Luquillo Information Management (LUQ IM) Progress Report  
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Introduction:

This is a report of the activities performed by LUQ Information Management staff to assist the scientific community in the collection and analysis of data to achieve their proposed research activities and to make data and related digital products available.

The main objective of the LUQ IM is to collaborate with the scientists in the preparation of the data they collect for data analyses and for the publication of data in the two LUQ’s data repository: the LUQ website and the LTER Network’s, PASTA.

Data Collection and Analyses:

At the beginning of a project, when LUQ scientists meet to plan for what, who and how data will be collected, the information manager participates actively in the discussion and proposes templates for data collection at the field, standardization of common measurements valuesand the design of the different data bases that will hold the data to be collected. Also, the LUQ IM staff designs data entry sheets for the collection of data at the field.

LUQ IM encourages and assists the investigator in filling the metadata forms for each of the data sets at the beginning of each individual project. This form not only provides a way to comply with LUQ’s commitment to share and publish data following LUQ data management policybut it is also a tool to organize data and design databases which eventually eases the future processes of data analyses and publication.

LUQ IM is in charge of entering the data in certain data bases like the CTE Plant, Seedling and Litterfall data sets and the El Verde precipitation and temperature data. For other projects’ data sets, like the “Bird abundance - point counts”, LUQ IM staff enters data sporadically as requested by the owner of the data set. The information manager prepares simple summary analyses that assist investigators in the quality control process of their data.

The information manager and the data entry person collaborate directly and continuously with the field technicians in their data collection activities. The labels for the weekly collection water sample bottles are printed at the LUQ IM using a relational database management script associated to the water quality data that is entered weekly by the LUQ IM data entry staff. The data entry and field technicians meet regularly to perform quality control processes on the data collected and entered.

Data files are thoroughly evaluated prior to publication in the data repositories and for preparation for data analyses by the information manager. Although investigators perform the analyses of their data, simple data analyses including summary of data and chart preparation of serial data are made, when viable, for data sets. These intermediate products are shared with the investigators for data correction and visualization. This is regularly done for the El Verde meteorological data.

Data Availability and related tools:

Since its beginning in 1988, the LUQIM have been actively developing an information management system that includes the metadata standards, incorporation of network’s controlled vocabulary and researcher’skeywords, and specific templates to manage metadata and data in order to make it available in the data depositories available through time (currently LUQ Website and PASTA). We collaborated with other LTER sites (SEV, Plum, NTL, CAP, Jornada, McMurdo) in the development of a data management system framework called DEIMS which is currently used by 7 sites of the US LTER and other countries like Taiwan, Spain, and Israel.

LUQ IM has developed templates to manipulate, evaluate and transform automatically data. For example, a template to make automatic daily summaries for manually gathered El Verde precipitation data was developed and is currently used to transform the entered data to daily averages before its publication in the depositories. Another example is a set of mysql scritpts and excel templates developed to transform a 178-columns data file to a 7-column one.

LUQ Metadata forms are provided online or directly sent to the investigator prior to their filing of data. The information manager provides assistance to the investigator or student to fill out the metadata forms if requested. No data is received by LUQ IM without its corresponding metadata.

When data is received for publication in the depositories, the information manager assures that the format of the data file(s) received is database-ready and completely and adequately documented. One or more iteration of data and metadata corrections may happen between the information manager and the investigator until the data and metadata passes, without errors, the evaluation of the Networks’ data repository, PASTA.

Once the data is PASTA ready, it is made available in the local website and thePASTA Data Depositories**.** The information manager then sends a communication to the owner of the data set and the LUQ PI about the update or new upload of the their data along with its URLs in the local as well as the PASTA depositories. The PASTA DOI of the just updated or published data set is then transfer to the local data set’s metadata.

In addition to entering, revising and publishing data and metadata, the information manager maintains communication with LUQ scientists and students to inform them and get their feedback about the changes done in the Information Management System which is embedded in LUQ website. Also, investigators with ongoing data sets receive annual notifications from the information manager to update their data.

Throughout time, the information manager has given presentations to different parts of the community related to the LTER Program and the research activities done at the Luquillo LTER. In her participation of Conventions related to the development of websites he has presented to other scientific-related technicians the concepts related to the LTER Program and LUQ research.

Currently, the information manager is involved in two projects related to making accessible to the public 386 legacy-UPR owned research papers from 1957 to 1980s and another related to making accessible the administrative information and products relatedto grants and research projects for the Department of Environmental Science of the Natural Science Faculty of the University of Puerto Rico.

The Department of Chemistry of this Faculty and the Dean of Graduate Studies of this Faculty have requested to expand these databases to contain the data of all other Departments in this Faculty.

Related Links Mentioned in this Report:

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| Document of Site | URL |
| Example of template for a project’s data collection at the field, standardization of common measurements values | <http://luq.lternet.edu/sites/default/files/LTEPDocs-TemplateDatabase-Draft-fromIM.xlsx> |
| LUQ data management policy | <http://luq.lternet.edu/informationmanagement/datapolicy> |
| Query to print labels for bottles collecting water samples | <http://luq.lternet.edu/article/query-prepare-labels-biweekly-water-sample-luquillo-mountains> |
| summary of data and chart preparation of serial data are made | <http://luq.lternet.edu/data/luqmetadata14> |
| incorporation of network’s controlled vocabulary and researcher’s | <http://vocab.lternet.edu/vocab/vocab/index.php> - LTER <http://vocab.lternet.edu/vocab/luq/index.php> - LUQ |
| Templates for manually gathered El Verde precipitation data was developed | <http://luq.lternet.edu/article/2017/02/20/el-verde-precipitation-and-temperature-manual-entry-and-extract-templates> |
| transform a 178-columns data file to a 7-column one. | <http://luq.lternet.edu/article/2017/02/20/luquillo-invertebrates-data-file-transformation-tool> |
| LUQ Metadata forms are provided online or directly sent to the investigator prior to their filing of data. | <http://luq.lternet.edu/IM/rulesProtocolsandTemplatesforDataFiling> |
| PASTA Data Depository | <https://portal.lternet.edu/nis/browseServlet?searchValue=LUQ> |
| LUQ Data Depositories | <http://luq.lternet.edu/datacatalog> |
| Publications and presentations to different parts of the community related to the LTER Program and the LUQ research | <http://luq.lternet.edu/IM/LUQIMPublications> |
| Special Project to recover research papers from 1957 to 1980s | <http://sandbox.ites.upr.edu/viewbiblioyearCEER> |
| Special Project to making accessible the administrative information and related products | <http://sandbox.ites.upr.edu/> |