AmeriFlux (/)

Data Variables

[pdf] (http://ameriflux.lbl.gov/wp-content/uploads/2018/11/AmeriFlux_Data_Variables_gen20181116.pdf)

This document describes variable labels and file formatting used for continuously sampled data within the AmeriFlux and European Fluxes databases. Agreement on a common and shared system to name and organize the variables collected is important to data sharing across networks.

Continuously sampled data are defined as observations that are reported at regular intervals of time, generally daily or more frequent, for a certain time period. The time interval between two sequential values is always the same.

The rules described in this document include the following:

- **Temporal representativeness and timestamps**;
- **Data variable base names** that indicate the measured or derived physical quantity or quality information;
- **Data variable qualifiers** that indicate additional information like position, quality flags, filtering states, gap-filling, processing methods, etc.

The rules generally apply to the various steps involved in the data life cycle within the network data system: from data uploads by the tower team to centralized processing and quality assessment / quality control (QA/QC), to the data distributed to final users. Rules specific to particular aspects of the measurement life cycle are noted. See also Half-hourly / Hourly Data Upload Format (https://ameriflux.lbl.gov/half-hourly-hourly-data-upload-format/) and Uploading High-Frequency Data (http://ameriflux.lbl.gov/data/how-to-uploaddownload-data/uploading-high-frequency-data/).

1. Temporal representativeness and timestamps

Two forms of reporting the time associated with data are needed:

- Data files using **daily**, **monthly**, and **yearly** resolutions use a single timestamp variable: TIMESTAMP. For these types of files, the temporal resolution of the data matches the temporal resolution of the timestamp. For instance, a single timestamp with daily resolution is sufficient to unambiguously identify the interval represented by a daily aggregate, e.g., 20150728.

- Data files in **half-hourly**, **hourly**, and **weekly** resolutions use two timestamps variables. TIMESTAMP_START and TIMESTAMP_END to refer to the start and end of the reporting interval. In these types of files, the temporal resolution of the data differs from that of the timestamp. For instance, using a timestamp with minute resolution — e.g., 201507281730 — to identify a single half-hour period can be interpreted in different ways: 5:00pm to 5:30pm, 5:30pm to 6:00pm, or even 5:15pm to 5:45pm. While various conventions can be used to eliminate ambiguity, we have found the use of these two timestamp variables to be the most straightforward.

For half-hourly and hourly timestamps, use 00-23 to report the hour.

Below are examples of resolutions using a single TIMESTAMP variable as well as resolutions using both TIMESTAMP_START and TIMESTAMP_END.

- sample **half-hourly** data file (both timestamps):

```
TIMESTAMP_START,TIMESTAMP_END,CO2,...
201507281700,201507281730,391.1,...
201507281730,201507281800,391.8,...
...
```

- sample **hourly** data file (both timestamps):

```
TIMESTAMP_START,TIMESTAMP_END,CO2,...
201507281700,201507281800,391.1,...
201507281800,201507281900,391.8,...
...
```

- sample **daily** data file (single timestamp):

```
TIMESTAMP,CO2,...
20150728,391.1,...
20150729,392.8,...
...
```

- sample **weekly** data file (both timestamps):

```
TIMESTAMP_START,TIMESTAMP_END,CO2,...
20150701,20150707,391.1,...
20150708,20150714,391.8,...
20150715,20150721,390.9,...
20150722,20150728,392.0,...
...
```

- sample **monthly** data file (single timestamp):

```
TIMESTAMP,CO2,...
201507,391.1,...
201508,392.8,...
...
```

- sample **yearly** data file (single timestamp):

```
TIMESTAMP,CO2,...
2014,388.1,...
2015,392.8,...
...
```

Timestamp column ordering (text-based files only)

For text file data representations (i.e., CSV formatted), timestamps are always in the first column(s) of the file.

Time zone convention

Time is reported in local standard time (i.e., without Daylight Saving Time). The time zone is specified using the Site General Information BADM (http://ameriflux.lbl.gov/data/badm-data-templates/) for the site.

Missing data

Missing data are reported using -9999 as replacing value.[2] Data for all days in a leap year are reported.

[1] *Biological, Ancillary, Disturbance and Metadata.*
[2] *Other values such as -6999, N/A, and NaN are not acceptable as an indication of a missing value.*

2. Data Variable: Base names

Base names indicate fundamental quantities that are either measured or calculated / derived. They can also indicate quantified quality information.

Table 1. Base names for data variable labels

Name	Description	Units

Name	Description	Units
TIMEKEEPING		
TIMESTAMP_START	ISO timestamp start of averaging period (up to a 12-digit integer as specified by the data's temporal resolution)	YYYYMMDDHHMM
TIMESTAMP_END	ISO timestamp end of averaging period (up to a 12-digit integer as specified by the data's temporal resolution)	YYYYMMDDHHMM
BIOLOGICAL		
DBH	Diameter of tree measured at breast height (1.3m) with continuous dendrometers	cm
LEAF_WET	Leaf wetness, range 0-100	%
SAP_DT	Difference of probes temperature for sapflow measurements	deg C
SAP_FLOW	Sap flow	mmolH2O m-2 s-1
STEMFLOW	Excess precipitation that drains from outlying branches and leaves and is channeled through the stems to the ground	mm
T_BOLE	Bole temperature	deg C
T_CANOPY	Temperature of the canopy and/or surface underneath the sensor	deg C
THROUGHFALL	Excess precipitation that passes directly through a canopy or drips from wet leaves to the ground	mm
FOOTPRINT		
FC_SSITC_TEST	Results of the Steady State and Integral Turbulence Characteristics for FC according to Foken et al 2004 (i.e., 0, 1, 2)	adimensional
FCH4_SSITC_TEST	Results of the Steady State and Integral Turbulence Characteristics for FCH4 according to Foken et al 2004 (i.e., 0, 1, 2)	adimensional
FETCH_70	Distance at which footprint cumulative probability is 70%	m
FETCH_80	Distance at which footprint cumulative probability is 80%	m
FETCH_90	Distance at which footprint cumulative probability is 90%	m
FETCH_FILTER	Footprint quality flag (i.e., 0, 1): 0 and 1 indicate data measured when wind coming from direction that should be discarded and kept, respectively	adimensional
FETCH_MAX	Distance at which footprint contribution is maximum	m
FN2O_SSITC_TEST	Results of the Steady State and Integral Turbulence Characteristics for FN2O according to Foken et al 2004 (i.e., 0, 1, 2)	adimensional
FNO_SSITC_TEST	Results of the Steady State and Integral Turbulence Characteristics for FNO according to Foken et al 2004 (i.e., 0, 1, 2)	adimensional
FNO2_SSITC_TEST	Results of the Steady State and Integral Turbulence Characteristics for FNO2 according to Foken et al 2004 (i.e., 0, 1, 2)	adimensional
FO3_SSITC_TEST	Results of the Steady State and Integral Turbulence Characteristics for FO3 according to Foken et al 2004 (i.e., 0, 1, 2)	adimensional
GASES		
CH4	Methane (CH4) mole fraction in wet air	nmolCH4 mol-1
CO	Carbon Monoxide (CO) mole fraction in wet air	nmolCO mol-1
CO2	Carbon Dioxide (CO2) mole fraction in wet air	µmolCO2 mol-1
CO2C13	Stable isotopic composition of CO2 - C13 (i.e., d13C of CO2)	‰ (permil)
CO2_SIGMA	Standard deviation of carbon dioxide mole fraction in wet air	µmolCO2 mol-1
FC	Carbon Dioxide (CO2) turbulent flux (no storage correction)	µmolCO2 m-2 s-1

Name	Description	Units
FCH4	Methane (CH4) turbulent flux (no storage correction)	nmolCH4 m-2 s-1
FN2O	Nitrous oxide (N2O) turbulent flux (no storage correction)	nmolN2O m-2 s-1
FNO	Nitric oxide (NO) turbulent flux (no storage correction)	nmolNO m-2 s-1
FNO2	Nitrogen dioxide (NO2) turbulent flux (no storage correction)	nmolNO2 m-2 s-1
FO3	Ozone (O3) turbulent flux (no storage correction)	nmolO3 m-2 s-1
H2O	Water (H2O) vapor mole fraction	mmolH2O mol-1
H2O_SIGMA	Standard deviation of water vapor mole fraction	mmolH2O mol-1
N2O	Nitrous Oxide (N2O) mole fraction in wet air	nmolN2O mol-1
NO	Nitric oxide (NO) mole fraction in wet air	nmolNO mol-1
NO2	Nitrogen dioxide (NO2) mole fraction in wet air	nmolNO2 mol-1
O3	Ozone (O3) mole fraction in wet air	nmolO3 mol-1
SC	CO2 storage flux	µmolCO2 m-2 s-1
SCH4	Methane (CH4) storage flux	nmolCH4 m-2 s-1
SN2O	Nitrous oxide (N2O) storage flux	nmolN2O m-2 s-1
SNO	Nitric oxide (NO) storage flux	nmolNO m-2 s-1
SNO2	Nitrogen dioxide (NO2) storage flux	nmolNO2 m-2 s-1
SO2	Sulfur Dioxide (SO2) mole fraction in wet air	nmolSO2 mol-1
SO3	Ozone (O3) storage flux	nmolO3 m-2 s-1
HEAT		
G	Soil heat flux	W m-2
H	Sensible heat turbulent flux (no storage correction)	W m-2
H_SSITC_TEST	Results of the Steady State and Integral Turbulence Characteristics for H according to Foken et al 2004 (i.e., 0, 1, 2)	adimensional
LE	Latent heat turbulent flux (no storage correction)	W m-2
LE_SSITC_TEST	Results of the Steady State and Integral Turbulence Characteristics for LE according to Foken et al 2004 (i.e., 0, 1, 2)	adimensional
SB	Heat storage flux in biomass	W m-2
SG	Heat storage flux in the soil above the soil heat fluxes measurement	W m-2
SH	Heat storage flux in the air	W m-2
SLE	Latent heat storage flux	W m-2
MET_ATM		
PA	Atmospheric pressure	kPa
PBLH	Planetary boundary layer height	m
RH	Relative humidity, range 0-100	%
T_SONIC	Sonic temperature	deg C
T_SONIC_SIGMA	Standard deviation of sonic temperature	deg C
TA	Air temperature	deg C

Name	Description	Units
VPD	Vapor Pressure Deficit	hPa
MET_PRECIP		
D_SNOW	Snow depth	cm
P	Precipitation	mm
P_RAIN	Rainfall	mm
P_SNOW	Snowfall	mm
RUNOFF	Run off	mm
MET_RAD		
ALB	Albedo, range 0-100	%
APAR	Absorbed PAR	µmol m-2 s-1
FAPAR	Fraction of absorbed PAR, range 0-100	%
FIPAR	Fraction of intercepted PAR, range 0-100	%
LW_BC_IN	Longwave radiation, below canopy incoming	W m-2
LW_BC_OUT	Longwave radiation, below canopy outgoing	W m-2
LW_IN	Longwave radiation, incoming	W m-2
LW_OUT	Longwave radiation, outgoing	W m-2
NDVI	Normalized Difference Vegetation Index	adimensional
NETRAD	Net radiation	W m-2
PPFD_BC_IN	Photosynthetic photon flux density, below canopy incoming	µmolPhoton m-2 s-1
PPFD_BC_OUT	Photosynthetic photon flux density, below canopy outgoing	µmolPhoton m-2 s-1
PPFD_DIF	Photosynthetic photon flux density, diffuse incoming	µmolPhoton m-2 s-1
PPFD_DIR	Photosynthetic photon flux density, direct incoming	µmolPhoton m-2 s-1
PPFD_IN	Photosynthetic photon flux density, incoming	µmolPhoton m-2 s-1
PPFD_OUT	Photosynthetic photon flux density, outgoing	µmolPhoton m-2 s-1
PRI	Photochemical Reflectance Index	adimensional
R_UVA	UVA radiation, incoming	W m-2
R_UVB	UVB radiation, incoming	W m-2
SPEC_NIR_IN	Radiation (near infra-red band), incoming	µmolPhoton m-2 s-1
SPEC_NIR_OUT	Radiation (near infra-red band), outgoing	µmolPhoton m-2 s-1
SPEC_NIR_REFL	Reflectance (near infra-red band)	adimensional
SPEC_PRI_REF_IN	Radiation for PRI reference band (e.g., 570 nm), incoming	µmolPhoton m-2 s-1
SPEC_PRI_REF_OUT	Radiation for PRI reference band (e.g., 570 nm), outgoing	µmolPhoton m-2 s-1
SPEC_PRI_REF_REFL	Reflectance for PRI reference band (e.g., 570 nm)	adimensional
SPEC_PRI_TGT_IN	Radiation for PRI target band (e.g., 531 nm), incoming	µmolPhoton m-2 s-1
SPEC_PRI_TGT_OUT	Radiation for PRI target band (e.g., 531 nm), outgoing	µmolPhoton m-2 s-1
SPEC_PRI_TGT_REFL	Reflectance for PRI target band (e.g., 531 nm)	adimensional

Name	Description	Units
SPEC_RED_IN	Radiation (red band), incoming	µmolPhoton m-2 s-1
SPEC_RED_OUT	Radiation (red band), outgoing	µmolPhoton m-2 s-1
SPEC_RED_REFL	Reflectance (red band)	adimensional
SW_BC_IN	Shortwave radiation, below canopy incoming	W m-2
SW_BC_OUT	Shortwave radiation, below canopy outgoing	W m-2
SW_DIF	Shortwave radiation, diffuse incoming	W m-2
SW_DIR	Shortwave radiation, direct incoming	W m-2
SW_IN	Shortwave radiation, incoming	W m-2
SW_OUT	Shortwave radiation, outgoing	W m-2
MET_SOIL		
SWC	Soil water content (volumetric), range 0-100	%
SWP	Soil water potential	kPa
TS	Soil temperature	deg C
TSN	Snow temperature	deg C
TW	Water temperature	deg C
WTD	Water table depth	m
MET_WIND		
MO_LENGTH	Monin-Obukhov length	m
TAU	Momentum flux	kg m-1 s-2
TAU_SSITC_TEST	Results of the Steady State and Integral Turbulence Characteristics for TAU according to Foken et al 2004 (i.e., 0, 1, 2)	adimensional
U_SIGMA	Standard deviation of velocity fluctuations (towards main-wind direction after coordinates rotation)	m s-1
USTAR	Friction velocity	m s-1
V_SIGMA	Standard deviation of lateral velocity fluctuations (cross main-wind direction after coordinates rotation)	m s-1
W_SIGMA	Standard deviation of vertical velocity fluctuations	m s-1
WD	Wind direction	Decimal degrees
WS	Wind speed	m s-1
WS_MAX	maximum WS in the averaging period	m s-1
ZL	Monin-Obukhov Stability	adimensional
PRODUCTS		
GPP	Gross Primary Productivity	µmolCO2 m-2 s-1
NEE	Net Ecosystem Exchange	µmolCO2 m-2 s-1
RECO	Ecosystem Respiration	µmolCO2 m-2 s-1

3. Data Variable: Qualifiers

Qualifiers are suffixes appended to variable base names that provide additional information about the variable. For example, the _F qualifier in the variable label TS_F indicates that soil temperature (TS) has been gap-filled by the network.

Multiple qualifiers can be added, and they must **follow the order in which they are presented here**. See Data Variable Qualifier Examples (https://ameriflux.lbl.gov/data/data-variable-qualifier-examples/) for additional guidance.

In general, qualifiers are applied at the network level (network teams only) and should not be used in data uploads by tower teams. Exceptions are noted in the qualifier descriptions below.

3.1. Qualifiers: General

General qualifiers indicate additional information about a variable.

3.1.1. _PI (Provided by PI / tower team)

- Use: network team only
- Details: _PI indicates a variable that has been QA/QC filtered or gap-filled by the tower team, independently of network QA/QC or gap-filling processing.

3.1.2. _QC (Quality control flag)

- Use: network team only
- Details: _QC reports quality checks resulting from standard and centralized QA/QC of the data.

3.1.3. _F (Gap-filled variable)

- Use: tower team or network team
- Details: _F indicates that the variable has been gap-filled.

3.1.4. _IU (Instrument units)

- Use: tower team or network team
- Details: _IU indicates that the variable uses instrument units (e.g., counts, mV, absorbance) instead of standard units (e.g., mm, degC, µmol mol-1). In general, this qualifier is used only in high-frequency data uploads and should be discussed with the network team before using.

3.2. Qualifiers: Theme, Methods, and Uncertainty

Placeholder for theme, methods, and uncertainty related qualifiers.

This will be their position in the order of suffixes to variable labels.

These qualifiers are currently being defined along with the post-processing results.

3.3. Qualifiers: Positional *(_H_V_R)*

Positional qualifiers are used to indicate relative positions of observations at the site. For example, observations can be measured at different points in space (e.g., along a vertical profile or in different positions within the horizontal plane) or measured at the same position using two or more sensors (replicates). Position qualifiers are appended to a variable base name. The actual sensor position is reported along with the corresponding position qualifier in BADM Instrument Ops template (http://ameriflux.lbl.gov/data/badm-data-templates/).[3]

See Data Variable Qualifier Examples (https://ameriflux.lbl.gov/data/data-variable-qualifier-examples/) for examples of positional qualifiers.

[3] Note: the indices may be reassigned by the network team in released data products. Any such change will be based on positions described in the BADM and feedback from tower teams.

3.3.1. *_H_V_R* (Three-index positional qualifier)

- Use: tower team and network team
- Details: The three components of the qualifier are indices that indicate an observation's spatial position. In other words, the indices describe the position of a sensor relative to other sensors that measure the same variable within a site. They are not measurements of distances. The letters *H*, *V*, and *R* are to be replaced with integer values to represent:

Horizontal position *(H)*: Use of the same *H* index indicates the same position within the horizontal plane among variables with the same base name. For example, observations that have the same variable base name and are arranged in a vertical profile would have the same *H* index. Note: variables with different base names could have different *H* indices even if located in the same physical location.

Vertical position *(V)*: Use of the same *V* index indicates the same position along the vertical axis among variables with the same base name. Indices must be in order, starting with the highest. For example, *V* = 1 for the highest air temperature or most shallow soil temperature sensor in a profile. The indices are assigned on the basis of the relative position for each vertical profile separately.

Replicate *(R)*: The *R* index indicates that the variable is measured in the same position (both *H* and *V*) as another sensor. Two co-located sensors are considered "replicates" if the difference in observations is due to separate instrumentation or different measurement technique. Spatial variability is never represented with different *R* indices. Defining spatial variability versus replication is variable dependent. For example, two radiometers measuring incoming radiation that are spaced 1 meter apart horizontally could be considered replicates, while two soil water content sensors at 1 meter horizontally spacing may have different spatial positions (different *H* indices).

Example:
Two profiles of soil temperature in two different horizontal positions: Profile 1 has four sensors at -2, -5, -10 and -30 cm, and Profile 2 has three sensors, one at -5 and two at -30 cm (e.g. different models). The codes will be:

Sensor	Code
Profile 1, -2 cm	TS_1_1_1
Profile 1, -5 cm	TS_1_2_1
Profile 1, -10 cm	TS_1_3_1
Profile 1, -30 cm	TS_1_4_1
Profile 2, -5 cm	TS_2_1_1
Profile 2, -30 cm, sensor model A	TS_2_2_1
Profile 2, -30 cm, sensor model B	TS_2_2_2

Adding sensors:

- When a new sensor is added in the horizontal plane, a new value of the *H* qualifier is added.
- When a new height / depth is added in an existing vertical profile, the entire profile can be renumbered to be in sequential order. Alternatively, a new index number can be used (even if not in the correct order). Metadata describing the new position or renumbered profile should be indicated in a BADM Instrument Ops template (http://ameriflux.lbl.gov/data/badm-data-templates/). If a new index number is used out of the correct order, the entire profile may be renamed sequentially by the network team. When the position is not measured for a certain year, the values for that year will be filled with -9999.
- **For AmeriFlux sites, see Data Variable: Qualifiers (Section 5) at Half-Hourly / Hourly Data Upload Format (https://ameriflux.lbl.gov/half-hourly-hourly-data-upload-format/) for additional instructions.**

Example:
Continuing the example above, two new sensors are added. One is added in a new horizontal position at -30 cm depth, forming the new Profile 3. The other sensor is added to the existing Profile 2 at -20 cm depth. The codes become:

Sensor	Code
Profile 1, -2 cm	TS_1_1_1
Profile 1, -5 cm	TS_1_2_1
Profile 1, -10 cm	TS_1_3_1
Profile 1, -30 cm	TS_1_4_1
Profile 2, -5 cm	TS_2_1_1
Profile 2, -20 cm	TS_2_2_2
Profile 2, -30 cm, sensor model A	TS_2_3_1

Sensor	Code
Profile 2, -30 cm, sensor model B	TS_2_3_2
Profile 3, -30 cm	TS_3_1_1

Note: The entire Profile 2 is renumbered to accommodate the new sensor (TS_2_2_2) that is positioned between existing sensors above and below.

3.4. Qualifiers: Aggregation

Data from individual sensors may be aggregated by the network team using variable base names, position qualifiers, metadata, and discussion with the tower team. It is possible for tower teams to upload their preferred aggregations as well, using the aggregation qualifiers as described below. However, AmeriFlux prefers that individual sensor data are uploaded over aggregated values.

See Data Variable Qualifier Examples (https://ameriflux.lbl.gov/data/data-variable-qualifier-examples/) for examples of aggregation qualifiers.

3.4.1. _*H*_*V*_A (Aggregation of replicates)

- Use: network team only
- Details: If replicates can be aggregated, they are averaged, and the result is reported with the *R* index of the _*H*_*V*_*R* position qualifier replaced with the letter A, i.e. _*H*_*V*_A. Continuing the example above, if the TS_2_3_1 and TS_2_3_2 can be averaged, the result will be named TS_2_3_A. Standard deviation and number of samples can also be reported with TS_2_3_A_SD and TS_2_3_A_N (see _SD and _N descriptions below).
- Note: *H* and *V* are replaced with numerical indices, while A is used as is.

3.4.2. _*#* (Aggregation layer index)

- Use: tower team or network team
- Details: Variables with the same base name and the same height / depth but different horizontal positions can be aggregated. This aggregation across a horizontal plane represents the footprint at a given layer. The _*#* qualifier is replaced by a numerical index indicating the layer's relative height / depth position.
- Note: An aggregated layer index may not be needed for variables that are representative of the tower footprint, either through aggregation or spatial resolution (see note in example after 3.4.4). There are a few exceptions like soil temperature where the qualifiers are always needed to indicate layer depth.

3.4.3. _SD (Standard deviation – spatial variability)

- Use: network team only
- Details: Standard deviation of an aggregated variable. The _SD qualifier must be used in conjunction with an aggregation of replicates or aggregation layer index.

3.4.4. _N (Number of samples – spatial variability)

- Use: network team only
- Details: Number of samples in the aggregated variable. The _N qualifier must be used in conjunction with an aggregation of replicates or aggregation layer index.

Example:
Continuing the examples above, variables measured by sensors located at different positions within the horizontal plane but at a "similar" height / depth can be averaged. The aggregated layer variable qualifier *(_#)* indicates the sequential horizontal planes, with 1 indicating the highest layer position.

TS_1 = TS_1_1_1 (sensor at -2 cm)
TS_2 = TS_1_2_1 **&** TS_2_1_1 (sensors at -5 cm)
TS_3 = TS_1_3_1 (sensor at -10 cm)
TS_4 = TS_2_2_2 (sensor at -20 cm)
TS_5 = TS_1_4_1 **&** TS_2_3_A **&** TS_3_1_1 (sensors at -30 cm)

Note: TS_2_3_A in layer 5 is the aggregated value of replicate sensors in Profile 2 located at -30 cm depth, as indicated by the _*H*_*V*_A qualifier.

If a specific layer *(_#)* has two or more sensors, additional variables are also created. The standard deviation between sensors is identified with _SD. The number of sensors in the layer is identified with _N. In the case above, this would happen for TS_2 and TS_5, producing TS_2_SD, TS_2_N, TS_5_SD and TS_5_N.

Note: If a variable is not measured along a vertical profile, the _# qualifier is not used. For example, if there is only one radiation sensor measuring SW_IN, SW_IN_1 is not created. Similarly if there are PPFD sensors at different heights below canopy measuring PPFD_BC_IN, they can be averaged and standard deviation calculated. The _# is not used — the variables are named directly PPFD_BC_IN and PPFD_BC_IN_SD.

3.5 Order of Qualifiers

When multiple qualifiers are used, qualifiers are ordered as follows:

1. General Qualifiers (As ordered in Section 3.1)
2. Position Qualifiers or Aggregation Qualifiers (As ordered in Section 3.3 or Section 3.4)

See Data Variable Qualifier Examples (https://ameriflux.lbl.gov/data/data-variable-qualifier-examples/) for examples of positional and aggregation qualifiers.

Example:

Variable	Explanation
TA_F_1_1_1	Air temperature (TA), gap-filled by network (_F) at horizontal position 1, vertical position 1, and replicate 1 (_1_1_1).
FC_PI_F_1_1_A	Carbon dioxide CO2 flux (FC), gap-filled by tower team (_PI_F), aggregated value of replicated sensors at horizontal position 1 and vertical position 1 (_1_1_A).
P_IU_1	Precipitation (P) in instrument units (_IU) e.g. mV, at aggregate layer 1 (_1).
TS_2_3_A_SD	Standard deviation (_SD), for soil temperature (TS) at horizontal position 2 and vertical position 3 aggregated across replicate sensors (_2_3_A).
TS_5_N	Number of samples (_N) for soil temperature (TS) aggregated into layer 5 (_5).

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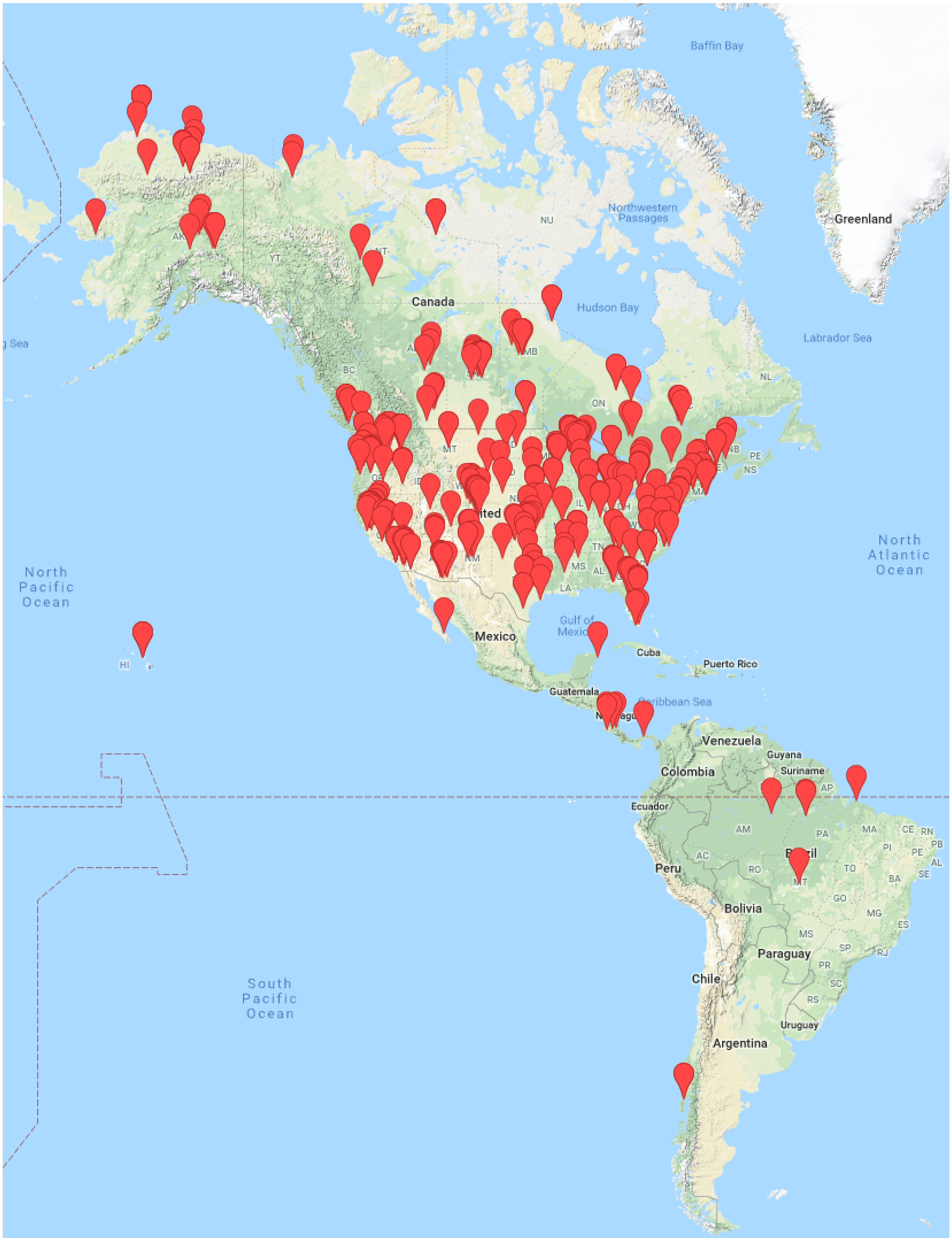
MAP OF SITES



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