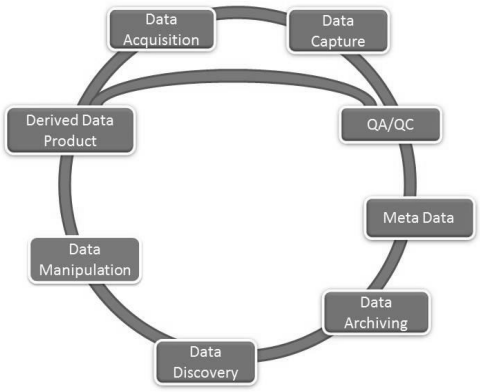
Training Material

Information Management Training Course

Related Links

- Recorded Presentations (982) [1]

2007 training need survey and possible training modules



LNO and information managers interested in training created this list of possible training modules to schedule in the spring of 2008:

Hands on Cyberinfrastructure Training modules available at LNO by LNO staff:

1. Basics of XML - towards synthesis applications through quality metadata

Covers: XML basic rules, schemas, and the EML standard. Editors for XML, and custom editors for metadata in EML. XML everywhere: XML in web services, XML in webforms, XML in mash-ups, XML in standards, XML in databases. Brief overview of synthesis tools, such as Kepler, EcoTrends and other prototypes.
Prerequisites: None.
Objectives: Good knowledge of XML and its potential as a integrative and sustainable managing tool.

2. Eml editors

Covers: Why use XMLSpy / oXygen to edit EML? Targeted Editors: BRIEF overview of Morpho, and the new EML editor (in development)
Prerequisite: knowledge of XML basics (XML rules, XML schemas). Familiarity with EML and EML best practices.
Objectives: a good exposure to some of the leading XML editors and a chance to join the group of first testers/developers of the new and exciting web based EML editor

3. Database management systems for the web

Covers: Basic data modeling using essential principles to build a relational database from scratch and fundamental Structured Query Language (SQL) commands such as insert, update, delete, and select with a focus on web applications.
Prerequisites: Basic knowledge of or experience with relational database systems.
Objectives: Learn basic RDMS Principles to create relational database for the development of web based applications.

4. Web-to-database connections with PHP

Covers: Topics covered include: how data-driven websites work and are designed; PHP and MySQL (introduction and advantages); building PHP pages using Dreamweaver to collect and display information from a MySQL database; Basic Javascript commands
Prerequisites: Knowledge of XHTML and Structured Query Language (SQL).
Objectives: learn the basic principles of Database driven web sites and serve as a starting point for development of database driven web based applications.

5. Working with XForms - Agile web forms

Covers: Ajax-like web form performace without Javascript. Knowledge of XForms and Orbeon (that encompasses XForms, XPL, application controller and XSLT), Make forms that validate content instantaneously. Forms that implement your XML schema.
Prerequisites: 1) Basic understanding on how to work with the Tomcat server (to deploy Orbeon). 2) A good understanding of XML, some XSLT desirable. 3) A know how of Unix shell/DOS shell directory navigation.You need to state how would you use XForms/Orbeon, bring your project to class, tell us about your project in detail.
Objective: a cutting edge technology that will enable you to deploy quickly new ways to capture data, and operate on data over XML.

6. Making EML (or XML) documents look readable on the web

Covers: How to make XLST stylesheets to make appealing web pages on metadata. Transforming EML documents into BDP (FGDC) documents and vice versa
Pre-requisites: 1) HTML, XML, and how to edit XML. (XML Spy, etc), 2) Some unix command line knowledge a plus or SOME knowledge on how to navigate your way in windows using a shell (cmd.exe) will help (Xpath), 3) You need to state how would you use XSLT, bring your project to class, tell us about your project in detail.
Objective: An in-depth knowledge of how to create stylesheets, incorporate them into EML applications and information architecture.

7. Jpgraph : offering nice real time plots of data coming out of your database

Covers: how to offer dynamical graphics (basic plots, time series, histograms, pie-charts) with your back end database
Pre-requisites: 1) some knowledge of PHP, some mySql or some SQL flavor, state how would you use JPGraph, bring your project to class, tell us about your project in detail.
Objective: a working system to offer plots in your site.

8. Introduction to Web Mashups with Javascript and Google Maps

Covers: Developing Web Mashups by using Javascript and the Google Map Application Programmers Interface (API). This course will

review and present information relating to intermediate HTML, the HTML Document Object Model, Javascript (including Javascript Objects), and the Google Map API.
Prerequisites: Basic understanding of website architectures, including browser/server interactions, writing HTML-based web pages, and basic computer programming principles.
Dynamic web programming (e.g., php, asp, jsp), including database interaction, would be helpful (but is not necessary).
Objective: To obtain a fundamental understanding of Web Mashups, including how they are implemented by using Javascript and the Google Map API in a "hands on" demonstration. Completion of this course should allow the participant to develop a Google Map Mashup at their own institution or site.
9. Introduction to Cyber security
Covers: This module will introduce the participant to a myriad of cyber security issues that fall into domain of the site information manager including network security, hardware security, software security, and data security. The overview will discuss threats and attacks, privacy issues, and common myths. Hands on exercises will be in using the Public Key Infrastructure (PKI) and encryption in everyday computing.
Prerequisites: none.
Objective: To obtain a fundamental understanding of cyber security issues that pervade our every activity. The course is not designed to be comprehensive but to give the participant a basic understanding of some of the most common security issues that effect the day to day information management operation.
Hands on Cyberinfrastructure Training modules available at LNO by ESRI Authorized Instructor:
10. The primary goal is to focus on getting basic GIS skills at each LTER, thus allowing sites with no GIS presence to be familiar with the benefits and those sites with divided GIS and IM professionals develop an approach to integrate their work as well as the data and information in a sustainable architecture.
Intro to GIS:
a. Benefits of GIS. Explain what GIS does. Show application examples. Discuss projects that demonstrate how GIS is used. Speak in direct and non-technical language.
b. Challenges of GIS. As with many technologies GIS can offer a solid return, but there are hardships involved. For example, in the 1980's and early 1990's, the generation of the data itself represented a significant (the bulk) investment in any GIS project…simply creating the data was a gargantuan task. Today data is much more available, but there are gotcha's involved at every step (projections for example).
c. The key parts of a GIS/A beginning vocabulary. For example, GIS at its core is information tied to a geographic point. Show examples of different types of data, characteristics, specifications, and usage. (Raster and vector, polygons, arcs, points and databases.)
d. Core skills.
a. Importing
b. Conversion
c. Projections
d. Editing
e. Manipulation (joins, clipping, overlays, modeling)
f. Raster overview (imagery, land cover classification, DEMs, DRGs)
g. Map Making
(I'd suggest this happen in context of an example project).
e. Experts Tips. A very useful exercise would be to focus on typical 'gotcha's' that can be avoided through some basic knowledge and communication of best practices (I can't tell you how many times I've received a shp file without the requisit prj file…which leads to guessing and fumbling around with the projection. There are a number of areas where a good trainer should be able to anticipate future problems and communicate these pearls of wisdom in the classroom…"I wish I had known this when starting out".
Suggestions for a more advanced class:
a. SDE – networking/organizing/cataloging/documenting.
b. Serving GIS across the internet.
c. Land Cover classification.

Attachment	Size
lter-training-needs-2006-05-15-21.doc [2]	116 KB

Introduction to LTER IM

Introduction
Presentations

- Introduction to LTER IM [3] John Porter [pptx]
- DataONE [4] presentation "Why Share Data" [5] [ppt]

Exercises
Lesson Plan
Additional Resources

NSF Data Management Plan

Introduction
As of January 18, 2011, all proposals to NSF must include a Data Management Plan, which is a formal document that outlines what you will do with your data during and after your research. This ensures that your data will be safe now and in the future and that you will be able to comply with NSF policies for sharing of results, primary data, physical samples and collections.

Presentations

- Data Management Plan [6] Kristin Vanderbilt [pptx]
- DataONE [7] presentation "Data Management Plans" [ppt] [8]

Exercises

- Download [9] the data management plan template from the DataConservancy [10]
- You may follow the detailed instructions on how to fill out this document outlined by J. Brunt in How to Write a Data Management Plan for a National Science Foundation (NSF) Proposal [11]
- Or you can add to this document after completing each of the main sections in this LTER Information Management Course. We will refer back to the different sections in the Data Management Plan at the end of each section.

Lesson Plan
Additional Resources

- How to Write a Data Management Plan for a National Science Foundation (NSF) Proposal [11] by James Brunt
- NSF Dissemination and Sharing of Research Results [12]
- Association of Research Libraries Resources for Data Management Planning [13]

Attachment	Size
DMPs_Vanderbilt_2012_formatted_20120808.pptx [6]	8.87 MB

Data Acquisition

Presentations
Data Acquisition, Kristin Vanderbilt [pptx] [14]

Attachment	Size
QA_QC Training Module_LTER_2012_08_16.pptx [15]	4.98 MB

Digital Data Organization

Introduction Once data are acquired in the field or laboratory, they frequently will have to be hand entered or if acquired digitally organized in a way that they can be analyzed. Consideration for QA/QC are important at this step. Both, Excel and databases offer approaches to speed data entry and provide some control over data quality. **Presentations**

- Introduction to using databases [16] [pptx] - Corinna Gries
- Introduction to Streaming Data [17] [pptx] - John Porter
- Data Acquisition [18] [pptx] - Kristin Vanderbilt
- DataONE [7] presentation "Data Entry Manipulation" [pptx] [19]

Additional Resources

- Porter Intro to data modeling attached as a resource [20]
- Intro to avoiding data entry mistakes in Excel [21]

Attachment	Size
databases.pptx [16]	1.23 MB

Quality Assurance / Quality Control

Introduction: Quality Assurance and Quality Control must be part of every step during the data life cycle. Approaches for QA/QC during data acquisition [22] and digital organization of data [23] are discussed in those sections.

Thesauri and controlled vocabularies
Introduction
Thesauri provide a reference usually including a Globally Unique Identifier for certain terms, e.g., taxonomic names and geographic place names. Both of which have changed throughout history and using a GUID from an accepted thesaurus will help define the exact meaning of terms used.
Presentations

- Thesauri and Controlled Vocabularies [24] [pptx]

Additional Resources

- **Spatial Gazetteers**

- The GeoNames geographical database [25] covers all countries and contains over eight million place names that are available for download free of charge.
- Alexandria Digital Library List of Links to Online Gazetteer and Related Sites [26]
- Duke list of online gazetteers [27]
- **Taxonomic Authorities**
  - Catalogue of Life [28]
  - Integrated Taxonomic Information Service [29]
  - Encyclopedia of Life
  - [30]

Metadata

Introduction
Presentations

- DataONE [7] presentation "What are Metadata" [pptx] [31]
- DataONE [7] presentation "The Value of Metadata" [ppt] [32]
- DataONE [7] presentation "Writing Metadata" [pptx] [33]

Exercises
See Attachments:
vanderbi.10.1.xml: sample EML file
Morpho Exercise.docx

Lesson Plan
Additional Resources
More information may be found within this website under Resources/IM Practices/Metadata [34]

Attachment	Size
vanderbi.10.1.xml [35]	9.08 KB
classHOBOData.txt [36]	43.63 KB
Morpho Exercise_20120813a.pdf [37]	2.83 MB
LTER_Class_Metadata_2012.pptx [38]	3.67 MB

Data Archiving

Introduction
Presentations

- Best Practices in Data Preservation [pptx] - J. Porter [39]

Exercises
Lesson Plan
Additional Resources

Data Security

Introduction
Presentations

- DataONE [7] presentation "Protected Back-up" [pptx] [40]

Exercises
Lesson Plan
Additional Resources

Attachment	Size
Best Practices for Sharing and Archiving Data - Hook et al. 2010 [41]	1.31 MB
7_Easy_Steps_to_Data_Security_2012Q3.pptx [42]	3.07 MB
SevenEasyStepstoDataSecurity2012Q3.pdf [43]	113.54 KB

Data Manipulation

Introduction

Data Manipulation - general
Presentations
DataONE [7] presentation "Analysis and Workflow" [pptx] [44]
Additional Resources

Data Manipulation - Kepler
Presentations
Accessing Data in the LTER NIS - The Kepler Workflow System [45] [pptx] - Corinna Gries
Exercises
Kepler example workflows [46]
Additional Resources
Downloading Kepler:
Java Runtime Environment (jre6) http://www.java.com [47]
Kepler https://kepler-project.org [48]
R statistical package (optional) http://www.r-project.org/ [49]

Documentation https://kepler-project.org/users/documentation [50]
Examples https://kepler-project.org/users/sample-workflows [51]
Mailing list http://www.keplerproject.org/en/Mailing_List [52]

Data Manipulation - R
Presentations
Data Manipulation - R [53] [pptx] -John Porter
Exercises
Introduction to R [54] - a tutorial
Some R commands to demo [55] -John Porter
Some R Exercises to try [56]
Additional Resources
R Project [49] Comprehensive R Network Mirrors [57] Quick R [58] - a cookbook of R solutions
An R Tip Sheet - handy commands [59] -John Porter

Data Repositories and the NIS

Introduction
Data repositories are available through several research groups and have the goal to make data discoverable and accessible. That is, the data will be available into the future to people who did not collect the data themselves.
Presentations

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Additional Resources

- Screen casts of the different workflows [60]
- Accessing data in the NIS using Matlab, R, or Kepler [61]
- Central data repository for download e.g. LTER, CSO, GLEON
- Publish datasets as data papers e.g. ESA archives http://esapubs.org/archive/ [62]
- Submit data with a paper e.g. DRYAD http://datadryad.org/ [63], many publishers offer server space for additional materials
- Submit data to general repository e.g. KNB http://knb.ecoinformatics.org/index.jsp [64], DataONE http://www.dataone.org/data [65]

GIS Data Management

Introduction
This section includes information on the following:
1. GIS Data Formats
2. Creating metadata for spatial data
3. Converting metadata to EML
4. Special considerations for archiving and publishing spatial datasets
5. Converting latitude and longitude files into data usable by GIS software and Google products.
Presentations

Exercises
Lesson Plan
Additional Resources

Attachment	Size
GIS Data Management_class4.pptx [66]	2.95 MB

Attachment	Size
documenting_GIS_data.pptx [67]	465.94 KB
geographic_coord_ponds.xml [68]	3.96 KB

IM for multi-investigator projects

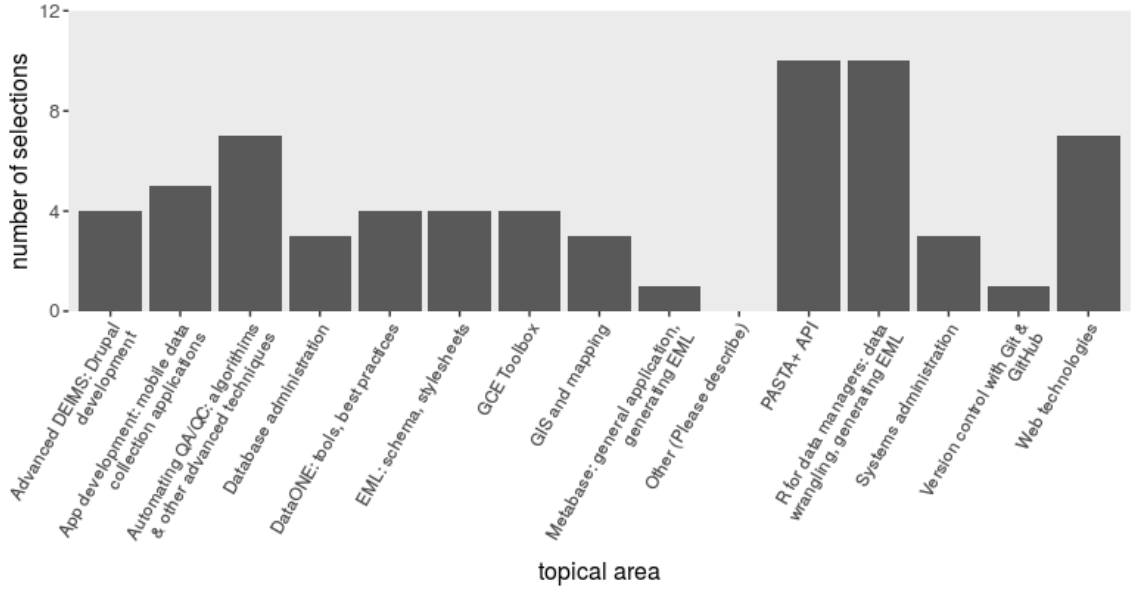
Introduction
Presentations

- Considerations for multi-investigator projects [69] [pptx] - Corinna Gries

IMC training interests survey results 2017

The expansion of the LTER Network with new sites has contributed to a renewed focus on the skills and knowledge that an LTER Information Manager must possess to address the informatics needs of an LTER site. The IM Skillset and Training Resources Group [70] was tasked to identify these critical areas of expertise, and to recommend appropriate training resources to help ensure that new Information Managers have the skills that they need. At the same time, the working group recognized that current Information Managers may be interested to acquire new skills in light of evolving technology, or to introduce new or improved tools or procedures into the information management system at their site. To help identify and work toward developing training that would be most beneficial to the community should opportunities arise, the working group distributed a web-based survey to LTER Information Managers in March 2017 in which respondents were asked to rate topical areas where they would be interested to receive training. Highlights from the survey are detailed on this page, and results of the complete survey are included as an attachment.

Figure 1. Results from the first and overarching question of the survey in which respondents were asked to select up to four technology areas where they feel more training would be beneficial to their job.



The most popular topical areas included the PASTA API (n=10), R for data managers (n=10), automating QA/QC (n=7), and web technologies (n=7).

The use of stylesheets to translate XML (n=5) and web services (n=8) were the most popular choices of more focused implementations of the PASTA API. Using cURL in (n=4) and out (n=3) of scripting languages (e.g., Python) were the most selected options when drilling down to specific web services.

Among respondents interested in automating QA/QC, R, Python, and SQL were the most popular choices in a follow-up question regarding tools of interest.

Web application programming (n=5) and web-based data visualization (n=6) were the most selected specific options of the web technologies topical area. Respondents noted that Javascript and PHP would be the most beneficial tools to address web application programming, while Shiny, Plotly, Chart.js, and dygraphs were among the most favored tools for web-based data visualization.

Attachment	Size
IM-training-survey-final.txt [71]	6.95 KB

Web Presence using Content Management Systems

Introduction
Presentations

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Exercises
Lesson Plan
Additional Resources

This material is based upon work supported by the National Science Foundation under Cooperative Agreement #DEB-0236154. 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.
Please contact us with questions, comments, or for technical assistance regarding this web site.

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

Links:
[1] http://im.lternet.edu/links/goto/798/168/links_related
[2] http://im.lternet.edu/sites/im.lternet.edu/files/lter-training-needs-2006-05-15-21_0.doc
[3] http://im.lternet.edu/sites/im.lternet.edu/files/Introduction to LTER IM themed.pptx
[4] http://www.dataone.org/education-modules
[5] http://www.dataone.org/sites/all/documents/L01_DataManagement.pptx
[6] http://im.lternet.edu/sites/im.lternet.edu/files/DMPs_Vanderbilt_2012_formatted_20120808.pptx
[7] https://www.dataone.org/content/education
[8] https://www.dataone.org/sites/all/documents/Mod2_FINAL.ppt
[9] http://im.lternet.edu/sites/im.lternet.edu/files/NSFDataManagementPlanTemplatev1.1.pdf
[10] http://dataconservancy.org/
[11] http://intranet2.lternet.edu/node/3248
[12] http://www.nsf.gov/bfa/dias/policy/dmp.jsp
[13] http://www.arl.org/rtl/eresearch/escien/nsf/nsfresources.shtml
[14] http://im.lternet.edu/sites/im.lternet.edu/files/QA_QC Training Module_LTER_2012_0_0.pptx
[15] http://im.lternet.edu/sites/im.lternet.edu/files/QA_QC Training Module_LTER_2012_08_16_0.pptx
[16] http://im.lternet.edu/sites/im.lternet.edu/files/databases.pptx
[17] http://im.lternet.edu/sites/im.lternet.edu/files/StreamingData12.pptx
[18] http://im.lternet.edu/sites/im.lternet.edu/files/QA_QC Training Module_LTER_2012_0.pptx
[19] https://www.dataone.org/sites/all/documents/Mod3_FINAL.pptx
[20] http://im.lternet.edu/sites/im.lternet.edu/files/Intro_to_DataModels07.ppt
[21] http://www.techrepublic.com/blog/five-apps/five-tips-for-avoiding-data-entry-errors-in-excel/825?tag=nl.e101
[22] http://im.lternet.edu/node/940
[23] http://im.lternet.edu/node/941
[24] http://im.lternet.edu/sites/im.lternet.edu/files/QAQCthesauricontrolledvocabulariesthemed.pptx
[25] http://www.geonames.org/
[26] http://www.alexandria.ucsb.edu/~lhill/dgie/DGIE_website/gaz_links.htm
[27] http://library.duke.edu/research/subject/guides/maps/gazetteers.html
[28] http://www.catalogueoflife.org/
[29] http://www.itis.gov/
[30] http://eol.org/
[31] https://www.dataone.org/sites/all/documents/Mod7_FINAL.pptx
[32] https://www.dataone.org/sites/all/documents/Mod8_FINAL.ppt
[33] https://www.dataone.org/sites/all/documents/Mod9_FINAL.pptx
[34] http://im.lternet.edu/im_practices/metadata
[35] http://im.lternet.edu/sites/im.lternet.edu/files/vanderbi.10.1.xml
[36] http://im.lternet.edu/sites/im.lternet.edu/files/classHOBOData.txt
[37] http://im.lternet.edu/sites/im.lternet.edu/files/Morpho Exercise_20120813a.pdf
[38] http://im.lternet.edu/sites/im.lternet.edu/files/LTER_Class_Metadata_2012.pptx
[39] http://im.lternet.edu/sites/im.lternet.edu/files/Data_Preservation_archives_best_practices.pptx
[40] https://www.dataone.org/sites/all/documents/Mod5_FINAL.ppt
[41] http://im.lternet.edu/sites/im.lternet.edu/files/BestPractices-2010.pdf
[42] http://im.lternet.edu/sites/im.lternet.edu/files/7_Easy_Steps_to_Data_Security_2012Q3.pptx
[43] http://im.lternet.edu/sites/im.lternet.edu/files/SevenEasyStepstoDataSecurity2012Q3.pdf
[44] http://www.dataone.org/sites/all/documents/L10_AnalysisWorkflows.pptx
[45] http://im.lternet.edu/sites/im.lternet.edu/files/Data_Manipulation_Kepler_themed.pptx
[46] http://im.lternet.edu/sites/im.lternet.edu/files/KeplerExamples.zip
[47] http://www.java.com
[48] https://kepler-project.org
[49] http://www.r-project.org/
[50] https://kepler-project.org/users/documentation
[51] https://kepler-project.org/users/sample-workflows
[52] http://www.keplerproject.org/en/Mailing_List
[53] http://im.lternet.edu/sites/im.lternet.edu/files/R_EML_basics.pptx
[54] http://cran.r-project.org/doc/manuals/R-intro.html
[55] http://im.lternet.edu/sites/im.lternet.edu/files/Rdemo10.txt
[56] http://im.lternet.edu/sites/im.lternet.edu/files/R_exercise.pptx
[57] http://cran.r-project.org/mirrors.html
[58] http://www.statmethods.net/
[59] http://im.lternet.edu/sites/im.lternet.edu/files/R_tip_sheet.txt
[60] http://mtsms.unm.edu/Mediasite/Catalog/Full/cf020feb9c6a4222a57d8daa334f7e3521/b671822aa4c04e6caa5d2157a55da6e514/cf020feb9c6a4222a57d8daa334f7e3521/?state=GHrbcctw5uPTuUXj0ogE
[61] http://im.lternet.edu/sites/im.lternet.edu/files/NISdataworkflowsbestpractices0.1.pdf
[62] http://esapubs.org/archive/
[63] http://datadryad.org/
[64] http://knb.ecoinformatics.org/index.jsp
[65] http://www.dataone.org/data
[66] http://im.lternet.edu/sites/im.lternet.edu/files/GIS Data Management_class4.pptx

[67] http://im.lternet.edu/sites/im.lternet.edu/files/documenting_GIS_data_0.pptx
[68] http://im.lternet.edu/sites/im.lternet.edu/files/geographic_coord_ponds.xml
[69] http://im.lternet.edu/sites/im.lternet.edu/files/multiInvestigatorCampaignthemed.pptx
[70] http://im.lternet.edu/node/1285
[71] http://im.lternet.edu/sites/im.lternet.edu/files/IM-training-survey-final.txt