

2D wind speed and direction (DP1.00001.001)

Measurement

Two-dimensional wind speed (m/sec) and direction (degree)

Collection methodology

2D wind speed and direction is measured using a solid-state anemometer at the top of the aquatic meteorological station, and on each measurement level of the terrestrial tower, excluding the tower top. Measurement level height is determined on a site-specific basis. Measurements are representative of a spatial point throughout time and are made at 0.1 Hz. Data are published as 2- and 30-minute temporal 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 includes cleaning and removing debris from the sensor. It is typically performed every two weeks. Sensor validation is performed annually.

Data package contents

2DWSD_30min: 2D wind speed and direction averaged over 30 minutes

2DWSD_2min: 2D wind speed and direction averaged over 2 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 (windSpeedFinalQF and windDirFinalQF). NEON recommends only using data where the corresponding final quality flag is 0. 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, step and spike, 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 (windSpeedExpUncert and windDirExpUncert) which comprises known and quantifiable uncertainties.

Standard calculations

For wrapper functions to download data from the API, and functions to merge tabular data files across sites and months, see the [neonUtilities R package](#).

Sensor height (zOffset; m) and the latitude, longitude (referenceLatitude, referenceLongitude; °), and elevation (m) of the tower reference corner or aquatic meteorological station base 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 index 000 corresponds to the tower, and VER indices 010-070 increase with increasing height.

Documentation



[NEON Sensor Command, Control and Configuration \(C3\) Document: 2D Wind](#)

NEON.DOC.000387vD | 299.6 KiB | PDF



[NEON Algorithm Theoretical Basis Document \(ATBD\) – 2D Wind Speed and Direction](#)

NEON.DOC.000780vD | 698.8 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 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/DP1.00001.001>

Citation

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