EXCHANGE Campaign 1 | Read Me

EXCHANGE Campaign 1: A Community-Driven Baseline Characterization of Soils, Sediments, and Water Across Coastal Gradients

Summary

The EXploration of Coastal Hydrobiogeochemistry Across a Network of Gradients and Experiments (EXCHANGE) program is a consortium of scientists working together to improve our understanding of how the two-way exchange of water between estuaries or large lake lacustuaries and the terrestrial landscape influence the state and function of ecosystems across the coastal interface. Campaign 1 focuses on the spatial variation in biogeochemical structure and function at the coastal terrestrial-aquatic interface (TAI). Through coordinated sampling, EXCHANGE measured baseline biogeochemical datasets at a broad range of sites in the Great Lakes and Mid-Atlantic regions. For more information, please see the **Related References** section on ESS-DIVE and https://compass.pnnl.gov/FME/EXCHANGE.

Change History

History	Release Date	What's New
Version 1	May 2023	**ec1_metadata_v1.zip** Data descriptor File-level metadata Sample catalog Kit-level metadata Collection-level metadata Collection-level data Sample unique identifier metadata (ISGN)
		ec1_soil_v1.zip Soil pH Soil conductivity Soil Gravimetric Water Content (GWC) Soil bulk density Soil Total Carbon (TC) Soil Total Nitrogen (TN)
		ec1_sediment_v1.zip Sediment Gravimetric Water Content (GWC)
		ec1_water_v1.zip Basic water quality (pH, ORP, alkalinity, salinity) Total Suspended Solids (TSS)

Contact: coastal.exchange@pnnl.gov

History	Release Date	What's New
		Colored Dissolved Organic Matter (CDOM) Dissolved organic matter composition (FTICRMS) Total Dissolved Nitrogen (TDN) Dissolved Organic Carbon (DOC)

Experimental Design

In the Fall of 2021, the EXCHANGE Consortium gathered samples from 52 coastal terrestrial-aquatic interfaces (TAIs). At each of these sites, they collected soil samples from across a transverse elevation gradient, which included soils from coastal upland forests, transitional forests, and wetlands. They also collected surface water and nearshore sediment samples (Figure 1). Samples collected from EC1 were analyzed for bulk geochemical parameters, bulk physicochemical parameters, organic matter characteristics, and redox-sensitive elements. These datasets are useful in evaluating the physicochemical factors that drive spatial variations in the cycling of organic matter across coastal terrestrial-aquatic interfaces (TAIs). They also facilitate an understanding of the biogeochemical control points in coastal ecosystems that can be transferred across different systems. Future data types will be added to the ESS-DIVE data package as they are completed and will be version-controlled in the **Change History** section above.

Contact: coastal.exchange@pnnl.gov

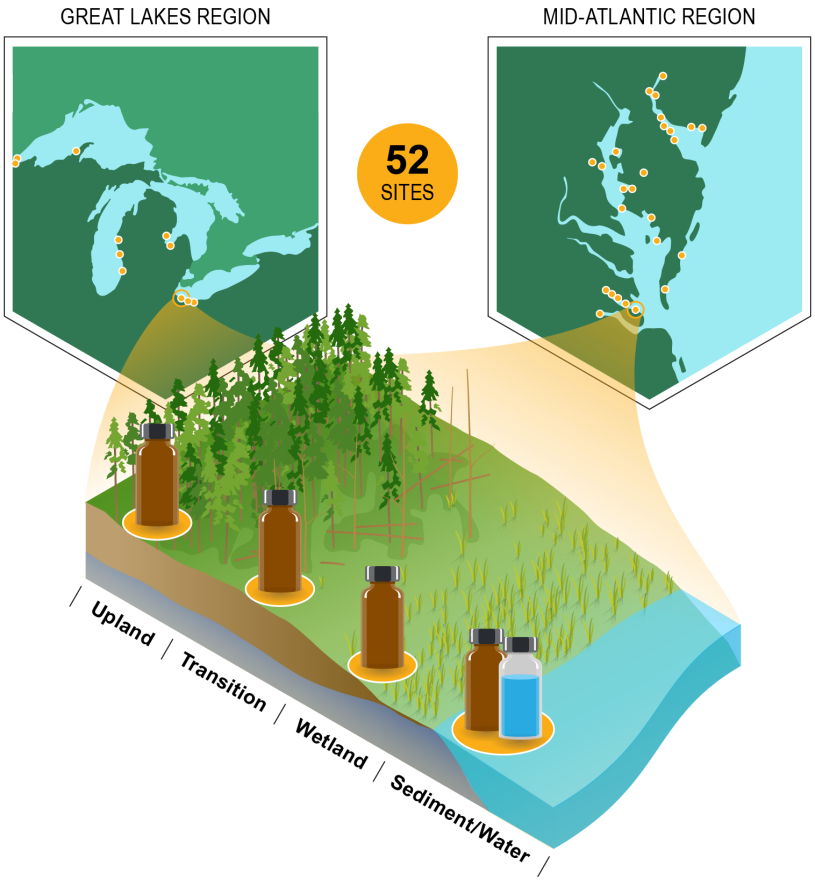

Figure 1: Sampling Design for EXCHANGE Campaign 1

Data Package Structure

This ESS-DIVE data package includes:

- ec1_metadata_[VERSION NUMBER].zip
  - *ec1_dd.csv*: a file-level data descriptor file containing a list of every column present in the data files
  - *ec1_flmd.csv*: a file-level data descriptor file containing a list of every file name present in the data package
  - *ec1_sample_catalog.csv*: a file containing a list of all samples and their collection status or information about methodological inconsistencies
  - *ec1_metadata_kitlevel.csv*
  - *ec1_metadata_collectionlevel.csv*
  - *ec1_data_collectionlevel.csv*
  - *ec1_igsn_metadata.csv*

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- ec1_soil_[VERSION NUMBER].zip
- ec1_sediment_[VERSION NUMBER].zip
- ec1_water_[VERSION NUMBER].zip

CSV file structure

- [Campaign]_[Sample Type]_[Analyte]_[QC level].csv
  - Ex. *ec1_soil_tctn_L2.csv*
  - Ex. *ec1_metadata_kitlevel_L2.csv*
- All .csv dataset files contain the following first three identifying columns:
  - *campaign*: coordinated sampling effort
  - *kit_id*: unique identifier for each collection of samples from a given site
  - *transect_location*: position along the coastal TAI transect (Figure 1)

DAT file structure

- [Kit_ID]_[Processing Step A]_[Processing Step ...Z].dat
  - Ex. *K004_DilCorr_IFE_RamNorm.dat*
  - Ex. *K013_DilCorr_Abs.dat*
- All .dat dataset files are organized by Kit_ID and in matrices.

Please see **Related References** for more information.

Citations & Acknowledgements

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Terminology

LOD	Limit of detection
Analytical Averaging	Averaging of instrument replicate runs of a single sample
not applicable (in sample catalog)	Analysis type is not conducted on that sample type

Processing Levels

Level	Description
1	Flags are provided but **not** applied and LOD ranges. Normal QA/QC procedures implemented (e.g. blank correction, etc). Analytical averaging and outlier removal.
2	All flags applied to data. Analytical averaging and outlier removal. Data is summarized based on categorical variables (e.g. Transect Location, Kit ID)

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