Triple aspirated air temperature (DP1.00003.001)

Measurement

Air temperature, available as one- and thirty-minute averages derived from triplicate 1 Hz temperature observations collected by 3 Platinum Resistance Thermometers (PRTs).

Collection methodology

Six components are used to generate triple aspirated air temperature: a snout heater, a turbine, one aspirated shield fan, and three PRTs. These PRTs can be found at the top of NEON tower infrastructure. PRTs use a known linear relationship between electrical resistances of platinum and ambient temperature to determine temperature.

For information about disturbances, land management activities, and other incidents that may impact data at NEON sites, see the Site management and event reporting (DP1.10111.001) data product.

Maintenance and calibration

If needed, the sensor can be cleaned with a soft sponge or soft bristle brush to remove debris. As with all sensors, they are replaced on an annual basis with new or refreshed sensors and calibrated before being installed.

Data package contents

TAAT_1min: Triple aspirated air temperature averaged over 1 minute
TAAT_30min: Triple aspirated air temperature averaged over 30 minutes
variables: Description and units for each column of data in data tables
readme: Data product description, issue log, and other metadata about the data product
sensor_positions: Geospatial locations of individual sensors

Data quality

The data products of Instrumented Systems are flagged by a number of quality assurance checks. These can be either for individual measurements or as a summary from averaged measurements. An automated despiking algorithm is used as part of the data quality checks in place for this data product among other quality flags and quality metrics. In cases where sensors failed calibration a "Suspect Calibration" flag will be added to the corresponding data. Range tests are used to ensure observations fall within the ideal minimum and maximum values. Any large jumps in the data that might be missed with the Range test are typically

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captured with a Step test. Similarly, persistence tests are used to ensure the fluctuation of recorded values is realistic. If there are missing data points, a null test monitors the amount of missing points over a given period of time.

Documentation

NEON Sensor Command, Control, and Configuration (C3) Document: Triple Redundant Aspirated Air Temperature
NEON.DOC.000385vC | 295.9 KiB | PDF

NEON Algorithm Theoretical Basis Document (ATBD) – Triple Redundant Aspirated Air Temperature
NEON.DOC.000654vC | 561.4 KiB | PDF

NEON Algorithm Theoretical Basis Document (ATBD) – Time Series Automatic Despiking for TIS Level 1 Data Products – QA/QC
NEON.DOC.000783vB | 374.8 KiB | PDF

NEON Algorithm Theoretical Basis Document (ATBD) –Quality Flags and Quality Metrics for TIS Data Products
NEON.DOC.001113vC | 1.1 MiB | PDF

NEON Preventive Maintenance Procedure: AIS & TIS Thermometrics Platinum Resistance Thermometer (PRT)
NEON.DOC.004757vB | 2.6 MiB | PDF

NEON Algorithm Theoretical Basis Document (ATBD) – QA/QC Plausibility Testing
NEON.DOC.011081vD | 476.8 KiB | PDF

For more information on data product documentation, see:
https://data.neonscience.org/data-products/DP1.00003.001

Citation

To cite data from Triple aspirated air temperature (DP1.00003.001), see citation here:
https://data.neonscience.org/data-products/DP1.00003.001
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