Guidelines for LTER Website Design and Content

Approved by LTER Science Council, 17 May 2018

Cite as:

Guidelines for LTER Website Design and Content, ver 2.0. 17 May 2018.

Websites are now the primary way that external stakeholders learn about a site's research, education, personnel, and other activities. At the same time, they provide critical information for investigators associated with an LTER site or those interested in becoming involved. The Network has a strong interest in ensuring that both these goals are met in ways that offer website visitors a consistent, engaging experience, while also leaving enough flexibility to allow LTER sites to accommodate the needs of their academic institutions and agency partners.

These LTER Network recommendations are intended to improve access to site information, to credit NSF funding, and to emphasize LTER Network membership, as well as improving the overall quality and usability of LTER Network websites.

Guidelines for LTER Website Design and Content **[1]** were first established in 2009 and are referenced in the Guidelines for LTER Information Management Systems **[2]**. LTER sites use these guidelines for informal self-assessment and planning, redesigning existing web pages, and developing new web pages. Alongside these guidelines, we suggest reviewing and referring to existing LTER websites and contacting webmasters at those sites to learn how they have implemented desirable features.

This version was updated in 2017-2018 by a committee of information managers, PIs and communications managers: Marty Downs (NCO, co-chair), Mary Martin (HBR, co-chair); Mike Gooseff (MCM), Jill Haukos (KNZ), John Porter (VCR), Kristen Vanderbilt (FCE), Mark Watkins (CAP), and Yang Xia (KNZ).

The Working Group's recommendations cover three areas of website content and design:

1. **Requirements**: LTER Network branding and NSF funding acknowledgement are required.

2. **Content Recommendations**: These recommendations aim to foster consistent approaches to content licensing, navigation, and access to key information across the Network. However, they are broad recommendations intended to cover many different situations. The needs of the LTER site and their key audiences—as well as the capacity for technical support and content updating—should take priority.

3. **Web Design Suggestions**: This section offers general suggestions for developing content that is accessible and appealing to the audiences that are highest priority for your site.

Requirements

LTER Network Identity (required)

1. Display a link to the LTER Network Homepage (http://www.lternet.edu/) **[3]** and the following text on the home page: "This site is a member of the U.S. LTER Network." Where feasible, use the LTER Network logo to demonstrate Network affiliation. Logos can be found under Network Graphics **[4]** at the quick links menu on the LTERNET website.
2. The LTER network domain, lternet.edu, Domain Naming System (DNS) alias (https://3-letter-site-acronym.lternet.edu) should be used to reach a site's homepage in addition to the local URL. When a site is originally set up or when it is moved, website managers will need to coordinate with the Network Communications Office to ensure that security certificates are updated at both the LTER site and the Network Communications Office.

NSF funding acknowledgement (required)

Section XI.E.4 of the NSF Proposal and Award Policy and Procedures Guide **[5]** requires acknowledgement of NSF funding and specific disclaimer language on web pages. See: https://www.nsf.gov/pubs/policydocs/pappg18_1/nsf18_1.pdf

Include the following disclaimer on your web site, typically in the footer, after the licensing statement:

*This material is based upon work supported by the **National Science Foundation** under [list current grant number and dates.] Any opinions, findings, conclusions, or recommendations expressed in the material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.*

Alternatively, for sites with multiple funding sources, link from shorter more general footer text to an acknowledgements and disclaimers page that includes the full, official language, for example:

> *Our work is primarily funded by the National Science Foundation and <other funders>, but opinions, findings, conclusions, or recommendations are our own. [Link to full disclaimer page.]*

In either case, include the NSF logo along with the footer text. Official NSF logos and usage standards can be found at: https://www.nsf.gov/policies/logos.jsp

Recommendations

Content Licensing and Credit Recommendations

In the spirit of open access to taxpayer-funded information, Creative Commons licensing is preferred whenever possible. It provides clarity for potential users and a clear pathway to acknowledge creators. To encourage information re-use, please use the least restrictive license that will meet your site's needs.

Model language and link to license (other licenses may be used, depending on the needs of the site, but some indication of ownership and accessibility is required):

> *Except where otherwise noted, material may be re-used under a* **[Creative Commons BY-SA 4.0](#)** *license.*

Content Recommendations

The website of an LTER site is its most consistently visible face. Day-in and day-out, it tells visitors what the priorities of the site are—both through the nature of the content and how it is organized. At initial site set-up and at least every few years, the site's principal investigators or executive team should weigh in on a few key questions that will allow the people responsible for generating content and maintaining the website to make day-to-day decisions that are consistent with the site's priorities.

1. What external audiences are most important to reach? Some audiences to consider:
    a. Unaffiliated scholars, collaborators and potential collaborators, potential students
    b. Educators and students -- both local and national
    c. Neighbors -- with concerns about, or interests in, site operations
    d. Partners and other stakeholders -- depending on the site, these might include NGOs or government agencies
    e. Funders -- NSF and also university administrators or foundations
    f. News media
2. What information do our investigators need to do their work? To collaborate effectively?
3. What do web site visitors want to know about the LTER site?
4. What is important for them to know about the LTER site?
5. What kind of a relationship do we want to have with website visitors? Is there an action we would like them to take after visiting the website?
6. How can we make information easy to access for site researchers without detracting from the experience of external visitors?

After reviewing a survey of web managers and PIs, as well as existing LTER websites, the web guidelines committee suggests the following broad content categories will be useful for most sites, *although the organization and needs of individual sites should always take priority*.

About

This section is recommended, but not required, on LTER web pages.
Generally, the "about" section focuses on the way a site is organized and funded. It's also a good location for content that is primarily interesting to internal audiences.

● Brief description of the site, its history, funding, and the relationship with any partners (USDA, NOAA, University, non-profit) or its location within a university structure.
● Site contact information, including how to contact the main administrative staff at the site, including the mailing address and/or site address, phone, and email.
● Listing of LTER-affiliated personnel, searchable or categorized by name and role. (At some sites, this resides on the main menu)
● The "About" section is a good location for a sexual harassment policy (if your site, research station, or University has one), reporting procedure, or statement of community values. The LTER Network Executive Board is in the process of making specific recommendations on how to develop and communicate these items. When completed, a link will be added.
● Additional suggestions:
  ○ Brief description of the LTER program and the importance of long-term research
  ○ Information about facilities, how to visit
  ○ Newsletter subscriptions
  ○ Resources for site personnel
  ○ Grant documents
  ○ Site calendar
  ○ Employment and volunteer opportunities

Research

This section is recommended on LTER web pages, but the most appropriate content may vary by intended audience.
This section is often the most extensive and includes information about the research foci of the current LTER project and its evolution. Pay particular attention to research that requires long-term observation and experimentation. Common sub-categories include:

● Descriptions of major research areas for your LTER site. These can be organized in a way that communicates your site's research most effectively, but some reference or link to the 5 core research themes of the LTER Network can help in describing how the Network facilitates cross-cutting science.

- Key findings or transformational science. These may be drawn from a site's proposal or renewal, but they usually should be rewritten for a more general audience.
- The current conceptual model or the evolution of conceptual models, if they offer insight into research findings.
- Descriptions of major ecosystem-scale experiments can be very helpful for researchers seeking to collaborate or synthesize. (See, for example, https://lter.kbs.msu.edu/research/long-term-experiments/)
- Description of information management practices or link to data section with description.
- "Publications" and "data" have traditionally been top-level menu items for LTER sites. Depending on the nature of a site's key audiences and the demand for space on the main menu, the website manager may choose to keep them on the main menu or to display them under "research."
- Additional suggestions, depending on resources and capacity:
  - Research news, nuggets and accomplishments
  - Complementary grants
  - Research-focused newsletters, RSS web feeds, etc.
  - Site bibliography, including peer reviewed articles, theses, dissertations, abstracts, book chapters, technical reports and others. Link to publicly-available full-text where possible (open access, research gate, or pre-print versions). Do not link to online pdfs unless you have permission to do so.
  - Progress reports and proposals, including documents that are downloadable.
  - How to conduct research at the site. This section often includes maps of sites and experiments, administrative protocols for proposing new research, and links to field site policies. If your LTER site has a sexual harassment policy, reporting procedure, or statement of community values, in your "About" section, linking to it from site-use policies allows visitors to find and access it more easily.

Education/Learning

This section is recommended, but not required, on LTER web pages. The appropriate title for this section may be different, depending on the nature of the activities.

The nature of the education and outreach programs varies among sites, with some sites relying entirely on the NSF-funded Schoolyard LTER supplements and others building extensive partnerships. Where a partner organization conducts the majority of a site's outreach program, it may make sense to link to that organization's content from a page that explains the nature of the relationship with the partner organization and describes the role of key education and outreach personnel.

When a site maintains its own education content, it typically includes the following types of information:
- Descriptions of educational activities, such as field trip opportunities or after-school activities.
- REU and RET opportunities and products

- Schoolyard LTER books, including a link to the [whole series on lternet website](#) [6] and any associated curriculum materials.
- Citizen science programs and other science outreach activities, such as Science Cafés.
- Art-and-Science activities. The [Ecological Reflections](#) website [7] (produced via an LTER Network Office working group) maintains a variety of useful content as of 2017, though it has not been recently updated. Consider linking to it if it is relevant to your site.
- Downloadable resources for teachers and students, such as classroom activities, data literacy resources, and curriculum guides
- Education news, nuggets and accomplishments
- Education or outreach focused newsletters or social media

Data

This section is recommended, but not required, on LTER web pages.
Data that is collected with LTER funds must be made publicly available. The 2017 [LTER Network Data Access Policy](#) **[8]** states, in part:

> *"Data and information derived from publicly funded research in the U.S. LTER Network, totally or partially from LTER funds from NSF, Institutional Cost-Share, or Partner Agency or Institution where a formal memorandum of understanding with LTER has been established, are made available in a community accepted data repository (e.g., LTER Repository, EDI Repository, Arctic Data Center, BCO-DMO) with as few restrictions as possible, on a nondiscriminatory basis. LTER Network scientists should make every effort to release data in a timely fashion and with attention to accurate and complete metadata."*

Neither NSF nor LTER Network policy requires a site to post their data on their website in addition to public repositories, but many groups of investigators find it to be a convenience because a local catalog can be customized in ways that a large repository's portal cannot.

Whether or not a site chooses to maintain a local data catalog, the data section of the website should include:

- A brief description of the scope and type of data collected at a site. This description should work together with a data catalog, if one exists, helping visitors to determine whether to invest in exploring the catalog. The core LTER research themes may provide a useful organizing principle, but sites should use whatever organization best fits their research.

  Core LTER Research themes:
    - primary production
    - organic matter
    - disturbance
    - inorganic nutrients
    - Populations

- Information about where and how to best access a site's data and metadata.
- Data access and documentation policy and practices for the LTER site
- Link to the [LTER Network's Data Access Policy](#)
- Contact information for the site's information manager or link to the contact page of the site.
- Network resources, including the [LTER Data Portal](#) [9] and the [Environmental Data Initiative](#) [10].
- In addition, some sites may want to offer links to data training opportunities for students and faculty.

Publications

This section is recommended, but not required, on LTER web pages.

For some LTER sites, this is key information for primary audiences and so resides on the main menu. At other sites it is more of a resource for internal audiences and so resides on the "about" menu or other handy, but less-prominent, location. Either way, website managers should take a few key factors into consideration in its display.

- Maintaining the bibliography can be labor intensive. Make maximum possible use of modern reference managers such as EndNote and Zotero to maintain consistency and improve the ability to share publication lists with the Network Communications Office and other organizations.
- The website publication list is not specifically limited to LTER-funded publications, as this information is provided independently to NSF. It may include related publications that would be useful to researchers, students, managers, and reporters, and others.

Policy/Outreach/Engagement/Applications

This section is recommended, but not required, on LTER web pages.

This category is the most variable depending on the site and associated activities. Choose a title that fits your activities and your audience. Some sites have extensive partnerships which channel LTER science into resource management decisions, while others pursue lots of policy-relevant research, but have fewer explicit connections.

Suggested types of content for this section:
- Brief, accessible descriptions of policy-relevant datasets or experiments and the associated researchers
- Stories about how that data has been used, including what impact it has had on decisions.
- What are the implications of the science? Avoid language that suggests the science tells us what to do, but don't shy away from sharing what evidence says about likely trajectories and consequences.

Where partner organizations engage in policy-related activities, it may be useful to link to content displayed on the website of the partner organization, being careful to distinguish between the activities of privately-funded partners and the NSF-funded LTER. See, for example, [Science Policy Exchange](#) **[11]** or [Hubbard Brook Research Foundation](#) **[12]**.

Additional Potential Categories

The usefulness of these categories depends on the goals and resources of the individual LTER sites. They are presented here as options for your consideration.

- Image Gallery
- Data management tools
- Resource page for news media
- Communications resources
- Courses
- Field and/or lab manuals or protocols required by site personnel
- Software, analysis, and modeling tools
- Opportunities for employment or volunteers, etc
- Calendar

General Web Design Suggestions

Many books are written each year on how to build effective websites. Here, we note a few key considerations for the researcher who may be thrust into the role of communicator.

Tools

Depending on local constraints (technical, financial and management) sites may consider using content management systems (such as wordpress, drupal, joomla, etc.) that allow people with modest technical skills to participate in maintaining and contributing content. With tagging and content association, they also allow the same content to be displayed in various locations, helping to maintain accurate and up-to-date information and improving search results.

Navigation

Implement a functional and efficient system of menus to facilitate navigation within the site. Where possible, limit the number of main menu categories to five or less, with information that is locally important (but perhaps less important to external audiences) placed in footer links or supplemental menus.
- Menus should use short, straightforward titles that reflect the content that will be displayed.
- Drop-down or mega-menus are particularly helpful in allowing visitors to know what they should expect to find under a given menu.
- Repeat the main navigation menu on most public pages of the website.

Accessibility

Make sure your website is accessible to visitors who use screen readers by using alternative descriptions for images. [Many resources](#) are available for developing websites that are fully accessible to people with disabilities. Writing good alt-text for images also increases your search rankings.

Search

The more information a site provides, the harder it can be for a visitor to find the specific information they seek.
- Provide full-site search capabilities within your site.
- Most new visitors will find your site through a search engine. make it easy for them by following best practices for search engine optimization:
    - Use page titles that include key search terms.
    - Use keywords and page descriptions (these show up on google search as snippets) for key information.
    - A sitemap.xml file is used to describe the relationships between your main content pages. submitting it to google tells them which pages you think are most important to index (i.e., where would a google user want to land).
    - Consider running an [search engine optimization audit](#) on your site. several free tools exist that can identify potential problems.

Language

Writing for the web is different than writing for the page. employ shorter sentences and shorter paragraphs. make liberal use of formatting and images to lead site visitors through the site.

Social Media

If your lter site uses social media, include prominent links to your accounts on your website. If you have a twitter presence, consider including a live feed or a feed based on a site hashtag. Whether or not your LTER site has a social media presence, include share buttons, where appropriate, to allow visitors to easily share content from your website.

Responsive Design

In 2016, over half of all web traffic originated from mobile devices. The most recent search algorithms strongly favor sites that look good on mobile devices, known as "responsive" design. This affects your search ranking, even if site users are accessing your site primarily from desktops.

Most modern content management systems use design principles that ensure your site looks good on phones, tablets and desktop with no extra effort on your part. If you are building directly in HTML or PHP, be sure to test on a variety of screen sizes.

Analytics

Even occasional assessment of web traffic data (collected through google analytics or other analytics services) can tell you a great deal about who is visiting your website, where they come from, and how they engage with content. This data is a valuable source of insights to improve how you present information. **NOTE**: sites must register with google analytics (a free service, as of 2018) in order for data to be collected.

Resources and References

Additional Resources

- **Accessibility Resources**:
  https://www.section508.gov/content/build/website-accessibility-improvement
- **Usability Resources**
  https://www.nngroup.com/topic/web-usability/
- **Sample of experiment descriptions**:
  https://lter.kbs.msu.edu/research/long-term-experiments/
- **Search Engine Optimization Resources:**
  https://blog.hubspot.com/marketing/seo-analysis-tools
- **LTER Project Schema Archive (**https://github.com/lter/projectDB) offers one approach to integrating data accessibility with research descriptions. It was developed by LTER information managers around 2009 and implemented by Santa Barbara Coastal LTER and Georgia Coastal LTERs: http://sbc.lternet.edu//research/catalog/index.html; https://gce-lter.marsci.uga.edu/public/research/research.htm.

References

[1] **2009 Website Design and Content Guidelines**, ver 1.1, 27 January 2009.
https://lternet.edu/wp-content/uploads/2012/01/LTER_Web_Site_Design_and_Content_Guidelines_V1.1.pdf

[2] **Guidelines for LTER Information Management Systems**, ver 2.1, 03 January 2018.
https://lternet.edu/wp-content/uploads/2018/01/LTER_IMS_Guidelines_V2_1_20180103.pdf

[3] **LTER Network home page.** https://lternet.edu

[4] **LTER Network Graphics**. https://lternet.edu/graphic-resources/

[5] **NSF Proposal and Award Policy and Procedures Guide**, ver 18-1. 29 January 2018.
https://www.nsf.gov/pubs/policydocs/pappg18_1/nsf18_1.pdf

[6] **Schoolyard Book Series**. https://lternet.edu/schoolyard-book-series/

[7] **Ecological Reflections**. http://www.ecologicalreflections.com/

[8] **LTER Network Data Access Policy**, revised 19 May 2017.
https://lternet.edu/policies/data-access

[9]   **LTER Data Portal.** https://portal.lternet.edu/nis/home.jsp

[10] **Environmental Data Initiative.** https://environmentaldatainitiative.org/

[11] **Science Policy Exchange**. https://science-policy-exchange.org/

[12] **Hubbard Brook Research Foundation**.
https://hubbardbrook.org/hubbard-brook-research-foundation