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LTER IM Guidelines

LTER Information Management Requirements and Recommendations.
**Final versions of these documents are stored in the LTER Document Archive (https://lternet.edu/?taxonomy=document-types&term=information-management [1])

LTER Data Access Policy

The LTER data access policy can be found here (Revised by the LTER Science Council, May 19, 2017):

https://lternet.edu/data-access-policy/ [2]

Terms of Reference

Terms of Reference for the IMC [3]
Terms of Reference for the Controlled Vocabulary Working Group [4]
Terms of Reference for the Units Working Group [5]

Submission Procedures for IM support

http://intranet2.lternet.edu/nisac/submission-procedures-im-support

Guidelines for LTER Information Management Systems

This document was created by the LTER Information Managers Committee. Version 2.1 was approved by the LTER Executive Board on 20 December, 2017, and builds on a previous version from 2009. This document defines best practices for LTER site information management systems. (Version 2.2 corrects a URL in the references to cite the 2017 version of EML Best Practices. All three versions mentioned are attached. See links below.)

The goal of an Information Management System is to support site, network and overall ecological science by (1) facilitating access to data and metadata by LTER scientists, the scientific community, and the public, in order to enable new scientific discoveries and their applications; (2) ensuring the integrity, security, and usability of those data and metadata for future generations through replication in repositories that provide immutability, versioning and public access; and (3) increasing the

efficiency of operations within an LTER site. LTER information management systems provide important linkages between scientists and the general public by providing a complex mix of information resources (e.g., photos, data, research summaries, publications).

A successful Information Management System at an LTER site is created and maintained through the coordinated efforts of the Information Manager, other information technology staff, field and laboratory technicians, researchers, and site management. Such a system is comprised of hardware, software, and people and used to store and deliver scientific information. It is an integral part of the overall LTER science program at a site.

[1] Review Criteria for LTER Information Management Version 1.1. 2009. http://im.lternet.edu/sites/im.lternet.edu/files/LTER_IM_Review_Criteria... [6]

Attachment	Size
LTER_IMS_Guidelines_V2.2.pdf July 2018 version [7]	93.2 KB
LTER_IMS_Guidelines_V2.1.pdf January 2018 version [8]	272.5 KB
LTER_IM_Review_Criteria_V1.1.pdf Deprecated. Retained for historic archive. [6]	26.23 KB

A. Information Management System design and implementation

1. Scope
a. Data and metadata should be made available online within two years of data collection, as specified and prioritized in the LTER Network Data Access Policy [2].
b. In cases where data cannot be directly downloaded for practical reasons (e.g., non-digital assets or digital files too large to allow direct network downloads like GIS, remote sensing, or modeling datasets), sites should have an alternate procedure for making data discoverable and accessible to the scientific community.
c. The Information Management System should include an up-to-date list of publications supported by the site LTER program.
d. Inclusion of catalogs of non-electronic materials managed in support of LTER research (e.g., samples, specimens, documents, photographs, etc.) is encouraged.
e. Sites are encouraged to collect evidence of data use, within the limitations of anonymous access metrics provided by data repositories.

2. Design

a. The Information Management System should include critical design features such as data and metadata encoding, short-term backup, long-term media and format migration, system administration, security, and scalability.
b. Site data and metadata should be backed up regularly and copies stored offsite to protect against disaster.
c. Sensitive data (such as personal information or location of endangered species) should be protected against misappropriation and misuse.
d. Sites should provide mechanisms by which site data can be discovered (site catalog, links to external search resources such as the LTER Data Portal (https://portal.lternet.edu [9]) [3] or DataONE (https://www.dataone.org/ [10] [4]).
e. Sites should submit data to repositories that provide digital identifiers, immutability, versioning, data security, and public access.

f. Sites are encouraged to develop systems to ensure timely public data release, per the LTER Data Policy.

3. Site Information Portal*

a. Data, metadata, and other information management resources, such as publication lists and personnel lists, should be well organized, readily located, and easily accessed from the site information portal.
b. Site information portal should conform to pertinent guidelines for LTER web site design and content.
c. Site information portal should contain a list of site data sets with links to access the data.
d. Innovations in site information portal design and Information Management System interface, especially where suitable for use by other sites, are encouraged.

4. Documentation

a. Information Management System architecture, procedures, and protocols should be clearly documented and documentation should be sufficient to maintain continuity if there is a turnover of personnel.
b. Sites should have a management plan for the Information Management System indicating how critical tasks are accomplished by site personnel.

[* Portal refers to any mechanism that allows users to locate and retrieve information, including webpages and apps]

B. Information Management System support for site, network, and community science

1. Integration with site science

a. All stages of research design and development, from initial project design to final archiving of data and metadata, should be integrated into the Information Management System.
b. Meetings between the information manager and researchers are encouraged.
c. Periodic internal review of the Information Management System is encouraged.

2. Policies

a. Site data release, access, and use policies should comply with LTER Network policies [2].
b. Site policies should be clearly stated on the site information portal.

3. Metadata

a. Metadata should be of sufficient quality and completeness to ensure long-term (> 20 years) usability of data [5].
b. Metadata should conform to current best practices and repository requirements [6].

4. Data

a. Data integrity should be protected by appropriate quality control procedures (i.e., range checks, duplicate detection, enumeration checks [e.g., codes, sites, taxonomic]).
b. Data should comply with quality measures appropriate to the repository where they are archived.

5. Contribution to LTER Network and community activities

a. Site should contribute relevant data and metadata to network information resources approved by the LTER Science Council (e.g., LTER Data Portal or other active cross-site databases).
b. Participation by the Information Manager in other LTER activities such as committees, workshops, and tool development; in community activities such as review teams, panels, training, and collaborations with informatics partners; and in related research activities such as developing proposals and publications, is encouraged.

C. References

[1] Review Criteria for LTER Information Management Version 1.1. 2009. http://im.lternet.edu/sites/im.lternet.edu/files/LTER_IM_Review_Criteria... [6]

[2] LTER Network Data Access Policy & LTER Network Data Use Agreement. 2005. See LTER Intranet (https://lternet.edu/policies/data-access [11]) for current version.

[3] Michener, W.K., J. Porter, M. Servilla, K. Vanderbilt. 2011. Long term ecological research and information management. 6:13-24.

[4] Michener, W., Vieglais, D., Vision, T., Kunze, J., Cruse, P., & Janée, G. 2011. DataONE: Data observation network for earth-preserving data and enabling innovation in the biological and environmental sciences. D-Lib Magazine. 17:3.

[5] Michener, W. K., J. W. Brunt, J. J. Helly, T. B. Kirchner, & S. G. Stafford. 1997. Nongeospatial metadata for the ecological sciences. Ecological Applications 7:330-342.

[6] EML Best Practices for LTER Sites. 2011. https://im.lternet.edu/sites/im.lternet.edu/files/emlbestpractices-2.0-F... [12]

Critical Site Functionality

Critical Site Functionality

LTER Critical Site Functionality Document

Versions of the Critical Site Functionality document will be stored here.

Attachment	Size
Critical_Site_Functionality_20070719.doc [13]	92 KB

Guidelines for LTER Web Site Design and Content

This document was created by the LTER Web Site Design Working Group and reviewed by the LTER Information Management Committee. It was vetted by the LTER Network Community, and presented to the LTER Network Information System Advisory Committee and Coordinating Committee for approval in spring of 2006. The Review Criteria for LTER Information Management Systems states that site's web pages "should conform to LTER Network recommendations" [1].

Information Management Teams and National Science Foundation Reviewers use the Review Criteria in formal reviews of LTER sites. The Review Criteria and these recommendations may also be used by sites for informal self-assessment and planning, redesigning existing web pages and developing new web pages. The community of LTER Information Managers may need to review and update these recommendations in the future to reflect changes in web and other information technologies, as well as data synthesis and delivery strategies within the LTER Network. The primary goals of these recommendations are to improve access to site information and to emphasize membership in the LTER Network on site web pages.

The Working Group's recommendations cover three areas of websites: (1) design elements that portray the site as part of the LTER Network, (2) organizational schemas that facilitate easy navigation to information and data at the site, at other sites and across the LTER Network, and (3) access to current and important data and content.

Attachment	Size
LTER_Web_Site_Design_and_Content_Guidelines_V2.0.pdf [14]	171.97 KB
LTER_Web_Site_Design_and_Content_Guidelines_V1.1.pdf [15]	88.87 KB
EB Data access recommendations Nov 2008.doc [16]	56.5 KB
Introduction of Site Acronym Web Alias - Fall 2001 Databits article (pdf) [17]	215.12 KB

A. LTER Network Identity

- Display the standard LTER Network Logo (http://www.lternet.edu/gallery/graphics/NET_010008.gif.html [18]) with a link to the LTER Network Homepage (http://www.lternet.edu/ [19]) and following text on the home page. (This Site is a Member of the LTER Network).
- Display a link to siteDB, which is an All LTER Site Characteristics Database (http://www.lternet.edu/sites/ [20]). This gateway will link to profiles and homepages of all other LTER sites.
- The LTER network domain, lternet.edu, Domain Naming System (DNS) alias (site_acronym.lternet.edu) may be used to reach a site's homepage in addition to the local URL.

B. Navigation

- Develop a hierarchical navigation system with links and pull down menus or another menu system for the website.
- Repeat the navigation menu on all public pages of the web site
- The web site should be searchable.

C. Content

- Data Access: every site shall implement the following data access functionalities:
  - On the site's home page provide a direct link to the site's data catalog, prominently displayed as a one-click url
  - On the topmost data catalog page: (example at http://intranet.lternet.edu/im/files/im/LTER%20Data%20Page%20Elements%20... [21])

1. identify signature data sets that best represent the site's research goals;
2. provide a capability to search datasets by LTER core area, by owner, and by keyword;
3. provide a capability to browse datasets by LTER core areas;
4. provide a prominent link to the LNO MetaCat system (a Network-wide database of metadata, http://metacat.lternet.edu [22]);
5. provide a prominent link to network-wide databases (ClimDB/HydroDB (http://www.fsl.orst.edu/climhy/ [23]), SiteDB (http://www.lternet.edu/sites/ [20]), Remote Sensing Archive (http://www.lternet.edu/technology/sdw/sitelist.html [24]), and;
6. provide a prominent link to the EcoTrends website (http://ecotrends.info [25])

- The terms to be used to describe core areas are:
  1. primary production
  2. organic matter
  3. disturbance
  4. inorganic nutrients
  5. populations

- Create links that reach content in few mouse clicks and use evocative and straightforward words that reflect the content that will be displayed.
- We recommend sites include these links from the home page:
  - Site contact information, including information as to how to contact the main administrative staff at the site, including the mailing address, fax number, etc.
  - Searchable site personnel directory for all people involved in the project.
  - Site data from which data and metadata are downloadable.
  - Searchable site bibliography, including searchable citations from publications including peer reviewed articles, theses, dissertations, abstracts, book chapters, technical reports and others. Check with your home institution(s) as to whether PDF files of publications may be downloadable.
  - Progress reports and proposals, including documents that are downloadable.v
  - Research news, nuggets and major accomplishments or links to digital newsletters, RSS web feeds, etc.
  - Network resources, including websites and databases in the Network Information System (NIS), such as siteDB, climDB, etc.
  - Research Description, including information about the LTER project and its research foci.
  - Education and outreach, including, for example, information about education and outreach activities, or downloadable resources for teachers and students.
  - Include Information Management as an integral part of the LTER site and research program. This is a place to highlight IM projects, innovations, and information system specifications.
  - Include the site’s data access policy.
- Other suggestions for content within the website:
  - List or identify core and long term datasets explicitly
  - Calendar of events
  - Information about equipment and facilities, which will communicate an invitation to conduct research, create opportunities for other scientists and give instructions for doing research at the site
  - Field and/or lab manuals or protocols required by site personnel
  - Software, analysis, and modeling tools
  - Research policies and applications for conducting research
  - Opportunities for employment or volunteers, etc

Attachment	Size
LTER Data Page Elements Example.txt [26]	3.95 KB

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the material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Please contact us with questions, comments, or for technical assistance regarding this web site.

Source URL: http://im.lternet.edu/resources/im_requirements

Links:
[1] https://lternet.edu/?taxonomy=document-types&term=information-management
[2] https://lternet.edu/data-access-policy/
[3] http://im.lternet.edu/home/tor
[4] http://im.lternet.edu/sites/im.lternet.edu/files/TermsOfRef_Vocab_2011_management.docx
[5] http://im.lternet.edu/sites/im.lternet.edu/files/UWG_ToR_20Jan2011.pdf
[6] http://im.lternet.edu/sites/im.lternet.edu/files/LTER_IM_Review_Criteria_V1.1.pdf
[7] http://im.lternet.edu/sites/im.lternet.edu/files/LTER_IMS_Guidelines_V2.2._20180709.pdf
[8] http://im.lternet.edu/sites/im.lternet.edu/files/LTER_IMS_Guidelines_V2_1_20180103.pdf
[9] https://portal.lternet.edu
[10] https://www.dataone.org/
[11] https://lternet.edu/policies/data-access
[12] https://im.lternet.edu/sites/im.lternet.edu/files/emlbestpractices-2.0-FINAL-20110801_0.pdf
[13] http://im.lternet.edu/sites/im.lternet.edu/files/Critical_Site_Functionality_20070719.doc
[14] http://im.lternet.edu/sites/im.lternet.edu/files/Guidelines-for-LTER-Web-Site-Design-and-Content-revised-2018-05-17.pdf
[15] http://im.lternet.edu/sites/im.lternet.edu/files/LTER_Web_Site_Design_and_Content_Guidelines_V1.1_0.pdf
[16] http://im.lternet.edu/sites/im.lternet.edu/files/EB Data access recommendations Nov 2008_0.doc
[17] http://im.lternet.edu/sites/im.lternet.edu/files/01fall_db_Site_AcronymWebAlias.pdf
[18] http://www.lternet.edu/gallery/graphics/NET_010008.gif.html
[19] http://www.lternet.edu/
[20] http://www.lternet.edu/sites/
[21] http://intranet.lternet.edu/im/files/im/LTER%20Data%20Page%20Elements%20Example_0.txt
[22] http://metacat.lternet.edu
[23] http://www.fsl.orst.edu/climhy/
[24] http://www.lternet.edu/technology/sdw/sitelist.html
[25] http://ecotrends.info
[26] http://im.lternet.edu/sites/im.lternet.edu/files/LTER Data Page Elements Example_0.txt