Lake Champlain Sea Grant Data Management and Sharing Plan

All Lake Champlain Sea Grant-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. Lake Champlain Sea Grant researchers may collect multiple types of environmental data, including recorded and derived observations and measurements of the physical, chemical, biological, geological, and geophysical properties and conditions of the water, earth, and atmosphere and correlative data, such as socio-economic data, related documentation, and metadata. Media, including voice recordings and photographs, may be included.

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

Option 1: In some cases, it might be best 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. PIs 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. PIs should provide the LCSG Research Coordinator with a copy of the data management and sharing plan for the repository they use and specific links to the project data stored in this repository.

Option 2: Data from projects may be archived and organized into previously established cyberinfrastructure currently maintained by the Forest Ecosystem Monitoring Cooperative (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 2 year embargo period for purposes of publication, the data will be available for download through the FEMC website. The LCSG Research Coordinator may be able to provide some limited guidance on how to create metadata and data file for curation in the FEMC repository.

Other considerations

The research supported by the LCSG is enabled by public funding, and so data produced by these projects will be made available to the public in a timely manner. In rare instances PIs may need to withhold some types of data for intellectual property and/or privacy reasons. PIs should discuss these needs with the LCSG Research Coordinator prior to accepting funding for any project supported by the LCSG.

Lake Champlain Sea Grant extension and education programs also produce some data. These include the Watershed Alliance program and the Lakes Lay Monitoring Program. 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 Basin. Similarly, 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 other 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)

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