

Climate Research Lab Monthly Meteorological Summary-December, 2017

Background

This summary is produced by the UPEI Climate Lab for the month of December, 2017. Data is reported for 32 climate stations in the province as shown on Table 1. The annual summaries of PEI climate data for 2014, 2015 and 2016 and the monthly summaries for 2017 are now posted on the UPEI Climate Lab Website. (<http://projects.upei.ca/climate/research/>).



Figure 1 –Lecky Road Washout, Milburn, December 2014

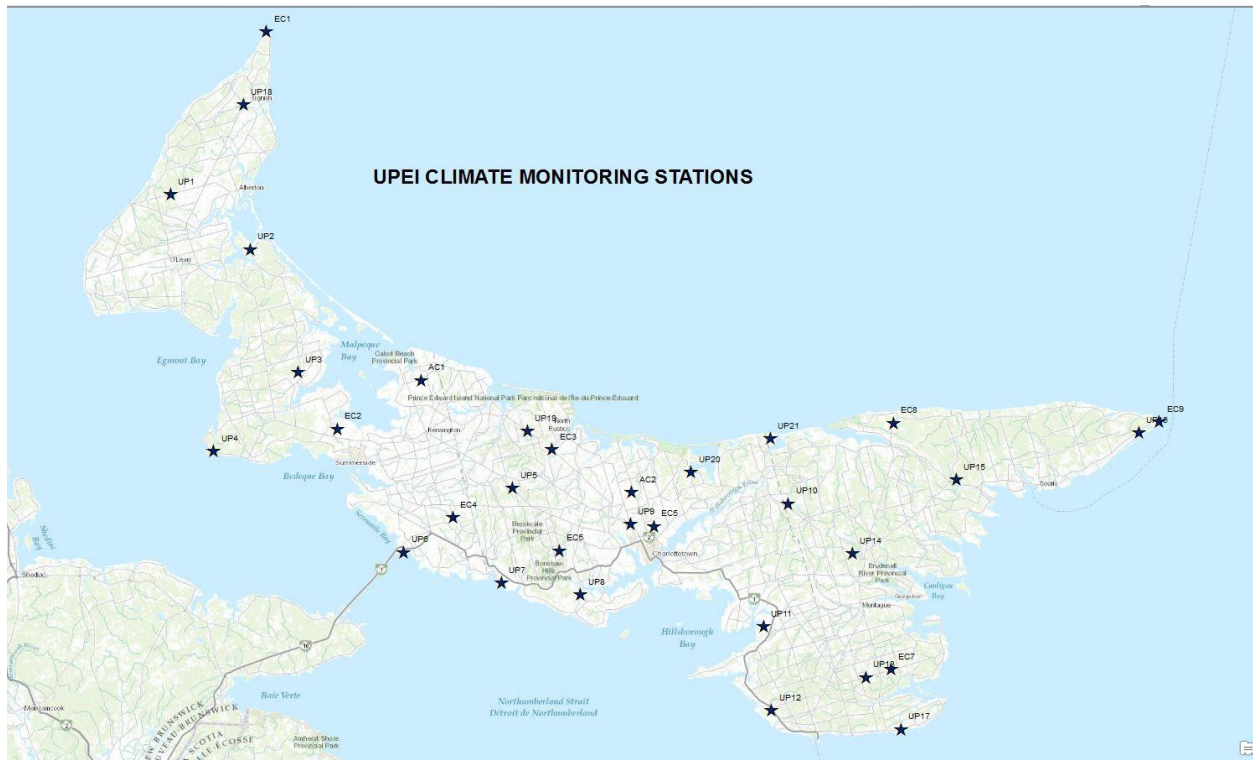


Figure 2 - Map showing climate station locations monitored by the UPEI Climate Research Lab

A listing of stations currently being monitored by UPEI Climate Research Lab is provided in Table 1. This includes Environment Canada, Agriculture Canada, Agriculture PEI, NAV Canada, UPEI and privately operated stations that operate on an annual basis.

Table 1 – PEI Climate Stations Monitored by UPEI

ID Code	Map ID	Community	Lat.	Long.	Date Installed	Operator
IPRINCEE22	UP13	Alliston	46.052032	-62.638389	25-Jun-15	CNP
8300100	EC7	Alliston/Peters Road	46.064393	-62.581808	01-Jan-36	M. Radvanyi
Remote	UP3	Arlington	46.52964	-63.927503	30-Jun-15	Arlington Orchard
KNW01	AC1	Baltic	46.517266	-63.648411	14-Aug-14	Kensington North
IPEBORDE2	UP6	Borden - Carleton	46.248346	-63.686935	26-Jan-95	G. Read

IPRINCEE28	UP1	Brockton	46.80649	-64.21685	23-Sep-15	UPEI
83000562	EC8	Cable Head	46.4503	-62.5758	14-Aug-03	EC
IPRINCEE26	UP4	Cape Egmont	46.4067	-64.118742	10-Sep-15	UPEI
IPRINCEE17	UP14	Cardigan Head	46.2461	-62.66833	01-Oct-14	R. Angus
8300300	EC5	Charlottetown	46.28917	-63.119167	14-Sep-12	NAV Canada
IPRINCEE16	UP15	Dingwells Mills	46.362154	-62.432651	14-Nov-13	UPEI
IPRINCEE31	UP16	East Point	46.43554	-62.018632	16-Jul-15	Newman
8300418	EC9	East Point	46.45227	-61.971635	8-Dec-92	EC
IPEIELMW2	EC5	Elmwood	46.2508	-63.3342	01-Sep-93	B. Jameson
IPRINCEE32	UP10	Fanning Brook	46.32419	-62.8141	05-Nov-15	UPEI
IPRINCEE13	UP12	Flat River	45.999949	-62.852033	06-Nov-13	UPEI
IPRINCEE15	UP2	Foxley River	46.7208	-64.0356	20-Nov-13	UPEI
IPRINCEE30	UP5	Glen Valley	46.34884	-63.439941	06-Oct-15	UPEI
IPRINCEE27	UP7	Hampton	46.2003	-63.4652	11-Sep-15	M. Cassidy
830P001	AC2	Harrington	46.342506	-63.169736	01-Jul-00	Agric. Canada
IPRINCEE 35	UP19	Hope River	46.43816	-63.40707	10- December-16	A.MacKay
8305500	EC4	Maple Plains	46.3028	-63.575567	21-Jun-01	BBEMA
IPRINCEE 4	UP20	Mill Cove	46.37400	-63.03508	24-Apr-12	P. Lawlor
8300497	EC3	New Glasgow	46.408911	-63.350289	01-Oct-71	H. Dingwell
8300516	EC1	North Cape	47.05806	-63.998611	18-Oct-02	EC
IPRINCEE14	UP11	Orwell Cove	46.13153	-62.869768	13-Nov-13	UPEI
IPRINCEE21	UP8	St. Catherine's	46.182023	-63.286157	25-Jun-15	Matos Winery
ISAVAGEH2	UP21	Savage Harbour	46.42587	-62.85565	June 27, 2017	Abegweit Conservation Society
8300700	EC2	Summerside	46.44111	-63.83806	19-Jul-99	EC
IPRINCEE36	UP18	Tignish	46.9453	-64.0516	02- December-16	UPEI
IPRINCEE19	UP17	White Sands	45.970	-62.558	25-Oct-14	M. Harwood
IPRINCEE11	UP9	Winsloe South	46.292358	-63.1727104	13-Sep-13	UPEI

Data Summary

Table 2 summarizes the climate data recorded during the month of December 2017 for all observation stations monitored by UPEI Climate Research Lab. Daily average solar radiation for stations which have solar radiation sensors is included to provide information for solar energy, crop production, and plant growth purposes. The Environment Canada Station at North Cape and a private station at Cardigan Head experienced some technical issues with their temperature sensors during December.

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

Climate Station Name	Map ID	Tmean °C	Tmax °C	Tmin °C	PPT (mm)	Snow (cm)	Avg. Wind Speed km/h	Max. Wind Speed km/h	Daily Avg. Solar Radiation (kWh/m²/D)
Alliston / Peters Road	EC7	-2.8	12.5	-19.0	109.1	4.0			
Alliston (CNP)	UP13	-3.8	11.9	-19.7	69.1		5.5	64.4	
Arlington	UP3	-5.0	10.8	-20.4	50.6		2.2	41.8	
Baltic	AC1	-4.7	12.0	-19.4			17.8	46.9	
Borden	UP6	-3.9	10.1	-18.7	63.8	0.0	21.3	86.9	1.03
Brockton	UP1	-5.2	9.3	-18.1			7.8	66.0	0.54
Cape Egmont	UP4	-4.7	8.5	-18.8	68.0		15.4	74.0	0.98
Cardigan Head	UP14	Inc	Inc	Inc	79.2		4.3	51.5	
Ch'town Airport	EC6	-4.0	12.2	-19.4	85.8	22.7		82.0	
Dingwells	UP15	-3.4	11.3	-23.6	63.0		7.5	75.6	
East Point	EC9	-1.7	12.8	-18.4	101			91.0	
East Point (N)	UP16	-2.8	10.4	-18.6	81.6		11.9	80.5	
Elmwood	EC5	-4.2	11.2	-18.9	57.9	23.6	10.0	56.3	
Fanning Brook	UP10	-3.2	12.7	-18.3	69.8		9.7	62.8	0.99
Flat River	UP12	-2.4	12.2	-17.3	15.5		12.8	82.1	
Foxley River	UP2	-4.3	10.1	-17.7	99.1		8.5	72.4	
Glen Valley	UP5	-4.7	11.3	-19.6	80.5		15.1	72.4	0.97
Hampton	UP7	-4.3	10.6	-19.2	53.6		18.4	93.3	1.04
Harrington	AC2	-4.1	12.4	-20.2	77.7		16.3	111.0	
Hope River	UP19	-1.5	22.0	-6.5	92.2		12.8	92.5	
Maple Plains	EC4	-5.0	11.2	-20.9			14.6	44.6	
Mill Cove	UP20	-3.8	13.0	-20.5	70.4		4.7	40.2	
New Glasgow	EC3	-4.4	12.0	-20.0	102.2	20.0			
North Cape	EC1	Inc	Inc	Inc	107.1		35.4	96.0	
Orwell	UP11	-2.7	12.9	-17.3	65.0		12.8	61.1	

Cove									
St. Catherines	UP8	-3.9	11.2	-19.2	47.8		7.9	64.4	
St. Peter's	EC9	-3.7	11.6	-20.8	105.6		18.1	96.0	
Savage Harbour	UP21	-3.7	12.6	-19.6	52.4		14.1	72.4	0.82
Summerside	EC2	-4.7	11.5	-19.1	77.5		21.6	82.0	
Tignish	UP18	-4.8	9.4	-19.0	84.6		7.4	66.0	0.82
White Sands	UP17	-2.5	10.8	-17.7	62.7		20.5	105.6	0.89
Winsloe South	UP9	-4.2	11.9	-19.1	79.0	23.6	5.2	45.1	

? Reading maybe inaccurate.

Inc. Incomplete record, equipment malfunction

The measurements from ten (10) CoCoRaHS observers located on PEI are recorded in table 3. Some of the CoCoRaHS stations listed on table 3 are also climate stations listed on Table 2. This includes: UP6, EC5, and UP9.

Table 3 CoCoRaHS Precipitation Amounts from Eleven Locations on PEI, December, 2017

CoCoRaHS Station	Total Precipitation in mm	Total Snowfall in cm
CAN-PE-1 Stratford	58.2	14.7
CAN-PE-3 Wellington	88.9	31.0
CAN-PE-7 Morell	86.4	23.9
CAN-PE-10 New London	98.8	15.5
CAN-PE-13 Bedeque	61.5	5.1
CAN-PE-19 Winsloe South	89.4	23.6
CAN-PE-20 Bonshaw	81.3	23.6
CAN-PE-23 Borden-Carleton	81.3	0.0
CAN-PE-25 – Caledonia	128.5	15.7
CAN-PE-26 – Grand Tracadie	67.8	18.3

Table 4 provides thirty year climate normal values for the 1981 to 2010 period for seven (7) climate stations in the province for the month of December.

Table 4 December Climate Normal for PEI Stations 1981 to 2010

Parameter	Ch'town A	New Glasgow	Summerside A	O'Leary	Alberton	Monticello	East Baltic
Mean Monthly T in C	-3.3	-3.3	-3.8	-4.0	-3.5	-2.4	-2.5
Mean Monthly Ppt. in mm	118.1	132.5	100.3	106.5	93.7	117.6	128.9

Mean Monthly Snow cm	65.6	72.3	53.5	59.3	50.8	55.9	61.8
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Discussion

December temperatures were mainly slightly below normal across the province with just 5 stations reporting slightly above normal temperatures. The highest monthly mean for the province was -1.7°C which was observed at East Point possibly due to the continued buffering effect of the warm water temperatures in the Gulf of St. Lawrence and Northumberland Strait. The low monthly mean was -5.2°C at Brockton. The maximum temperature for the month was 13.0°C at Mill Cove on December 13th. The coldest temperature reported during the month for all stations listed in this summary was -23.6°C which was recorded at Dingwells Mills on December 31st.

Table 5 – Variation of December 2017 Monthly Mean Temperature from 1981-2010 Climate Normal

Climate Station	December 2017 Mean C	30 Year Normal C 1981-2010	Variation from Normal C
Alliston / Peters Rd	-2.8	-3.3	0.50
Alliston CNP	-3.8	-3.3	-0.50
Arlington	-5.0	-4.0	-1.00
Baltic	-4.7	-3.8	-0.90
Borden - Carleton	-3.9	-3.8	-0.10
Brockton	-5.2	-3.5	-1.70
Cape Egmont	-4.7	-3.8	-0.90
Cardigan Head	Inc	-2.4	Inc
Charlottetown A	-4.0	-3.3	-0.70
Dingwells	-3.4	-2.4	-1.00
East Point	-1.7	-2.5	0.80
East Point – UP16	-2.8	-2.5	-0.30
Elmwood	-4.2	-3.3	-0.90
Fanning Brook	-3.2	-3.3	0.10
Flat River	-2.4	-3.3	0.90
Foxley River	-4.3	-4.0	-0.30
Glen Valley	-4.7	-3.3	-1.40
Hampton	-4.3	-3.8	-0.50
Harrington	-4.1	-3.3	-0.80
Hope River	-1.5	-3.3	1.80
Maple Plains	-5.0	-3.8	-1.20
Mill Cove	-3.8	-3.3	-0.50
New Glasgow	-4.4	-3.3	-1.10
North Cape	Inc	-3.5	Inc
Orwell	-2.7	-3.3	0.60

St. Catherine's	-3.9	-3.3	-0.60
St. Peters	-3.7	-2.4	-1.30
Savage Harbour	-3.7	-3.3	-0.40
Summerside A	-4.7	-3.8	-0.90
Tignish	-4.8	-3.5	-1.30
White Sands	-2.5	-3.3	-5.80
Winsloe South	-4.2	-3.3	-0.90

Readings in red may not be accurate.

Table 6 – Variation of December 2017 Total Precipitation Amounts from 1981-2010 Climate Normal

Climate Station	Total PPT in mm December 2017	30 Year Normal mm 1981-2010	Variation from Normal mm
Alliston / Peters Rd	101.0	118.1	-17.10
Alliston CNP	69.1	118.1	-49.00
Arlington	50.6	106.5	-55.90
Baltic			
Borden – Carleton (CoCo Can-PE-23)	81.3	100.3	-19.00
Brockton			
Cape Egmont	68.0	100.3	-32.30
Cardigan Head (CoCo Can-PE-27)	79.2	117.6	-38.40
Charlottetown A	85.8	118.1	-32.30
Dingwells	63.0	117.6	-54.60
East Point - EC	101.0	128.9	-27.90
East Point – UP16	81.6	128.9	-47.30
Elmwood (CoCo- Can-PE-20)	81.3	132.5	-51.20
Fanning Brook	69.8	118.1	-48.30
Flat River	15.5	118.1	-102.60
Foxley River	99.1	106.5	-7.40
Glen Valley	80.5	132.5	-52.00
Hampton	53.6	100.3	-46.70
Harrington	77.7	118.1	-40.40
Hope River	16.3	132.5	-116.20
Maple Plains			
Mill Cove	70.4	118.1	-47.70
New Glasgow	102.2	132.5	-30.30
North Cape	107.1	93.7	13.40
Orwell	65.0	118.1	-53.10
St. Catherine's	47.8	118.1	-70.30
St. Peters	105.6	117.6	-12.00
Savage Harbour	52.4	118.1	-65.70
Summerside A	77.5	100.3	-22.80

Tignish	84.6	93.7	-9.10
White Sands	62.7	118.1	-55.40
Winsloe South (CoCo-Can-PE-19)	89.4	118.1	-28.70

Readings in red may not be accurate due to no rain collector heater or gauge malfunction.

All stations except North Cape had below normal precipitation during the month. As indicated on table 6 some stations did not accurately record precipitation due to lack of a heater unit to enable determination of the water equivalent or due to equipment malfunction. The highest rainfall total for December was 128.5 mm at the CoCoRaHS station in Caledonia and the lowest total was 63.0 mm at Dingwells Mills.

Snowfall was much below normal during December with a highest total snowfall recorded of 31.0 cm at the CoCoRaHS station at Wellington. The station at Borden-Carleton didn't report snow during the month.

Average wind speeds across the province ranged from 2.2 km/h at Arlington to 35.4 km/h at North Cape. The maximum gust for the month was 111 km/h reported at Harrington on December 13th.

The solar radiation values ranged from 0.54 kWh/m²/D at Brockton to 1.04 kWh/m²/D at Hampton. These readings were slightly higher than most reported for the same month in the previous year.

Closure

- Temperatures were generally slightly below normal across the province.
- Precipitation was generally below normal for all reporting stations with below normal snowfall reported
- A major wind storm with some snow occurred on December 13th.
- The maximum wind gust recorded was 111 km/h at Harrington Research Station on December 13th.

Some phenological and weather events during the month are recorded on Table 7.

Table 7–December Weather or Phenological Events 2017

Date	Location	Type of Event	Comments
December 4 th	Entire province	First snow storm of the winter	3 cm of snow at Charlottetown with a power pole down at Desable.
December 10 th	Winsloe South	Rain and snow storm	21.4 mm of rain and 1.0 cm of snow
December 13 th	Harrington and other locations	Wind storm	Gust of 111 km/h at Harrington
December 25 th	Entire province	Very windy, some power outages	A White Christmas



Figure 3- Aerial Photo Lennox Island, September 2017

Sources:

Environment Canada Climate Data Archives and associated websites

WUnderground.com

CoCoRaHS.org/Canada

AgraWeather Atlantic Website

Michael Radvanyi

PEIStormChaser

CBC News

The Guardian

D. Jardine, UPEI Climate Research Lab, March 8, 2018.