and daily low temperature values were broken during the year. The month of October had five days which broke daily high values and October 2017 was the second warmest October in the history of weather observations for the province going back to 1873.

Table 9 -Climate Extremes Prince Edward Island Climate Stations 2017

Parameter	Extreme Value	Date Observed	Station
Daily Tmax (C)	30.9	June 11, 2017	Tignish
Daily Tmin (C)	-28.9	February 12, 2017	Maple Plains
Highest Annual Tmean	7.5		Orwell Cove
Lowest Annual Tmean	5.9		Maple Plains
Max Wind Gust (km/h)	135.0	March 22, 2017	Harrington
Max. Daily Ppt (mm)	53.1	January 25, 2017	Foxley River
Highest Annual Ppt (mm)	1131.4		New Glasgow
Highest Annual Snowfall (cm)	260.6		Charlottetown Airport

Figure 11 - New climate station at Savage Harbour, Abegweit Conservation Society, June 2017

Sources:

Adam Fenech

Environment Canada Climate Data Archives

WUnderground.com

CoCoRaHS.org/Canada

AgWeather Atlantic Website

Michael Radvanyi, Peters Road

PEIStormChaser Website maintained by Bill Jameson.

CBC News, various stories.

Roger and Linda Dunn, Elmsdale

Jimmy Doucette, Tignish

D. Jardine, UPEI Climate Research Lab, April 9, 2018

Appendix A – Comparison of Annual Normal Values for Tmean and Ptot

Table 6 – Mean Monthly and Annual Temperature Variation from 30 Year Normal – PEI Climate Stations 2017

	Jan	Var. from Normal	Feb	Var. from Normal	Mar	Var. from Normal	Apr	Var. from Normal	May	Var. from Normal	Jun	Var. from Normal	July	Var. from Normal	Aug	Var. from Normal	Sep	Var. from Normal	Oct	Var. from Normal	Nov	Var. from Normal	Dec	Var. from Normal	Year	Var. from Normal
Alliston	-4	3.7	-4.4	2.9	-3.6	-0.5			9.4	0.2	15.6	1.1	18.9	0.2	18.7	0.4	15.7	2.6	11.6	3.3	3.7	0.8	-3.8	-0.5	6.5	0.9
Alliston /Peters Rd	-3.5	4.2	-4.4	2.9	-2.5	0.6	5.2	2.1	9.4	0.2	15.6	1.1	19.8	1.1	19.1	0.8	16.7	1.6	12.1	4	4.6	1.7	-2.8	0.5	7.4	1.8
Arlington	-4.6	4	-5.3	2.4	-3.8	-0.6	4.1	1.2	9.8	0.4	15.9	1.1	19.3	0.7	18.6	0.2	15.7	1.4	11.3	3.1	2.7	0.3	-5	-1	6.6	1.1
Baltic	-4.2	3.5	-5.1	1.8	-3.8	-0.9	4.4	1.4	9.3	-0.2	15.6	0.9	19.2	0	18.8	0.2	16.1	2	12.3	3.9	3.2	0.6	-4.4	-0.9	6.8	1.1
Borden	-3	4.7	-4.7	2.2	-3.4	-0.5	4.5	1.5	10	0.5	15.8	1.1	19.3	0.1	19.9	1.3	16.5	2.4	12.5	4.1	3.9	1.3	-3.9	-0.1	7.3	1.6
Brockton	-5	3.2	-5.9	1.8	-4.2	-0.9	3.9	1.5	9.7	1	16.1	1.6	19.2	0.5	18.8	0.2	15.6	1.2	11.5	2.9	2.4	-0.2	-5.2	-1.7	6.4	0.9
Cape Egmont	-4.6	3.1	-5.4	1.5	-4	-1.1	3.8	0.8	9.7	0.2	15.2	0.5	18.9	0.2	18.9	0.3	16.1	2	12	3.6	3.3	0.7	-4.7	-0.9	6.6	0.9
Cardigan Head	-4.6	2.3	-5.5	1.5	-4	-1.2	3.9	1.5	8.2	-0.4	14.5	0.5	18.6	0.1	17.4	-1	14.7	0.4	10.6	2						
Ch'town A	-5	2.7	-5.5	1.8	-4.3	-1.2	4.1	1	9.5	0.3	15.5	1	18.4	-0.3	18.3	0	15.4	1.3	11.5	3.2	2.8	-0.1	-4	-0.7	6.4	0.8
Dingwells	-3.8	3.1	-4.4	3.4	-3.2	-0.4	4.4	2	8.9	-0.8	15.2	1.2	18.2	-0.3	17.9	-0.5	15.6	1.3	10.7	2.1	3.7	0.3	-3.4	-1	6.7	0.9
East Point EC	-2.4	4.4	-3.4	3.4	-2.8	0.1	3.2	0.8	7.5	-1.1	15.2	1.6	17.2	-1	17.9	-0.1	16.4	2.3	12.3	3.9	5.1	1.9	-1.7	0.8	7.0	1.4
East Point N	-3.1	3.7	-4.2	2.6	-3.5	-0.6	2.4	0	7.2	0.7	14	0.4	18.6	0.4	18.6	0.6	15.9	1.8	12	3.6	4.2	1	-2.8	-0.3	6.6	1.0
Elmwood	-4.5	3.2	-5	2.3	-3.8	-1	4.7	1.6	9.9	0.5	15.6	1	18.7	-0.1	18.5	-0.1	15.5	1.1	11.5	3	3.2	0.2	-4.2	-0.9	6.7	0.9
FanningBrook	-3.9	3.8	-4.5	2.8	-3.3	-0.2	4.9	1.8	9.7	0.4	15.9	1.4	18.8	0.1	18.5	0.2	15.4	1.3	11.7	3.4	3.9	0.9	-3.2	0.1	7.0	1.4
Flat River	-3.3	4.4	-3.7	3.6	-2.6	0.5	4.9	1.8	9.6	0.4	15.3	0.8	18.6	-0.1	18.8	0.5	16	1.9	11.7	3.4	4.3	1.4	-2.4	0.9	7.3	1.7
Foxley River	-3.8	4.8	-5	2.7	-3.3	-0.1	4.4	1.5	9.8	0.4	16.3	-0.2	19.9	1.3	19.2	0.8	16.3	2	12.3	4.1	3.3	0.9	-4.3	-0.3	7.1	1.6
Glen Valley	-4.7	3	-5.1	2.2	-4.1	-1.3	4.1	1	8.9	-0.3	15.4	0.8	18.4	-0.4	18.4	-0.2	15.7	1.3	11.7	3.2	2.9	-0.1	-4.7	-0.9	6.4	0.8
Hampton	-4.7	3	-5.2	1.7	-3.8	-0.9	4	1	9.2	-0.3	14.5	-0.2	18.1	-1.1	18.2	-0.4	15.6	1.5	11.3	2.9	3.3	0.7	-4.3	-0.3	6.4	0.6
Harrington	-4.7	3	-5.3	2	-4.1	-1	4.1	1	9.4	0.2	15.6	1.1	18.6	-0.1	18.2	-0.4	15.6	1.5	11.6	3.3	3.1	0.2	-4.1	-1.4	6.5	0.9
Hope River	-3.3	4.4	-3.5	3.8									19.9	1.1												
Maple Plains	-4.9	2.8	-5.8	1.1	-4.4	-1.5	3.9	0.9	9.1	-0.4	14.6	-0.1	17.7	-1.5	17.1	-1.5	14.6	0.5	10.9	2.5	2.7	0.1	-5	-1.2	5.9	0.2
Mill Cove	-4.3	3.4	-5	2.3	-3.2	-0.1	4.6	1.5		0.3	16	1.5	19.3	0.6	19	0.7	15.9	1.8	12	3.7	3.5	0.6	-3.8	-0.5	6.2	0.6
New Glasgow	-4.5	3.2	-5.2	2.1	-3.8	-1	4.7	1.6	8.9	-0.3	15.4	0.8	18.4	-0.4	17.8	-0.8	15.8	1.4	12	3.5	3.2	0.2	-4.4	-1.1	6.5	0.7
North Cape	-4	4.2	-5.2	2.5	-4.4	-1.1	2.9	0.5	7.6	-1.1	14.7	0.2	18.7	0	18.6	0	15.3	0.9	11.5	2.9						
Orwell Cove	-3.1	4.6	-3.4	3.9	-2.6	0.5	5.2	2.1	10.3	1.1	15.9	1.4	19	0.3	19.3	1	16	1.9	11.9	3.6	4.3	1.4	-2.7	0.6	7.5	1.9
Savage Hbr															18.9	0.6	16.4	1.7	12.5	4.2	3.9	1	-3.7	-0.4		
St. Catherines'	-4.2	3.5	-4.6	2.7	-3.5	-0.4	4.8	1.7	10	0.8	15.8	1.3	19.3	0.6	19	0.7	15.8	1.5	12.1	3.8	3.7	0.8	-3.9	-0.6	7.0	1.4
St. Peter's	-4	2.9	-4.5	2.5	-3.8	-1	3.9	1.5	8.6	0	15.4	1.4	20.5	2	18.4	0	15.8	2.3	11.7	3.1	4.1	0.7	-3.7	-1.3	6.9	1.1
Summerside	-4.9	2.8	-6.1	0.8	-4.6	-1.7	4.3	1.3	10	0.5	15.7	1	19.2	0	18.6	0	15.8	1.7	11.5	3.1	2.7	0.1	-4.7	-0.9	6.5	0.8
Tignish	-4.4	3.8	-5.4	2.3	-3.9	-0.6	3.9	1.5	8.8	0.1	15.9	1.4	19.4	0.7	18.1	-0.5	15.6	1.2	11.4	2.8	2.6	0	-4.8	-1.3	6.4	0.9
White Sands	-3	4.7	-3.8	3.5	-3	0.1	4.4	1.3	8.9	-0.3	15.4	0.9	19.2	0.5	19.2	0.9	16.6	2.5	12.3	4	4.6	1.7	-2.5	-0.8	7.4	1.8
Winsloe South	-3.8	3.9	-4.4	2.9	-3.5	-0.4	4.4	1.3	9.4	0.2	15.8	1.3	19.1	0.4	18.7	0.4	15.8	1.7	12	3.7	3.4	0.5	-4.2	-0.9	6.9	1.3
Average	-4.1	3.6	-4.8	2.4	-3.6	-0.6	4.2	1.3	9.2	0.1	15.4	0.9	18.9	0.2	18.6	0.1	15.8	1.6	11.7	3.4	3.5	0.7	-3.9	-0.6	6.8	1.1

Table 7 – Mean Monthly Precipitation Variation from 30 Year Normal – PEI Climate Stations 2017 (mm)

	Jan	Var. from Normal	Feb	Var. from Normal	Mar	Var. from Normal	Apr	Var. from Normal	May	Var. from Normal	Jun	Var. from Normal	July	Var. from Normal	Aug	Var. from Normal	Sep	Var. from Normal	Oct	Var. from Normal	Nov	Var. from Normal	Dec	Var. from Normal	Year	Var. from Normal
Alliston	36.3	-64.7	13.2	-70	16.9	-69.4			138.3	47.3	63.2	-35.6	47.2	-32.7	98	2.3	71.9	-24	40.6	-71.6	74.4	-38.1	69.1	-49	669.1	inc
AllistonPeters Rd	117	15.9	115.6	32.4	59	-27.3	57.4	-26.3	134.9	43.9	94.5	-4.3	52.1	-27.8	119.2	23.5	100	4.1	44.5	-67.7	95.6	-16.9	101	-17.1	1090.7	-67.6
Arlington	25.6	-73.4	25.4	-56.4	15	-74.4	28.4	-58.4	186.8	83.9	71.4	-13.4	27.8	-68.2	55.4	-32.3	77.7	-24.1	52.6	-47	116	3.9	50.6	-55.9	732.7	inc
Baltic					0		36.1	-48.1	167.5	72.6	92.6	1.3	13	-61.1	50.4	-42.3	39.3	-57.4	39.6	-48.1	131.1	5.1			569.6	inc
Borden	90.7	-5.5	113.5	-53.3	46.7	-32.7	43.7	-43.1	146.3	51.4	92.2	0.9	27.4	-46.7	94.5	1.8	58.4	-38.3	57.2	-47.6	101.1	3.4	81.3	-19	953.0	-119.9
Brockton	56.4	-40	47	-27.5	34.8	-46.1	28.7	-51.4	106.7	14	59.2	-22.9	20.2	-66.1	24.6	-55.1	54.1	-37.5	40.1	-56	42.4	-56.7			514.2	inc
Cape Egmont	68.8	-27.4	18.8	-56.1	40.1	-44.1	40.1	-44.1	156.2	61.3	61.2	-30.1	21.6	-52.5	47.5	-45.2	69.6	-27.1	46.5	-41.2	113	15.3	68	-32.3	751.4	-321.5
Cardigan Head	97.2	-3.7	91.7	10	61	-26	49	-37.8	152.9	62.8	71.4	-19.3	40.6	-38.7	94.2	5.3	81	-26.9	41.4	-73.6	119.1	-5	79.2	-38.4	978.7	-191.5
Ch'town Airport	110	9.3	113.1	29.9	66.7	-19.6	41.9	-41.8	160.4	69.4	85	-13.8	68.8	-11.1	127.5	31.8	73.9	-22	37.8	-74.4	93	-19.5	85.8	-32.3	1064.2	-94.1
Dingwells	101	-0.1	62.7	-19	41.4	-45.6	41.4	-45.4	133.9	43.8	64.5	-26.2	35.8	-43.5	82	-6.9	68.1	-39.8	32.3	-82.7	89.4	-34.7	63	-54.6	815.3	-354.9
East Point	81.4	-34.7	36.7	-54.6	18.9	-76.8	45.4	-47.3	102.5	9.4	55.4	-45.5	44.4	-42.2	97	-6.6	71.2	-43.5	30.1	-92.4	91.4	-34.6	101	-27.9	775.4	-496.6
East Point New	74.4	-41.7	10	-81.3	18	-77.7	45	-47.7	96.6	3.5	68.4	-32.5	36.2	-50.4	82.6	-21	67.4	-47.3	25.8	-96.7	70.2	-55.8	81.6	-47.3	676.2	inc
Elmwood	26.2	-9	100.1	13.3	48.3	-47.3	51.8	-43.8	164.3	66	91.4	-6.9	29.5	-49.1	123.7	36.2	78	-29.4	36.8	-84.9	115.3	-14	81.3	-51.2	946.7	-311.2
FanningBrook	94.5	-6.5	42.7	-40.5	38.4	-45.3	30.2	-45.3	111.8	20.8	73.2	-25.6	40.1	-39.8	71.6	-24.1	53.3	-42.6	29.5	-82.7	89.9	-22.6	69.8	-48.3	745.0	-413.3
Flat River	61.7	-39.3	42.4	-40.8	15.7	-56.1	30.2	-53.5	100.3	9.3	35.3	-63.5	24.6	-55.3	75.7	20	46.7	-49.2	33	-84	47.2	-65.3	15.5	-102.6	528.3	inc
Foxley River	99.8	0.8	57.2	-24.6	45.2	-44.2	28.4	-58.4	175.3	72.4	78.2	-6.6	15.2	-80.8	49	-38.7	50	-51.8	45.2	-54.4	108.7	-3.4	99.1	-7.4	851.3	-296.5
Glen Valley	60.2	-59.8	21.6	-65.2	18.5	-58.5	37.1	-58.5	149.4	51.1	95	-3.3	38.9	-39.7	81.3	-6.2	63.2	-44.2	42.4	-79.3	129.3	0	80.5	-52	817.4	-440.5
Hampton	21.8	-74.4	18.3	-56.6	17.8	-66.4	42.7	-41.5	123.4	28.5	57.4	-33.9	32.8	-41.3	105.2	12.5	73.7	-23	43.7	-44	96.3	-1.4	53.6	-46.7	686.7	inc
Harrington	108	6.6	62.9	-20.3	37.6	-48.7	40.9	-43.8	155.9	64.9	75.3	-23.5	37.4	-42.5	99.2	3.5	56.5	-39.4	34.8	-77.4	120.5	8	77.7	-40.4	906.3	-252.0
Hope River	51.8	-49.2	24.9	-61.9	17.8	-61.9	32.5	-63.1	111.5	13.2	18	-80.3	18.5	-60.1	41.7	-45.8	40.9	-66.5	42.2	-79.5	92.2	-37.1	16.3	-116.2	508.3	inc
Maple Plains					37.4	-46.8	37.4	-46.8	143.6	48.7	87.4	-3.9	37.4	-36.7	100.8	8.1	60	-36.7	34.8	-52.9	132	34.3			670.8	inc
Mill Cove	53.1	-47.9	22.6	-60.6	16.2		39.6	-44.1	140.1	49.1	68.3	-30.5	33	-46.9	102.6	6.9	43.9	-52	35.3	-76.9	102.4	-10.1	70.4	-47.7	727.5	inc
New Glasgow	147	27	104.4	17.6	69.8	-25.8	53.6	-42	177	78.7	72.4	-25.9	72.2	-6.4	86.8	-0.7	72.8	-34.6	41.6	-80.1	126	-3.3	102.2	-30.3	1125.8	-132.1
North Cape	79.2	-17.2	66.6	-7.9	55.9	-25	50	-30.1	161.9	69.2	64.7	-17.4	45.4	-40.9	72.6	-7.1	53.1	-38.5	80.1	-16	147.4	48.3	107.1	13.4	984.0	-69.1
Orwell Cove	80.8	-20.2	21.3	-61.9	18.8	-67.8	26.7	-57	100.8	9.8	48.8	-50	43.4	-36.5	79	-16.7	73.7	-22.2	28.2	-84	79	-33.5	65	-53.1	665.5	inc
St. Catherines'	50	-51	17.5	-65.7	14.5	-71.8	35.6	-48.1	139.7	48.7	54.1	-44.7	33.3	-46.6	113	17.3	54.9	-41	40.1	-72.1	81.3	-31.2	47.8	-70.3	681.8	inc
St. Peter's	124	23.2	84.6	2.9	43.6	-43.4	47	-39.8	108.1	18	50.4	-40.3	26.7	-52.6	65	-23.9	47.2	-60.7	29.5	-85.5	106.3	-17.8	105.6	-12	838.1	-332.1
Savage Harbour															59	-36.7	40	-55.9	26.4	-85.8	91	-21.5	52.4	-65.7	268.8	inc
Summerside	80.3	-15.9	45.8	-29.1	24.8	-54.6	33.3	-50.9	148.4	53.5	69	-22.3	25.6	-48.5	45.1	-47.6	79.5	-17.2	45.4	-42.3	115.8	18.1	77.5	-22.8	790.5	-282.4
Tignish	66.2	-30.2	49.4	-25.1	33.6	-47.3	36.8	-43.3	139.2	46.5	57	-25.1	21.4	-64.9	54	-25.7	40.4	-51.2	72.2	-23.9	115.6	16.5	84.6	-9.1	770.4	-282.7
White Sands	53.3	-47.7	9.7	-73.5	16.5	-73.5	34.8	-48.9	83.6	-7.4	38.6	-60.2	19	-60.9	71.1	-24.6	90.9	-5	30.7	-81.5	56.9	-55.6	62.7	-55.4	567.8	inc
Winsloe South	88.9	-2.4	89.7	6.5	43.9	-42.4	35.1	-48.6	152.1	61.1	86.6	-12.2	71.4	-8.5	131.6	35.9	68.3	-27.6	26.9	-85.3	109.7	-2.8	89.4	-28.7	993.6	-164.7
Average	76.0		52.7		33.3		39.4		137.7		67.7		35.5		81.3		63.1		40.2		100.0		73.8		770.8	-256.8
																									inc= incomplete record	