Artic LTER **ARC**, Jornada LTER **JRN**, LTER Network Office **LN**O, Luquillo LTER **LUQ**, McMurdo Dry Valleys LTER **MCM**, North Tempeate Lakes LTER **NTL**, Sevilleta LTER **SEV**, Europe-LTER

DEIMS Working Group 2012 ASM Report

Drupal Ecological Information Management System : Paving LTER Science's Last Mile

An opportunity to establish LTER as leaders in ecological information management

Drupal Ecological Information Management System : Paving LTER Science's Last Mile

An opportunity to establish LTER as leaders in ecological information management

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The Drupal Ecological Information Management System 2012 ASM working group successfully accomplished its two pre-set goals:

1. Offer the LTER, the wider community and NSF program officers a first person view of the new advances in LTER information management at the site level

2. Provide DEIMS members an in-person forum to discuss new developments for this distributed but very active group.

The group was co-organized by Inigo San Gil (MCM/LNO), Kristin Vanderbilt (SEV), Eda Melendez (Luquillo) and Marshall White (LNO). The DEIMS "Paving LTER's science last mile" was the second ASM working group submitted. Unfortunately, the working group was not allocated for the requested day, and was scheduled at the end of the ASM meeting. Despite the adverse timing, this working group was well attended, with over twenty people with a notable international presence (South Africa, Taiwan and Europe). Altogether, ten LTER sites were represented. The representative from Luquillo LTER could not attend due to illness.

Agenda. The agenda listed eight to ten minute presentations for each DEIMS LTER site representative. The group showcased the highlights of the work, focusing on the status of the information management system, the work towards network service consumption (PASTA compliance, controlled vocabularies, unit dictionaries) as well as state of the art functionality geared towards data discovery, usability and participation. We planned to videotape the session, but the room was not equipped with the necessary instruments (camera, tripod, microphones).

Minutes	**Agenda topics**	**Presenter**
10	Introduction to DEIMS	Inigo San Gil
8	History of DEIMS	Marshall White
10	Overall Status / Plans	Kristin Vanderbilt
8	Luquillo LTER	Eda Melendez
8	North Temperate Lakes	Aaron Stephenson
10	**BREAK**	
8	Jornada LTER	Ken Ramsey
8	Arctic LTER	Jim Laundre
8	Plum Island	Hap Garritt
8	Sevilleta LTER	Kristin Vanderbilt
8	Europe LTER	David Blankman
5	McMurdo LTER	Inigo San Gil
10	Q & A	

This agenda was modified to accommodate questions and answers throughout the sessions. The 2hour morning session was extended in the afternoon session to the expense of a few business discussions.

The DEIMS working group added some business discussions to the project status and features for all participating LTER sites. The attendants presented the status of the plans to hire a team of Drupal professionals using pooled supplement funds, and a bit of support from LNO ARRA funds. The mechanism for hire is a public Request for Proposals (RFP), based at the University of New Mexico. Jornada (JRN), Arctic (ARC), McMurdo (MCM) and Plum Island (PIE) are not contributing money to this pooled effort; however, all DEIMS participants participated in the wording of the scope of work for this DEIMS call for proposals. The RFP main stated goals are:

- Audit the current DEIMS product by professionals, refine, port it to the latest release, and package it for all audiences.

- Prepare a professional information management system in a box, featuring: Easy to deploy and use. Implementation of relational database. Create web applications geared towards mobile devices. Make the end product usable: Create easy to use data catalogs, maps and information discovery mechanism. Produce and consume network services, including EML, controlled vocabularies and unit dictionaries. Consume future services, such as the PASTA portal, and the dataONE API services. The system must be in network compliance, producing high quality EML and other standards. Produce dynamic maps, news items and bibliographies. Ensure all information has connectivity through direct relationships and controlled vocabularies.

Individual Reports

Inigo San Gil and Marshall White introduced the workshop, covering the DEIMS basics and history of the DEIMS project. The history of DEIMS chronologically started at the previous ASM (2009), with an all-in exposure of the current shortcomings of the data search and information retrieval LTER capabilities, and what could we do about it with no resources or support. The progress and success of the DEIMS project was highlighted:7 sites and the network office actively engaged, a national laboratory and OBFS site using the DEIMS products as well as international LTER sites. DEIMS pivotal idea is to use the best information management technology that is free and maintained by the large Drupal community of developers.

All these sites provide a state of the art bibliography with multi-faceted for the sites, as well as inventories of metadata, locations, personnel and research projects. Data is connected to all these inter-related elements via direct relationships and indirect relationships, using keywords (tagging). The source of the keywords is multiple, from ad-hoc site-centric vocabularies to network sponsored controlled vocabularies. EML is produced automatically as a service, as well as the service to provide the EML metadata to the central catalogs. EML units are populated using the network services for units, and desirable contemporary look and feel is achieved re-using web site technologies offered by the Drupal community. We have access to a relational database to store the information to sites, and code to formulate queries and views to access all the site-related information customized to different audiences.

A. Stephenson (NTL) showed the advanced data query catalog, in addition to the NTL overall site experience. A demo on how to search and easily download data drew praises from the crowd

B. Vanderbilt (SEV) showed the site functionality, including the data catalog and EML.

C. San Gil showed Luquillo's (LUQ) bulk updates for easy changes for all information, presented on behalf of Melendez (illness)

D. Ramsey (JRN) showed the plans and progress of Jornada to integrate geoportal and Drupal, integration with taxonomic services (ITIS) and others.

E. Hap Garritt (PIE) showed the state of the art of the Plum Island Ecosystem

F. Jim Laundre (ARC) showed the excel-to-drupal application to ingest metadata in DEIMS, using the extensive excel application to collect metadata

Next Steps

The DEIMS working group members agreed to advance the work by continuing the current efforts and begin to focus on marketing the DEIMS products to all LTER and the ecological community beyond. An NSF Research Coordination Network is a suitable vehicle to achieve the immediate DEIMS goals:

1. Disseminate the DEIMS products (information management in a box) to the wider community (all LTER sites, Organization of Biological Field Stations, other networks (research laboratories, nascent networks such as NutNet, NPN, etc)

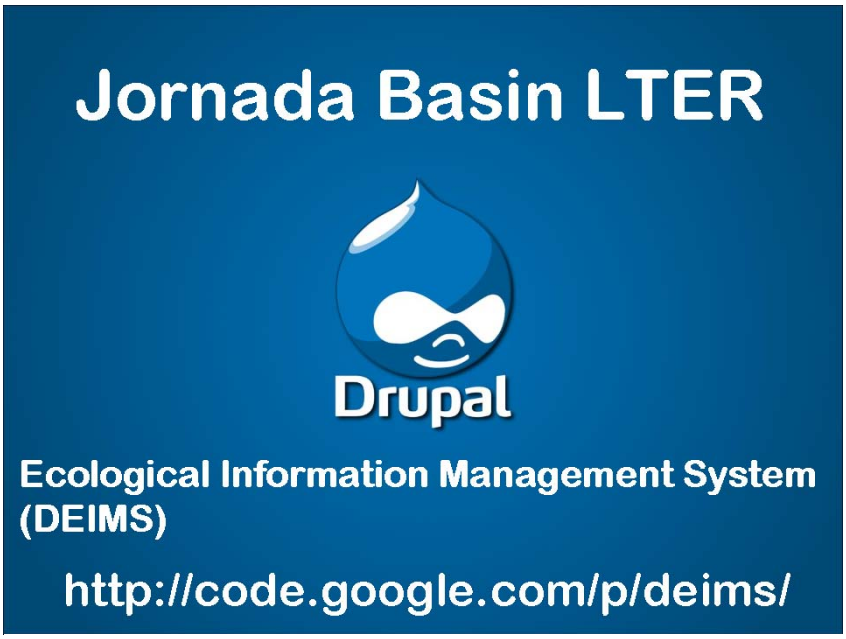
2. Provide necessary training – DEIMS removes the programming learning curve and the database expertise required by traditional web technologies. DEIMS provides web interfaces to accomplish most or all the functions needes at a given site or group, however, the interfaces and workflows are new, and require familiarization the manager and users. DEIMS should provide training and remote-training materials to teach the interfaces and functions offered by the system.

3. Extend DEIMS to include new needs: Integration with exernal APIs, such as MG-RAST (metagenomics), PASTA (LTER), or data.gov (federal repository of data), among others.

Appendix

Here you can find the power point slides from several presenters. Many presenters used Live Demonstrations, not included here.

JORNADA LTER SLIDES

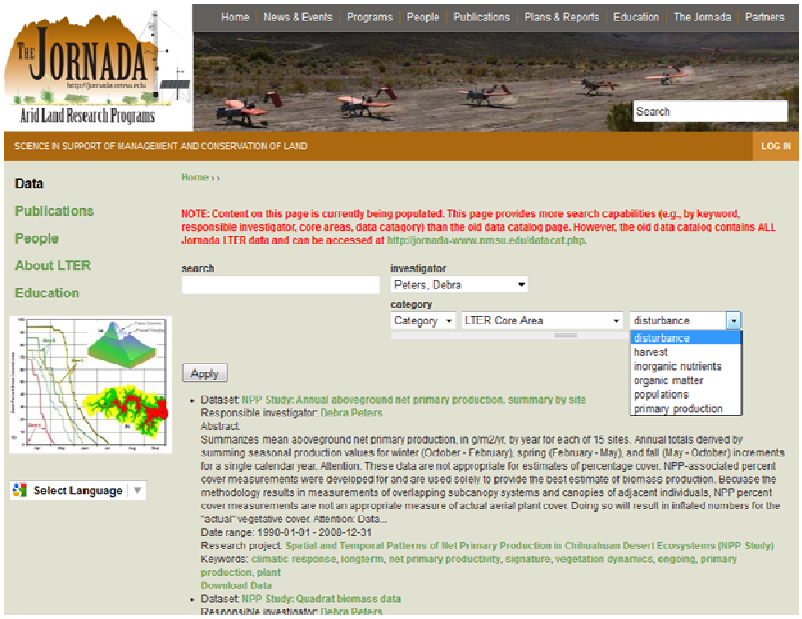


My Experience Learning Drupal

- Initially, steep learning curve
- Learned Drupal basics and online resources for learning Drupal at LTER DEIMS training workshop (Nov. 2011)
- In my experience, Drupal has a large and active user community and there are many online tutorials and resources available to learn Drupal
- The LTER training workshop was invaluable

Where we are

- Data catalog
- Data table query
- Personnel directory
- Bibliography
- EML metadata generation and harvest
- Aegir (site migration and deployment)



Home

Navigation

- Data rs npp annual production
- Data rs npp monthly precipitation
- Data npp annual production
- Pixels networks

User login

Username *

Password *

- Create new account
- Request new password

Log in

Jornada NPP Annual Production data table

Year: 2000

Site:

Zone:

Apply Reset

year	zone	site	annual_npp	key	POINT_X	POINT_Y
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2000	T	TAVI	33.6	TTAVI	-106.71115080000001	32.54988554
2000	T	EAST	36.5	TEAST	-106.7408003	32.51529294
2000	P	TOBO	4.8	PTOBO	-106.77094219999999	32.66799893
2000	P	SMAL	152.19999999999999	PSMAL	-106.8608696	32.54026929
2000	P	COLL	38.1	PCOLL	-106.7904508	32.53252287
2000	M	WELL	98.2	MWELL	-106.85074470000001	32.50630211
2000	M	RABB	77.900000000000001	MRABB	-106.7962824	32.51150508
2000	M	NORT	86	MNORT	-106.7877944	32.51906728
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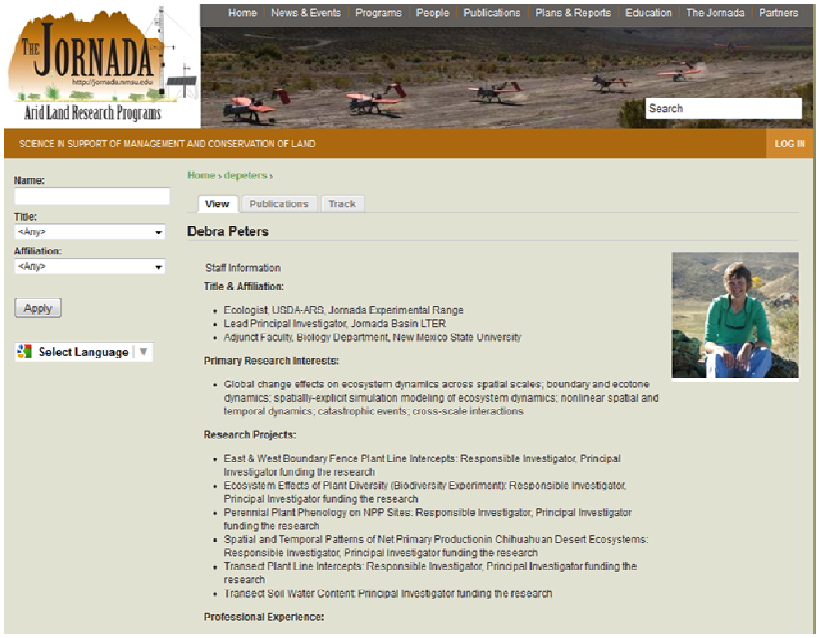

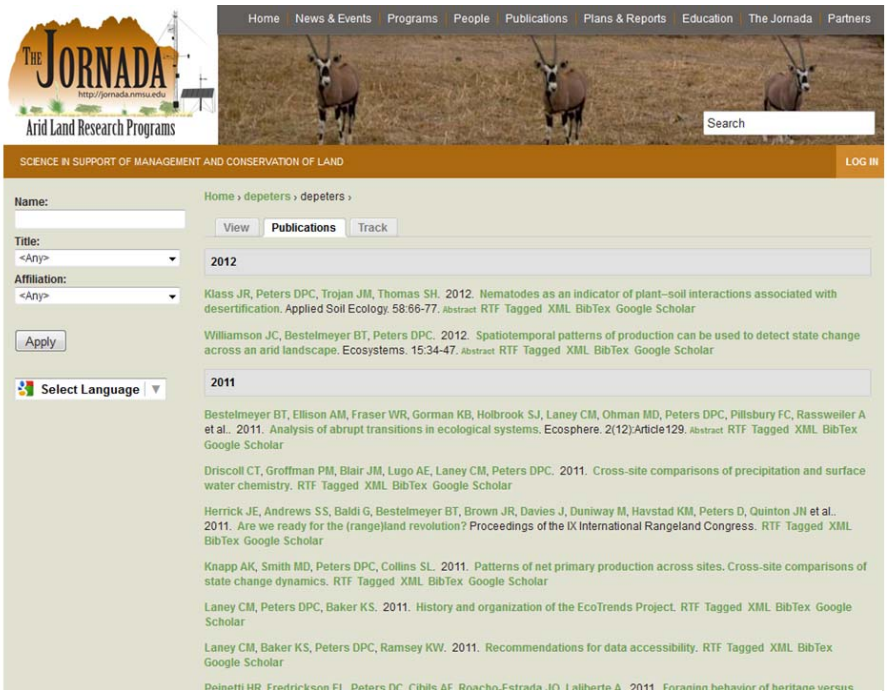
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2012
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Williamson JC, Bestelmeyer BT, Peters DPC. 2012. Spatiotemporal patterns of production can be used to detect state change across an arid landscape. Ecosystems. 15:34-47. Abstract RTF Tagged XML BibTex Google Scholar
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Knapp AK, Smith MD, Peters DPC, Collins SL. 2011. Patterns of net primary production across sites. Cross-site comparisons of state change dynamics. RTF Tagged XML BibTex Google Scholar
Laney CM, Peters DPC, Baker KS. 2011. History and organization of the EcoTrends Project. RTF Tagged XML BibTex Google Scholar
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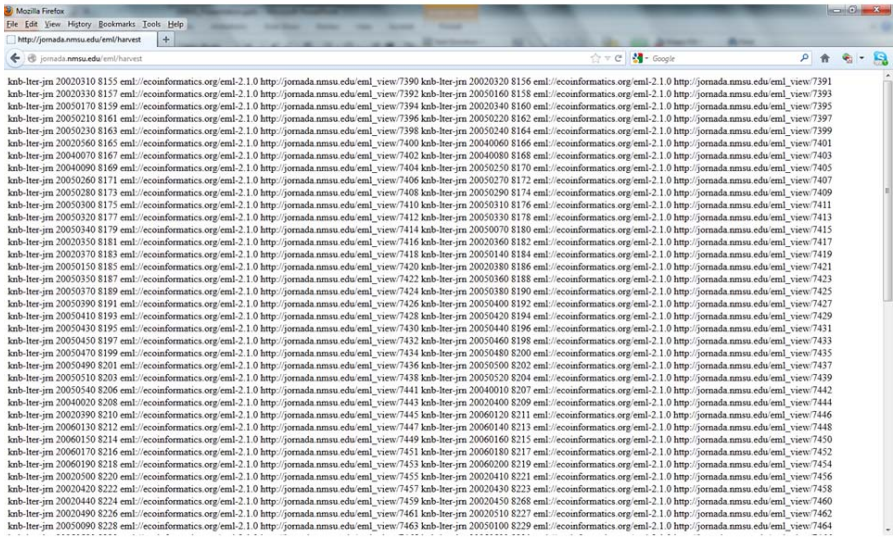
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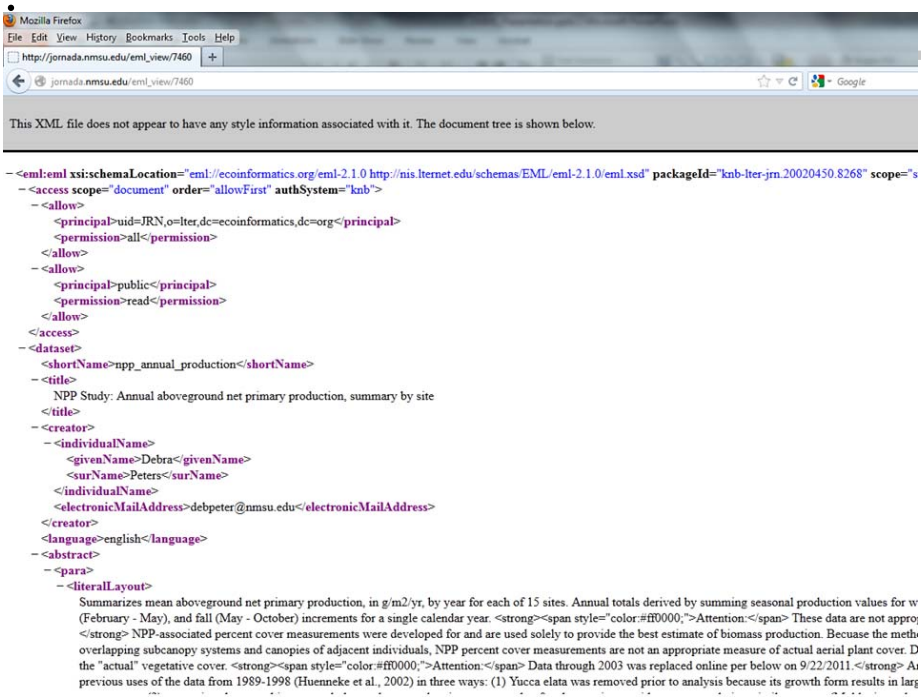
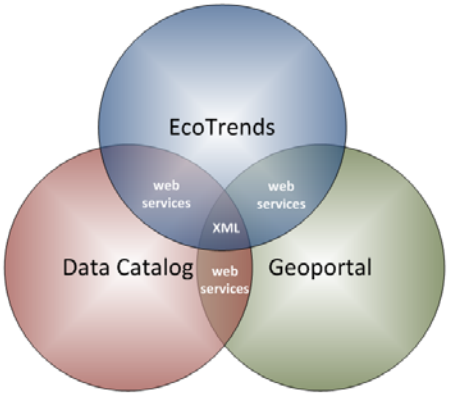


Where we are going

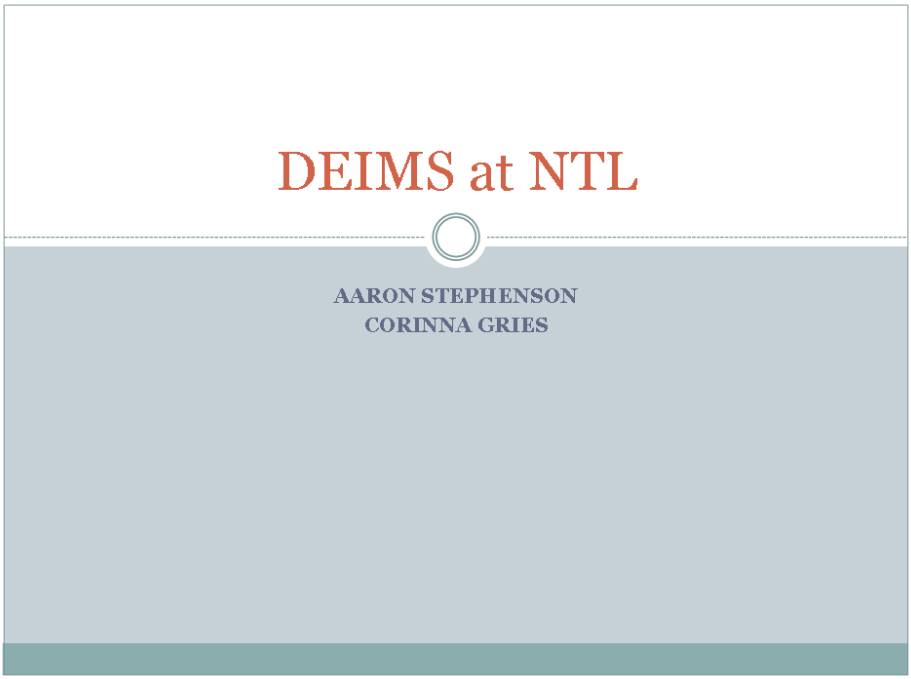
- By Nov. 2012
  - Data catalog layout
  - Metadata content
  - Dataset packages
  - Shapefile packages
  - Link persons with profiles
- DEIMS v2
  - Import/export FGDC
  - Data table query
  - Web services API
  - Interactive map of research sites
  - Integrate data catalog with geoportal and EcoTrends



EcoServer

EML and FGDC formatted XML metadata will be used to populate databases using web services to automate loading and synchronization of content between databases

NORTH TEMPERATE LAKES LTER SLIDES



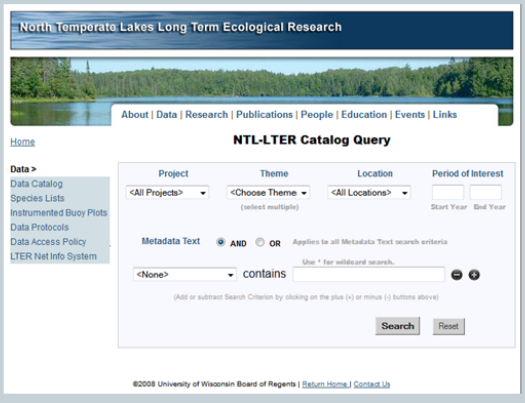
The Old System

- Oracle Database of Metadata

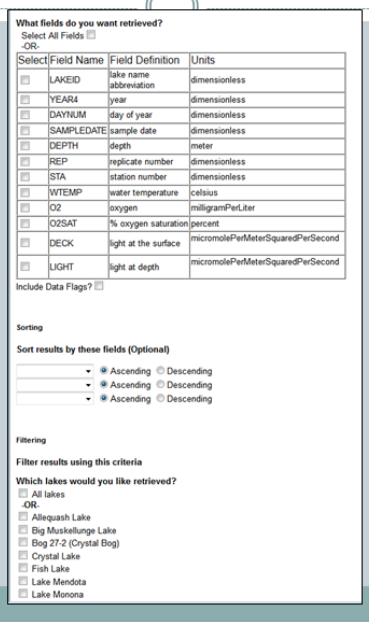
mendota_wtemp_hi_res	meta_datatable_attribute
mendota_wtemp_hourly	meta_datausers
meta_attribute	meta_keyword
meta_attribute_datetime	meta_keywordset
meta_attribute_enum_codes	meta_paragraph
meta_attribute_numeric	meta_party
meta_attribute_text	meta_primary_lakes
meta_category	meta_project
meta_category_abstract	meta_project_query
meta_category_dataset	meta_protocol
meta_category_protocol2	meta_protocol_keywordset
meta_category_protocols	meta_protocol_project
meta_datarequests	meta_protocol_roles
meta_dataset	meta_protocol_text
meta_dataset_geog_coverage	meta_protocol_theme
meta_dataset_primary_lakes	meta_qdisplay
meta_dataset_project	meta_qphrases
meta_dataset_protocol	meta_revision
meta_dataset_roles	meta_species_query
meta_dataset_text	meta_taxon_cov
meta_dataset_theme	meta_units
meta_dataset_type	meta_unittype
meta_datatable	microbial_activity_summary

The Old System

- Java application for querying and downloading data



The Old System



What fields do you want retrieved?

Select All Fields

-OR-

Select	Field Name	Field Definition	Units
	LAKEID	lake name abbreviation	dimensionless
	YEAR4	year	dimensionless
	DAYNUM	day of year	dimensionless
	SAMPLEDATE	sample date	dimensionless
	DEPTH	depth	meter
	REP	replicate number	dimensionless
	STA	station number	dimensionless
	WTEMP	water temperature	celsius
	O2	oxygen	milligramPerLiter
	O2SAT	% oxygen saturation	percent
	DECK	light at the surface	micromolePerMeterSquaredPerSecond
	LIGHT	light at depth	micromolePerMeterSquaredPerSecond

Include Data Flags?

Sorting

Sort results by these fields (Optional)

Ascending Descending

Ascending Descending

Ascending Descending

Filtering

Filter results using this criteria

Which lakes would you like retrieved?

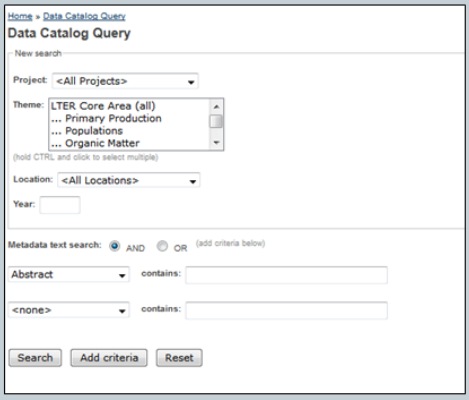
All lakes

-OR-

Allequash Lake
Big Muskellunge Lake
Bog 27-2 (Crystal Bog)
Crystal Lake
Fish Lake
Lake Mendota
Lake Monona

Conversion to DEIMS

- DEIMS content types populated from Oracle database
- Drupal module for search and query application



Home » Data Catalog Query

Data Catalog Query

New search

Project: <All Projects>

Theme: LTER Core Area (all)
... Primary Production
... Populations
... Organic Matter

(hold CTRL and click to select multiple)

Location: <All Locations>

Year:

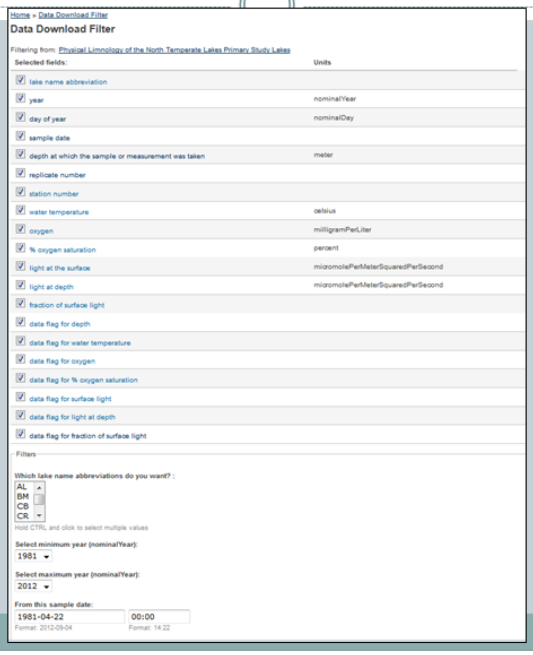
Metadata text search: AND OR (add criteria below)

Abstract contains:

<none> contains:

Search Add criteria Reset

Conversion to DEIMS



Experiences

- Important decisions:
  - Content organization with content types vs. tagging system (Drupal taxonomy)
  - Keyword lists

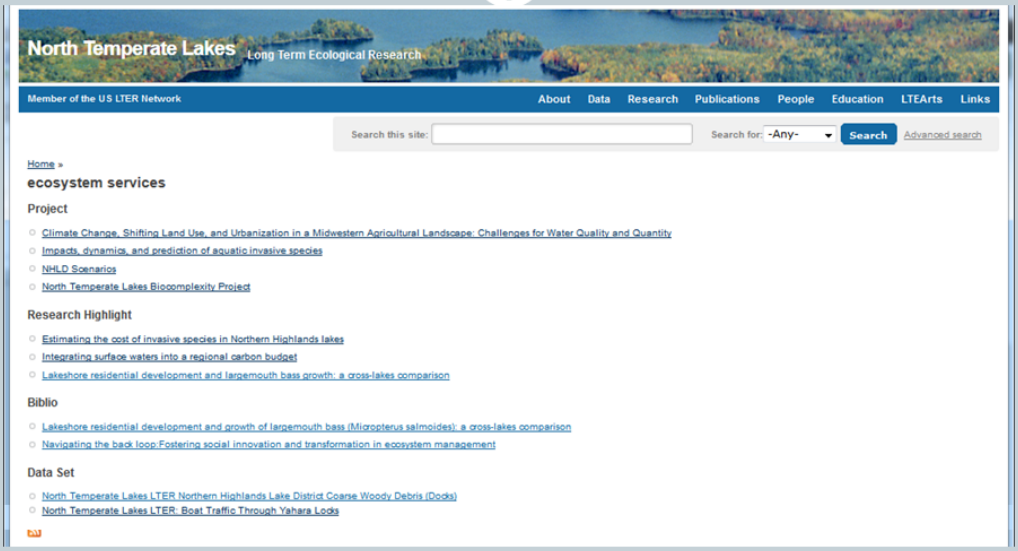
Content types vs. tagging

- Content types:
  - Person
  - Projects
  - Research highlights
  - News

Content types vs. tagging

- Tagging system:
  - LTER keywords
  - NTL keywords
  - NTL subject areas

Tagging across content types

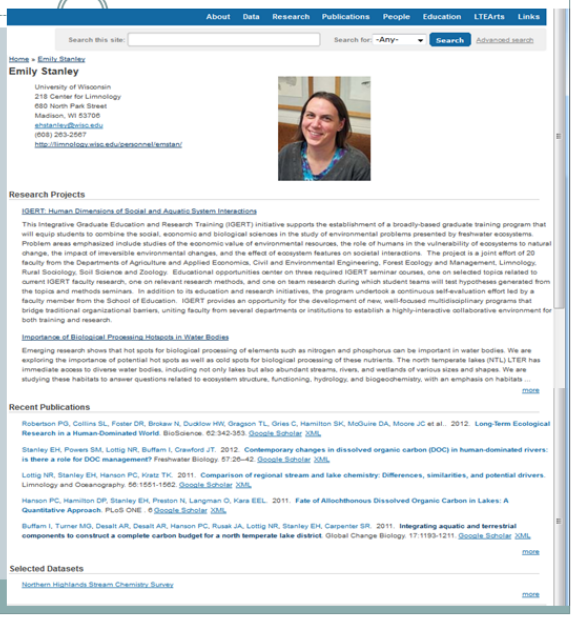


Most Effort in the Drupal System

- Content conversion from old system
- Programming of module
- Tagging of content information

Most Ease in the Drupal System

- Interlinking of information
- View development
- Presentation (css, panels)
- Use of some third party modules (e.g. biblio)




Overall Status/Plans for DEIMS

Improvements Needed

* Migrate to Drupal 7
* Revise Drupal2EML module
* Create 'wizard-like' approach to documenting variables
* Generate sophisticated catalog query page
* Simplify integrating external data in to DEIMS with query capabilities (a la NTL)
* Create an easy-to-deploy and update version of DEIMS

Improvements Needed

* Mechanism for entering taxonomic metadata
* Drupal 7 module to consume LTER Controlled Vocabulary web services
* Module that suggests to the user a unit when he/she enters a unit in the *variable* "unit" field
* Module to export DEIMS content in to ISO19139

2012 IM supplements

* LUQ - $50 K
* NTL - $50 K
* SEV - $40 K + $30 K from 2011 DEIMS supplement
* LNO - $80K (ARRA money)

The Process

* Request for Qualifications
* Request for Proposals

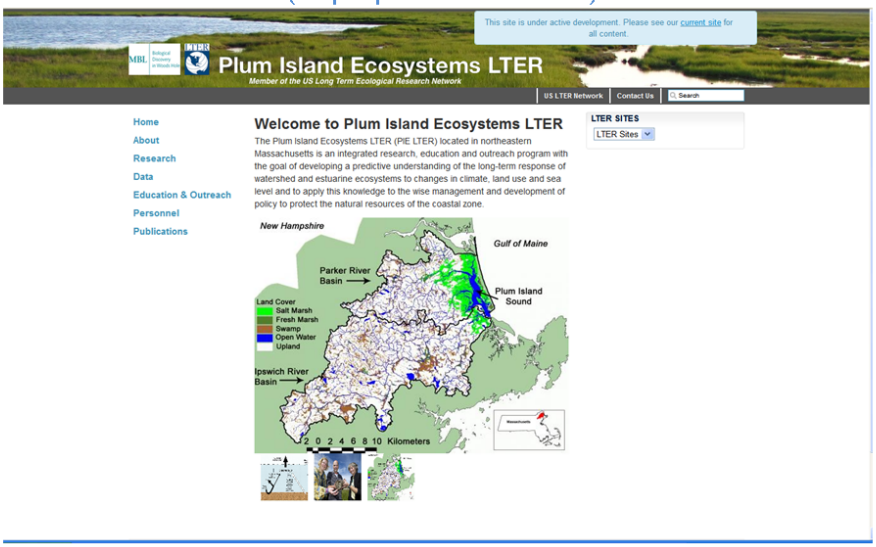
PLUM ISLAND ECOSYSTEM LTER SLIDES

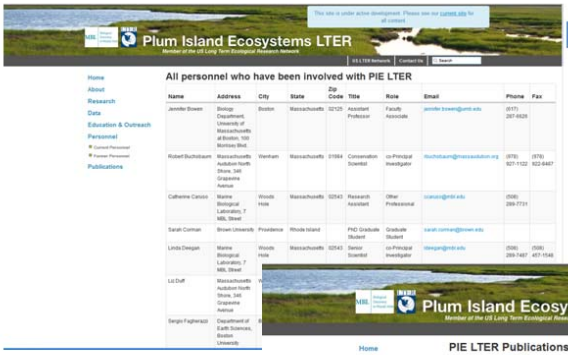
PIE LTER

Drupal Ecological Information Management System

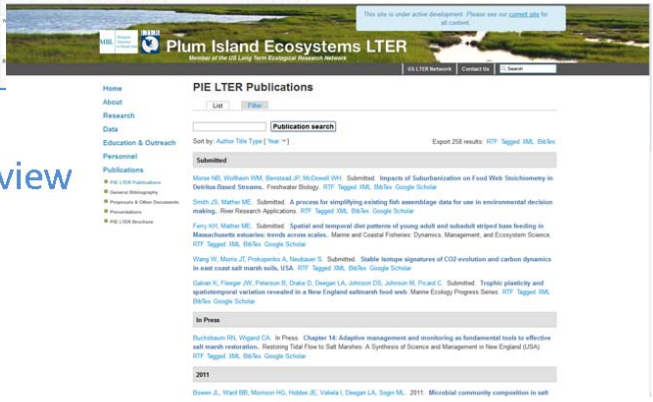
(DEIMS)

(http://pie-lter.mbl.edu)

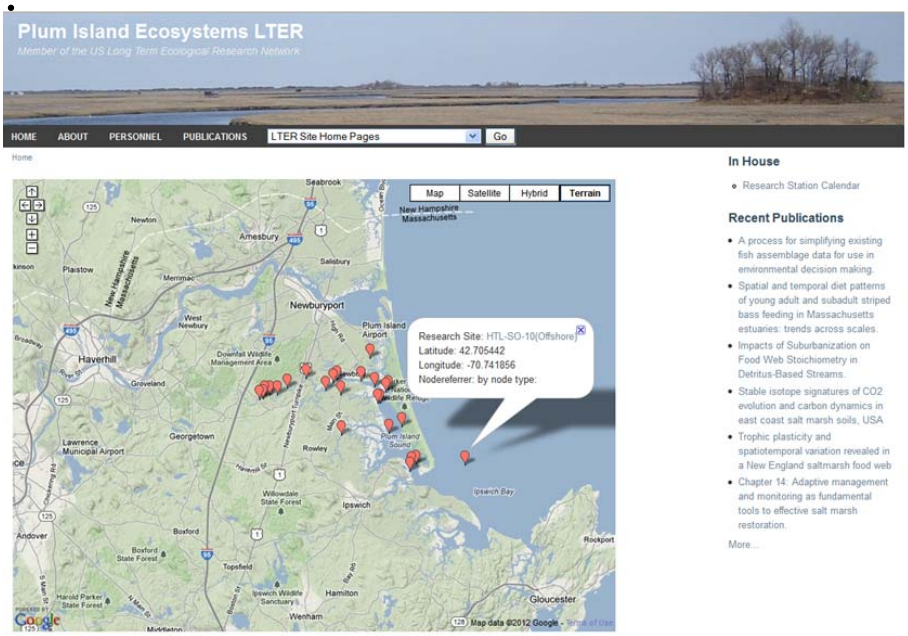




Person content view



Biblio module view



Gmap & Views module, displaying research site locations and pop up window containing other content information.

On-going tasks for PIE Drupal web site

- 2012 – Migrate existing Excel EML to Drupal

- 2012 – Update datasets using LTER Controlled Vocabulary for LTER and PIE keywords.

- 2012 – Develop search and query capabilities of content using Drupal Views, Panels and Taxonomy modules and LTER and PIE controlled keywords.

- 2012/2013 – Develop geo-referenced views of content using Drupal Gmap and Open Layers modules.

- 2012/2013 – Incorporate LTER Unit Dictionary into the Drupal metadata editor