

CFI Sentinels Datasets

14th June 2022

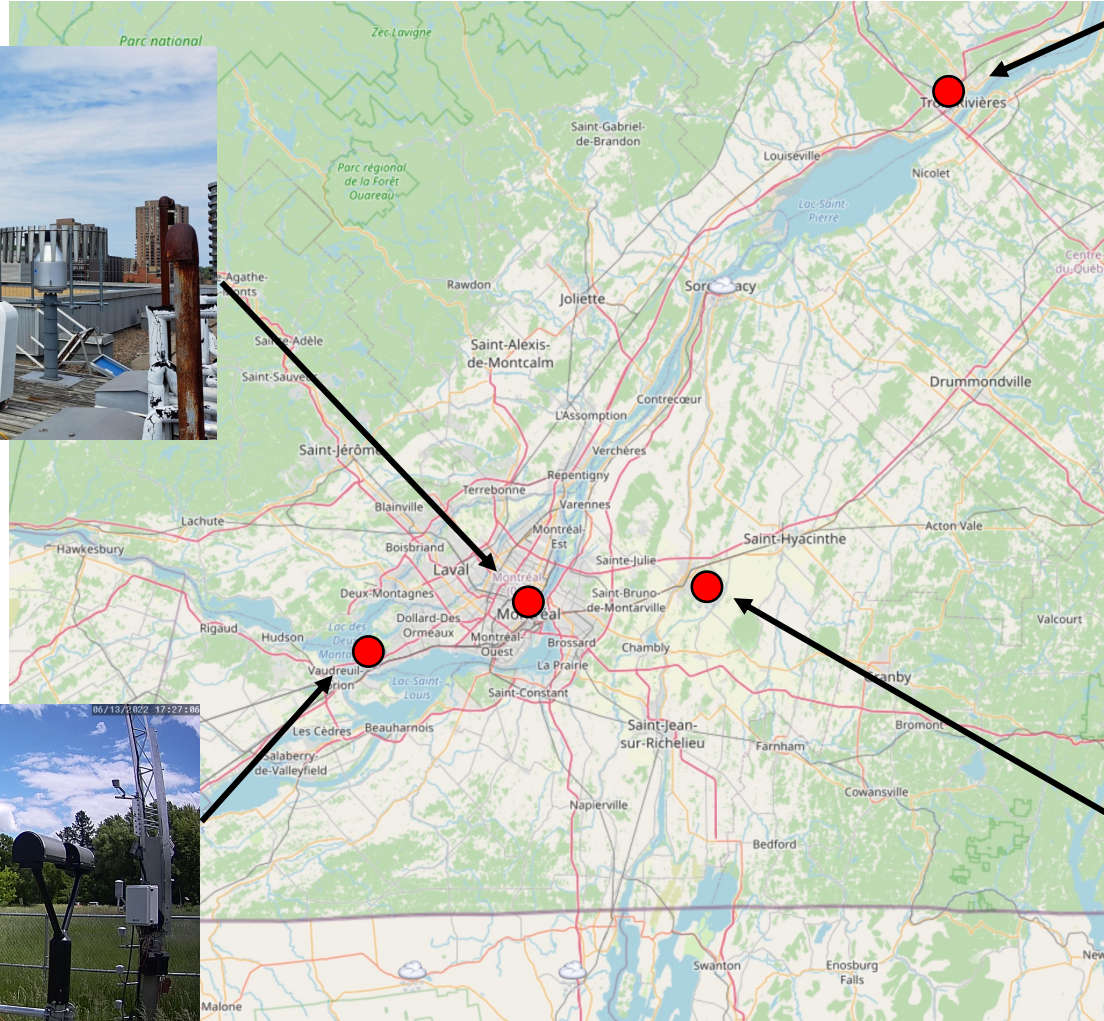
Mathieu Lachapelle, Dustin Fraser, Juliann Wray, Yeechian Low, Margaux Girouard, Hadleigh Thompson, Julie Thériault, John Gyakum

Sites location

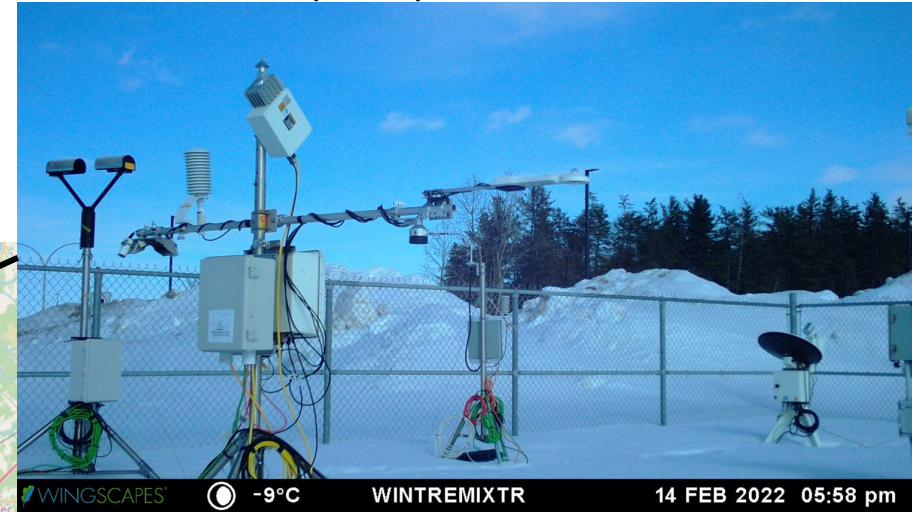
UQAM-PK (UQAM)



Arboretum (ARBO)



Trois-Rivières (TROI)



Gault (GAUL)



Datasets list

- CFI Climate Sentinels Snow Depth Data (Margaux Girouard)
- CFI Climate Sentinels Hotplates Data (Margaux Girouard)
- CFI Climate Sentinels Icing Detector Data (Dustin Fraser)
- CFI Climate Sentinels Pressure, Wind, Temperature and Relative Humidity Data (Yeechian Low)
- CFI Climate Sentinels Pyranometer and Radiation Data (Yeechian Low)
- CFI Climate Sentinels MRR-2 Data (Mathieu Lachapelle & Dustin Fraser)
 - Total of 6 datasets : 1 raw + 1 processed for ARBO, GAUL and UQAM
- CFI Climate Sentinels Disdrometer Data (Mathieu Lachapelle & Dustin Fraser)
 - Total of 4 datasets : ARBO, GAUL, TROI and UQAM

Quality control for every variable

- Identifying missing or unrealistic data (outside specified range).
- Listing intervals > 1 hour of continuous missing/unrealistic data.
- Visualizing data on a graph from 1st Nov. 2021 to 31st March 2022.
- No other post-processing is applied.

► Dimensions: (station: 4, time: 216001)

▼ Coordinates:

station	(station)	<U4	'ARBO' 'GAUL' 'TROI' 'UQAM'	 
time	(time)	datetime64[ns]	2021-11-01 ... 2022-03-31	 

▼ Data variables:

latitude	(station)	float32	45.43 45.54 46.35 45.51	 
longitude	(station)	float32	73.94 73.15 -72.58 73.57	 
height_above_...	(station)	float64	49.0 132.0 47.0 69.0	 
snow_depth_av...	(station, time)	float64	25.0 26.0 26.0 25.0 ... nan nan nan	 
snow_depth_sr...	(station, time)	float64	nan nan nan nan ... nan nan nan nan	 
swe_cs725	(station, time)	float64	nan nan nan nan ... nan nan nan nan	 

▼ Attributes:

History : Collected and processed by Margaux Girouard and Mathieu Lachapelle UQAM

Instrument : SDMS40 Multipoint Scanning Snowfall Sensor (for stations GAUL, ARBO and UQAM).
SR50A Sonic Distance Sensor (for stations GAUL and TROI).

Contact : Hadleigh Thompson, UQAM, thompson.hadleigh@uqam.ca

Location : ARBO: Instrument yard of Arboretum CFI sentinel weather station.
GAUL: Instrument yard of Gault CFI sentinel weather station, Mont St-Hilaire, QC, CA
N.
TROI: Instrument yard of Trois-Rivières CFI sentinel weather station, Trois-Rivières, Q
C, CAN.
UQAM: UQAM-PK CFI sentinel weather station, rooftop of President-Kennedy buildin
g, Montreal, QC, CAN

CFI Climate Sentinels Snow Depth Data

CFI Climate Sentinels Snow Depth Data							
Variables included	Units	Dataset variable name	Instrument model	Site	Time interval	End Time Interval	Link to instrument manual
Average Snow Depth	mm	snow_depth_avg_sdms40	SDMS40	ARBO	2021-11-01	2022-03-31	https://www.campbellsci.ca/sdms40
Average Snow Depth	mm	"	"	GAUL			"
Average Snow Depth	mm	"	"	UQAM			
Average Snow Depth	mm	snow_depth_sr50a	SR50A	GAUL	2021-11-01	2022-03-31	sr50a-series.pdf - Campbell Scientific
Average Snow Depth	mm	"	"	TROI	2021-12-08	2022-03-31	
Snow Water Equivalent	mm	swe_cs725	CS725	GAUL			



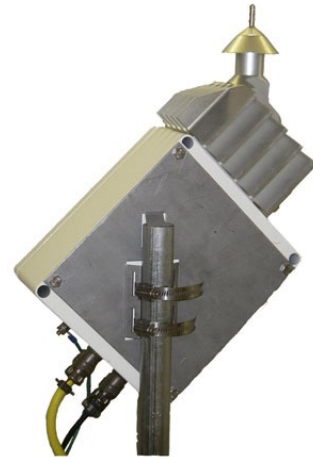
Hotplates Data

CFI Climate Sentinels Hotplates (link to readme)							
Variables included	Units	Dataset variable name	Instrument model	Site	Start Time Interval	End Time Interval	Link to instrument manual
Precipitation Rate	mm/h	precipitation_rate_k63	K63 HOTPLATE® TOTAL PRECIPITATION GAUGE	ARBO	2021-11-01	2022-03-31	http://www.pondengineering.com/k63
Precipitation Rate	mm/h	"	"	GAUL			"
Precipitation Rate	mm/h	"	"	TROI			"
Precipitation Rate	mm/h	"	"	UQAM			"
Surface Pressure	mbar	pressure_k63	"	ARBO			"
Surface Pressure	mbar	"	"	GAUL			"
Surface Pressure	mbar	"	"	TROI			"
Surface Pressure	mbar	"	"	UQAM			"
Hotplate Functionning Status	-	status_k63	"	ARBO			"
Hotplate Functionning Status	-	"	"	GAUL			"
Hotplate Functionning Status	-	"	"	TROI			"
Hotplate Functionning Status	-	"	"	UQAM			"



Icing Detector Data

CFI Climate Sentinels Icing Detector Data (link to readme)							
Variables included	Units	Dataset variable name	Instrument model	Site	Start Time Interval	End Time Interval	Link to instrument manual
Ice thickness on detector	mm	ice	Ice Detector (2400 BAUD Output) can	All four sites (GAUL, ARBO, UQAM, TROI)	2021-11-01	2022-03-31	https://www.campbellsci.ca/0872f1
Heater function status	-	heater_Status	"	"	"	"	"
Ice detector function status	-	ice_Status	"	"	"	"	"



Pressure, Wind, Temperature and Relative Humidity Data

CFI Climate Sentinels Pressure, Wind, Temperature and Relative Humidity Data (README)							
Variables included	Units	Dataset variable name	Instrument model	Site	Start Time Interval	End Time Interval	Link to instrument manual
Pressure	kPa	station_pressure	CS106 - IRGASON	GAUL	2021-10-31	2022-03-31	https://eos.meteo.mcgill.ca/media/documents/irgason.pdf
Wind speed	m/s	wind_speed	Anemometer 05103	GAUL	2021-10-31	2022-03-31	https://eos.meteo.mcgill.ca/media/documents/wind.pdf
Wind direction	degrees from north	wind_direction	Anemometer 05103	GAUL	2021-10-31	2022-03-31	https://eos.meteo.mcgill.ca/media/documents/wind.pdf
Standard deviation of wind direction	degrees	wind_direction_stddev	Anemometer 05103	GAUL	2021-10-31	2022-03-31	https://eos.meteo.mcgill.ca/media/documents/wind.pdf
Maximum wind speed	m/s	max_wind_speed	Anemometer 05103	GAUL	2021-10-31	2022-03-31	https://eos.meteo.mcgill.ca/media/documents/wind.pdf
Wind direction of maximum wind speed	degrees from north	max_wind_direction	Anemometer 05103	GAUL	2021-10-31	2022-03-31	https://eos.meteo.mcgill.ca/media/documents/wind.pdf
Temperature	°C	temp_2m	HMP 155	GAUL	2021-10-31	2022-03-31	https://eos.meteo.mcgill.ca/media/documents/hmp155.pdf
Relative humidity	%	relative_humidity	HMP 155	GAUL	2021-10-31	2022-03-31	https://eos.meteo.mcgill.ca/media/documents/hmp155.pdf

Pressure, Wind, Temperature and Relative Humidity Data

Pressure	kPa	station_pressure	CS106 - IRGASON enhanced barometer	ARBO	2021-10-31 23:55	2022-04-01 00:00	https://eos.meteo.mcgill.ca/media/documents/irgason.pdf
Wind speed	m/s	wind_speed	Anemometer 05103	ARBO	2021-10-31 23:55	2022-04-01 00:00	https://eos.meteo.mcgill.ca/media/documents/wind.pdf
Wind direction	degrees from north	wind_direction	Anemometer 05103	ARBO	2021-10-31 23:55	2022-04-01 00:00	https://eos.meteo.mcgill.ca/media/documents/wind.pdf
Standard deviation of wind direction	degrees	wind_direction_stddev	Anemometer 05103	ARBO	2021-10-31 23:55	2022-04-01 00:00	https://eos.meteo.mcgill.ca/media/documents/wind.pdf
Wind direction of maximum wind speed	degrees from north	max_wind_direction	Anemometer 05103	ARBO	2021-10-31 23:55	2022-04-01 00:00	https://eos.meteo.mcgill.ca/media/documents/wind.pdf
Temperature	°C	temp_2m	HMP 155	ARBO	2021-10-31 23:55	2022-04-01 00:00	https://eos.meteo.mcgill.ca/media/documents/hmp155.pdf
Relative humidity	%	relative_humidity	HMP 155	ARBO	2021-10-31 23:55	2022-04-01 00:00	https://eos.meteo.mcgill.ca/media/documents/hmp155.pdf

Pressure, Wind, Temperature and Relative Humidity Data

Pressure	kPa	station_pressure	HotPlate Precipitation Gauge	TROI	2022-02-02	2022-03-31	https://journals.ametsoc.org/view/journals/atot/28/2/2010jitecha1375_1.xml
Wind speed	m/s	wind_speed	HotPlate Precipitation Gauge	TROI	2022-02-02	2022-03-31	https://journals.ametsoc.org/view/journals/atot/28/2/2010jitecha1375_1.xml
Temperature	°C	temp_2m	HMP 155	TROI		2022-03-31	https://eos.meteo.mcgill.ca/media/documents/hmp155.pdf
Relative humidity	%	relative_humidity	HMP 155	TROI	2021-12-08	2022-03-31	https://eos.meteo.mcgill.ca/media/documents/hmp155.pdf

Pressure, Wind, Temperature and Relative Humidity Data

Pressure	kPa	station_pressure	CS106	UQAM	2022-01-26	2022-03-31
Wind speed	m/s	wind_speed	Anemometer 05103	UQAM	2022-01-26	2022-03-31
Wind direction	degrees from north	wind_direction	Anemometer 05103	UQAM	2022-01-26	2022-03-31
Standard deviation of wind direction	degrees	wind_direction_stddev	Anemometer 05103	UQAM	2022-01-26	2022-03-31
Wind direction of maximum wind speed	degrees from north	max_wind_direction	Anemometer 05103	UQAM	2022-01-26	2022-03-31
Temperature	°C	temp_2m	HMP 155	UQAM	2022-01-26	2022-03-31
Relative humidity	%	relative_humidity	HMP 155	UQAM	2022-01-26	2022-03-31
Accumulated precipitation	mm	precip_local	CS700 tipping bucket rain gauge	UQAM	2022-01-26	2022-03-31

Sentinels Pyranometer and Radiation Data

CFI Climate Sentinels Pyranometer and Radiation Data (README)				4 netCDF files		
Variables included	Units	Dataset variable name	Instrument model	Site	Start Time Interval	End Time Interval
Solar radiation flux	W/m^2	solar_insolation	CMP 10 pyranometer	GAUL	2021-10-31	2022-03-31
Standard deviation of solar radiation flux	W/m^2	solar_insolation_stddev	CMP 10 pyranometer	GAUL	2021-10-31	2022-03-31
Solar radiation flux	W/m^2	solar_insolation	CMP 10 pyranometer	ARBO	2021-10-31	2022-04-01
Standard deviation of solar radiation flux	W/m^2	solar_insolation_stddev	CMP 10 pyranometer	ARBO	2021-10-31	2022-04-01
Downwelling shortwave radiation	W/m^2	short_wave_downwelling	CNR4	TROI	2021-12-08	2022-03-31
Upwelling shortwave radiation	W/m^2	short_wave_upwelling	CNR4	TROI	2021-12-08	2022-03-31
Downwelling longwave radiation	W/m^2	long_wave_downwelling	CNR4	TROI	2021-12-08	2022-03-31
Upwelling longwave radiation	W/m^2	long_wave_upwelling	CNR4	TROI	2021-12-08	2022-03-31
Downwelling shortwave radiation	W/m^2	short_wave_downwelling	CNR4	UQAM	2022-01-26	2022-03-31
Upwelling shortwave radiation	W/m^2	short_wave_upwelling	CNR4	UQAM	2022-01-26	2022-03-31
Downwelling longwave radiation	W/m^2	long_wave_downwelling	CNR4	UQAM	2022-01-26	2022-03-31
Upwelling longwave radiation	W/m^2	long_wave_upwelling	CNR4	UQAM	2022-01-26	2022-03-31

Other Data (available upon request)

- Soil Probes
- Flux Data
- Ceilometer
- Visibility Sensor
- Leaf Wetness Sensor

Manual Hydrometeor Photographs Dataset

- Includes 4073 photos : *[Team name]_[Site name]_[UTC time: YYYYMMDD_HHMM]_[counter].JPG*
- Will be available by selecting the **site** and the **IOP** (?)
- Quality Control :
 - All photographs were check 1 by 1
 - Duplicates and useless photographs were removed

IOP	IOP Duration	Locations	# DSLR Photos	# Misc. Photos	P types on photos
1	2100 UTC 2 Feb – 0900 UTC 3 Feb 2022	Sorel Gault DOW-CAN-S DOW-US-Plattsburgh	0 0 0 0	8 0 0 0	SN - - -
2	0800 UTC 10 Feb – 1330 UTC 10 Feb 2022	Sorel Gault DOW-CAN-N DOW-US-N	0 0 0 0	11 0 0 0	SN, PL - - -
3	2200 UTC 11 Feb – 0630 UTC 12 Feb 2022	Sorel Gault DOW-CAN-N DOW-US-N	0 0 0 0	0 0 0 0	- - - -
4	2300 UTC 17 Feb – 1000 UTC 18 Feb 2022	Sorel Gault DOW-CAN-S DOW-US-Plattsburgh	464 335 112 20	18 0 0 0	SN SN,IC,PL SN,IC,PL SN,IC,PL
5	2000 UTC 22 Feb – 0530 UTC 23 Feb 2022	Sorel Trois-Rivières Gault DOW-CAN-N DOW-US-N	329 279 0 0 0	89 0 0 0 0	PL,IC PL,IC - - -
6	0900 UTC 25 Feb – 2000 UTC 25 Feb 2022	ESSX	73	0	SN

7	1600 UTC 01 Mar – 0200 UTC 02 Mar 2022	Sorel Gault DOW-CAN-SE DOW-US-N	476 465 12 19	0 0 0 0	SN SN SN SN
8	0600 UTC 06 Mar – 1730 UTC 06 Mar 2022	Sorel Trois-Rivières Gault DOW-CAN-N DOW-US-N	156 0 0 0 0	0 0 0 0 0	SN, PL - - - -
9	1400 UTC 07 Mar – 0200 UTC 08 Mar 2022	Sorel Gault DOW-CAN-SE DOW-US- Plattsburgh	378 126 0 0	77 0 0 0	PL,SN SN,PL - -
10	0000 UTC 12 Mar – 0900 UTC 12 Mar 2022	Sorel Gault JEAN DOW-US- Plattsburgh	298 211 16 0	0 0 0 0	SN SN,PL SN,PL -
11	0000 UTC 15 Mar – 0700 UTC 15 Mar 2022	Gault JEAN DOW-US- Plattsburgh	77 11 0	0 13 0	SN SN -