Chemical properties of surface water (DP1.20093.001)

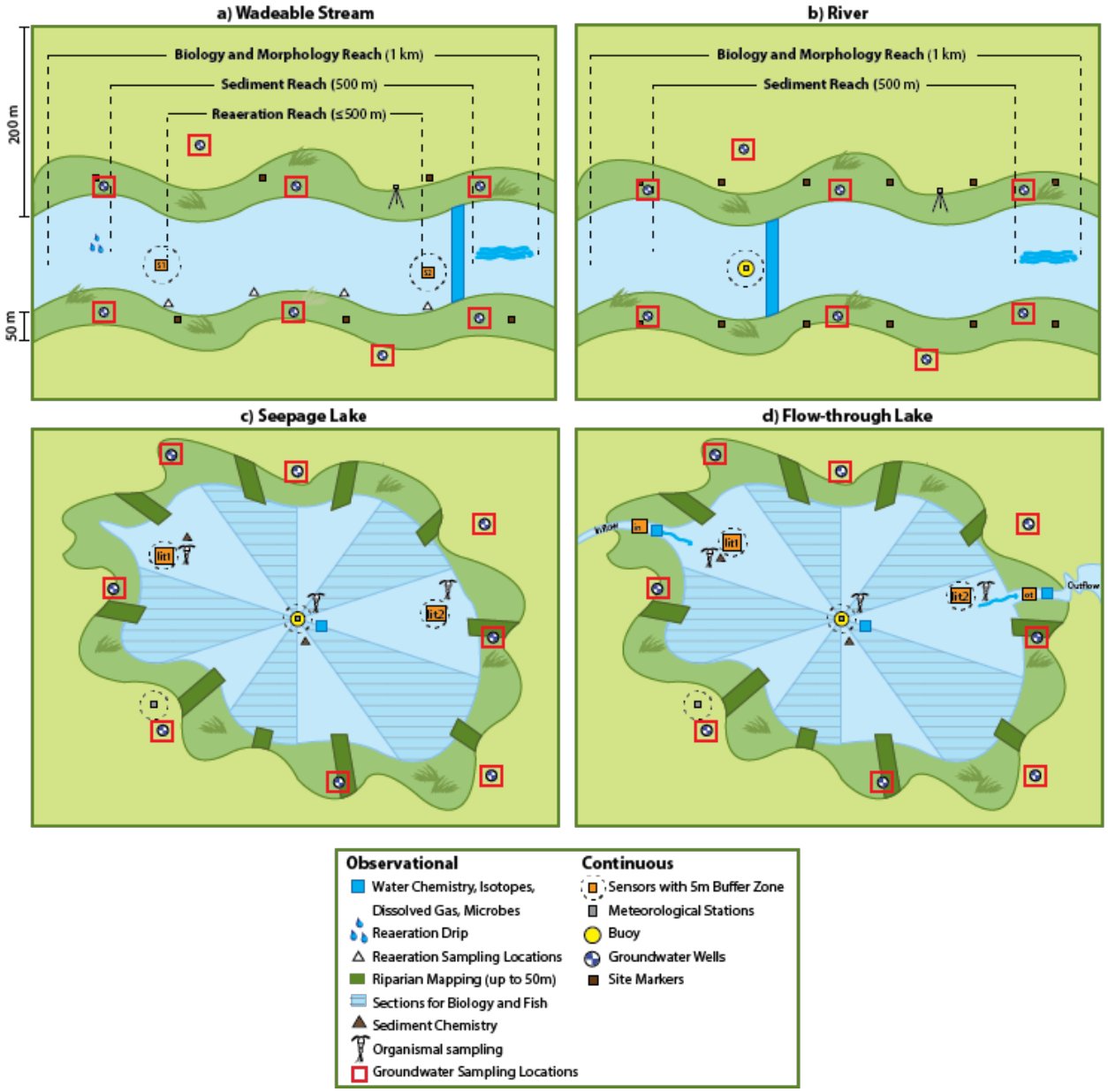
Measurement

Chemistry of surface water, including anions, cations, conductivity, pH, and various forms of carbon and nutrients including total, dissolved and particulates.

Collection methodology

Wadeable stream water collection occurs in the thalweg near the downstream sensor set while non-wadeable streams sample from a depth of 0.5m. Samples are taken up to 26 times per year (Fig 1). Lakes are sampled at up to 3 locations with variable depths near the bouy, inlet and outlet sensors 12 times per year (Fig 1). A more detailed description can be found in the AOS Protocol and Procedure: Water Chemistry Sampling in Surface Waters in Groundwater (NEON.DOC.002905). Samples are filtered within 3 hours of collection, kept cold, then shipped overnight to an analytical laboratory for processing.

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.



Generic layout of NEON surface water sampling locations (blue quadrangles) in a) wadeable streams, b) rivers, c) seepage lakes, and d) flow-through lakes.

Data package contents

swc_fieldSuperParent: Field data for the parent sample of surface water chemistry
swc_asiPOMFieldData: Surface water stable isotopes field data
swc_externalLabSummaryData: Surface water chemistry external lab summary data
swc_domainLabData: Surface water chemistry ALK and ANC domain lab data summary data

swc_externalLabDataByAnalyte: Surface water chemistry from external lab in long format
swc_fieldData: Surface water chemistry summary data per site per bout
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
validation: Description of data validation applied at the points of collection and ingest

Data quality

Data on conditions during sampling can be found in the swc_fieldSuperParent table. The sampleCondition field in the swc_externalLabDataByAnalyte table provides information about the condition of the sample at the time of analysis. The swc_externalLabSummaryData table provides data about long-term performance of the analytical laboratory, including method detection limits, precision, and uncertainty.

Note that values can be blank (or NA when downloaded using neonUtilities) for analyteConcentration for a few different reasons. Users are encouraged to look at entries in sampleCondition and belowDetectionQF for details on the reason for a particular record. Records with entries other than "GOOD" or "OK" in sampleCondition likely indicate that data for a given analyte were not collected and users cannot infer a value for the analyte to include in their analysis. For records with "ND" values for belowDetectionQF, users can infer that the analyte concentration is very low and may want to include the records in their analysis.

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.

Note that data in the swc_externalLabDataByAnalyte table are reported in long format, with one record for each combination of sample and analyte.

Table joining

Table 1	Table 2	Join by field(s)
swc_fieldSuperParent	swc_fieldData	parentSampleID
swc_fieldData	swc_domainLabData	parentSampleID
swc_fieldData	swc_externalLabDataByAnalyte	Not fully automatable: sampleID in swc_externalLabDataByAnalyte corresponds to filtSampleID, filtNutSampleID, rawSampleID, rawNutSampleID, and pcnSampleID in swc_fieldData

Table 1	Table 2	Join by field(s)
swc_asiPOMFieldData	swc_domainLabData	parentSampleID
swc_asiPOMFieldData	swc_externalLabDataByAnalyte	Not fully automatable: sampleID in swc_externalLabDataByAnalyte corresponds to isotopePOMSampleID or isotopePOMRep2SampleID in swc_asiPOMFieldData
swc_asiPOMFieldData	swc_fieldData	parentSampleID
swc_asiPOMFieldData	swc_fieldSuperParent	parentSampleID
swc_domainLabData	swc_externalLabDataByAnalyte	Requires intermediate table: join via swc_fieldData table
swc_domainLabData	swc_fieldSuperParent	parentSampleID
swc_externalLabDataByAnalyte	swc_fieldSuperParent	Requires intermediate table: join via swc_fieldData table
swc_externalLabSummaryData	Any other table	Join not recommended. Relevant quality control data can be connected to analytes by overlap of analysisDate with labSpecific start and end dates.

Documentation

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

AOS Protocol and Procedure: SWC – Water Chemistry Sampling in Surface Waters and Groundwater
`NEON.DOC.002905vJ | 3.5 MiB | PDF`

NEON User Guide to Chemical Properties of Surface Water (NEON.DP1.20093) and Chemical Properties of Groundwater (NEON.DP1.20092)
`NEON_waterChem_userGuide_vE | 661 KiB | PDF`

For more information on data product documentation, see:
https://data.neonscience.org/data-products/DP1.20093.001

Citation

To cite data from Chemical properties of surface water (DP1.20093.001), see citation here:
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