

# Relative humidity (DP1.00098.001)

## Measurement

Relative humidity (%), temperature (degrees Celsius), and dew or frost point temperature (degrees Celsius)

## Collection methodology

Relative humidity and temperature are measured using a humidity and temperature probe installed at the top of the tower infrastructure, aquatic site meteorological stations, and in the soil array. Measurements represent a point at the sensor's location, are made at a frequency of 1 Hz, and data are published as 1-minute and 30-minute averages.

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

Preventative maintenance and visual inspection is typically performed every two weeks, and calibration is performed annually.

## Data package contents

RH\_1min: Relative Humidity averaged over 1 minute

RH\_30min: Relative Humidity 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

Each measurement is accompanied by a final quality flag (RHFinalQF, tempRHFFinalQF, dewTempFinalQF). Data with a final quality flag of 1 are potentially inaccurate and should only be used with caution. The final quality flag is based on automated QA/QC tests, including range, gap, and spike tests, as well as a manually set science review flag if applicable. Each measurement is accompanied by an estimate of measurement uncertainty, expressed at the 95% confidence level (RHExpUncert, tempRHExpUncert, dewTempExpUncert), which comprises known and quantifiable uncertainties.

Please note that quality checks are comprehensive but not exhaustive; therefore, unknown data quality issues may exist. Also note that, conversely, some quality-flagged data are still usable depending on the scientific use case. Additionally, these [Level 1 data](#) are not currently gap-filled or corrected for sensor drift or

shifts, such as those introduced by sensor swaps or field calibrations. Users are advised to evaluate quality of the data as relevant to the scientific research question being addressed, perform data review and post-processing prior to analysis, and use the data quality flags, issue logs, and maintenance records included in download packages to aid interpretation. A tutorial with examples of how to do this can be found [here](#).

## Standard calculations

For wrapper functions to download data from the API, and functions to merge tabular data files across sites and months, NEON provides the `neonUtilities` package in R and the `neonutilities` package in Python. See the [Download and Explore NEON Data](#) tutorial for introductory instructions in both programming languages.

Sensor height (`zOffset`; m) and the latitude, longitude (`referenceLatitude`, `referenceLongitude`; °), and elevation (m) of the tower or soil plot reference corners are in the `sensor_positions` file (...`sensor_positions...`.csv). Use the HOR.VER component of the time series file name (`horizontalPosition` and `verticalPosition` if stacked using `neonUtilities`) to link to the corresponding row in the HOR.VER column of the `sensor_positions` file. HOR indices correspond to the tower, soil plot, or aquatic meteorological station location, and VER indices correspond to vertical location such as at a higher measurement level on the tower. Soil plot sensors will have a HOR index of their plot number and VER index 000.

## Documentation

-  [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 Sensor Comannd, Control and Configuration \(C3\) Document: Humidity and Temperature Sensor](#)  
NEON.DOC.000850vC | 310.5 KiB | PDF
-  [NEON Algorithm Theoretical Basis Document \(ATBD\) – Humidity and Temperature Sensor](#)  
NEON.DOC.000851vD | 606.2 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: Humidity and Temperature Sensor](#)  
NEON.DOC.004934vC | 4.6 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/DP1.00098.001>

## Citation

To cite data from Relative humidity (DP1.00098.001), see citation here:

<https://data.neonscience.org/data-products/DP1.00098.001>

For general guidance in citing NEON data and documentation, see the citation guidelines page:

<https://www.neonscience.org/data-samples/guidelines-policies/citing>

## Contact Us

NEON welcomes discussion with data users! Reach out with any questions or concerns about NEON data:

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