



CLIMATE CHANGE REPORT **SERIES**

Real-Time Weather Stations in Nova Scotia and Their Spatial Gaps

Xander Wang, Ph.D., P.Eng.

School of Climate Change and Adaptation
University of Prince Edward Island

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University of Prince Edward Island, Charlottetown, Canada.

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Xander Wang, Ph.D., P.Eng.
School of Climate Change and Adaptation
University of Prince Edward Island
550 University Avenue
Charlottetown, PE
Canada C1A 4P3
Telephone: (902) 628-4343
Email: xxwang@upei.ca

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For any questions or concerns, please contact Dr. Xander Wang at:
xxwang@upei.ca.

Executive Summary

Real-time weather information is extremely important for predicting extreme weather events and developing emergency response measures. In particular, the development of reliable flood forecasting systems heavily relies on a well-established weather monitoring network which is expected to be capable of capturing the spatial variations of local climate. In this study, we aim to investigate on the availability of real-time weather stations across Nova Scotia and the gaps in their spatial coverage. The results from this study will be used to help determine where to install additional weather stations in order to better predict flooding events in Nova Scotia.

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1. Introduction

Real-time weather information plays a critical role in flood prediction and the related emergency response planning and management practices. It is important to establish a robust weather monitoring network in support of real-time flood forecasting. The first step for developing a robust network is to understand the existing capacity and limitations of the existing weather station network. Yet, this is still not well understood for the Province of Nova Scotia, Canada. Therefore, the purpose of this study is to investigate: (1) how many real-time weather stations are available in Nova Scotia? (2) whether there are any spatial gaps in capturing the local climate patterns across Nova Scotia?

2. Real-Time Weather Stations

In this study, we have first collected all weather stations maintained by Environment and Climate Change Canada (ECCC, website: <https://weather.gc.ca/>). There are 17 ECCC stations available for Nova Scotia and these stations are reporting weather data on an hourly basis. The weather information monitored by these ECCC stations includes temperature, precipitation, wind speed and direction, pressure, humidity, and dew point.

In addition to the ECCC stations, we have collected all publicly-available weather stations hosted by Weather Underground (WU, website: <https://www.wunderground.com/>). There are 231 WU stations for Nova Scotia and these stations are typically reporting weather data on a 5-min basis. The weather information monitored by these WU stations includes temperature, dew point, humidity, wind speed, wind direction, wind gust, pressure, precipitation rate, UV, and solar radiation.

The geographical locations of all ECCC and WU stations in Nova Scotia are shown in Figure 1. The detailed information (e.g., station name, latitude, longitude, and website) about these stations is listed in Table 1.

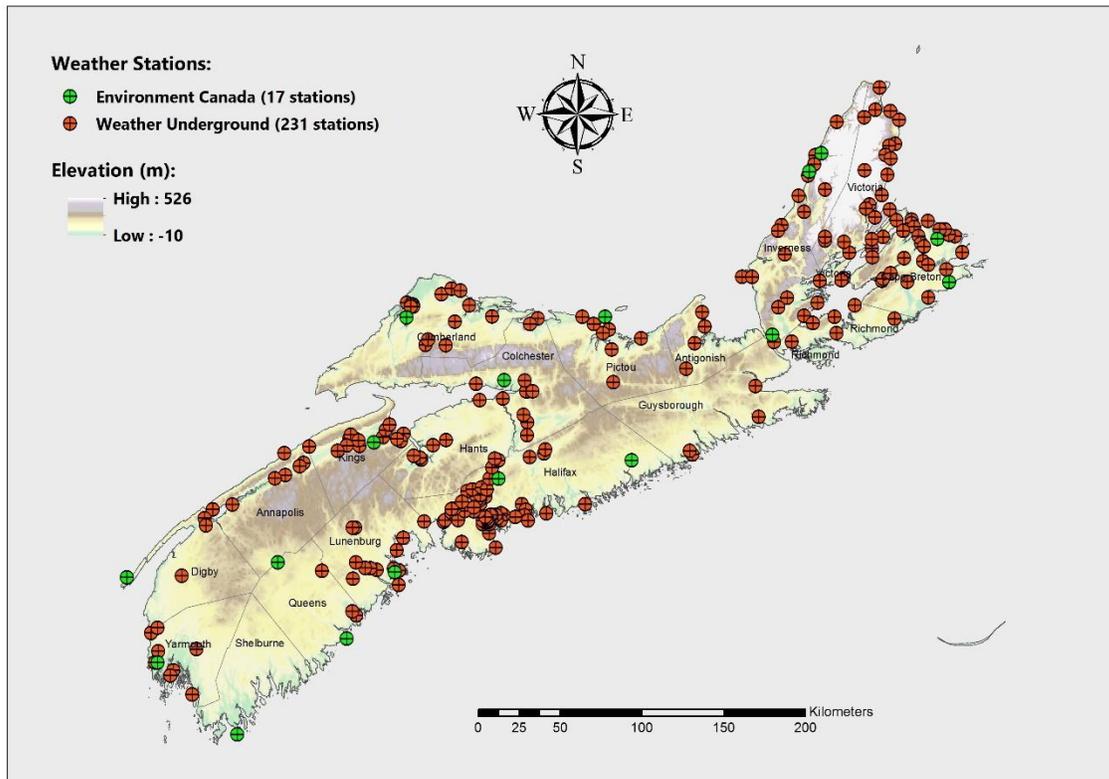


Figure 1. Map of all ECC and WU weather stations for Nova Scotia.

Table 1. List of all ECCC and WU weather stations in Nova Scotia (updated on December 11, 2020).

No.	Station Name	Latitude	Longitude	Source*	Website
1	Chéticamp	46.65	-60.95	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=aht
2	Grand Étang	46.55	-61.05	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=wzq
3	Sydney Airport	46.16	-60.05	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=yqy
4	Louisbourg	45.92	-59.97	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=auu
5	Port Hawkesbury Airport	45.66	-61.37	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=yph
6	Caribou Point	45.77	-62.68	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=wbk
7	Amherst	45.76	-64.24	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=xnp
8	Debert	45.42	-63.47	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=zdb
9	Malay Falls	44.98	-62.48	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=xmy
10	Kentville	45.07	-64.48	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=xkt
11	Halifax Airport	44.88	-63.51	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=yhz
12	Lunenburg	44.36	-64.30	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=xlb
13	Brier Island	44.29	-66.35	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=wwu
14	Kejimikujik Park	44.40	-65.20	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=wkg
15	Western Head	43.99	-64.66	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=wwc
16	Yarmouth Airport	43.83	-66.09	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=yqi
17	Baccaro Point	43.45	-65.47	ECCC	https://weather.gc.ca/past_conditions/index_e.html?station=acp
18	Bay St. Lawrence	47.00	-60.47	WU	https://www.wunderground.com/dashboard/pws/IBAYSAIN2
19	Smelt Brook	46.87	-60.39	WU	https://www.wunderground.com/dashboard/pws/INOVASCO132
20	Neil's Harbour	46.82	-60.32	WU	https://www.wunderground.com/dashboard/pws/INEWHA3
21	Cape North	46.88	-60.51	WU	https://www.wunderground.com/dashboard/pws/INOVASCO80
22	Big Intervale	46.84	-60.60	WU	https://www.wunderground.com/dashboard/pws/IBIGIN1
23	Pleasant Bay	46.82	-60.82	WU	https://www.wunderground.com/dashboard/pws/IPLEASAN4
24	North Ingonish	46.69	-60.36	WU	https://www.wunderground.com/dashboard/pws/IINGON2
25	Ingonish Beach	46.68	-60.41	WU	https://www.wunderground.com/dashboard/pws/IINGON1

26	Ingonish River	46.63	-60.44	WU	https://www.wunderground.com/dashboard/pws/ISOUTH586
27	Cape Smokey	46.61	-60.40	WU	https://www.wunderground.com/dashboard/pws/ICAPES5
28	Wreck Cove	46.52	-60.43	WU	https://www.wunderground.com/dashboard/pws/IWRECKCO2
29	North Shore	46.41	-60.48	WU	https://www.wunderground.com/dashboard/pws/INOVASCO133
30	Tarbotvale	46.36	-60.58	WU	https://www.wunderground.com/dashboard/pws/ITARBO1
31	West Tarbot	46.34	-60.61	WU	https://www.wunderground.com/dashboard/pws/ITARBOT4
32	Englishtown	46.29	-60.54	WU	https://www.wunderground.com/dashboard/pws/IENGLI1
33	Cape Dauphin	46.33	-60.42	WU	https://www.wunderground.com/dashboard/pws/ICAPED1
34	Millville	46.27	-60.37	WU	https://www.wunderground.com/dashboard/pws/IMILLVIL2
35	Florence	46.27	-60.25	WU	https://www.wunderground.com/dashboard/pws/IFLORE38
36	Sydney Mines	46.25	-60.25	WU	https://www.wunderground.com/dashboard/pws/INOVASCO30
37	Sydney Mines (Victoria Dr.)	46.23	-60.23	WU	https://www.wunderground.com/dashboard/pws/INOASCOT2
38	Georges River	46.21	-60.32	WU	https://www.wunderground.com/dashboard/pws/IGEORGES3
39	Moose Lake	46.55	-60.61	WU	https://www.wunderground.com/dashboard/pws/IMOOSE1
40	Cheticamp	46.64	-61.00	WU	https://www.wunderground.com/dashboard/pws/ICHTICAM2
41	Plateau	46.59	-61.01	WU	https://www.wunderground.com/dashboard/pws/IPOINTCR2
42	Grand Etang Harbour	46.55	-61.05	WU	https://www.wunderground.com/dashboard/pws/IGRAND2
43	St. Joseph du Moine	46.53	-61.06	WU	https://www.wunderground.com/dashboard/pws/ISAINTJO74
44	Kingross	46.45	-60.93	WU	https://www.wunderground.com/dashboard/pws/IKINGR1
45	Whale Cove Bight	46.42	-61.14	WU	https://www.wunderground.com/dashboard/pws/IMARGARE10
46	Margaree Forks	46.33	-61.10	WU	https://www.wunderground.com/dashboard/pws/IMARGA8
47	Broad Cove Chapel	46.26	-61.28	WU	https://www.wunderground.com/dashboard/pws/IBROADCO2
48	Inverness	46.23	-61.31	WU	https://www.wunderground.com/dashboard/pws/IINVERNE26
49	Henry Island	45.98	-61.60	WU	https://www.wunderground.com/dashboard/pws/IHENRYIS2
50	Port Hood	45.98	-61.52	WU	https://www.wunderground.com/dashboard/pws/IHARBOUR6
51	Port Hawkesbury	45.62	-61.36	WU	https://www.wunderground.com/dashboard/pws/IPORTH5
52	Evanston	45.62	-61.22	WU	https://www.wunderground.com/dashboard/pws/IEVANSTO2

53	St. Peter's	45.66	-60.87	WU	https://www.wunderground.com/dashboard/pws/ISAINTPE108
54	Baddeck Harbour	46.10	-60.75	WU	https://www.wunderground.com/dashboard/pws/IBADDECK3
55	Big Baddeck	46.16	-60.79	WU	https://www.wunderground.com/dashboard/pws/IBIGBA1
56	Middle River	46.17	-60.94	WU	https://www.wunderground.com/dashboard/pws/IMIDDLER2
57	MacLennan's Cross	46.19	-60.94	WU	https://www.wunderground.com/dashboard/pws/IMIDDLER3
58	Hays River	46.10	-61.26	WU	https://www.wunderground.com/dashboard/pws/INOVASCO149
59	River Denys	45.86	-61.25	WU	https://www.wunderground.com/dashboard/pws/IMELFORD2
60	Glendale	45.81	-61.32	WU	https://www.wunderground.com/dashboard/pws/IGLEND4
61	Widow Point	45.76	-61.12	WU	https://www.wunderground.com/dashboard/pws/IMARSH1
62	Saint Georges Channel	45.72	-61.05	WU	https://www.wunderground.com/dashboard/pws/ISAINTGE526
63	Framboise	45.73	-60.41	WU	https://www.wunderground.com/dashboard/pws/IFRAMBOI2
64	Two Rivers Wildlife Park	45.93	-60.30	WU	https://www.wunderground.com/dashboard/pws/IHUNTING26
65	St. Andrews Channel	45.94	-60.50	WU	https://www.wunderground.com/dashboard/pws/ISAINTAN134
66	Ben Eoin Beach 107A	45.95	-60.49	WU	https://www.wunderground.com/dashboard/pws/IBENEO5
67	Ben Eoin Yacht Club	45.98	-60.43	WU	https://www.wunderground.com/dashboard/pws/IBENEOIN2
68	Sydney Forks	46.06	-60.32	WU	https://www.wunderground.com/dashboard/pws/ISYDNEYF2
69	McKinnons Bay	46.02	-60.13	WU	https://www.wunderground.com/dashboard/pws/IALBER3
70	FrontLake	46.04	-60.17	WU	https://www.wunderground.com/dashboard/pws/ICARIB8
71	Catalone	45.99	-59.99	WU	https://www.wunderground.com/dashboard/pws/ICATALON21
72	Waddens Cove	46.08	-59.86	WU	https://www.wunderground.com/dashboard/pws/ISOUTHHE4
73	Port Caledonia	46.17	-59.91	WU	https://www.wunderground.com/dashboard/pws/INOVASCO23
74	Glace Bay	46.18	-59.96	WU	https://www.wunderground.com/dashboard/pws/IGLACE1
75	Tanya Drive	46.21	-59.99	WU	https://www.wunderground.com/dashboard/pws/INOVASCO71
76	Dominion	46.21	-60.03	WU	https://www.wunderground.com/dashboard/pws/IDOMINIO3
77	New Waterford Hwy. New Victoria	46.26	-60.12	WU	https://www.wunderground.com/dashboard/pws/INEWVICT2
78	South Bar	46.18	-60.20	WU	https://www.wunderground.com/dashboard/pws/ISOUTH532
79	CBRM Public Works	46.14	-60.18	WU	https://www.wunderground.com/dashboard/pws/ISYDNE403

80	Sydney	46.12	-60.16	WU	https://www.wunderground.com/dashboard/pws/IMIRAR1
81	McKinnons Bay	46.02	-60.13	WU	https://www.wunderground.com/dashboard/pws/IALBER3
82	Port of Iona	45.96	-60.80	WU	https://www.wunderground.com/dashboard/pws/IIONA2
83	Iona Highland Village	45.95	-60.82	WU	https://www.wunderground.com/dashboard/pws/IIONA3
84	Estmere	45.95	-60.99	WU	https://www.wunderground.com/dashboard/pws/IESTMERE2
85	Island Point	46.12	-60.57	WU	https://www.wunderground.com/dashboard/pws/ISOUTHSI3
86	Southside Boularderie	46.18	-60.48	WU	https://www.wunderground.com/dashboard/pws/INOVASCO189
87	Ross Ferry	46.17	-60.57	WU	https://www.wunderground.com/dashboard/pws/IROSSFER2
88	Marble Mountain Village	45.83	-61.01	WU	https://www.wunderground.com/dashboard/pws/IMARBLEM2
89	Roberta	45.75	-60.88	WU	https://www.wunderground.com/dashboard/pws/IROBERTA2
90	Beaver Cove	46.07	-60.57	WU	https://www.wunderground.com/dashboard/pws/IBEAVERC6
91	Johnstown	45.81	-60.72	WU	https://www.wunderground.com/dashboard/pws/IJOHNSTO5
92	Gabarus	45.84	-60.14	WU	https://www.wunderground.com/dashboard/pws/IGABAR2
93	Amherst Waste Water Treatment Plant	45.84	-64.24	WU	https://www.wunderground.com/dashboard/pws/IFORTL1
94	Amherst Town Hall	45.83	-64.21	WU	https://www.wunderground.com/dashboard/pws/IAMHER4
95	Chignecto Housing Co-op	45.83	-64.19	WU	https://www.wunderground.com/dashboard/pws/IAMHERST5
96	Gladstone Amherst	45.82	-64.19	WU	https://www.wunderground.com/dashboard/pws/INOVASCO143
97	Amherst Fire Department	45.83	-64.21	WU	https://www.wunderground.com/dashboard/pws/IAMHER6
98	Top of the Hill	45.82	-64.21	WU	https://www.wunderground.com/dashboard/pws/IAMHERST11
99	Sunrise Trail	45.89	-63.97	WU	https://www.wunderground.com/dashboard/pws/IAMHERST4
100	MyStation	45.92	-63.89	WU	https://www.wunderground.com/dashboard/pws/ILOWER25
101	Seacrest Lane	45.91	-63.82	WU	https://www.wunderground.com/dashboard/pws/ILINDE7
102	SpringField Farm	45.83	-63.75	WU	https://www.wunderground.com/dashboard/pws/IROCKL2
103	Oxford Nova Scotia	45.74	-63.86	WU	https://www.wunderground.com/dashboard/pws/IOXFORD88
104	Weather Station	45.40	-63.69	WU	https://www.wunderground.com/dashboard/pws/IPORTA28
105	Drew H	45.61	-64.09	WU	https://www.wunderground.com/dashboard/pws/ILEAMI2
106	Collingwood NS Fire Hall	45.61	-63.93	WU	https://www.wunderground.com/dashboard/pws/ICOLLING21

107	Herrett Road	45.64	-64.07	WU	https://www.wunderground.com/dashboard/pws/ISPRIN9
108	Jimtown	45.71	-61.90	WU	https://www.wunderground.com/dashboard/pws/INOVASCO27
109	Lakevale	45.79	-61.92	WU	https://www.wunderground.com/dashboard/pws/ILAKEV1
110	Merigomish	45.65	-62.40	WU	https://www.wunderground.com/dashboard/pws/IMERIGOM4
111	Fraser's Mountain Sub	45.59	-62.63	WU	https://www.wunderground.com/dashboard/pws/INEWGLAS3
112	Antigonish	45.62	-61.98	WU	https://www.wunderground.com/dashboard/pws/IANTIG1
113	Scott Aitken	45.70	-62.65	WU	https://www.wunderground.com/dashboard/pws/INSBRAES2
114	Lems Weather	45.68	-62.70	WU	https://www.wunderground.com/dashboard/pws/INSPICTO11
115	Three Brooks	45.73	-62.77	WU	https://www.wunderground.com/dashboard/pws/INOVASCO228
116	Caribou River	45.77	-62.86	WU	https://www.wunderground.com/dashboard/pws/ICARIBOU2
117	Brule Point	45.76	-63.21	WU	https://www.wunderground.com/dashboard/pws/IBRULEPO2
118	Sunrise Shore Marina	45.73	-63.27	WU	https://www.wunderground.com/dashboard/pws/IBRULESH2
119	Johnny 5	45.77	-63.57	WU	https://www.wunderground.com/dashboard/pws/IMIDDL2
120	Guysborough	45.38	-61.51	WU	https://www.wunderground.com/dashboard/pws/INOVASCO144
121	Ecowitt	45.21	-61.49	WU	https://www.wunderground.com/dashboard/pws/INEWHA6
122	Camp Weather Station	45.01	-62.01	WU	https://www.wunderground.com/dashboard/pws/ILISCO1
123	Spanish Ship Bay	45.03	-62.03	WU	https://www.wunderground.com/dashboard/pws/INOVASCO39
124	Ohio	45.48	-62.05	WU	https://www.wunderground.com/dashboard/pws/INOVASCO208
125	CDL8	45.41	-62.62	WU	https://www.wunderground.com/dashboard/pws/ICENTRED4
126	Eco_ONE	45.36	-63.29	WU	https://www.wunderground.com/dashboard/pws/ITRURO33
127	Davesweather	45.36	-63.30	WU	https://www.wunderground.com/dashboard/pws/ITRURO28
128	Princeton Hts	45.36	-63.25	WU	https://www.wunderground.com/dashboard/pws/ISALMONR3
129	Stevens Rd	45.19	-63.29	WU	https://www.wunderground.com/dashboard/pws/INOVASCO53
130	Mccurdy	45.12	-63.29	WU	https://www.wunderground.com/dashboard/pws/IWESTS4
131	Soggy Owl	45.02	-63.16	WU	https://www.wunderground.com/dashboard/pws/ISOUTH657
132	Cooks Lake	45.00	-63.27	WU	https://www.wunderground.com/dashboard/pws/ICOOKSBR3
133	weather	45.04	-63.15	WU	https://www.wunderground.com/dashboard/pws/IMIDDL10

134	Rural	44.74	-62.84	WU	https://www.wunderground.com/dashboard/pws/IOWLSHEA2
135	Martinique Beach	44.69	-63.14	WU	https://www.wunderground.com/dashboard/pws/IEASTP6
136	PIWeather	44.74	-63.33	WU	https://www.wunderground.com/dashboard/pws/IPORTE22
137	MacDougall	44.71	-63.30	WU	https://www.wunderground.com/dashboard/pws/IPORTE20
138	West Porters Lake	44.68	-63.31	WU	https://www.wunderground.com/dashboard/pws/IWESTPOR11
139	Tree Phantom Arbour Farm	44.65	-63.28	WU	https://www.wunderground.com/dashboard/pws/INOVASCO190
140	Lawrencetown	44.67	-63.38	WU	https://www.wunderground.com/dashboard/pws/ILAWRE2
141	Cole Harbour	44.68	-63.47	WU	https://www.wunderground.com/dashboard/pws/INSCOLEH2
142	Lochiel WS	44.69	-63.49	WU	https://www.wunderground.com/dashboard/pws/IWESTP4
143	Morris Lake Estates	44.65	-63.49	WU	https://www.wunderground.com/dashboard/pws/INOVASCO77
144	Russell Lake West	44.66	-63.52	WU	https://www.wunderground.com/dashboard/pws/IDARTMOU21
145	Dartmouth	44.68	-63.53	WU	https://www.wunderground.com/dashboard/pws/IDARTMOU27
146	Wade's Weather Station	45.42	-63.31	WU	https://www.wunderground.com/dashboard/pws/INSONSLO2
147	COVE Weather Station	44.66	-63.56	WU	https://www.wunderground.com/dashboard/pws/IDARTM1
148	Lakeview Avenue	44.68	-63.56	WU	https://www.wunderground.com/dashboard/pws/IDARTM3
149	Brightwood Golf & Country Club	44.68	-63.57	WU	https://www.wunderground.com/dashboard/pws/IDARTMOU8
150	Black Rock	45.32	-63.48	WU	https://www.wunderground.com/dashboard/pws/INOVASCO91
151	Loon Lane	45.23	-63.32	WU	https://www.wunderground.com/dashboard/pws/ISHORT2
152	Noel Shore	45.31	-63.66	WU	https://www.wunderground.com/dashboard/pws/INOELS1
153	Stanley Airfield (CCW4)	45.09	-63.92	WU	https://www.wunderground.com/dashboard/pws/ISTANL4
154	Upper Burlington	45.06	-64.02	WU	https://www.wunderground.com/dashboard/pws/INOVASCO109
155	Beachweather	45.12	-64.25	WU	https://www.wunderground.com/dashboard/pws/IAVONP1
156	Port Williams	45.10	-64.41	WU	https://www.wunderground.com/dashboard/pws/INOVASCO29
157	AFF	45.14	-64.39	WU	https://www.wunderground.com/dashboard/pws/ILOWER16
158	TheBoonies	45.17	-64.36	WU	https://www.wunderground.com/dashboard/pws/IMEDFORD2
159	Brooklyn Corner	45.09	-64.63	WU	https://www.wunderground.com/dashboard/pws/IBROOKLY3
160	Chappel	45.09	-64.67	WU	https://www.wunderground.com/dashboard/pws/IGRAFT19

161	Woodville Nova Scotia	45.11	-64.66	WU	https://www.wunderground.com/dashboard/pws/IWOODVIL4
162	INOVASCO229	45.04	-64.98	WU	https://www.wunderground.com/dashboard/pws/IEASTM4
163	Weather	45.00	-65.17	WU	https://www.wunderground.com/dashboard/pws/IPORTG1
164	Upper Clements Cottages	44.71	-65.56	WU	https://www.wunderground.com/dashboard/pws/IUPPERCL2
165	Station R	44.68	-65.71	WU	https://www.wunderground.com/dashboard/pws/IPORTWAD3
166	Cleveland's Weather Station	44.63	-65.77	WU	https://www.wunderground.com/dashboard/pws/IMOUNT121
167	Coastal Port Maitland	43.99	-66.15	WU	https://www.wunderground.com/dashboard/pws/INOVASCO73
168	Hebron	43.89	-66.09	WU	https://www.wunderground.com/dashboard/pws/IHEBRON2
169	Home Weather Station	43.83	-66.11	WU	https://www.wunderground.com/dashboard/pws/IYARMO1
170	Sluice Point	43.79	-65.97	WU	https://www.wunderground.com/dashboard/pws/ISLUICEP5
171	Upper Wedgeport	43.76	-65.99	WU	https://www.wunderground.com/dashboard/pws/IUPPER40
172	Abbotts Harbour Road	43.66	-65.82	WU	https://www.wunderground.com/dashboard/pws/IMIDDL9
173	Crowley Cove Weather Station	44.12	-64.59	WU	https://www.wunderground.com/dashboard/pws/IPORTM10
174	FoxCreek	44.14	-64.62	WU	https://www.wunderground.com/dashboard/pws/INSFOXCR2
175	Upper Kingsburg	44.29	-64.27	WU	https://www.wunderground.com/dashboard/pws/IKINGSBU3
176	Rye Hill Meadows	44.37	-64.27	WU	https://www.wunderground.com/dashboard/pws/IGARDENL2
177	Lunenburg Harbour	44.38	-64.31	WU	https://www.wunderground.com/dashboard/pws/INOVASCO232
178	weather1	44.37	-64.44	WU	https://www.wunderground.com/dashboard/pws/IRHODE3
179	Malcolm Residence	44.38	-64.49	WU	https://www.wunderground.com/dashboard/pws/INSDAYSP2
180	Jims Home Weather	44.38	-64.53	WU	https://www.wunderground.com/dashboard/pws/IBRIDG2
181	Young Island	44.48	-64.29	WU	https://www.wunderground.com/dashboard/pws/IINDIANP3
182	Stanford Lake	44.55	-64.24	WU	https://www.wunderground.com/dashboard/pws/ICHESTER32
183	Mill Lake Rd no 2	44.64	-64.08	WU	https://www.wunderground.com/dashboard/pws/ISIMMSSE2
184	Sunset	44.64	-63.93	WU	https://www.wunderground.com/dashboard/pws/IGLENH5
185	TANNER FREDERICK	44.65	-63.92	WU	https://www.wunderground.com/dashboard/pws/IGLENH7
186	Bayside	44.53	-63.79	WU	https://www.wunderground.com/dashboard/pws/INOVASCO128
187	VE1BZ	44.69	-63.87	WU	https://www.wunderground.com/dashboard/pws/IUPPER3

188	Three Brooks	44.66	-63.83	WU	https://www.wunderground.com/dashboard/pws/INOVASCO245
189	Three Brooks (EcoWitt)	44.65	-63.82	WU	https://www.wunderground.com/dashboard/pws/IHUBLE3
190	Duncans Cove	44.50	-63.53	WU	https://www.wunderground.com/dashboard/pws/INOVASCO72
191	Herring Cove Road 800 Block	44.58	-63.58	WU	https://www.wunderground.com/dashboard/pws/INSHALIF15
192	Brewer Court	44.63	-63.63	WU	https://www.wunderground.com/dashboard/pws/INOVASCO119
193	SMU Observatory	44.63	-63.58	WU	https://www.wunderground.com/dashboard/pws/INOVASCO115
194	Dalhousie Atmospheric Observatory	44.64	-63.59	WU	https://www.wunderground.com/dashboard/pws/IHALIF10
195	Norwood St. Weather Station	44.64	-63.60	WU	https://www.wunderground.com/dashboard/pws/IHALIF20
196	Halifax @ Connaught/Quinpool	44.64	-63.61	WU	https://www.wunderground.com/dashboard/pws/IHALIFAX46
197	Murdoch	44.65	-63.63	WU	https://www.wunderground.com/dashboard/pws/IHALIF1
198	Ashburn	44.65	-63.63	WU	https://www.wunderground.com/dashboard/pws/IHALIFAX39
199	Tribeno	44.65	-63.59	WU	https://www.wunderground.com/dashboard/pws/IHALIFAX40
200	NorthEndYard	44.66	-63.60	WU	https://www.wunderground.com/dashboard/pws/IHALIF21
201	Hydrostone	44.67	-63.61	WU	https://www.wunderground.com/dashboard/pws/IHALIF3
202	Ecowitt WH2320	44.70	-63.66	WU	https://www.wunderground.com/dashboard/pws/IHALIF17
203	Teniere	44.73	-63.68	WU	https://www.wunderground.com/dashboard/pws/IBEDFO55
204	BEDFORD 5C	44.74	-63.65	WU	https://www.wunderground.com/dashboard/pws/IBEDFO7
205	Waverley Fireschool	44.78	-63.61	WU	https://www.wunderground.com/dashboard/pws/IWAVERLE3
206	Home	44.77	-63.65	WU	https://www.wunderground.com/dashboard/pws/ILOWER68
207	First Lake	44.76	-63.66	WU	https://www.wunderground.com/dashboard/pws/ILOWERSA12
208	Caudle Park	44.77	-63.67	WU	https://www.wunderground.com/dashboard/pws/IBEDFORD45
209	Lower Sackville	44.79	-63.69	WU	https://www.wunderground.com/dashboard/pws/ILOWERSA18
210	Windsor Junction	44.79	-63.65	WU	https://www.wunderground.com/dashboard/pws/IWINDS20
211	Springfield Lake	44.81	-63.75	WU	https://www.wunderground.com/dashboard/pws/IMIDDLES41
212	Middle Sackville NS	44.82	-63.71	WU	https://www.wunderground.com/dashboard/pws/IMIDDLES32
213	Kinross Court	44.83	-63.64	WU	https://www.wunderground.com/dashboard/pws/IFALLRIV5
214	Fall River	44.82	-63.60	WU	https://www.wunderground.com/dashboard/pws/INOVASCO138

215	Grand Lake	44.88	-63.58	WU	https://www.wunderground.com/dashboard/pws/IGRANDLA84
216	5 in 1 Right Access	44.88	-63.58	WU	https://www.wunderground.com/dashboard/pws/IGRAND4
217	THE RIVERHOUSE	44.94	-63.56	WU	https://www.wunderground.com/dashboard/pws/IENFIELD22
218	Carmie's Pre	44.98	-63.51	WU	https://www.wunderground.com/dashboard/pws/IELMSDAL2
219	Enfield	44.99	-63.54	WU	https://www.wunderground.com/dashboard/pws/IENFIELD23
220	Don's Weather Station	44.70	-63.70	WU	https://www.wunderground.com/dashboard/pws/IBEDFO31
221	Shed Weather	44.70	-63.77	WU	https://www.wunderground.com/dashboard/pws/IUPPER69
222	VA1CYR	44.72	-63.70	WU	https://www.wunderground.com/dashboard/pws/IBEDFO16
223	Acurite Atlas	44.71	-63.85	WU	https://www.wunderground.com/dashboard/pws/ISTILL7
224	Westwood	44.71	-63.87	WU	https://www.wunderground.com/dashboard/pws/IUPPER60
225	Maplewood	44.75	-63.79	WU	https://www.wunderground.com/dashboard/pws/INOVASCO203
226	The Crossing	44.98	-64.11	WU	https://www.wunderground.com/dashboard/pws/IGARLA2
227	Windsor Nova Scotia	44.99	-64.12	WU	https://www.wunderground.com/dashboard/pws/INSWESTH2
228	Falmouth Dyke	45.00	-64.17	WU	https://www.wunderground.com/dashboard/pws/INOVASCO40
229	West Brooklyn MTN	45.08	-64.27	WU	https://www.wunderground.com/dashboard/pws/INOVASCO20
230	Fireworks FX	45.09	-64.30	WU	https://www.wunderground.com/dashboard/pws/IMELAN1
231	Westwood	44.71	-63.87	WU	https://www.wunderground.com/dashboard/pws/IUPPER60
232	Coldbrook Hayes	45.05	-64.59	WU	https://www.wunderground.com/dashboard/pws/ICOLDB3
233	Coldbrook Weather	45.08	-64.60	WU	https://www.wunderground.com/dashboard/pws/ICOLDB2
234	Ecowitt	45.05	-64.69	WU	https://www.wunderground.com/dashboard/pws/IWATER34
235	Moored East	45.02	-64.76	WU	https://www.wunderground.com/dashboard/pws/IBERWI1
236	River Pines	44.95	-65.02	WU	https://www.wunderground.com/dashboard/pws/ISOUTH591
237	Nictaux Weather	44.93	-65.05	WU	https://www.wunderground.com/dashboard/pws/INICTA4
238	Annapolis County	44.88	-65.16	WU	https://www.wunderground.com/dashboard/pws/ILAWRE4
239	Highway 1 Paradise	44.86	-65.24	WU	https://www.wunderground.com/dashboard/pws/INOVASCO87
240	Acurite Atlas	44.59	-65.76	WU	https://www.wunderground.com/dashboard/pws/IACACI2
241	Mapleseed	44.31	-65.93	WU	https://www.wunderground.com/dashboard/pws/IHAVE112

242	Cedar Lake	44.02	-66.10	WU	https://www.wunderground.com/dashboard/pws/INOVASCO121
243	Sarty Rd	44.32	-64.62	WU	https://www.wunderground.com/dashboard/pws/IHEBBSCR2
244	Auburndale	44.41	-64.60	WU	https://www.wunderground.com/dashboard/pws/INOVASCO174
245	Campground WS	44.60	-64.61	WU	https://www.wunderground.com/dashboard/pws/INEWBU4
246	Scarsdale	44.60	-64.63	WU	https://www.wunderground.com/dashboard/pws/ISCARSDA2
247	Molega lake	44.36	-64.86	WU	https://www.wunderground.com/dashboard/pws/ILABELLE2
248	Deep Sky Eye Observatory Weather Station	43.91	-65.80	WU	https://www.wunderground.com/dashboard/pws/ISOUTH523

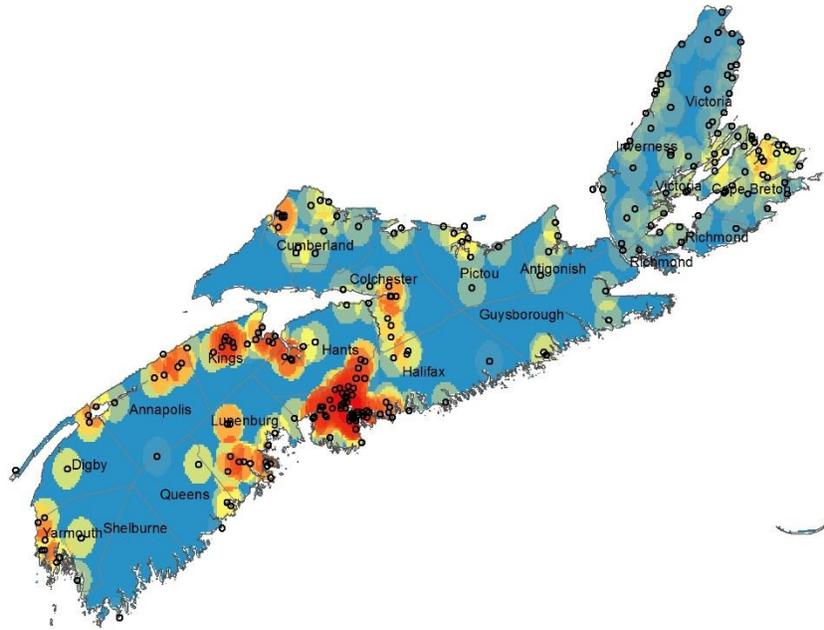
* Note that ECCC represents *Environment and Climate Change Canada* and WU represents *Weather Underground*, respectively.

3. Spatial Gaps

In order to identify the spatial gaps of real-time weather stations in Nova Scotia, we have generated two spatial maps including the density map of weather stations and a 10km buffer map of all weather stations. The results are shown in Figure 2.

While both maps can be used to identify the gaps in the spatial coverage of these real-time weather stations, we should note that the purpose of generating the 10km buffer map is to help identify those areas without any stations which will be given the highest priorities for installing additional stations. In comparison, the density map can be used to understand the robustness in monitoring local climate for those areas covered by the existing monitoring network. In other words, those areas with lower density are less reliable in terms of providing robust weather information and thus require the installation of more stations if resources are available.

(a) Density map of all weather stations in Nova Scotia



(b) 10km buffer map of all weather stations in Nova Scotia

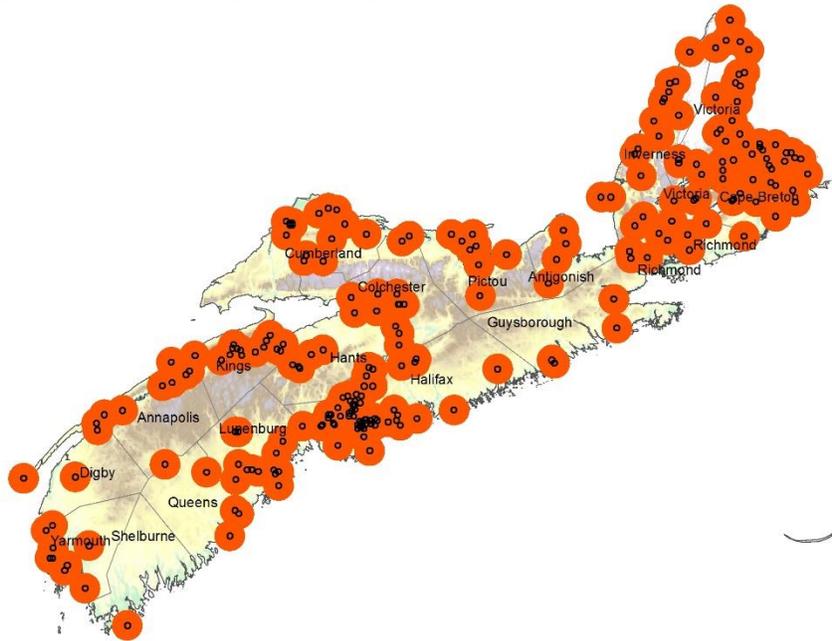


Figure 2. Density map and 10km buffer map of all real-time weather stations in Nova Scotia.

4. Conclusions

In this study, we have collected all real-time weather stations available for Nova Scotia. These stations come from two sources: ECCC and WU. Although there are also other types of stations (e.g., the CoCoRaHS, website: <https://www.cocorahs.org/>) offering certain weather monitoring information, we did not consider them in this study because they are not operated automatically or not reporting information on a real-time basis. The detailed information about these real-time weather stations is made available in this report. In addition, we have analyzed the spatial coverage of all real-time weather stations in Nova Scotia. Our results showed that there are still significant spatial gaps in the existing weather monitoring network of Nova Scotia and additional real-time stations should be installed in order to collect robust weather information for flood forecasting.



CLIMATE CHANGE REPORT **SERIES**

The Climate Change Report (CCR) series are prepared and published by the research group led by Dr. Xander Wang in the School of Climate Change and Adaptation at the University of Prince Edward Island, Charlottetown, Canada.

For any questions or concerns, please contact Dr. Xander Wang at: xxwang@upei.ca.

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