



## Lake Champlain Sea Grant Data Management and Sharing Plan

2024–2028

All Lake Champlain Sea Grant (LCSG)-funded research projects and efforts that produce environmental data will adhere to this Data Management and Sharing Plan. The lead researcher for each research project or effort involving environmental data collection is responsible for providing the project data and associated metadata to the LCSG Research Coordinator within two years of data collection. In rare instances researchers may need to withhold some types of data for intellectual property and/or privacy reasons. In such cases, researchers should discuss these needs with the LCSG Research Coordinator prior to accepting funding.

### Background

This plan was developed in accordance with the NOAA Data Sharing Directive for Grants, Cooperative Agreements, and Contracts, available from the following permanent URL: <https://nosc.noaa.gov/EDMC/PD.DSP.php>. This directive states that data and information collected and/or created under NOAA grants and cooperative agreements must be made visible, accessible, and independently understandable to general users, free of charge or at minimal cost, in a timely manner (typically no later than two years after the data are collected or created), except where limited by law, regulation, or policy or by security requirements. The requirement has two basic parts: (1) environmental data generated by a grant project must be made available after a reasonable period of exclusive use (usually two years or less), and (2) the grant application must describe the plan to make the data available.

Environmental data are defined by NOAA in Administrative Order (NAO) 212-15: Management of Environmental Data and Information as recorded and derived observations and measurements of the physical, chemical, biological, geological, and geophysical properties and conditions of the oceans, atmosphere, space environment, sun, and solid earth, as well as correlative data such as socio-economic data, related documentation, and metadata. Digital audio or video recordings of environmental phenomena (such as animal sounds or undersea video) are included in this definition. Numerical model outputs are included in this definition, particularly if they are used to support the conclusion of a peer-reviewed publication. Data collected in a laboratory or other controlled environment, such as measurements of animals and chemical processes, are included in this definition.

## LCSG Data Hub

LCSG data is organized as a Collection on the Forest Ecosystem Monitoring Cooperative (FEMC) cyberinfrastructure and website (<https://www.uvm.edu/femc/>) so that LCSG projects or activities that collect environmental data can be found in one place. Researchers may choose different hosts for environmental data (see below), but LCSG aims to publish metadata and contact information for data through the LCSG Collection on the FEMC database.

## Archive Options for Research Projects

There are two options from which lead researchers may choose to archive environmental data for public accessibility.

**Option 1:** Data from projects may be archived and organized into previously established cyberinfrastructure currently maintained by FEMC and hosted by the University of Vermont (UVM; Burlington, Vermont). The FEMC data archive, via the associated website (<https://www.uvm.edu/femc/>), provides searchable and linked information for over 200 research projects, including document archive, data display and visualization, search and download features, and metadata summaries (e.g. procedural methods, attribute information, related documents and citation and access specifications). The website allows users to browse and search, and information about projects, datasets and associated publications are indexed by search engines such as Google.

The FEMC has extended the Ecological Metadata Language (EML) standard (<https://knb.ecoinformatics.org/#external/emlparser/docs/index.html>) to document data in its system. This standard provides a flexible set of modules for documenting and sharing metadata, and because of the wide-ranging and diverse data associated with ecological investigations, this flexibility is its biggest asset. For this reason, EML is the preferred standard for the Long-Term Ecological Research Network and data in EML is easily federated to other data cataloging systems through the work of DataOne (<http://dataone.org/>), in which FEMC is a member node.

Following standard policies set by federal and state funding agencies, all data associated with LCSG projects curated in the FEMC repository will be made publicly available for download through the FEMC archive two years after their collection to allow time for publication. Data sharing will be open and in the public domain as governed by the Creative Commons license (<http://creativecommons.org/licenses>) that specifies that after the two-year embargo period for purposes of publication, the data will be available for download through the FEMC website.

**Option 2:** Researchers may choose to curate project data in an existing public or agency data repository that has been established for the specific purpose of storing data of the type generated by the project. Examples of public repositories can be found here: <http://researchguides.uvm.edu/datamanagement/access>. Researchers who choose this option take full responsibility to upload their metadata and data with the content and in the formats required by the repository and that the chosen repository has established procedures for providing access, data, and security that meet federal and NOAA requirements.

Researchers who choose this option should provide the LCSG Research Coordinator with the metadata to be shared through the LCSG Collection. Researchers should also share the data management and sharing plan for the repository they use to assure it meets NOAA's standards. When the metadata or data are published, the researcher should send links to the project data stored in this repository.

## Environmental Data from Education and Extension Programs

Lake Champlain Sea Grant extension and education programs also produce environmental data, including:

- The Interactive Map and Database located on the Watershed Alliance website (<http://www.uvm.edu/watershed/map>) is a user-friendly and filterable database of stream assessment data collected by schools participating in UVM Watershed Alliance's Stream Monitoring and Stewardship Program. The students in this program collect physical, biological, and chemical data on a local stream located in a sub-basin of Lake Champlain.
- Lay Monitoring Program participants collect data about lake health. These data and summary reports about all participating lakes are available online at: <https://dec.vermont.gov/watershed/lakes-ponds/monitor/lay-monitoring>.

Environmental data to be collected by students and members of the public may also include precipitation and stream water levels.

- If collected, precipitation data are anticipated to be collected following Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) protocols and data would be reported to that program's online database (<https://www.cocorahs.org/>).
- Water level data are anticipated to be collected as part of the CrowdHydrology project (or another similar project). These data are also available online (<http://www.crowdhydrology.com/>).

Both websites display results immediately in an easily accessible manner by any member of the public who has access to the internet (e.g., at home, work, a public library).

Other data or materials (e.g., brochures, pamphlets, fact sheets) produced directly by the LCSG extension programs will be stored directly on the LCSG website. The LCSG website is backed up routinely by the University of Vermont IT. This content is backed up regularly by UVM IT services (<https://www.uvm.edu/it/about/services/?Page=services-files.php>)

## Point of Contact

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