

## CFI Climate Sentinels Hotplate Precipitation Gauge data

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## 1. Data Set Description

**1.1. Introduction:** This dataset includes hotplate precipitation gauge data from 4 different sites sitting in the St. Lawrence River Valley. The hotplate data were obtained by the *K63 Hotplate Total Precipitation Gauge*. The instruments belonged to UQAM and McGill University. UQAM has one hotplate permanently installed on the rooftop of the President-Kennedy building, in downtown Montreal. Another hotplate was temporarily deployed by the UQAM team in the instrument yard of UQTR as part of the WINTRE-MIX field campaign. McGill's instruments are permanently installed in the instrument yards of Gault and Arboretum.

**1.2. Data version :** v1.0, 8 September 2022

### 1.3. Time period covered :

Table 1 : Time period covered

Sites	Instruments	Start	End
Gault	K63	2021-12-17	2022-03-30
Arboretum	“	2021-11-01	2022-02-10*
UQAM-PK	“	2022-02-12	2022-03-29
Trois-Rivières	“	2022-02-02	2022-03-31

\*Unfortunately, Arboretum Hotplate stopped working 10 days into the field campaign.

### 1.4. Location :

Table 2 : Location and elevation of the instruments at every site

Sites	Instrument	Latitude	Longitude	Site elevation (MSL)	Instrument elevation (AGL)
Gault	K63	45.535021 N	73.149006 W	132 m	1.5 m
Arboretum	“	45.430065 N	73.942156 W	49 m	2.1 m
UQAM-PK	“	45.508594 N	73.568741 W	69 m	2.4 m
Trois-Rivières	“	46.349835 N	72.581354 W	47 m	2.1 m

### 1.5. Data Frequency: 1 minute

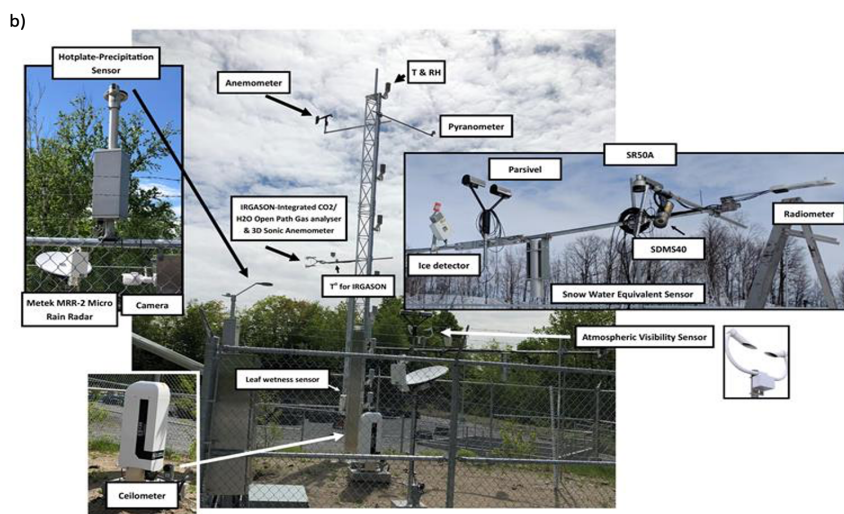
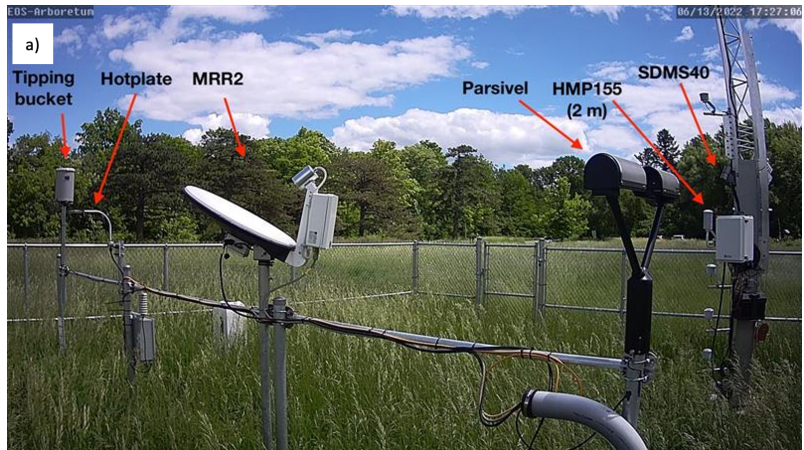
### 1.6. Dataset restrictions: Please refer to the WINTRE-MIX data policy

(<https://www.eol.ucar.edu/content/wintre-mixdata-policy>) as well as the WINTRE-MIX data management plan

([https://www.eol.ucar.edu/system/files/Data\\_Management\\_Plan-1Dec202.pdf](https://www.eol.ucar.edu/system/files/Data_Management_Plan-1Dec202.pdf)) for more information regarding dataset restrictions and dissemination.

### 1.7. Web address:

Preliminary Parsivel data are visualized as “quick look” plots on the WINTRE-MIX field catalog ( <https://catalog.eol.ucar.edu/wintre-mix/114/date/> ).





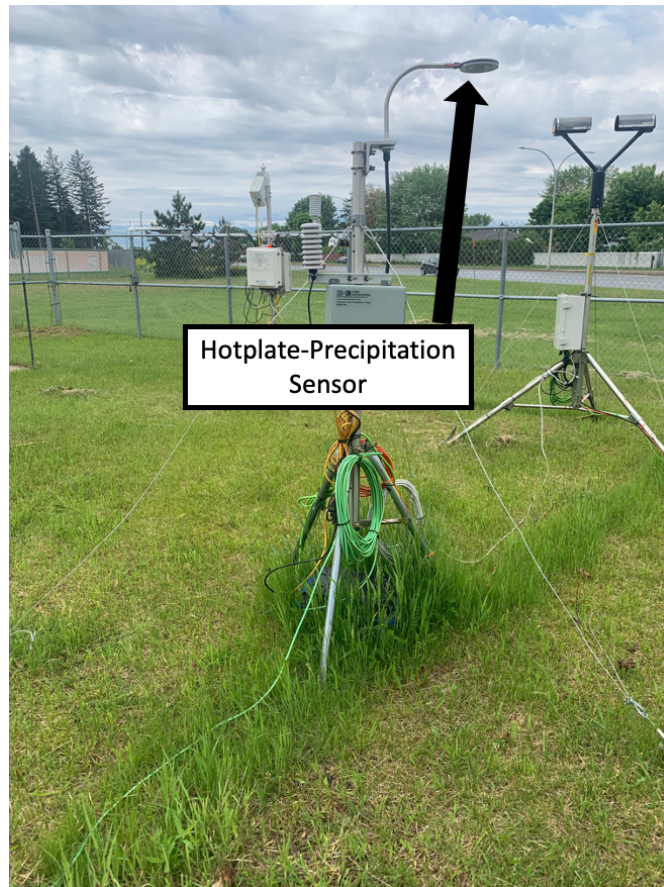


Figure 1 : a) Instrument yard of Arboretum, b) Instrument yard in Gault, c) Instrument yard on the rooftop of PK-UQAM and d) Instrument yard in Trois-Rivières

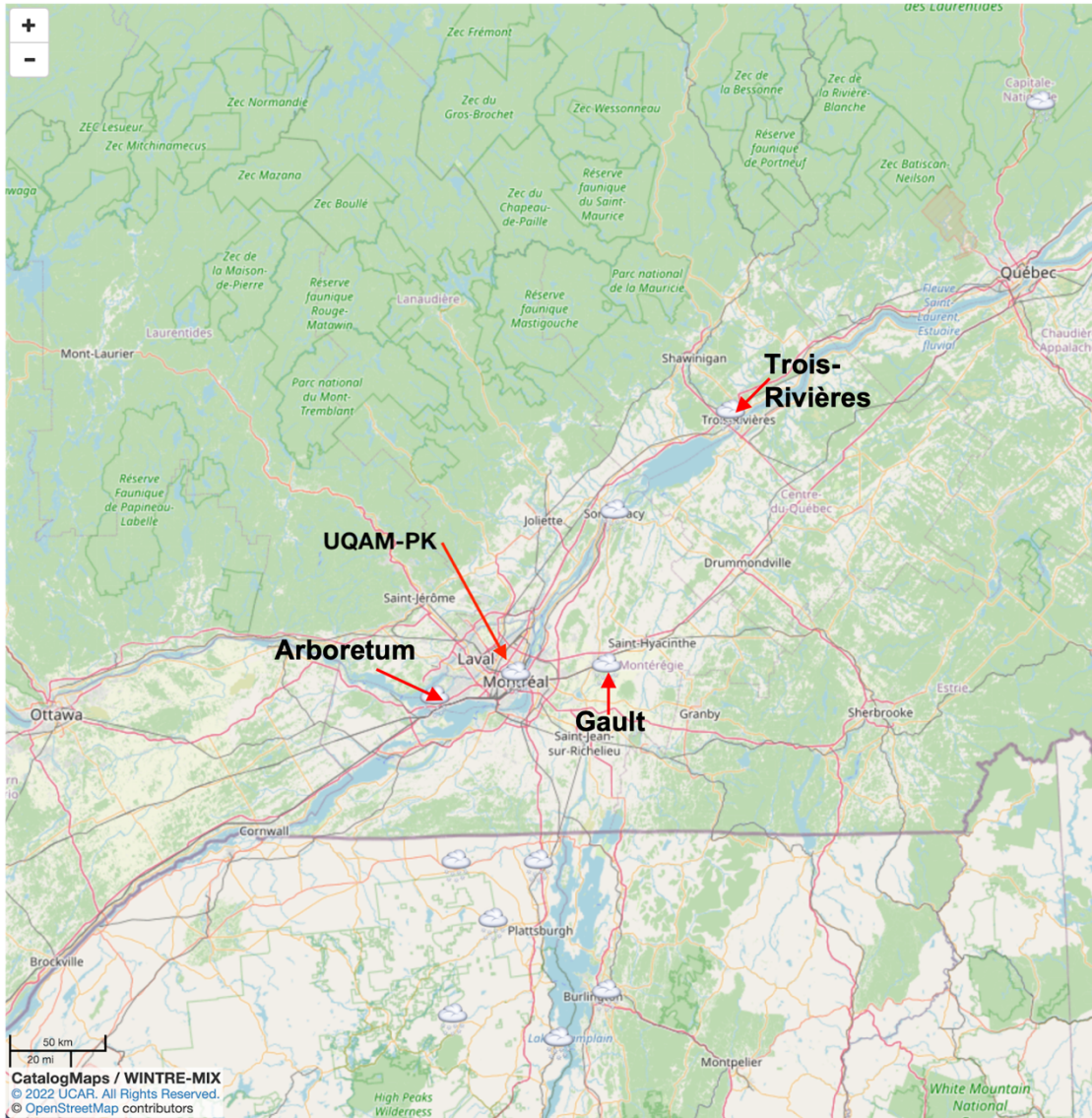


Figure 2: Approximate location of each site

## 2. Instrument description

The K63 Hotplate Total Precipitation Gauge measures total frozen, freezing, and liquid precipitation as well as environmental parameters such as barometric pressure. The attributes of the K63 are summarized in Table 3. More detailed technical information is available in Pond Scientific (2020).

Table 3: K63 Attributes

Parameter	Value
Operating Temp Range	- 40 °C to 50 °C
Operating Pressure Range	300 to 1100 mbar $\pm$ 1 mbar
Operating Liquid Equiv. Rate	0 to 50 mm/h $\pm$ 0.5 mm/hr

### 3. Data Collection and Processing

The K63 outputs a 1-minute average precipitation rate (liquid equivalent). The data are then appended to a file (suffix .dat) corresponding to the day of operation. The files are daily and contain 24 hours of data. The only post-processing applied to the data was only to use data within a valid range defined by Pond Engineering, the K63 manufacturer.

### 4. Data Formats

A NetCDF file has been produced and contains the data for each site and headers for every parameter. The time is in UTC and has the following format: YYYY-MM-DD hh:mm:ss. The average precipitation intensity is in mm/h and the barometric pressure is in mbar. The units and status statements are summarized in Table 4.

*Table 4: Units and status statements*

Parameter	Definition	Units	Status
precipitation_rate_k63	1-min Average PRCP Rate	mm/h	-
pressure_k63	1-min Average Barometric Pressure	mbar	-
status_k63	Stable at Operating Temperature	-	1
status_k63	Outside of stability band (precip may be under or over-reported)	-	2
status_k63	System Error - Heaters Disabled	-	3
status_k63	Error	-	4

### 5. Data Remarks

Table 5 summarizes all instrument interruptions > 1 h. Only 12 long interruptions occurred during the field campaign (1 Feb 2022 - 15 March 2022). They are highlighted in yellow. In the NetCDF file, variable values are replaced by NAN when data are missing.



Table 5: Summary of missing data

Site	Instrument	Interruption Lenght [hour]	Start	End
Gault	K63	6	2021-12-18 23:56	2021-12-19 05:53
Gault	"	14	2021-12-21 23:56	2021-12-22 14:08
Gault	"	1	2022-01-14 23:56	2022-01-15 01:10
Gault	"	1	2022-01-24 18:03	2022-01-24 19:08
Gault	"	1	2022-01-30 18:03	2022-01-30 19:04
Arboretum	"	4	2021-11-05 07:38	2021-11-05 11:43
Arboretum	"	6	2021-11-30 12:25	2021-11-30 18:08
Arboretum	"	1	2021-12-12 04:20	2021-12-12 05:39
Arboretum	"	28	2022-02-09 15:32	2022-02-10 19:24
Trois- Rivières	"	8	2022-02-03 04:31	2022-02-03 12:26
Trois- Rivières	"	7	2022-02-07 20:48	2022-02-08 03:43
UQAM-PK	"	11	2022-02-18 11:19	2022-02-18 22:34
UQAM-PK	"	15	2022-02-19 01:10	2022-02-19 15:47
UQAM-PK	"	15	2022-02-19 19:15	2022-02-20 09:52
UQAM-PK	"	15	2022-02-20 12:28	2022-02-21 03:05
UQAM-PK	"	15	2022-02-21 06:33	2022-02-21 22:02
UQAM-PK	"	15	2022-02-22 00:38	2022-02-22 15:15
UQAM-PK	"	15	2022-02-22 18:43	2022-02-23 09:20
UQAM-PK	"	15	2022-02-23 12:48	2022-02-24 03:25
UQAM-PK	"	13	2022-02-24 06:01	2022-02-24 18:32

## 6. Acknowledgement

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## 7. References

\*Pond Engineering, 2020: Model K63 Hotplate® Total Precipitation Gauge Operation & Maintenance Manual. *Pond Engineering Laboratories, Inc.*

*\*The manual is provided as attachment.*