Water quality (DP1.20288.001)

Measurement

Water quality measurements include specific conductance, dissolved oxygen, pH, chlorophyll a, turbidity and fluorescent dissolved organic matter (fDOM).

Collection methodology

Measured using YSI EXO2 Multisondes located at both the S1 (upstream) and S2 (downstream) locations of wadeable streams and on the buoy at lakes and river sites. At wadeable stream sites measurements are collected every minute. At lakes and river sites measurements are collected at 0.5 m below the surface every 5 minutes, and a vertical profile of the water column is collected every 4 hours.

fDOM is corrected for effects of temperature and absorbance on measured fluorescence. Absorbance data are obtained from a co-located SUNA. For this reason, fDOM in wadeable stream sites is only reported for the S2 (downstream) location.

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

The multisonde has an antifouling copper guard and an automated wiper which cleans the optical lens before every fifth measurement. Manual cleaning is performed bi-weekly and field calibration is performed monthly. Sensors are returned to the NEON CALVAL lab annually for refresh.

Multisonde inside protective PVC housing.

Data package contents

ais_maintenance: Information related to aquatic sensor and infrastructure maintenance
ais_multisondeCleanCal: Information related to multisonde cleaning and calibration activities
waq_instantaneous: Instantaneous water quality measurements
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 ("...FinalQF"). 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, gap, and spike tests, as well as a manually set science review flag if applicable ("...FinalQFSciRvw"). This data product also has automated flags for sensor lamp temperature and internal humidity. Each

measurement is accompanied by an estimate of measurement uncertainty, expressed at the 95% confidence level ("...ExpUncert"), 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), the latitude, longitude (referenceLatitude, referenceLongitude; °), and elevation (m) of the in stream infrastructure 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. An HOR of 101 or 111 correspond to Sensor Set 1 (upstream) and HOR of 102 or 112 correspond to Sensor Set 2 (downstream). An HOR of 103 correspond to buoys.

Documentation

NEON Aquatic Sampling Strategy
NEON.DOC.001152vB | 931.8 KiB | PDF

NEON Sensor Command, Control and Configuration (C3) Document: Multisonde, Stream
NEON.DOC.001166vH | 465.8 KiB | PDF

NEON Preventive Maintenance Procedure: AIS Surface Water Quality Multisonde
NEON.DOC.001569vD | 12.1 MiB | PDF

NEON Sensor Command, Control and Configuration (C3) Document: Buoy Meteorological Station and Submerged Sensor Assembly
NEON.DOC.003808vL | 1.8 MiB | PDF

NEON Algorithm Theoretical Basis Document (ATBD): Water Quality
NEON.DOC.004931vC | 1.6 MiB | PDF

NEON User Guide to AIS Maintenance Data
NEON_ISmaintenance_vB | 217.8 KiB | PDF

For more information on data product documentation, see:
https://data.neonscience.org/data-products/DP1.20288.001

Citation

To cite data from Water quality (DP1.20288.001), see citation here:
https://data.neonscience.org/data-products/DP1.20288.001

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