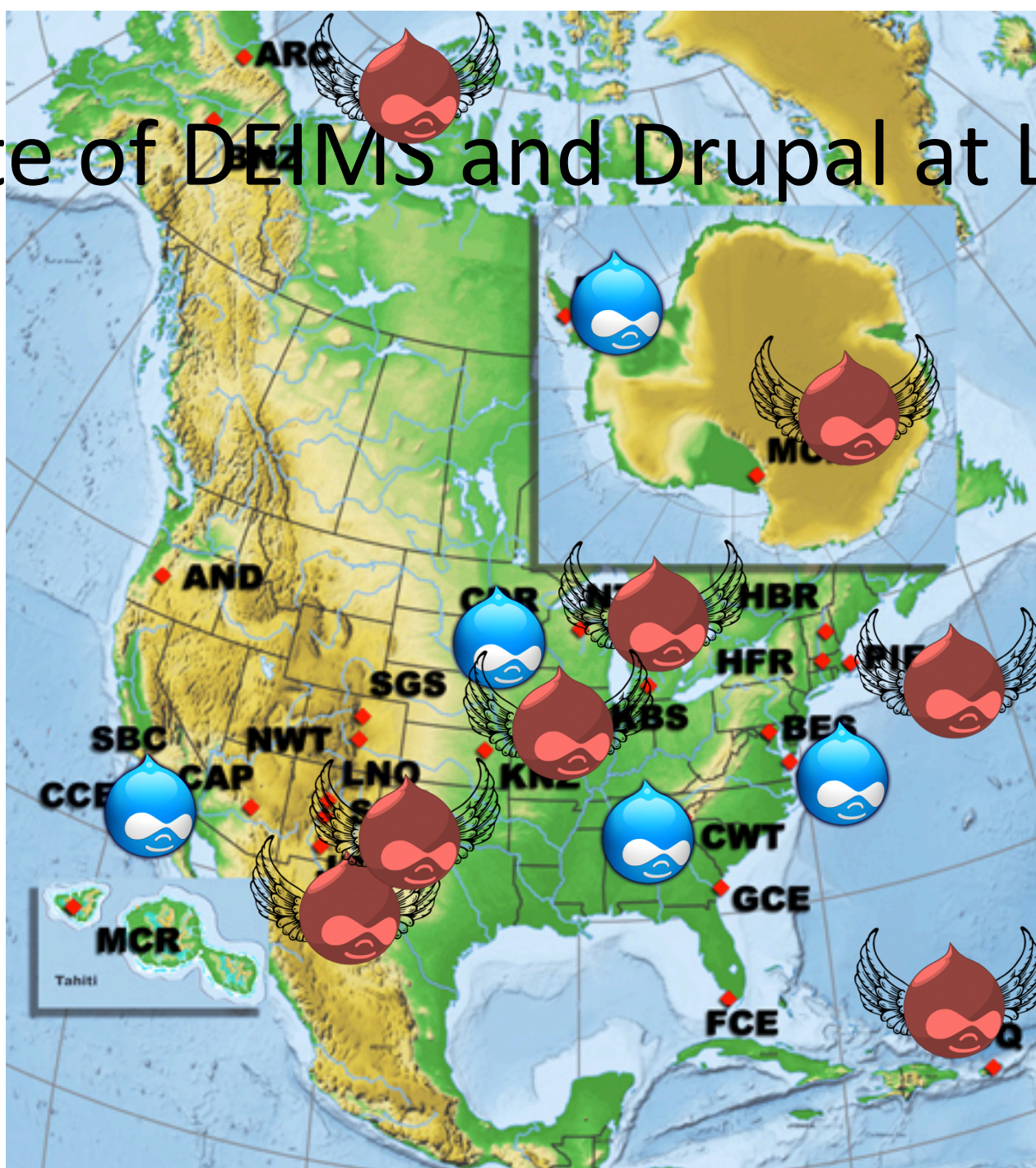




**An LTER Coalition of the Well Being:  
DEIMS**

# State of DEIMS and Drupal at LTER





# Drupal



# Not Just Any Open Source



96,069 users  
actively contributing



2,005 commits  
in the last week



4,448  
comments  
in the last week

31,712 Modules

2,165 Themes

964 Distributions

**Erynn Petersen** <https://austin2014.drupal.org/keynote-erynn-petersen.html>



# The Future of DEIMS

Development

Training

Migration / Adoption Support

**Overarching Goal**

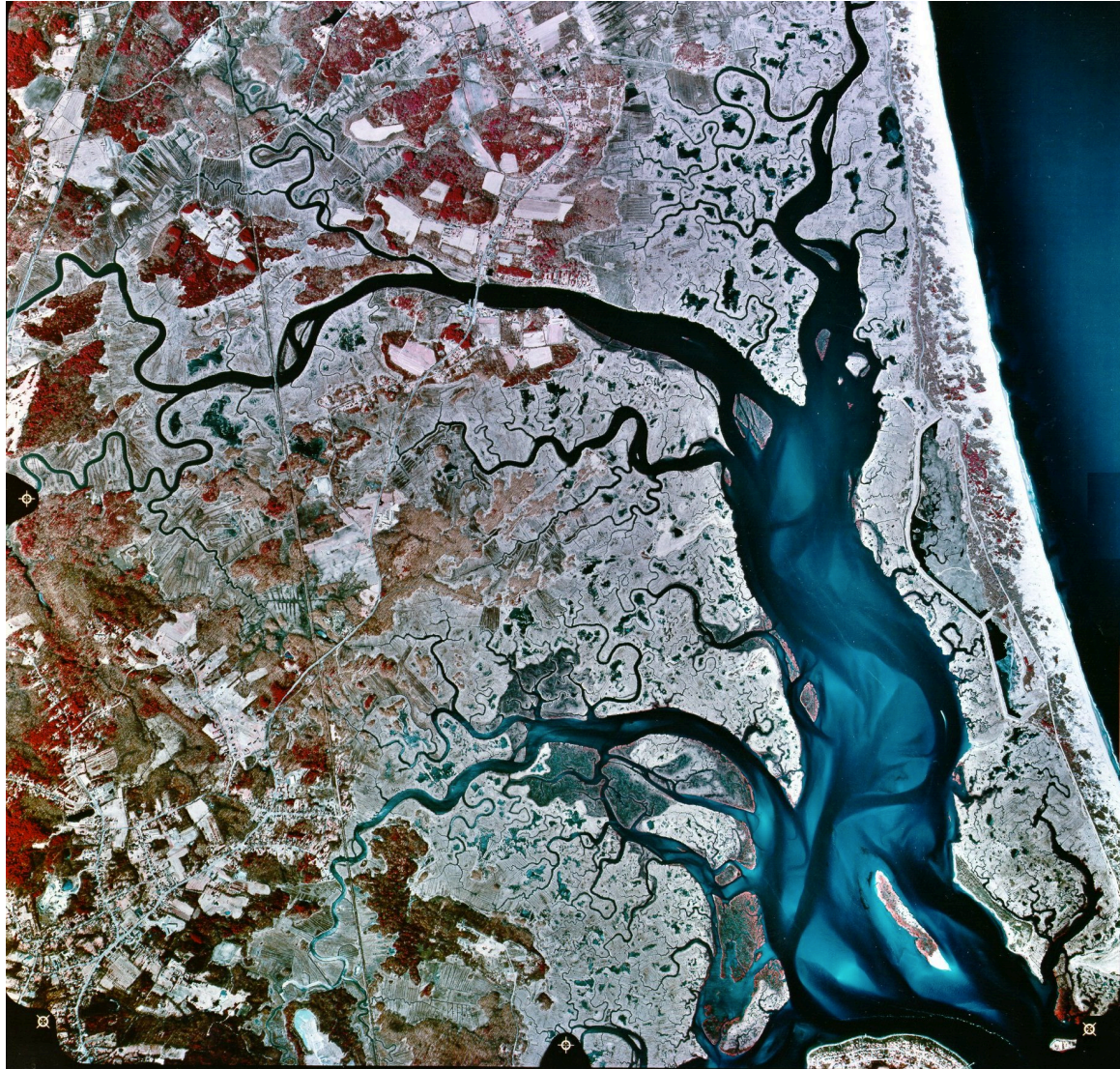
Build Capacity, enjoy communities

# OUTLINE

- David Blankman : ILTER – Jerusalem, Israel
- Hap Garritt : *Plum Island LTER* – Woods Hole, MA
- Corinna Gries: North Temperate Lakes LTER. Madison, WI
- Jim Laundre : Arctic LTER – Woods Hole, MA
- Jeanine McGann : MacroEcosystems – Albuquerque, NM
- Eda Melendez – Luquillo LTER – Rio Piedras, PR
- Ken Ramsey – Jornada LTER – Las Cruces, NM
- Inigo San Gil – McMurdo LTER – Albuquerque, NM
- Kristin Vanderbilt – Sevilleta LTER – Albuquerque, NM
- Yang Xia – Konza Prairie LTER – Manhattan, KS
- Adam Sheperd – BCO-DMO – Woods Hole, MA



# Plum Island LTER DEIMS





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## Welcome to Plum Island Ecosystems LTER

The Plum Island Ecosystems LTER (PIE LTER) located in northeastern Massachusetts is an integrated research, education and outreach program with the goal of developing a predictive understanding of the long-term response of watershed and estuarine ecosystems to changes in climate, land use and sea level and to apply this knowledge to the wise management and development of policy to protect the natural resources of the coastal zone.

PIE LTER research is focused in the estuary and watersheds of Plum Island Sound in northeastern Massachusetts. The estuary is fed by the Ipswich, Rowley and Parker Rivers with a combined drainage basin of 609km<sup>2</sup>. The Plum Island Sound estuary is a coastal plain, bar-built estuary with extensive areas of productive tidal marshes: the largest expanse of intertidal marsh in the Northeast.

PIE LTER is administered by [The Ecosystems Center](#), [Marine Biological Laboratory](#), Woods Hole, Massachusetts, USA. PIE is a member of the [US Long Term Ecological Research Network](#) funded by the [National Science Foundation's Long Term Ecological Research Program](#).



### Scale matters

Example of storm event flood in a suburban headwater stream (Burlington MA), showing how storm flood waters go over bankfull, deposit sand, and scour the riparian zone clear of leaf litter. Peak storm flow had occurred prior this picture being taken (Wollheim photo). [More information...](#)



LTER Network Site Links

Go

### RECENT PUBLICATIONS

- [Mysteries in the marsh](#)
- [What long-term, place-based funding has meant](#)
- [Distribution patterns of \*Melampus bidentatus\* and their implications on the effects of climate change on salt marsh animal populations](#)
- [Drivers of spatial and temporal variability in estuarine food webs](#)

[More...](#)

### PIE LTER FIELD GUIDE

[PIE field guide](#) (courtesy of EOL)

### TIDES, PLUM ISLAND SOUND (SOUTH END)

[NOAA Plum Island Sound Tide Chart](#)

### NEAR REAL-TIME WEATHER AND WATER QUALITY

[PIE LTER Weather](#) - Marshview Farm, Newbury, MA[PIE LTER Wind](#) - Ipswich Bay Yacht Club, Ipswich, MA[PIE LTER Water Level](#) - Ipswich Bay Yacht Club[PIE LTER Water Quality](#) - Ipswich Bay Yacht Club

### USGS DISCHARGE

[USGS provisional discharge](#), Ipswich and Parker Rivers



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- Authors
- Keywords

- General Bibliography
- Proposals & Other Documents
- PIE LTER Brochure

[News](#)

## PIE LTER Publications

[List](#)[Filter](#)Export 393 results: [RTF](#) [Tagged XML](#) [BibTex](#)[Author](#) | [Keyword](#) | [Title](#) | [Type](#) | [Year](#) ▼

### In Press

Giblin AE. In Press. **Mysteries in the marsh**. Long-Term Ecological Research: Changing the Nature of Scientists. [RTF](#) [Tagged XML](#) [BibTex](#) [Google Scholar](#)

Morris JT. In Press. **What long-term, place-based funding has meant**. Long-Term Environmental Research: Changing the Nature of Scientists. [RTF](#) [Tagged XML](#) [BibTex](#) [Google Scholar](#)

### 2015

Williams B. 2015. **Distribution patterns of *Melampus bidentatus* and their implications on the effects of climate change on salt marsh animal populations**. BS [RTF](#) [Tagged XML](#) [BibTex](#) [Google Scholar](#)

Nelson JA, Deegan L, Garritt RH. 2015. **Drivers of spatial and temporal variability in estuarine food webs**. Marine Ecological Progress Series. 533:67-77. [RTF](#) [Tagged XML](#) [BibTex](#) [Google Scholar](#)

Crosby SC, Ivens-Duran M, Bertness MD, Davey E, Deegan LA, Leslie HM. 2015. **Flowering and biomass allocation in U.S. Atlantic coast *Spartina alterniflora***. American Journal of Botany. 102 [RTF](#) [Tagged XML](#) [BibTex](#) [Google Scholar](#)

Smith MD, La Pierre KJ, Collins SL, Knapp AK, Gross KL, Barrett JE, Frey SD, Gough L, Miller RJ, Morris JT et al.. 2015. **Global environmental change and the nature of aboveground net primary productivity responses: insights from long-term experiments**. Oecologia. [RTF](#) [Tagged XML](#) [BibTex](#) [Google Scholar](#)

Blanchard S, Pontius Jr RG, Urban KM. 2015. **Implications of using 2m versus 30 m spatial resolution data for suburban residential land change modeling**. Journal of Environmental Informatics. 25:1-13. [RTF](#) [Tagged XML](#) [BibTex](#) [Google Scholar](#)

Johnson DS. 2015. **The savory swimmer swims North: A northern range extension of the blue crab *Callinectes sapidus*?** Journal of Crustacean Biology. 35:105-110. [RTF](#) [Tagged XML](#) [BibTex](#) [Google Scholar](#)

Mariotti G, Valentine K, Fagherazzi S. 2015. **Time-dependent behavior of a placed bed of cohesive sediment subjected to erosion and deposition cycles**. Ocean Dynamics. 65:287-294. [RTF](#) [Tagged XML](#) [BibTex](#) [Google Scholar](#)

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■ All Personnel

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## Active people, currently involved with PIE LTER

Name	Address	City	State	Zip Code	Title	Role	Email	Phone	Fax
Nathan Andrews	University of Rhode Island		Rhode Island		REU	Undergraduate Student	<a href="mailto:nandrews@uri.edu">nandrews@uri.edu</a>		
Caitlin Bauer	Bryn Mawr College		Pennsylvania		Intern	Undergraduate Student	<a href="mailto:cbauer@brynmawr.edu">cbauer@brynmawr.edu</a>		
David Behringer	Washington and Jefferson College		Pennsylvania		REU	Undergraduate Student	<a href="mailto:behringerdp@jay.washjeff.edu">behringerdp@jay.washjeff.edu</a>		
Samantha Bond	Marine Biological Lab, 7 MBL Street	Woods Hole	Massachusetts	02543	Research Assistant	Other Professional	<a href="mailto:sbond@mbi.edu">sbond@mbi.edu</a>	(508) 289-7583	(508) 457-1548
Jennifer Bowen	Biology Department, University of Massachusetts at Boston, 100 Morrissey Blvd.	Boston	Massachusetts	02125	Assistant Professor	co-Principal Investigator	<a href="mailto:jennifer.bowen@umb.edu">jennifer.bowen@umb.edu</a>	(617) 287-6626	
Robert Buchsbaum	Mass Audubon North Shore, 346 Grapevine Avenue	Wenham	Massachusetts	01984	Conservation Scientist	co-Principal Investigator	<a href="mailto:rbuchsbaum@massaudubon.org">rbuchsbaum@massaudubon.org</a>	(978) 927-1122	(978) 922-8487
Joshua Cain	WSAG, Earth Systems Research Center, Institute for the Study of Earth, Oceans, and Space, UNH, 211 Morse Hall	Durham	New Hampshire	03824	Graduate Student	Graduate Student	<a href="mailto:josh.s.cain@gmail.com">josh.s.cain@gmail.com</a>		
Wesley Clark	Eckerd College		Florida		REU	Undergraduate Student	<a href="mailto:wclark@eckerd.edu">wclark@eckerd.edu</a>		
Sarah Corman	Brown University	Providence	Rhode Island		PhD Graduate Student	Graduate Student	<a href="mailto:sarah.corman@brown.edu">sarah.corman@brown.edu</a>		
	Department of Marine Sciences,				Research	Other		(706)	

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- [Search Metacat](#)
- [Search PASTA](#)
- [Browse PIE Data Catalog by Research Area](#)
- [Browse PIE Data Catalog by LTER Core Area](#)
- [PIE Signature Data](#)
- [Spatial - GIS Data](#)
- [Research Locations, Maps & Aerial Imagery](#)
  - [Site Map & Data](#)
- [Analytical Methods](#)
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## Research Locations, Maps and Aerial Imagery

This section is currently a work in progress

### Research Locations:

[Site Map & Data](#) (click on a location tag to retrieve associated list of data)

[GIS-VA-PIEGIS](#) - Data file of research site locations

Research sampling areas throughout the Plum Island Ecosystems study area. Click for more information:

[Watershed Sampling Sites](#)

[Marsh Sampling Sites](#)

[Benthic Sampling Sites](#)

[Long-Term Monitoring Sites](#)

### Maps:

[PIE LTER Google map](#)

[Map of Plum Island Sound and the Surrounding Estuarine System](#)

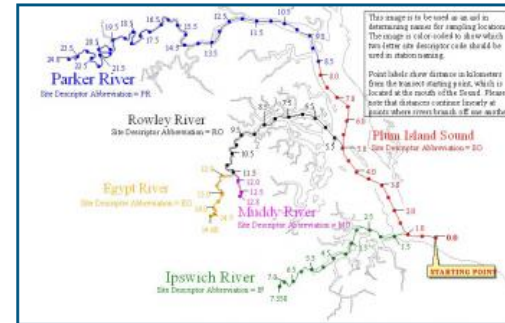
[Watershed Map with the Ipswich, Parker, and Rowley Rivers](#)

[1971 Land Use Map](#)

[1985 Land Use Map](#)

[Map of Plum Island Sound Streams, Ponds, and Watersheds](#)

[NOAA map of Newburyport Harbor and Plum Island Sound](#)



Map of riverine kilometer and site descriptor abbreviations

### Aerial Imagery:

[Infrared aerial photo of the mouth of the Parker River and Northern Plum Island Sound](#), Newbury, Massachusetts, 1:25,000 scale, Flown in July 1985 by James W. Sewall, Old Town, ME for University of Massachusetts, Amherst, MA.

[Color aerial photo of Plum Island Sound and surrounding estuarine system](#), Ipswich, Rowley and Newbury, Massachusetts, March 1992, 1:40,000 scale, USGS National Aerial Photographic Program.



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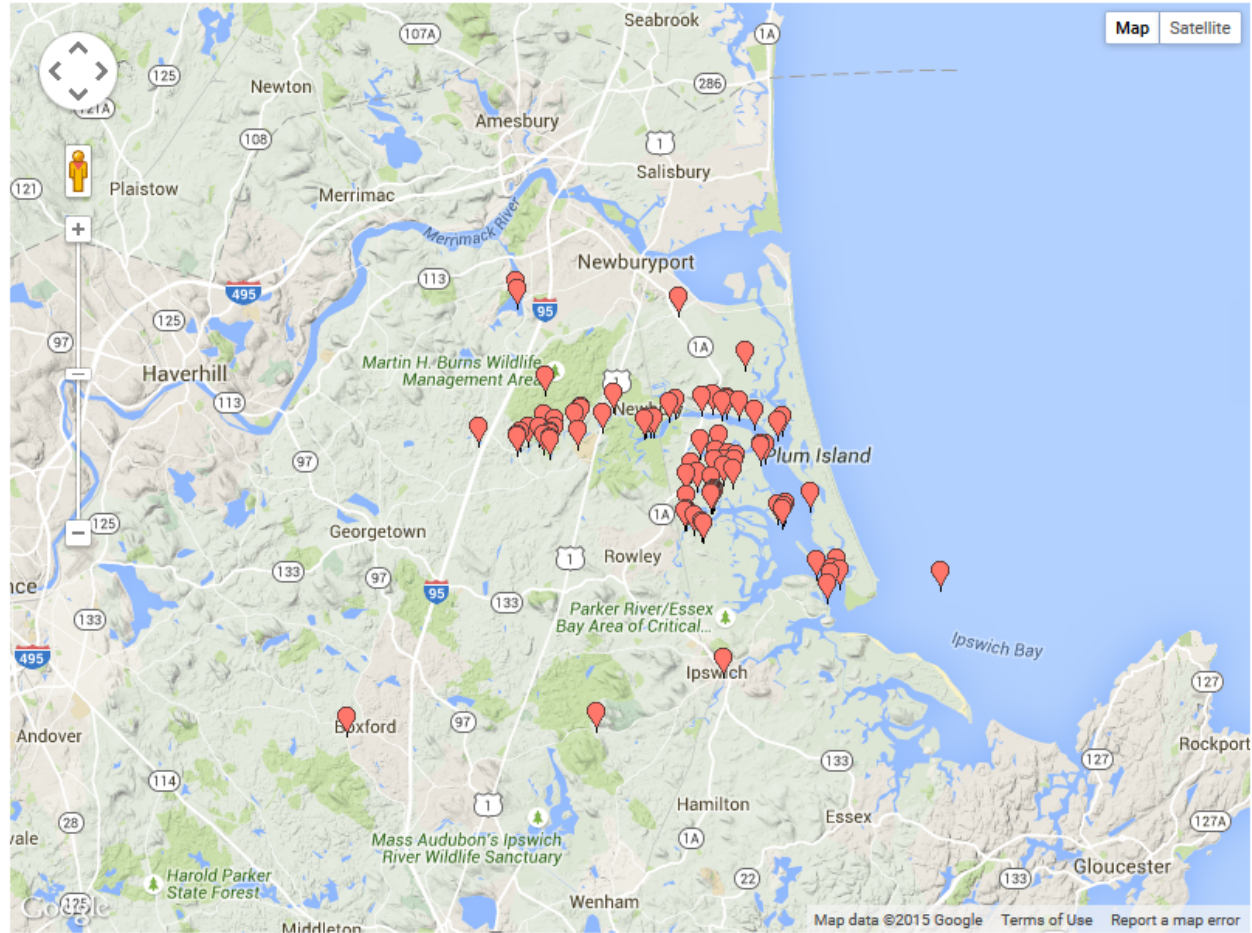
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## Research Sites with Data Links (click a location tag for a list of data for that location)





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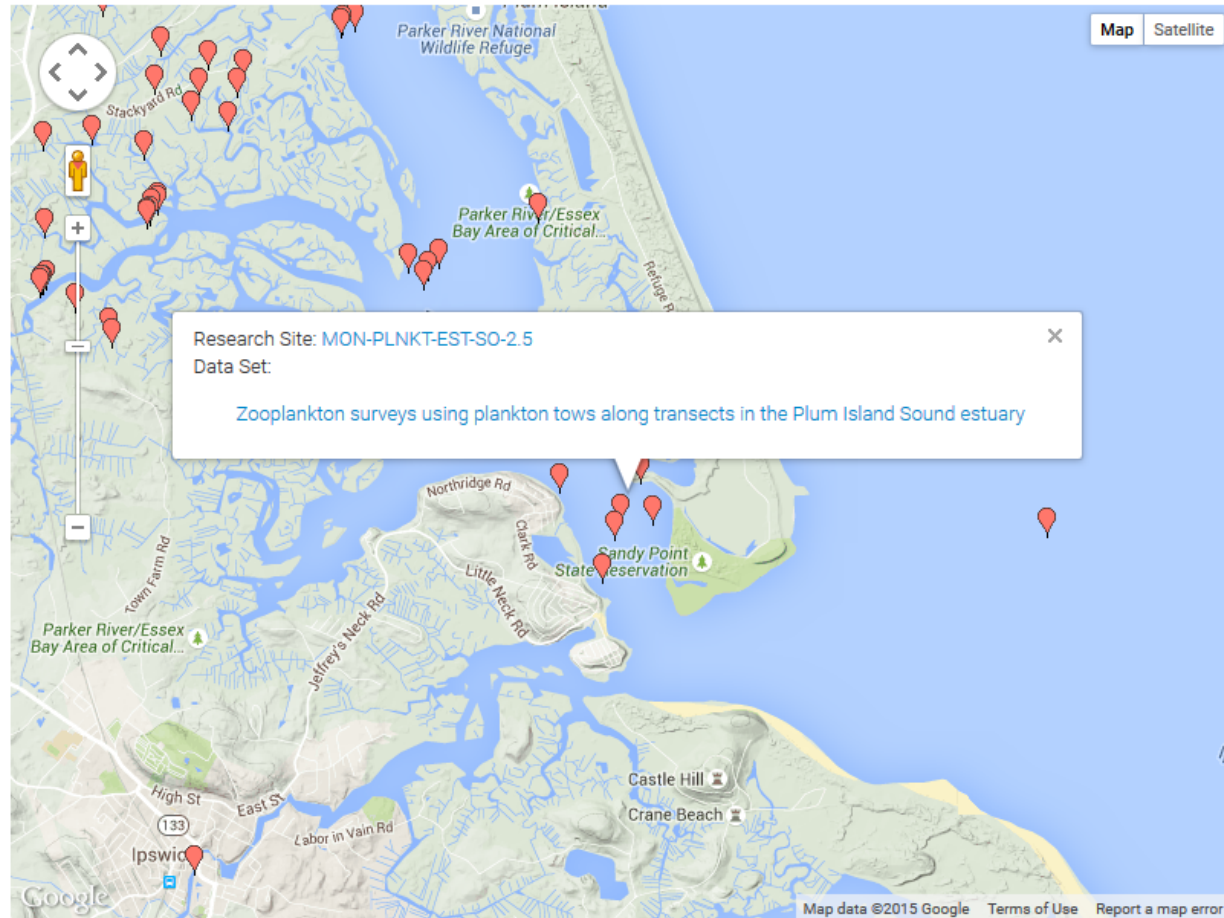
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## Research Sites with Data Links (click a location tag for a list of data for that location)



[Home](#)[About](#)[Research](#)[Data](#)[Education & Outreach](#)[Personnel](#)[Publications](#)[News](#)

## Zooplankton surveys using plankton tows along transects in the Plum Island Sound estuary

Version:

Investigators:

[Anne Giblin](#)

[Peter Milligan](#)

[Charles Hopkinson](#)

Associate Investigators:

[Hap Garritt](#)

[Jane Tucker](#)

Abstract:

Zooplankton were collected in spring and late summer/fall at four stations representing the salinity gradient in the Parker River-Plum Island Sound estuary. Two size classes, >335 micron and >150 micron, were collected by net tows.

Conductivity or salinity and temperature were recorded for each sample. Samples were concentrated to less than 250 ml and preserved in 70% EtOH. For taxonomy, sample splits were taken such that a minimum of 250 individuals were present, and counted under a dissecting microscope. Individuals were identified to the lowest taxonomic level possible, generally to species. Adult copepods were additionally characterized by sex.

Contact:

Research Site:

[MON-PLNKT-EST-SO-2.5](#)

[MON-PLNKT-EST-PR-10.5](#)

[MON-PLNKT-EST-PR-14](#)

[MON-PLNKT-EST-PR-21.75](#)

Methods:

EXPERIMENTAL DESIGN AND METHODS:

Zooplankton samples are collected and processed by PIE researchers according to the following:

NOTE: Only data from the > 335 $\mu$  and >150 $\mu$  sample fractions are contained in this dataset.

Collections for plankton monitoring are done annually in the early Spring and late Summer, seasons of high and low discharge respectively. Collections are typically synchronized to occur during the same weeks as dawn/dusk whole system metabolism studies, sediment benthic flux studies and whole estuary nutrient transect water collections. Planktonic collections generally occur during mid-low ebb tides.

Plankton are collected at four sites in the estuary representing varying salinities from near fresh water to near seawater.

The four site names were

P2 (MON-PLNKT-EST-PR-21.75), P5 (MON-PLNKT-EST-PR-14), OTL (Old Town Landing, MON-PLNKT-EST-PR-10.5)

<http://>

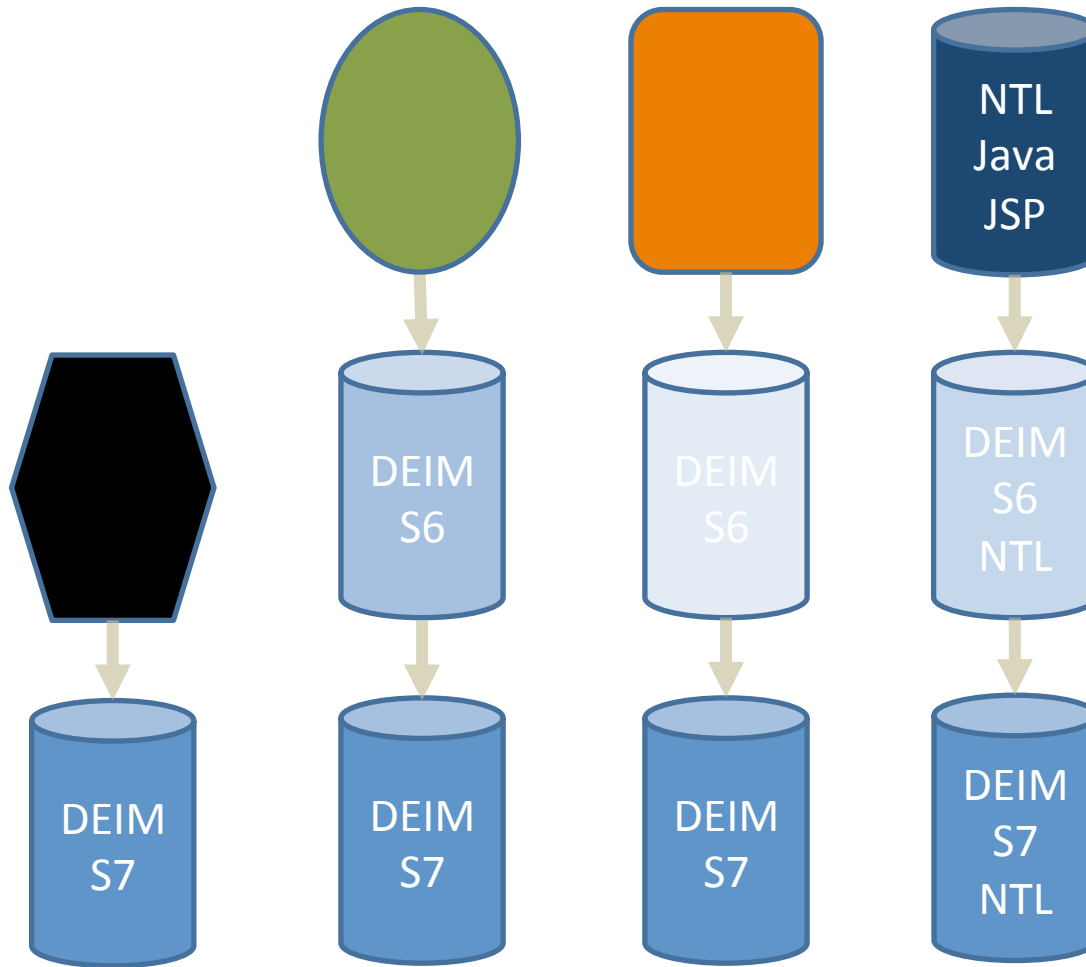
[pie-lter.ecosystems.mbl.edu/content/zooplankton-surveys-using-plankton-tows-along-transects-plum-](http://pie-lter.ecosystems.mbl.edu/content/zooplankton-surveys-using-plankton-tows-along-transects-plum-)

# North Temperate Lakes LTER DEIMS

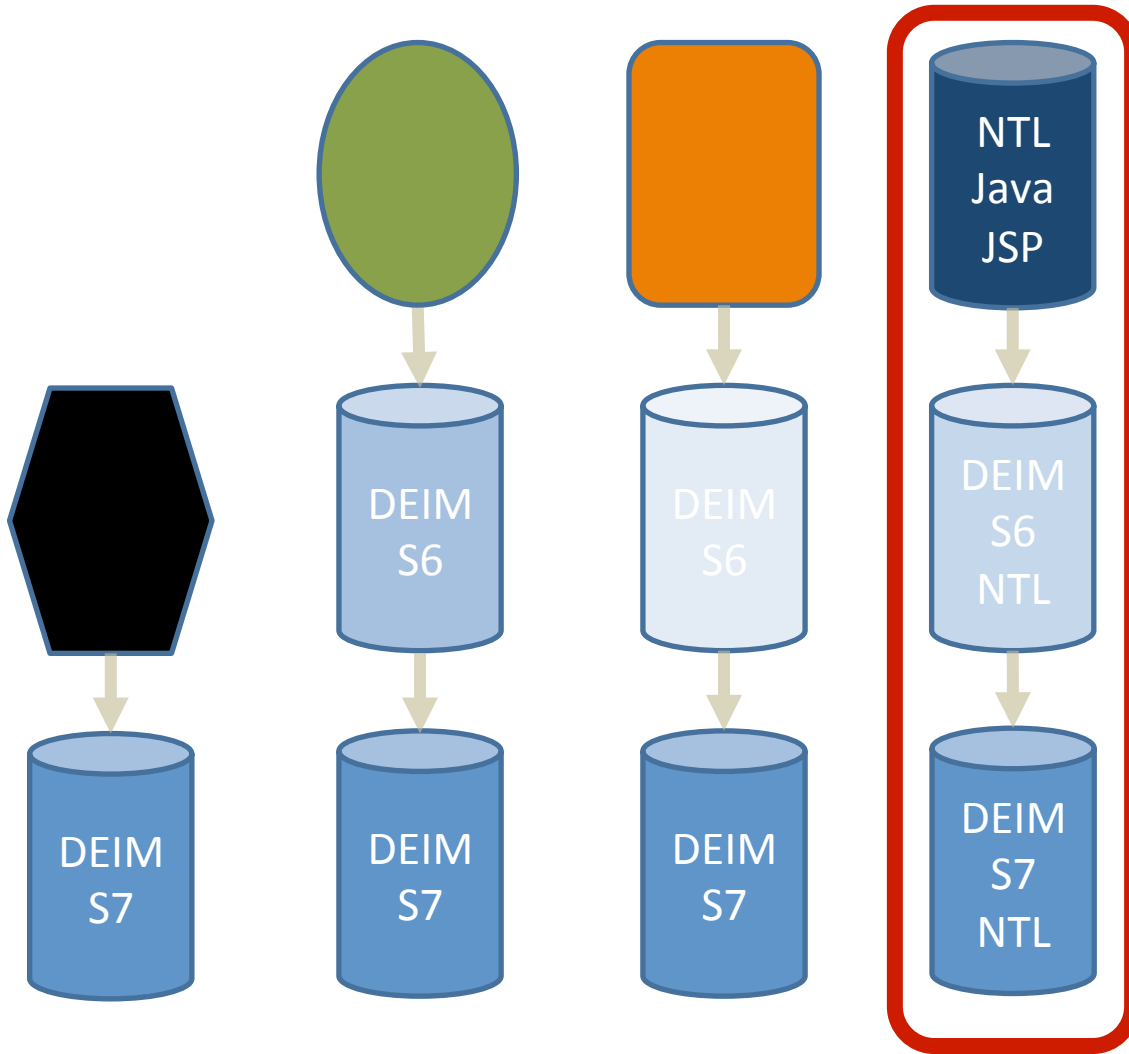


# Drupal migrations at NTL

Corinna Gries



Migration paths



Migration paths



# Java JSP to DEIMS 6

- Website based on a database
- Metadata in database
- Data in database
- Display directives in database (keywords)
- EML files separate and not created from database

- Migration – direct NTL database -> Drupal database
  - Meta data -> Content types
    - Variable, data table, data set
  - Display directives -> taxonomies (thematically tagging of information)
- Main issue
  - Understand DRUPAL concepts and use effectively
- NTL Customizations
  - Adapt EML module
  - Data search
  - Data query module
  - Taxonomies

## Java JSP to DEIMS 6

# Deims 6 to deims 7

- Main Issues
  - Some customizations of content types in NTL DEIMS6
    - Custom migration scripts for NTL
  - Taxonomies are more standardized in DEIMS7
  - Data search upgraded to faceted search
  - Data query module newly developed

Understand, Predict and Communicate the Role and Response of Lakes in a Changing Global Environment

Citizen Science App

**GLEON Networked Lake Science**

The Global Lake Ecological Observatory Network conducts innovative science by sharing and interpreting high resolution sensor data to understand, predict and communicate the role and response of lakes in a changing global environment.

Recent Publications

Understand, Predict and Communicate the Role and Response of Lakes in a Changing Global Environment

**Paul Hanson**

View Publications

GLEON Co-Chair



University of Wisconsin Center for Limnology  
<http://hanson.limnology.wisc.edu/>  
[pchanson@wisc.edu](mailto:pchanson@wisc.edu)

**Projects (leading)**

- PRAGMA-GLEON Expedition
- What are the scales of variability in the drivers of phytoplankton dynamics?

**Projects (participating)**

- General Lake Model (GLM) Multi-Lake Comparison Project – Phase 1 Physics
- Time-scale dependence in numerical simulations: Assessment of physical, chemical, and biological predictions in a stratified lake at temporal scales of hours to months
- Lake-size dependency of wind shear and convection as controls on gas exchange
- Light dependency of lake primary production
- A standards-based framework for real-time web-available sensor processing services (WASPS)

**Recent Publications**

- The importance of lake-specific characteristics for water quality across the continental United States
- Improving the precision of lake ecosystem metabolism estimates by identifying predictors of model uncertainty
- Conceptual challenges and practical issues in building the Global Lake Ecological Observatory Network
- The Global Lake Ecological Observatory Network (GLEON): The evolution of grassroots network science
- Evaluation of wireless sensor networks (WSNs) for remote wetland monitoring: Design and initial results.

This material is based upon work supported by the National Science Foundation under Grant Number DBI RCN 0639229 and MSB 1137327, 1137353. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Follow GLEON

Understand, Predict and Communicate the Role and Response of Lakes in a Changing Global Environment

**GLEON**

**GLEON Steering Committee**

GLEON Steering Committee members are nominated by all GLEON members and elected by the SC.

GLEON Sub-Committees are chaired by SC members and populated by both SC members and any other interested GLEON members. If you are interested in joining a committee, please contact the current co-chairs

**GLEON Co-Chairs**

 Paul Hanson University of Wisconsin Center for Limnology United States 2017-12-01	 Kathleen Weathers Cary Institute of Ecosystem Studies and Lake Sunapee Protective Association United States 2018-12-01
--	---

**Steering Committee Members**

 Jennie Brentrup Miami University United States 2015-12-01	 Justin Brookes The University of Adelaide Australia 2016-12-01	 Lisette de Senepont Domis Netherlands Institute of Ecology (NIOO-KNAW) Netherlands 2017-12-01
 Evelyn Gaiser Florida International University United States 2015-12-01	 David Hamilton University of Waikato New Zealand 2017-12-01	 Bas Ibelings University of Geneva Switzerland 2017-12-01
 Bomhul Kim Kangwon National University South Korea 2015-12-01	 Alo Laas Estonian University of Life Sciences Estonia 2017-12-01	 Zhengwen Liu Nanjing Institute of Geography and Limnology China 2016-12-01
 Cintia Piccolo Instituto	 Kevin Rose Department of Zoology	 Liz Ryder Dundalk Institute of

Other Drupal experiences - the good



UNIVERSITY OF WISCONSIN-MADISON

# Water Sustainability and Climate In the Yahara Watershed

WSC blog  

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YAHARA 2070

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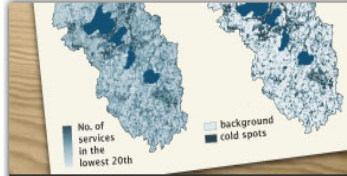
Search WSC



## research areas



scenarios



landscape analyses



groundwater and agriculture



water quality



urban life coexist. Sustaining clean and sufficient freshwater is essential for its well-being.

But as the region undergoes changes in land use and climate, its water and other natural benefits will also change. What changes could occur? How can the Yahara Watershed remain a resilient place to live, work and play?

These questions are at the heart of UW-Madison's Water Sustainability and Climate Project.

### FEATURED VIDEO



# Other drupal experiences

- the bad

# Conclusion

- Database to Drupal can be automated
- Some manual set up necessary
  - Effort is correlated with desired functionality and volume of information
- Deep understanding of database functionality necessary
- Linking of information (people, projects, publications, datasets)
- Taxonomies (thematically tagging of information)



# Arctic LTER DEIMS



# Arctic LTER web site

Our current web site has served us for about 10 years.



## Arctic Long Term Ecological Research Site

About the Arctic LTER

Arctic LTER Themes

Related Project Data

Data

Education

Publications and Reports

Personnel

Links to Other LTER Sites



Arctic LTER Health (Hr Avg) -0.8°C  
28 Aug 2015 05:00 AST



[Toolik Weather Graphs](#)

[Arctic LTER Weather Stations](#)

[Toolik Webcam](#)

[Animated Gif of yesterday's Webcam](#)

Google™ Custom Search

[Arctic LTER Inhouse login](#)

Welcome to the Arctic Long Term Ecological Research (ARC LTER) site, part of a [network of sites](#) established by the National Science Foundation to support long-term ecological research in the United States. Our [research site](#) is located in the foothills region of the Brooks Range, North Slope of Alaska (68° 38'N, 149° 43'W, elevation 760 m) and is based out of the University of Alaska's [Toolik Field Station](#).

The project is based year-round institute at [The Ecosystems Center](#), Marine Biological Laboratory, Woods Hole, Massachusetts. The Principal Investigator of the Arctic LTER is Gus Shaver while Breck Bowden, Laura Gough, Anne Giblin, Chris Luecke, Phaedra Budy and George Kling form an executive committee and direct the four main components of the research including groups focused on tundra, streams, lakes, and landscape interactions. ([Arctic LTER personnel](#))

**The long-term goal of Arctic LTER project is to understand and predict the effects of environmental change on arctic landscapes.** To achieve this goal the Arctic LTER studies the ecology of the surrounding tundra, streams, and lakes. We hope to gain an understanding of the controls of ecosystem structure and function through long-term monitoring and surveys of natural variation of ecosystem characteristics, through experimental manipulation of ecosystems for years to decades and through synthesis of results and predictive modeling at ecosystem and watershed scales.

The arctic region has warmed significantly over the past 30 years and arctic lands and freshwaters are already changing in response. The changes include a general "greening" of the arctic landscape, changes in species distributions and abundance, and changes in geophysical and biogeochemical processes and cycles at local and regional scales. Recently it has become apparent that climatic warming in the Arctic is accompanied by dramatic changes in disturbance regime, including disturbances related to thawing of permafrost, a surprising increase in wildfire, and changes in the seasonality and synchrony of ecosystem processes. These disturbances have important feedbacks on climate as well as human use of the land, in particular subsistence hunting and harvesting but also tourism and commercial resource extraction.

**For the years 2010-2016**, our Overall Goal is to understand changes in the arctic system at catchment and landscape scales as the product of: (i) Direct effects of climate change on states, processes, and linkages of terrestrial and aquatic ecosystems, and (ii) Indirect effects of climate change on ecosystems through a changing disturbance regime. (See [Arctic LTER 2010 proposal](#)).

The Arctic LTER research also addresses an important societal goal: the prediction of response of arctic ecosystems to environmental change, both natural and anthropogenic. The data and insights gained are provided to federal, Alaska state and North Slope Borough officials who regulate the lands on the North Slope.



### Arctic LTER News

#### New Project Added

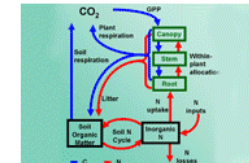
Turning on the lights – Photochemical and microbial processing of newly exposed carbon in arctic ecosystems. [Project information and data are now available.](#)

#### BLM Permit Documents

2014 application and previous year's BLM permit documents are now available [here](#).

#### Site Review Documents for 2013


2013 Arctic LTER Site



# Moving to Drupal

- Has been a long process.
  - Very different then using a html editor.
  - Needs a fast server
  - Large learning curve for Drupal
    - Not always “right out of the box” – patches, custom code, etc
- Benefits are:
  - Nicer interface
  - Related Content on a click of a mouse
  - Can have multiple editors of content
  - Web services for interfacing with PASTA, etc

# Beta web site



**MBL** Arctic Long Term Ecological Research  
Member of the U.S. Long Term Ecological Research Network

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[Add content](#) [Find content](#) [Clear Cache](#) [Blog](#)

This site is under active development. Please see our [current site](#) for all content.

## Welcome to the Arctic Long-Term Ecological Research Site

The Arctic Long Term Ecological Research (ARC LTER) site is part of a [network of sites](#) established by the National Science Foundation to support long-term ecological research in the United States. Our [research site](#) is located in the foothills region of the Brooks Range, North Slope of Alaska (68° 38'N, 149° 43'W, elevation 760 m) and is based out of the University of Alaska's [Toolik Field Station](#).

The Arctic LTER project's goal is to understand and predict the effects of environmental change on arctic landscapes, both natural and anthropogenic. We use long-term monitoring and surveys of natural variation of ecosystem characteristics, experimental manipulation of ecosystems (years to decades) and modeling at ecosystem and watershed scales to gain an understanding of the controls of ecosystem structure and function. Through this understanding we hope to address an important societal goal of predicting the response of arctic ecosystems to environmental change. The data and insights gained are provided to federal, Alaska state and North Slope Borough officials who regulate the lands on the North Slope and through this web site.



## Arctic News

[Arctic LTER synthesis book](#)



**A Changing Arctic: Ecological Consequences for Tundra, Streams, and Lakes.** edited by John E. Hobbie and George W. Kling.

This book in the Long Term Ecology Research (LTER) Synthesis Series, reports results from ecological studies at a site in northern Alaska, the region around Toolik Lake.

[more](#)

## Recent Arctic LTER Publications

2015 [Greater deciduous shrub abundance extends tundra peak season and increases modeled net CO<sub>2</sub> uptake](#)

2015 [NDVI as a predictor of canopy arthropod biomass in the Alaskan Arctic tundra](#)

2015 [Global environmental change and the nature of aboveground net primary productivity responses: insights from long-term experiments](#)

2015 [Northward displacement of optimal climate conditions for ecotypes of \*Eriophorum vaginatum\* L. across a latitudinal gradient in Alaska](#)

2015 [Contrasting soil thermal responses to fire in Alaskan tundra and boreal forest](#)

[See all Arctic LTER Publications](#)

## Toolik Weather and Webcam



[Current Toolik Webcam](#)

- [Toolik Weather Graphs](#)
- [Arctic LTER Weather Stations](#)
- [Animated Gif of yesterday's Webcam](#)



## Tracer Techniques

A tracer approach to investigation of the nitrogen (N) cycle of streams, first developed at the Arctic LTER, has transformed scientific understanding of the nitrogen cycle and food web structure in flowing waters.





This site is under active development. Please see our [current site](#) for all content.

# Edward Rastetter

- View
- Edit
- Manage display
- Log
- Devel

**Name:** Edward Rastetter

**Title:** Senior Scientist

**Role:** co-Principal Investigator

**Organization:**

The Ecosystems Center at the Marine Biological Laboratory, 7 MBL Street, Woods Hole, MA 02543

**Address:**

United States

**Email:** [erastett@mbi.edu](mailto:erastett@mbi.edu)

## Recent Publications

Jiang, Yueyang, Adrian V Rocha, John A O'Donnell, Jessica A Drysdale, Edward B Rastetter, and Gaius R Shaver. 2015. **"Contrasting Soil Thermal Responses To Fire In Alaskan Tundra And Boreal Forest"**. *Journal Of Geophysical Research: Earth Surface* 120 (2). Journal Of Geophysical Research: Earth Surface: 363-378. doi:10.1002/2014jfr003180.

Williams, Mathew W, Edward B Rastetter, Laura van der Pol, and Gaius R Shaver. 2014. **"Arctic Canopy Photosynthetic Efficiency Enhanced Under Diffuse Light, Linked To A Reduction In The Fraction Of The Canopy In Deep Shade"**. *New Phytologist* 202 (4). New Phytologist: 1267-1276. doi:10.1111/nph.12750.

Gokkaya, K., Yueyang Jiang, Edward B Rastetter, Gaius R Shaver, and Adrian V Rocha. 2014. **"Effect Of Vegetation Phenology And Stomatal Coupling On Carbon And Water Fluxes In Arctic Tundra"**. *Environmental Change Initiative Postdoc Symposium And Reception*. Environmental Change Initiative Postdoc Symposium And Reception. University of Notre Dame. Notre Dame, IN.

Pearce, Andrea R, Edward B Rastetter, Bonnie L Kwiatkowski, William B Bowden, Michelle C Mack, and Yueyang Jiang. 2014. **"Recovery Of Arctic Tundra From Thermal Erosion Disturbance Is Constrained By Nutrient Accumulation: A Modeling Analysis"**. *Ecological Applications* Preprint. Ecological Applications. doi:10.1890/14-1323.1.

Shaver, Gaius R, J. A Laundre, Sydonia M. Bret-Harte, F. S Chapin, III, Anne E Giblin, Laura Gough, Sarah E Hobbie, et al.. 2014. **"Terrestrial Ecosystems At Toolik Lake, Alaska"**. In *A Changing Arctic: Ecological Consequences For Tundra, Streams And Lakes*, 90-142. A Changing Arctic: Ecological Consequences For Tundra, Streams And Lakes. New York, NY: Oxford University Press.

[All Publications for Edward B. Rastetter](#)

## Data Sets

Daily summaries of photosynthetically active radiation (PAR), relative humidity, and temperature logged above, within, and below Betula nana and Salix pulchra shrub canopies during the summer of 2012 in vicinity of Toolik Lake, Alaska.

Photosynthetically active radiation (PAR) measurements, relative humidity, and temperature data collected every five minutes from Betula nana and Salix pulchra shrub canopies, summer of 2012 in vicinity of Toolik Lake, Alaska.

Leaf Area Index every 15 cm of 1m x 1m chamber flux and point frame plots and sites where PAR was monitored above, within and below S. pulchra and B. nana canopies during the growing season at the Toolik Field Station in AK, Summer 2012.

Photosynthetically Active Radiation data taken with the Delta-T SunScan wand every 15 cm of 1m x 1m chamber flux and point frame plots as well as four remotely monitored canopies at the Toolik Field Station in AK, Summer 2012.

Total and diffuse photosynthetically active radiation (PAR) recorded by a beam fraction (BF3) sensor during the summer of 2012 in vicinity of Toolik Lake, Alaska.

Maximum canopy height from 14 flux canopy and 19 point frame plots sampled near the shrub canopies at Toolik Field Station, Alaska, summer 2012.

A/Ci curve parameters measured from shoots harvested at three levels in the canopy from 19 point frame plots dominated by S. pulchra and B. nana shrubs near LTER Shrub plots at Toolik Field Station, Alaska, summer of 2012.

Individual chamber flux measurements from 14 flux whole-canopy shrub plots sampled near the LTER sites at Toolik Field Station, Alaska, summer 2012.

Raw pin-hit data from 19 1m x 1m point frame plots sampled near the LTER Shrub plots at Toolik Field Station in AK the summer of 2012.

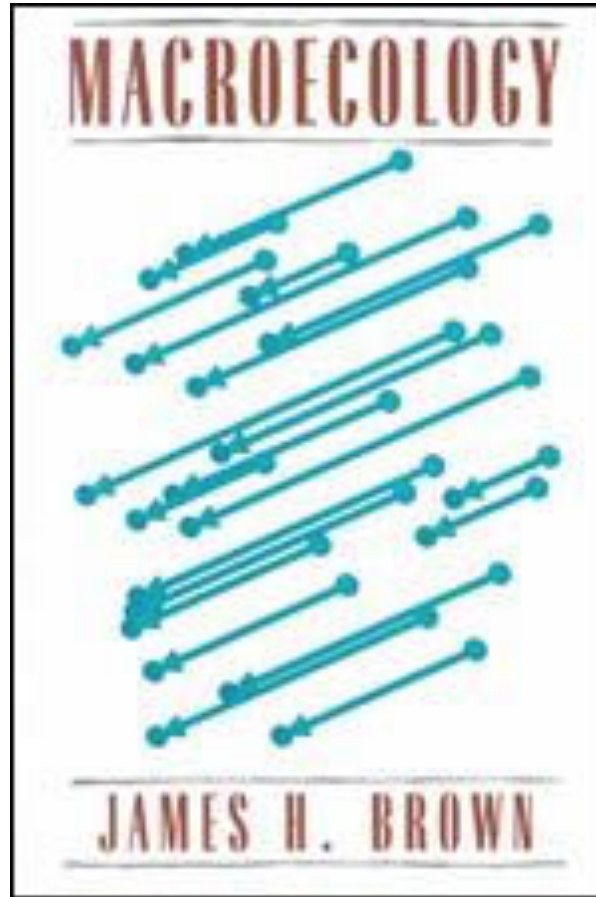
Percent carbon and nitrogen of leaves from shoots harvested at three levels in the canopy from 19 point frame plots dominated by S. pulchra and B. nana shrubs near LTER Shrub plots at Toolik Field Station, Alaska, summer of 2012.

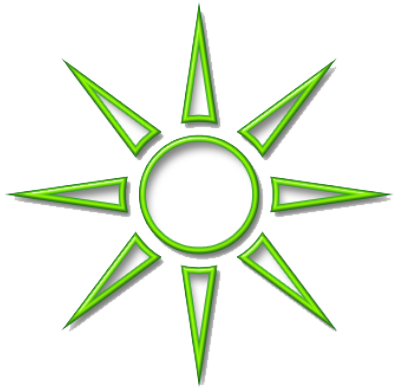
Harvest data including the shoot leaf area index, position in the canopy, and shoot and plant tissue count and mass for each shoot harvested at three levels in the canopy from 19 1m x 1m plots sampled near the LTER Shrub plots, Toolik Field Station, AK 2012.

# Frustrations

- Old site was easy to maintain.
- Spending a lot of time learning new software and tricks while the backlog of data files to process and check grows
- Why does each site have to develop, maintain and develop web sites that search and serve data?

# MacroEcosystems





# Data Management for Experimental Macroecology

## EFFECTS OF TEMPERATURE ON BIODIVERSITY

# Project overview

- The purpose of this project is to generate and test theory for how temperature impacts biodiversity through its effect on biochemical processes and metabolic rate. A combination of standardized surveys in the field and controlled experiments in the field and laboratory measure diversity of three taxa -- **trees, invertebrates, and microbes** -- and key biogeochemical processes of decomposition in seven forests distributed along a geographic gradient of increasing temperature from cold temperate to warm tropical.
- This ambitious, multi-pronged, highly integrated program of theoretical and empirical research takes advantage of the special expertise at the three collaborating institutions -- [University of New Mexico](#), [University of Arizona](#), and [University of Oklahoma](#).
- Participating labs within each university are as follows: [The Brown Lab](#) (UNM), [The Enquist Lab](#) (UA), [The Institute for Environmental Genomics](#) (UO), [The Kaspari Ant Lab](#) (UO), and the [LTER Network Office](#) (UNM).
- This material is based upon work supported by the National Science Foundation under Cooperative Agreement #DEB#1065836.



# Experimental sites

## 5 LTER Sites

HJ Andrews  
Niwot Ridge  
Harvard Forest  
Coweeta  
Luquillo



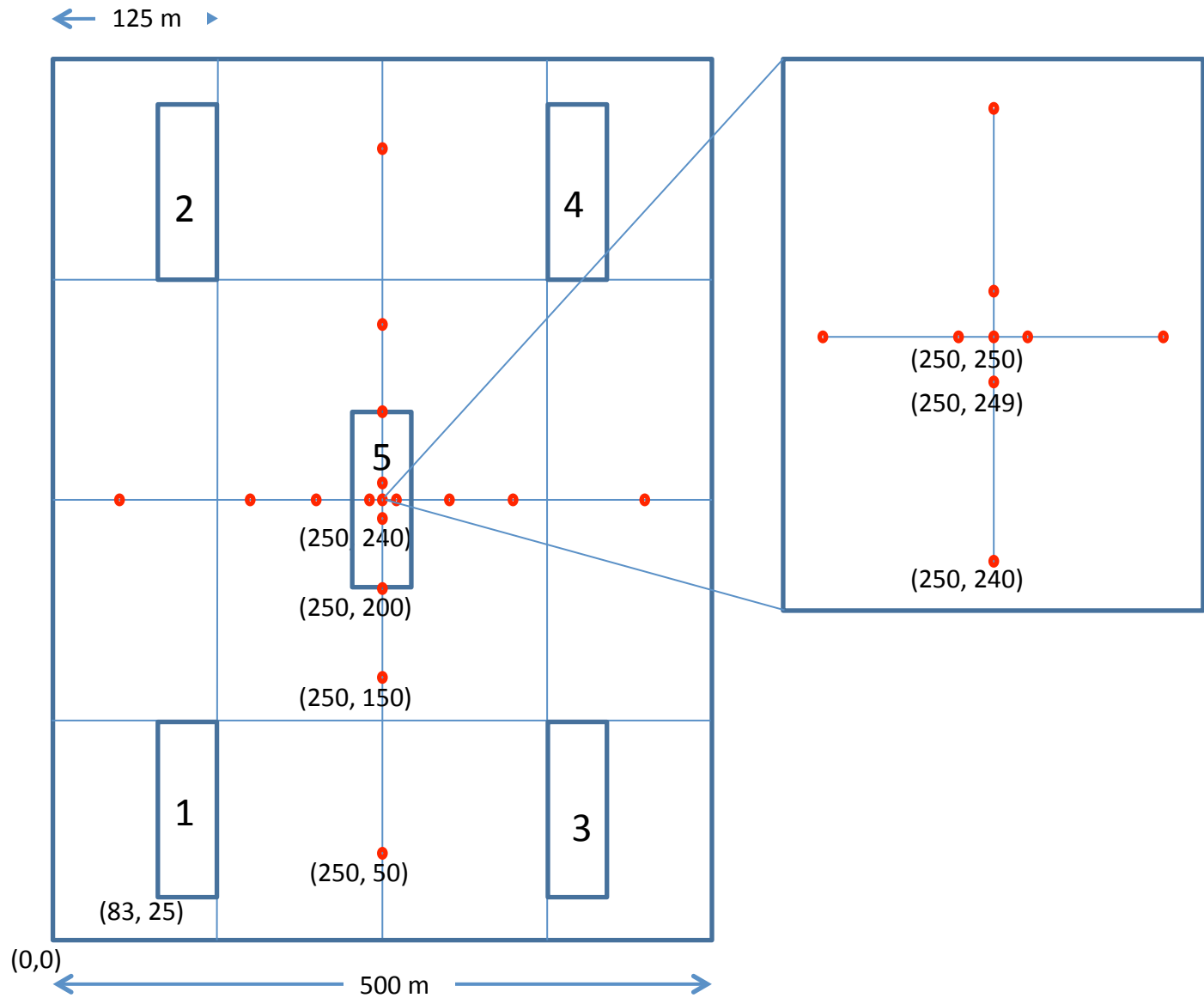
## Additional Sites

Barro Colorado Island  
(Panama)  
Mt. Bigelow (Arizona)

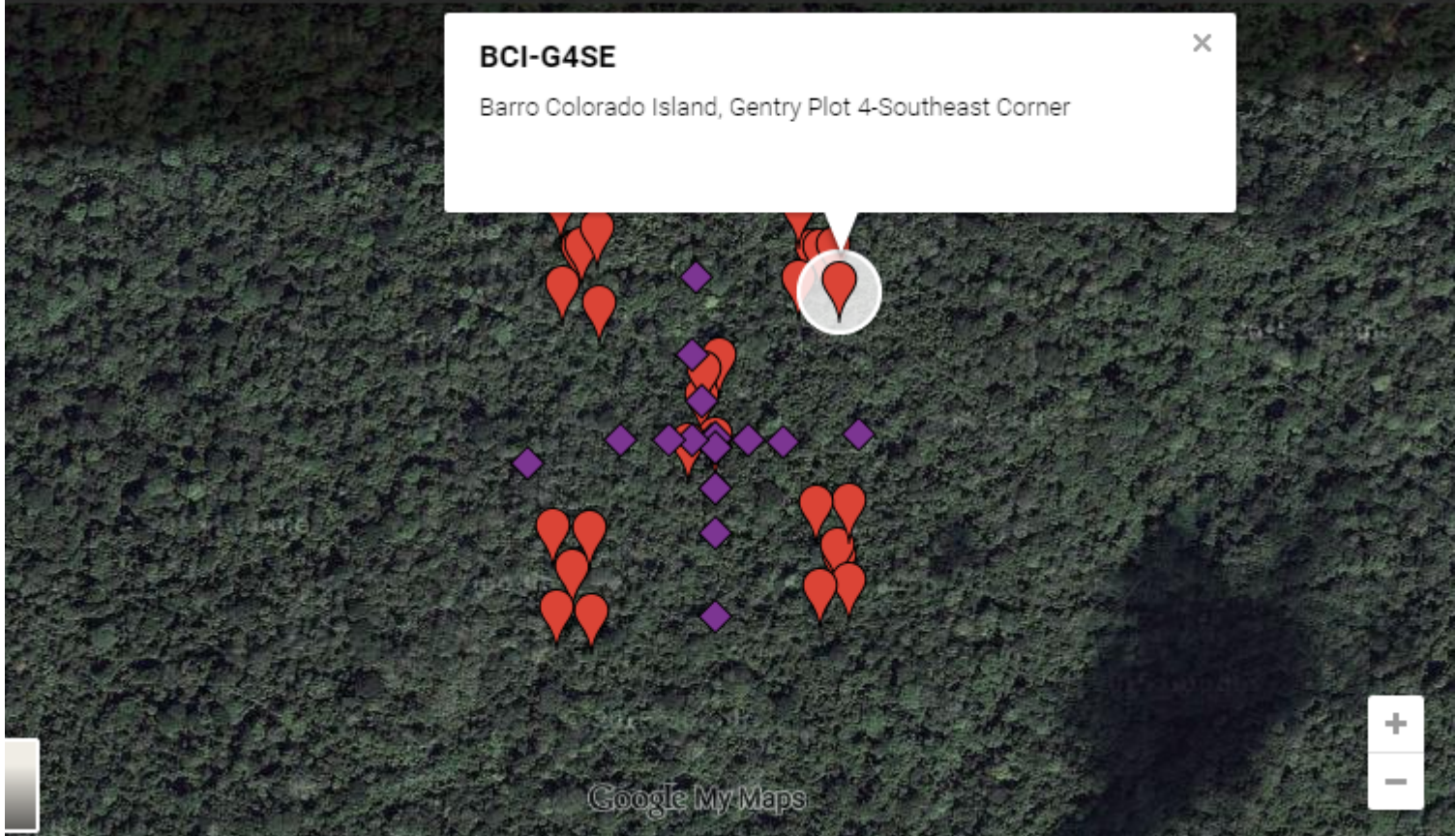
## Sampling Design

5 “Gentry” plots for tree taxa sampling transects

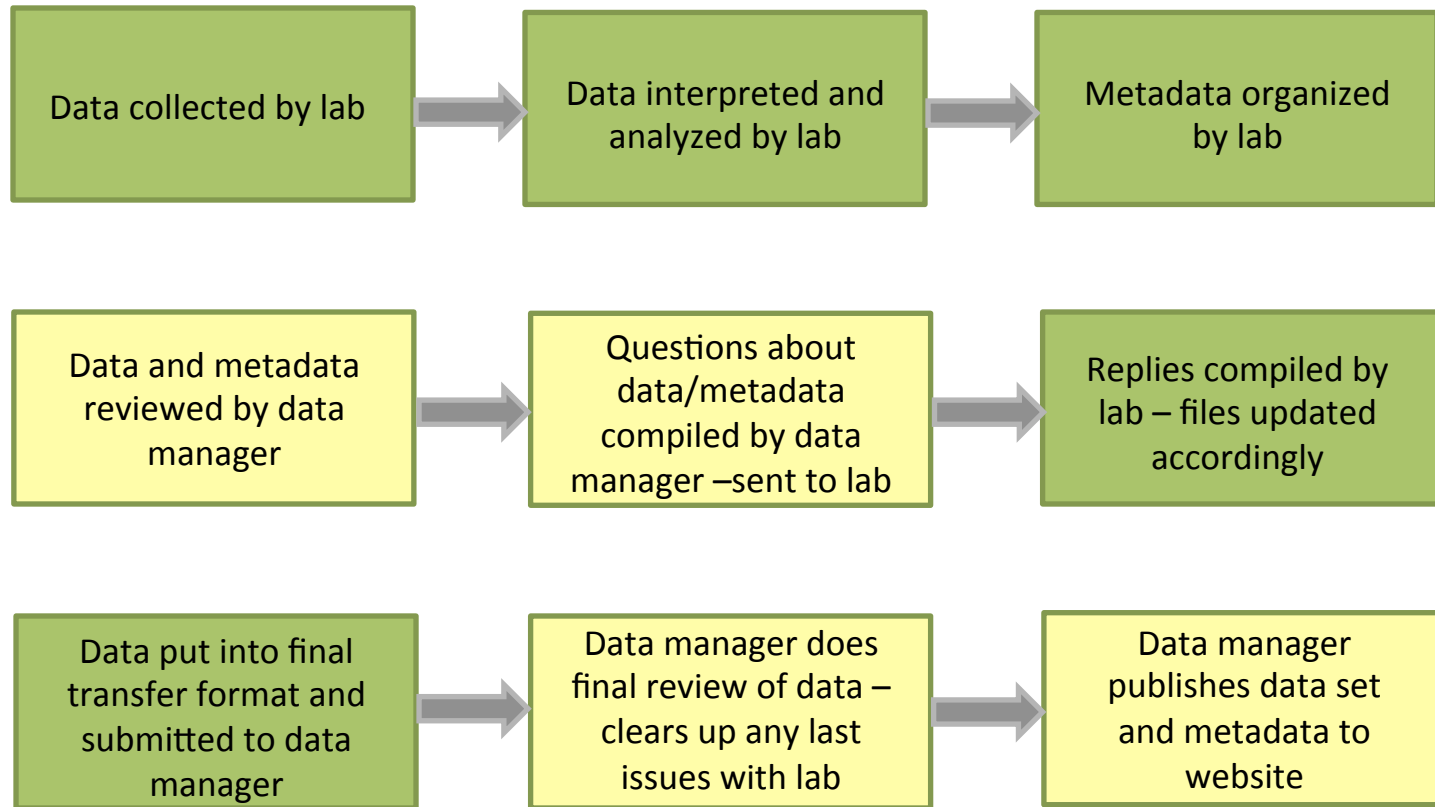
Log array sampling plots for soil invertebrates and microbes



**BCI-G4SE** ✕  
Barro Colorado Island, Gentry Plot 4-Southeast Corner



# DATA FLOWCHART



# data management

- Sample datasets generated by project:
- Macrosystems Tree Growth from Gentry Plots (Enquist Lab)
- HOBO Soil Temperature and Moisture (Enquist Lab)
- Invertebrate Collection Data (Kaspari Lab)
- 16S, ITS, and nifH OTU Sequencing Data (Zhou Lab)
- VIDA tree growth simulation (Brown Lab)
- Bird, mammal, precip data sets generated by data manager (Waide Lab)
  
- Project website ([macroeco.lternet.edu](http://macroeco.lternet.edu)) built on Drupal platform (Linux, Apache, MySQL, Php – LAMP)
- DEIMS installation ([macroeco2.lternet.edu](http://macroeco2.lternet.edu)) used to create a data site that has some public access but also allows project members to login and access data and information that is not yet publicly available. Allows for easy file sharing among project members as well as full data set curation and preservation.



# Using the Data explorer

- The Data Explorer is a feature in the DEIMS (Drupal Ecological Information Management System) installation which enables a user to search the data set by selecting variables from the dataset.
- The csv file is converted to MySQL and uploaded to backend of site.
- Then a connection is made to MySQL database.
- This allows the admin to chose which variables a user can filter data on
- Example: <http://macroeco2.lternet.edu/node/184/data>
- The selected variables can be previewed and then downloaded as a new csv file.

# Data challenges

- Gathering completed metadata
- Standardizing data formats
- Understanding genomics data
- Communication between labs
- Data preservation/permanent archiving

# summary

- Currently 100+ files in archive
- 40 data sets in DEIMS
- 33 uploaded to PASTA (using DEIMS to generated EML)
- Data will preserved in PASTA/Dataone after project ends

# Luquillo LTER DEIMS



# WHY DEIMS?

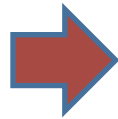
A DRUPAL Corollary solution to the  
Luquillo LTER Information  
Management System

Eda Meléndez  
LUQ Information Manager



# OVERVIEW

LUQ IMS  
TRAJECTORY



WHY  
DEIMS?



AFTER  
DEIMS?

- 0 OUT OF 386 USABLE DATA SETS

1989-1990  
Pandemonium  
(anarchy, chaos,  
confusion)



1995  
developing  
standards



2000  
LUQ IMS  
is born

- Infrastructure establishment in LUQ
- a survey among LUQ's scientists: What information would you need if you were going to use somebody else's data?
- the beginning of LUQ's metadata standards:
- Today: related metadata

- first metadata standards and Data Catalog
- Public HTML metadata pages

- 2003: static but structured LUQ website
- 2006: LNO staff DEIMS
- 2004-5: migration of all LUQ metadata into EML
- 2009 First LUQ DEIMS
- 2010's DEIMS 2 development and implementation
- 2014-15 LUQ DEIMS 2 implemented:

## WHY DRUPAL?

- UNEXISTING TOOL IN PLACE TO GENERATE EML PACKAGES:
  - NEEDED TOOL INTEGRATED INTO A SYSTEM TO GENERATE EML
  - NEEDED TOOL TO PRODUCE A HARVEST LIST TO BE HARVESTED INTO PASTA
- PANDEMONIUM STATE OF LUQ METADATA : NEEDED CENTRALIZATION OF METADA INTO A DATABASE
  - UNEXISTING PLATFORM TO ESTABLISH A COMMON INFORMATION MANAGEMENT FRAMEWORK:
  - NEEDED STRUCTURE
  - NEEDED TO INTER-RELATE INFORMATION
- STATIC WEBSITE : NEEDED SEARCHING ENGINES AND DISPLAYING TOOLS

## DRUPAL FACILITATOR:

➤ EML MODULE (DEIMS)

➤ MYSQL BACKBONE

➤ VIEWS, TAXONOMIES AND PANELS

WHY DRUPAL?

GENERATE EML  
PACKAGES

- Eml module (deims)
  - Generates downloadable eml packages on the fly
  - Fed into pasta

ADDED TWO LEVELS OF  
QC TO THE METADATA  
AND DATA FED INTO  
THE SYSTEM

- Some Data flaws
  - E.g., “.” as values in a numeric field
- Incomplete metadata

WHY DRUPAL?

CENTRALIZATION OF  
METADA INTO A  
DATABASE

## MYSQL BACKBONED

- Databased & dynamic website:
  - Migration in csv files (backups)
  - Users interface: inputs
- Framework for managing LTER data and metadata:
  - Incorporates standards:
    - Units
    - LTER Vocab
    - EML minimum metadata standards



WHY DRUPAL?

WEB SEARCH ENGINES  
AND DISPLAYING  
TOOLS

- VIEWS AND PANELS
  - RELATE INFORMATION:  
TWO DIFFERENT TYPES OF  
CONTENTS (DATA SETS AND  
PEOPLE)
  - DISPLAY INFORMATION IN  
TABLES AND/OR BOXES
  - DEFINE QUERIES TO  
EXTRACT INFORMATION
    - UNIONS
    - EXCLUSIONS
    - INTERSECTIONS

## WHY DRUPAL?

### WEB SEARCH ENGINES AND DISPLAYING TOOLS

### TAXONOMIES

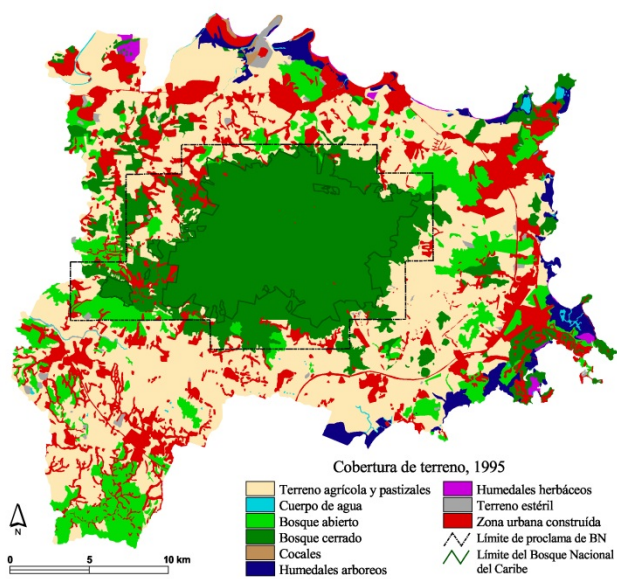
- Implement ontologies
  - LUQ's data set classification
  - LTER Controlled vocabulary
- Used in views
  - Filter/extract information

## AFTER DEIMS?

## WHY CHANGE WHAT IS GOOD?

- More exciting things to do
  - Galleries
  - Embedded websites
  - Data integration
  - Synthesis / data discovery tool
  - Enhanced Ontology Implementation
- Community/collaboration tool:
  - Website maintenance and update
  - IM Training
- Easy to migrate content to any CMS





The  
End





# Jornada LTER DEIMS



# **Drupal at the Jornada Basin LTER Past, Present, and Future**



# Drupal at Jornada: In the Beginning

- Single Drupal 6 website
- DEIMS version 1
  - Jointly developed by several LTER sites and subsequently customized separately
  - Heterogeneous DEIMS instances made it difficult to share enhancements to DEIMS by other sites
  - Subsequently, DEIMS version 2 was developed to allow sharing new functionality and upgrading to Drupal 7

# Drupal Learning Curve

- Initial learning curve was steep
- But, learning curve is not steep for everyone
- Great online resources ([drupal.org](http://drupal.org)) and tutorial videos
- Learning curve can be reduced dramatically by sharing basic Drupal concepts and interface use with new Drupalistas

# Aegir: Multisite Drupal

- Aegir supports multisite Drupal installation on a single server
- Aegir automates manual tasks using graphical interface
- Aegir servers can be integrated to allow migration from one Aegir server to another (server updates)
- Aegir features include:
  - automated backups of files and databases for hosted websites
  - site migration
  - site cloning
  - aliasing (with or without redirection)

# Server Deployment

- MySQL databases
  - Aegir database on localhost
  - Database server hosts all website databases for both Aegir instances
- Servers are virtualized using Citrix XenServer using NetApp central, mirrored storage system

# Redundant Backups

- Automysqlbackup script automatically backs up all MySQL databases using cron
- Aegir automatically backs up files folder and database for all websites
- Backup appliance performs snapshot and file level backups of file system and website libraries, modules, and themes folders as well as database backup files

# Current Hosted Websites

- Started with a single Drupal 6 website running DEIMS
- 2 Aegir servers host DEIMS and non-DEIMS Drupal websites
- Currently hosting:
  - Drupal 6
    - non-DEIMS websites: 2
    - DEIMS websites: 1
  - Drupal 7
    - non-DEIMS websites: 10
    - DEIMS websites:
      - 1 production, 3 development



# Hosted Websites: DEIMS

The screenshot shows the AEGIR administration interface for managing hosted websites. The browser address bar indicates the URL `jornada-websites.jrn.nmsu.edu/hosting/sites`. The page title is "Sites | jornada-websites.jrn.nmsu.edu". The navigation menu includes "Content", "Structure", "Appearance", "People", "Modules", "Configuration", "Hosting", "Reports", and "Help". The user is logged in as "admin".

## Sites

List [Add site](#)

Filters

Operations

Site	Profile	Created	Platform
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-d6.nmsu.edu</a>	Drupal	7 months 3 weeks ago	Drupal 6.34
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-dev.nmsu.edu</a>	DEIMS Platform	6 months 6 days ago	Drupal 7.36 DEIMS
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-kenr.nmsu.edu</a>	DEIMS Platform	3 weeks 2 days ago	Drupal 7.36 DEIMS
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-mitra.nmsu.edu</a>	DEIMS Platform	3 weeks 2 days ago	Drupal 7.36 DEIMS
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-valerie.nmsu.edu</a>	DEIMS Platform	3 weeks 2 days ago	Drupal 7.36 DEIMS
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-websites.jrn.nmsu.edu</a>	Hostmaster	7 months 3 weeks ago	hostmaster
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada.nmsu.edu</a>	DEIMS Platform	6 months 6 days ago	Drupal 7.36 DEIMS
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">arsrangescience.net</a>	Standard	6 months 2 weeks ago	Drupal 7.38
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-d7.nmsu.edu</a>	Standard	7 months 3 weeks ago	Drupal 7.38
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-data.nmsu.edu</a>	Drupal	6 months 2 weeks ago	Drupal 6.28

### Task queue

Task	Actions
<input checked="" type="checkbox"/> Clone: <a href="#">jornada-kenr.nmsu.edu</a>	<a href="#">View</a>
<input checked="" type="checkbox"/> Clone: <a href="#">jornada.nmsu.edu</a>	<a href="#">View</a>
<input checked="" type="checkbox"/> Disable: <a href="#">jornada-d7.nmsu.edu</a>	<a href="#">View</a>
<input checked="" type="checkbox"/> Clone: <a href="#">jornada.nmsu.edu</a>	<a href="#">View</a>
<input checked="" type="checkbox"/> Verify: <a href="#">jornada.nmsu.edu</a>	<a href="#">View</a>

[More tasks](#)

### Navigation

- [Add content](#)
- [Debug messages callback](#)

### Queues summary

Cron queue

# Hosted Websites: Non-DEIMS

The screenshot shows the AEGIR web hosting management interface. The browser address bar displays `jornada-webdev.jrn.nmsu.edu/hosting/sites`. The interface includes a navigation menu with options like Content, Structure, Appearance, People, Modules, Configuration, Hosting, Reports, and Help. The main content area is titled "Sites" and contains a table of hosted websites, a task queue, and navigation options.

**Sites**

List Add site

Filters

Operations

Site	Profile	Created	Platform
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">airrangescience.net</a>	Standard	5 months 1 week ago	Drupal 7.39
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-data.nmsu.edu</a>	Drupal	5 months 1 day ago	Drupal 6.35
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-g2.nmsu.edu</a>	Drupal	5 months 1 day ago	Drupal 6.35
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-webdev.jrn.nmsu.edu</a>	Hostmaster	5 months 2 weeks ago	hostmaster
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">landecology.org</a>	Standard	5 months 1 week ago	Drupal 7.39
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">landpotential.org</a>	Standard	5 months 1 week ago	Drupal 7.39
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">litar.info</a>	Standard	5 months 1 week ago	Drupal 7.39
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">nmgicli.org</a>	Standard	5 months 1 week ago	Drupal 7.39
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">swclimatehub.info</a>	Standard	5 months 1 week ago	Drupal 7.39
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">usgeoglam.org</a>	Standard	5 months 1 week ago	Drupal 7.39
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">westernsnowconference.org</a>	Standard	5 months 1 week ago	Drupal 7.39
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">winderosionnetwork.org</a>	Standard	5 months 1 week ago	Drupal 7.39
<input type="checkbox"/> <input checked="" type="checkbox"/> <a href="#">jornada-d7.nmsu.edu</a>	DEIMS Platform	5 months 3 days ago	Drupal 7.34 DEIMS

**Task queue**

Task	Actions
<input type="checkbox"/> Migrate: <a href="#">swclimatehub.info</a>	<a href="#">View</a>
<input type="checkbox"/> Migrate: <a href="#">winderosionnetwork.org</a>	<a href="#">View</a>
<input type="checkbox"/> Migrate: <a href="#">westernsnowconference.org</a>	<a href="#">View</a>
<input type="checkbox"/> Migrate: <a href="#">usgeoglam.org</a>	<a href="#">View</a>
<input type="checkbox"/> Migrate: <a href="#">landpotential.org</a>	<a href="#">View</a>

[More tasks](#)

**Navigation**

[Add content](#)

[Debug messages callback](#)

**Queues summary**

**Task queue**

Status: enabled

Description: Process the queue of outstanding hosting tasks.

Frequency: every 1 min

# Collaborative Jornada Website

The screenshot shows a web browser window with the URL [jornada.nmsu.edu](http://jornada.nmsu.edu). The website header features the logo for 'THE JORNADA Rangeland Research Programs' and the tagline 'SCIENCE AND TECHNOLOGY FOR THE MANAGEMENT AND CONSERVATION OF RANGELANDS'. Logos for 'das', 'Jornada Basin LTER', 'NST', and 'neon' are also present. A search bar is located in the top right. A navigation menu includes links for Home, Long Term Data, Our Programs, Data Catalogs, News & Events, Publications, Presentations, People, Education, and The Jornada Partners.

The main content area is organized into three columns: Science, Technologies, and Resources. Each column contains several links to research and data resources.

Science	Technologies	Resources
<a href="#">Long Term Agricultural Research (LTAR)</a>	<a href="#">Assessment, Inventory &amp; Monitoring (AIM)</a>	<a href="#">Land Potential Knowledge System (Land PKS)</a>
<a href="#">Long Term Ecological Research (LTER)</a>	<a href="#">Ecological Site Descriptions (ESD)</a>	<a href="#">Landscape Toolbox</a>
<a href="#">National Ecological Observatory Network (NEON)</a>	<a href="#">JournalMap</a>	<a href="#">Southwest Regional Climate Hub</a>
<a href="#">Remote Sensing Applications</a>	<a href="#">Monitoring &amp; Assessment Tools</a>	<a href="#">Data Catalogs</a>

On the left side, there are several featured content blocks: 'Jornada Blog' with a link to '5 Things You Need To Know About How We're Using Modern Technology To Understand Our Changing Environment'; 'Current weather at The Jornada Headquarters'; 'Land Ecology Blog' with the text 'It's the Management Stupid'; 'Smart Phone Apps Series to Help Maximize Land's Productivity, Protect Resources'; 'Botany Workshops'; and 'Find out what's happening in our bulletin'. At the bottom left, there is a link to 'Join our mailing lists'.

The bottom of the page features a large image of a snow-capped mountain range with a caption: 'Snow Pack and River Flow: Impact of Climate Change on the Waters of the'.

# The Future

- Deploy Apache CloudStack to expose systems as cloud services to allow science groups to rapidly provision their own servers and storage including the ability to deploy Drupal, DEIMS, and/or Aegir
- Enhance the DEIMS Data Explorer module
- Complete the integration of DEIMS and ESRI open source Geoportal using EML and ISO metadata
  - DEIMS can be automatically loaded using EML metadata
  - Geoportal can be automatically loaded using ISO or FGDC metadata
  - DEIMS can dynamically create EML, FGDC, and ISO metadata
  - Geoportal can dynamically create FGDC, Dublin Core, and ISO metadata
  - Integration of DEIMS and Geoportal will allow textual and map-based searches
  - Geoportal can provide access to any product available by URI including data, metadata, map, and image web services

# McMurdo Dry Valleys LTER



# Brief Outline

- New site
  - *If it aint broke, don't fix it*
  - (Some) MCM DEIMS Features
    - Version Control
    - Real Time data
    - Responsive Site





# McMurdo Dry Valleys Long Term Ecological Research (LTER)



August 28, 2015

Latest MCM LTER news [RSS](#) (what's this?)

### [New McMurdo DV LTER site](#)

04/20/2015 MCM LTER site revamped... and metadata links in this site will soon point to new site

### [Memories from the field](#)

01/16/2015 Ben Harding, current field team lead of the Stream Team. Ben tells of his father's project to Antarctica during the 1963-64 field season to install a network of antennas in advance of the International Quiet Sun Year.

### [Diana Wall inducted to the American Academy of Arts and Sciences](#)

10/31/2014 Diana Wall signs the American Academy of Arts and Sciences' Book of Members, a tradition that dates back to 1780. From that moment, Diana becomes a new member of the AAAS institution

*(View historical news & announcements)*

[Visit here the new MCMLTER site.](#) Visit, provide feedback. Metadata links point to new site.

[Click here to watch real time data from our stations](#)

### Research at McMurdo LTER

The McMurdo Dry Valleys Long-Term Ecological Research (MCM LTER) Program is an interdisciplinary and multidisciplinary study of the aquatic and terrestrial ecosystems in an ice-free region of Antarctica. MCM joined the National Science Foundation's [LTER Network](#) in 1993 and is funded through the Office of Polar Programs in six year funding periods.



Taking horizontal-vertical stake measure

- Home
- Research
- Data
- Personnel
- Publications
- Meetings
- Photos
- Education & Outreach
- Links
- PI Comms

Contact Search

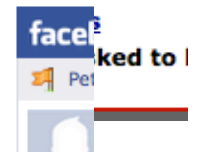


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S. 'Afgt

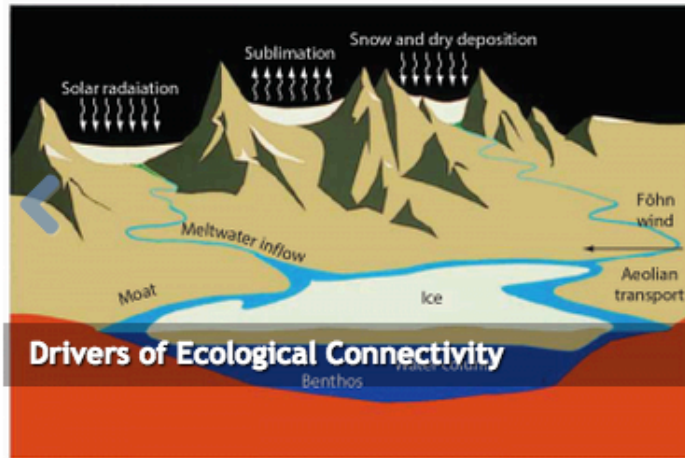
What



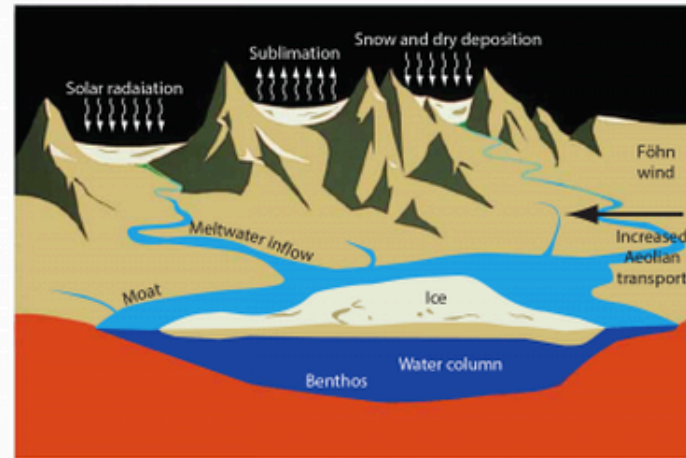
# New Site Features

## McMurdo Dry Valleys LTER

A Cold Summer - Discrete Connectivity



B Sunny Summer - More Connectivity



About

Research

Data

Personnel

Publications

Locations

News

PI Comms

Photos

L

## McMurdo LTER Project Overview

### Background

The McMurdo Dry Valleys LTER project is an interdisciplinary study of the aquatic and terrestrial ecosystems in a cold desert. In 1992 this area was selected as a study site within the National Science Foundation's Long-term Ecological Research (LTER) Program. Project research can be reviewed through the [original 1992 research proposal](#) to the National Science Foundation, or the more recent funding for another 6 years.

# Version Control

His  
Hom  
History of *Soil Biotic*

Revisions

Compare revisions

## Revisions for *Soil Biotic Effects Experiment*

View published

View draft

Edit draft

Manage display

Moderate

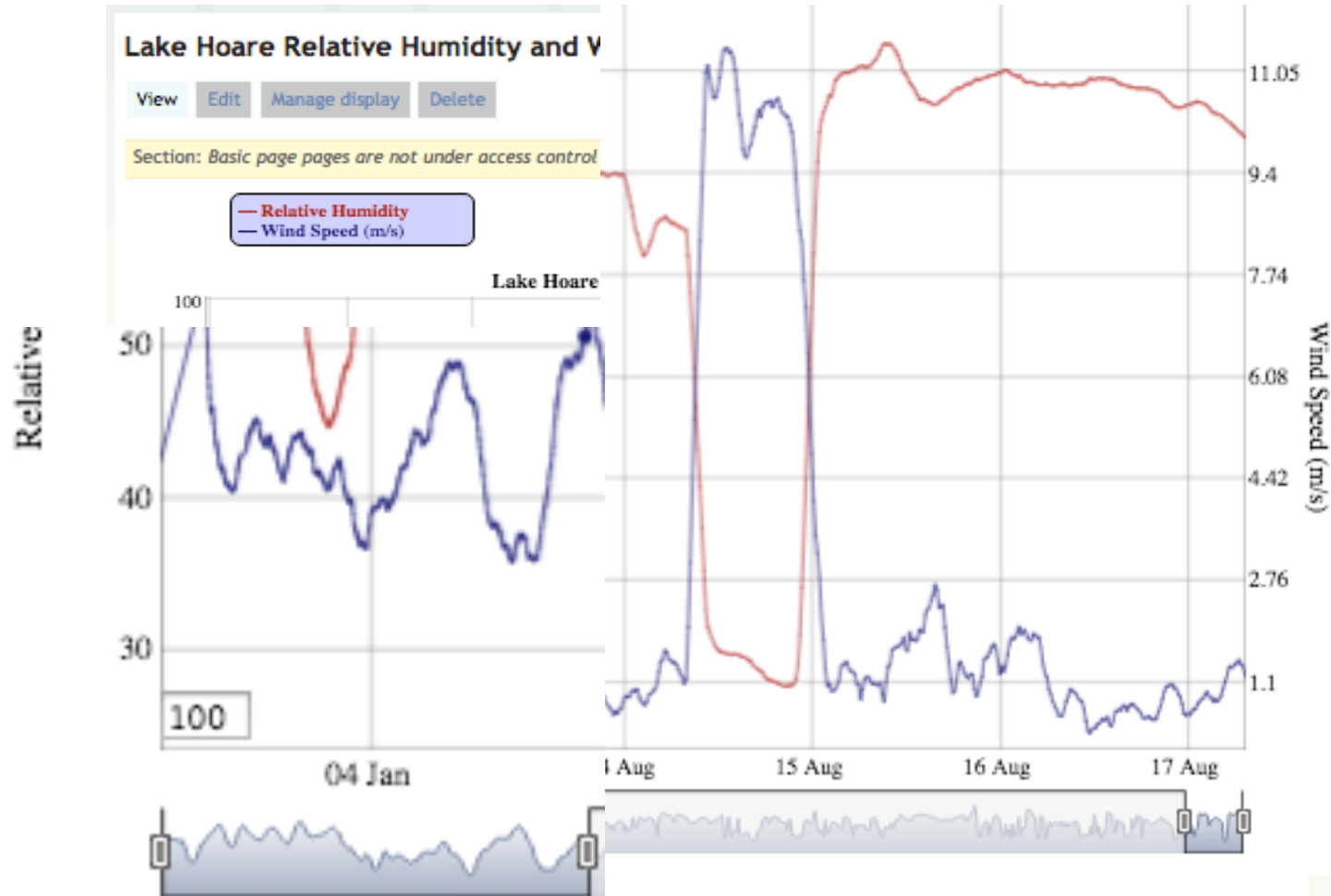
Delete

Revisions [Compare revisions](#)

Section: *Data set pages are not under access control*

Revision	Compare	Operations
Wed, 06/24/2015 - 15:20 by mlhaddix Edited by mlhaddix.	<input type="radio"/>	Revert Delete
Wed, 06/24/2015 - 15:20 by mlhaddix shortens title	<input checked="" type="radio"/>	current revision
Tue, 03/31/2015 - 12:31 by admin Edited by admin.	<input type="radio"/>	Revert Delete

# Real Time Data



itted file

Printer-friendly version

## Meteorological Stations Real Time:

- **Canada Glacier**
  1. Air Temp & Rel. Humidity
  2. Air Temp & Radiation
  3. Air Temp & Wind Speed
  4. Air Temp & Wind Direction
  5. Radiation
  6. Rel. Humidity & Wind Speed
  7. Wind Measurements
  8. Rel. Humidity & Wind Direction
- **Commonwealth Glacier**
  1. Air Temp & Rel. Humidity
  2. Air Temp & Radiation
  3. Air Temp & Wind Speed
  4. Air Temp & Wind Direction
  5. Radiation
  6. Rel. Humidity & Wind Speed
  7. Rel. Humidity & Wind Direction
  8. Wind Measurements
- **Explorer's Cove**
  1. Air Temp & Radiation
  2. Air Temp & Relative Humidity
  3. Air Temp & Wind Direction
  4. Air Temp & Wind Speed
  5. Precipitation
  6. Radiation
  7. Rel. Humidity & Wind Speed
  8. Rel. Humidity & Wind Direction
  9. Soil Temperature
  10. Wind Measurements
- **Friis Hills**
  1. Air Temp & Radiation
  2. Air Temp & Relative Humidity
  3. Air Temp & Wind Direction
  4. Air Temp & Wind Speed
  5. Pressure
  6. Radiation
  7. Rel. Humidity & Wind Speed
  8. Rel. Humidity & Wind Direction
  9. Wind Measurements
- **Lake Bonney**
  1. Air Temp & Rel. Humidity
  2. Air Temp & Radiation
  3. Air Temp & Wind Speed
  4. Air Temp & Wind Direction
  5. Relative Humidity & Wind Direction
  6. Relative Humidity & Wind Speed

11. Soil Temperature
  12. Wind Measurements
- **Lake Fryxell**
    1. Air Temp & Radiation
    2. Air Temp & Relative Humidity
    3. Air Temp & Wind Direction
    4. Air Temp & Wind Speed
    5. Depth
    6. Radiation
    7. Rel. Humidity & Wind Speed
    8. Rel. Humidity & Wind Direction
    9. Soil Temperature
    10. Wind Measurements
  - **Lake Hoare**
    1. Air Temp & Rel. Humidity
    2. Air Temp & Radiation
    3. Air Temp & Wind Speed
    4. Air Temp & Wind Direction
    5. Relative Humidity & Wind Direction
    6. Relative Humidity & Wind Speed
    7. Depth
    8. Pressure
    9. Radiation
    10. Soil Temperature
    11. Wind Measurements
  - **Lake Howard**
    1. Air Temp & Rel. Humidity
    2. Air Temp & Radiation
    3. Air Temp & Wind Speed
    4. Air Temp & Wind Direction
    5. Relative Humidity & Wind Direction
    6. Relative Humidity & Wind Speed
    7. Depth
    8. Radiation
    9. Wind Measurements
  - **Lake Vanda**
    1. Air Temp & Radiation
    2. Air Temp & Relative Humidity
    3. Air Temp & Wind Direction
    4. Air Temp & Wind Speed
    5. Depth
    6. Radiation
    7. Rel. Humidity & Wind Speed
    8. Rel. Humidity & Wind Direction
    9. Soil Temperature
    10. Wind Measurements
  - **Lake Vida**
    1. Air Temp & Radiation
    2. Air Temp & Relative Humidity

in

- **Miers Valley**
  1. Air Temp & Radiation
  2. Air Temp & Relative Humidity
  3. Air Temp & Wind Direction
  4. Air Temp & Wind Speed
  5. Depth
  6. Radiation
  7. Rel. Humidity & Wind Speed
  8. Rel. Humidity & Wind Direction
  9. Soil Temperature
  10. Wind Measurements
- **Mt. Fleming**
  1. Air Temp & Rel. Humidity
  2. Air Temp & Wind Speed
  3. Air Temp & Wind Direction
  4. Rel. Humidity & Wind Speed
  5. Rel. Humidity & Wind Direction
  6. Pressure
  7. Wind Measurements
- **Taylor Glacier**
  1. Air Temp & Rel. Humidity
  2. Air Temp & Wind Speed
  3. Air Temp & Wind Direction
  4. Rel. Humidity & Wind Speed
  5. Rel. Humidity & Wind Direction
  6. Depth
  7. Wind Measurements

## Lakes Real Time Data (Blue Boxes):

- East Lake Bonney Stage, Water Temperature and UW PAR
- Lake Fryxell Stage, Water Temperature and UW PAR
- Lake Hoare Stage, Water Temperature and UW PAR
- Lake Miers Stage, Water Temperature and UW PAR
- West Lake Bonney Stage, Water Temperature and UW PAR

## Stream Gages:

- Adams Stream Stage, Water Temperature and Conductivity
- Canada Stream Stage, Water Temperature and Conductivity
- Commonwealth Stream Stage, Water Temperature and Conductivity
- Lost Seal Stream Stage, Water Temperature and Conductivity
- Lawson Creek Stage, Water Temperature and Conductivity
- Miers Stream Stage, Water Temperature and Conductivity
- Onyx River at Vanda Stage, Water Temperature and Conductivity



# Real Time Data

**Dry Valleys LTER**

Search ▾ Data ▾ Personnel ▾ Publications ▾ Locations ▾ News ▾ PI Comms ▾ Photos ▾

- Browse by Category ▸
- Original Data Queries ▸
- Real Time ▸
  - Gages ▸
    - Adams
    - Canada
    - Commonwealth
    - Lawson
    - Lost Seal
    - Miers
    - Onyx at Vanda
  - Lakes Blue Boxes
  - Meteorology
- Data Explorer Dashboard
- Antarctic Diatoms

**Result**


## Glacier Stake Heights and Snow Depths

Long Term Ecological Research (LTER) project in the McMurdo Dry Valleys of Antarctica, has been undertaken to monitor mass balance and meltwater flow from the Taylor Valley. This includes stake height and snow depth measurements to the surface of six glaciers in the Dry Valleys, Antarctica. Monitoring the changes in these measurements over time provides

# Responsive / Adaptive

mcm.lternet.edu

## McMurdo Dry Valleys LTER



Environmental Stewardship

McMurdo LTER scientists are integral to the cooperative effort to responsibly conduct scientific field research in the Dry Valleys. We work with international collaborators, NSF, and others to reduce current and potential impact on this landscape and to maintain ecosystem function.

● ● ● ● ● ● ● ● ● ●

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### McMurdo LTER Project Overview

#### Background

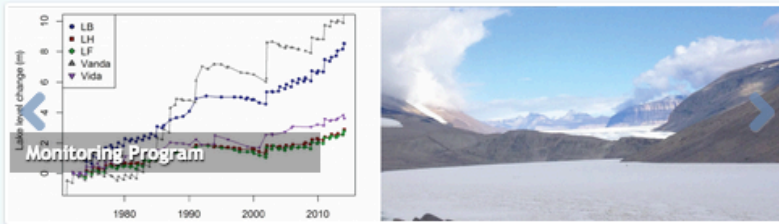
The McMurdo Dry Valleys LTER project is an interdisciplinary study of the aquatic and terrestrial ecosystems in a cold desert region of Antarctica. In 1992 this area was selected as a study site within the National Science Foundation's Long-term Ecological Research (LTER) Program. Details about the research can be reviewed through the [original 1992 research proposal](#) to the National Science Foundation, or the more recent [2010 proposal](#), resulting in funding for another 6 years.

[Read more](#)



sive

## McMurdo Dry Valleys LTER



Main menu

### McMurdo LTER Project Overview

#### Background

The McMurdo Dry Valleys LTER project is an interdisciplinary study of the aquatic and terrestrial ecosystems in a cold desert region of Antarctica. In 1992 this area was selected as a study site within the National Science Foundation's Long-term Ecological Research (LTER) Program. Details about the research can be reviewed through the [original 1992 research proposal](#) to the National Science Foundation, or the more recent [2010 proposal](#), resulting in funding for another 6 years.

[Read more](#)



#### Recent Publications

- [McMurdo Dry Valleys: a cold desert ecosystem](#)
- [Environmental Management of a Cold Desert Ecosystem](#)
- [A roadmap for Antarctic and Southern Ocean science for the next two decades and beyond](#)
- [Antarctic Terrestrial Microbiology : Invertebrates](#)

[More...](#)

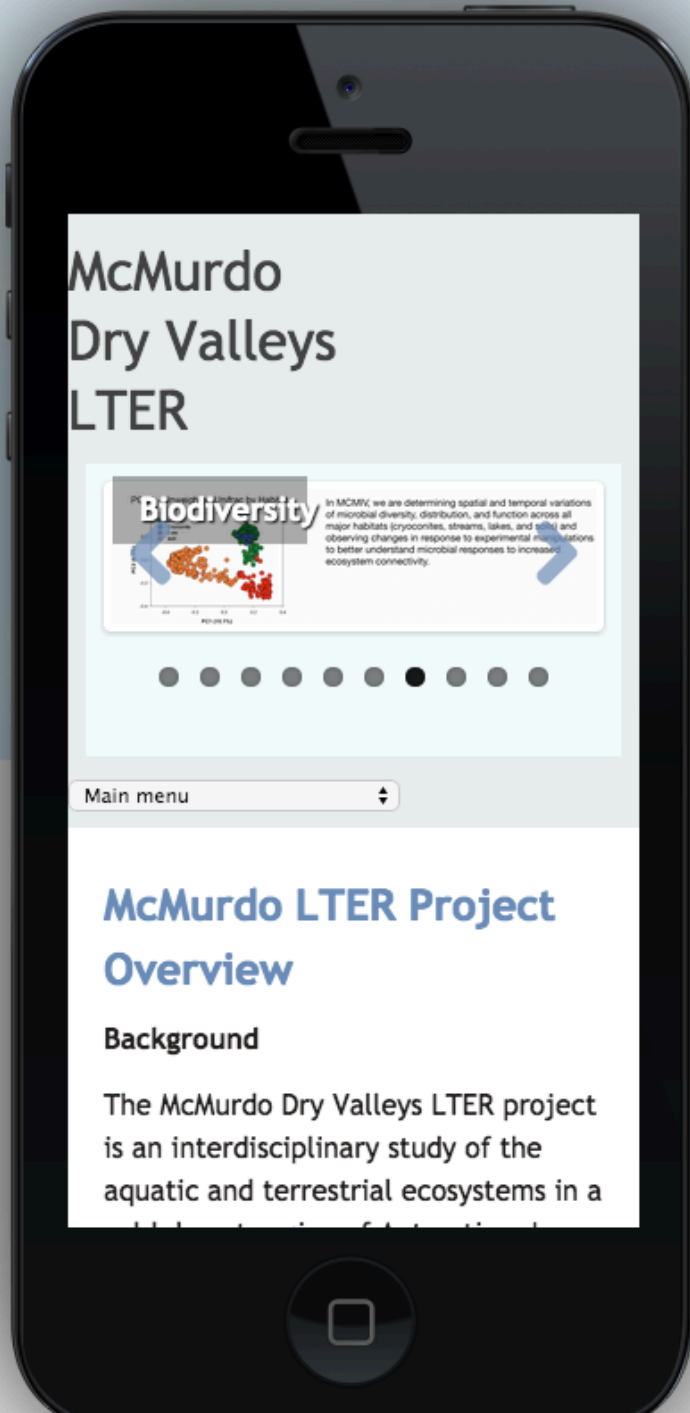
#### MCM LTER News

- [NSF EarthDay, hr 23: studying soil...](#)
- [Memories from the field](#)
- [Diane McKnight winner of 2015 John Dalton Medal](#)
- [John Priscu Awarded the 2014 Wilson Stibitz Award](#)
- [Prof. Peter Doran joins LSU](#)
- [Priscu on the Radio : Sub Glacial Biodiversity](#)
- [McMurdo LTER Site Review](#)
- [D. Wall receives SSSA's highest honor](#)

iPad Mini

# Responsive

## iPhone 5





A lake with an area of 1 square mile which occupies the north portion of Pyramid Trough, Scott Coast. Named by New Zealand Geographic Board (NZGB) (1994) in association with Pyramid Trough.

# McMurdo LTER Publications

— ▶ [Search](#)

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[Author](#) [Title](#) [Type](#) [ [Year](#) ▼ ]

Export 639 results: [BibTex](#) [RTF](#) [Tagged](#) [MARC](#) [XML](#) [RIS](#)

**Submitted**

Šabacká M, Priscu JC, McKnight DM, Wall DH, Barrett JE, Virginia RA. **Aeolian and fluvial fluxes of carbon and nitrogen among landscape units in Taylor Valley, Antarctica.** *Environmental Research Letters*. Submitted. [Google Scholar](#) [BibTex](#) [RTF](#) [Tagged](#) [MARC](#) [XML](#) [RIS](#)



## Recent Publications

- Antarctic microbial mats: A modern analog for Archean lacustrine oxygen oases
- McMurdo Dry Valleys: a

## MCM LTER News

- NSF EarthDay, hr 23: studying soil...
- Memories from the field
- Diane McKnight winner of 2015 John Dalton

## @MCM\_LTER Tweets

- Lessons from the bottom of the world by [@DianaWallSoil](#), we can all learn from our largest desert

## McMurdo Station Weather Now

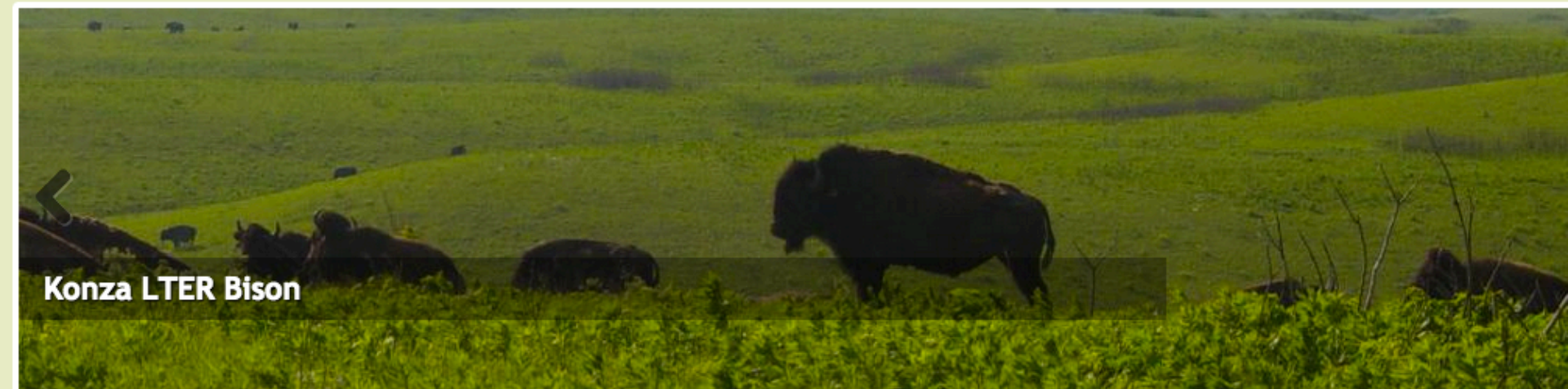


- Feels like: -6°F
- Temperature: -6°F
- UV index: -1



# Konza Prairie LTER DEIMS

## Konza Prairie LTER

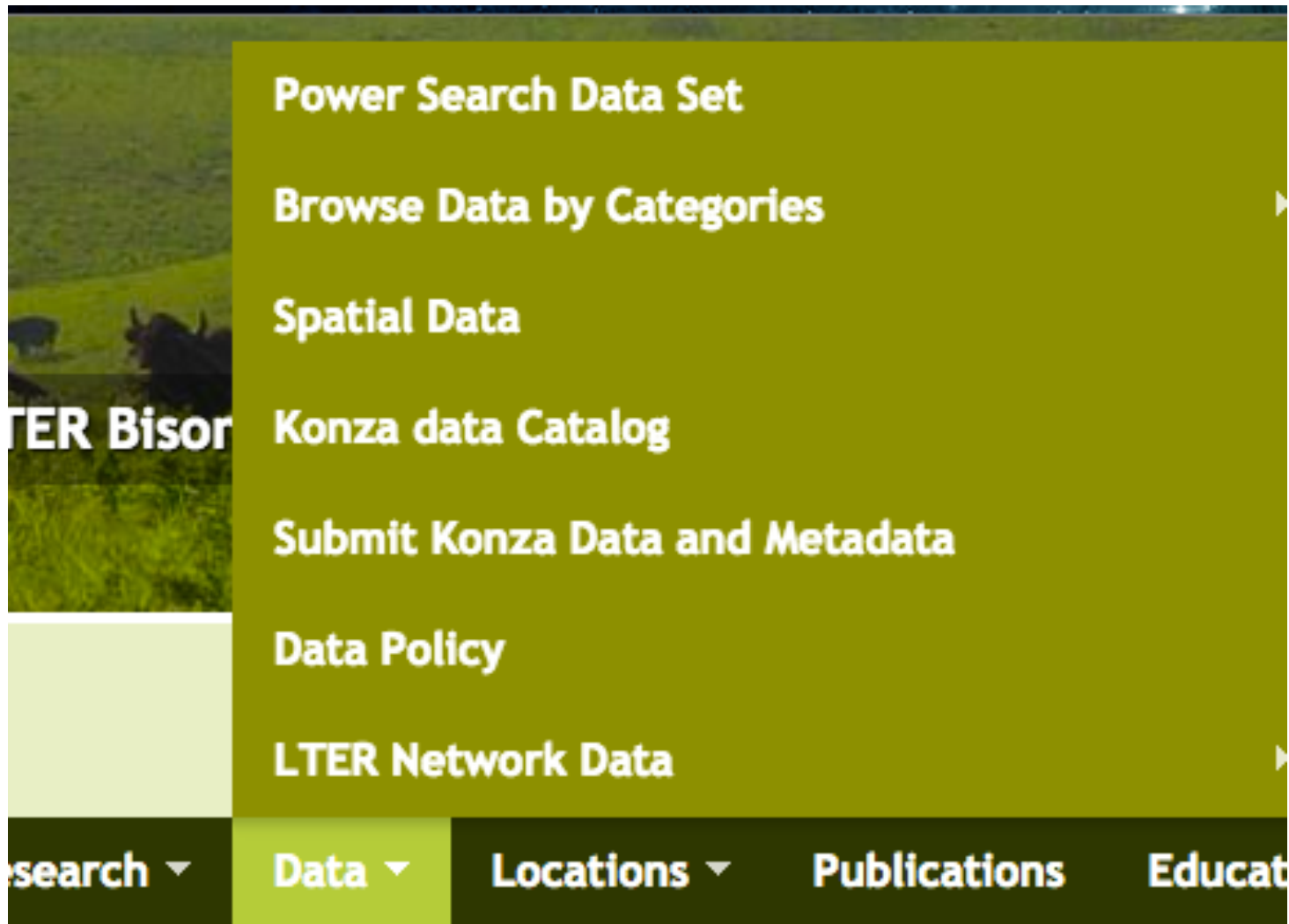


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## Konza Prairie Long-Term Ecological Research (LTER)

The Konza Prairie LTER is a comprehensive ecological research, education and outreach program, centered on one

# Konza Data



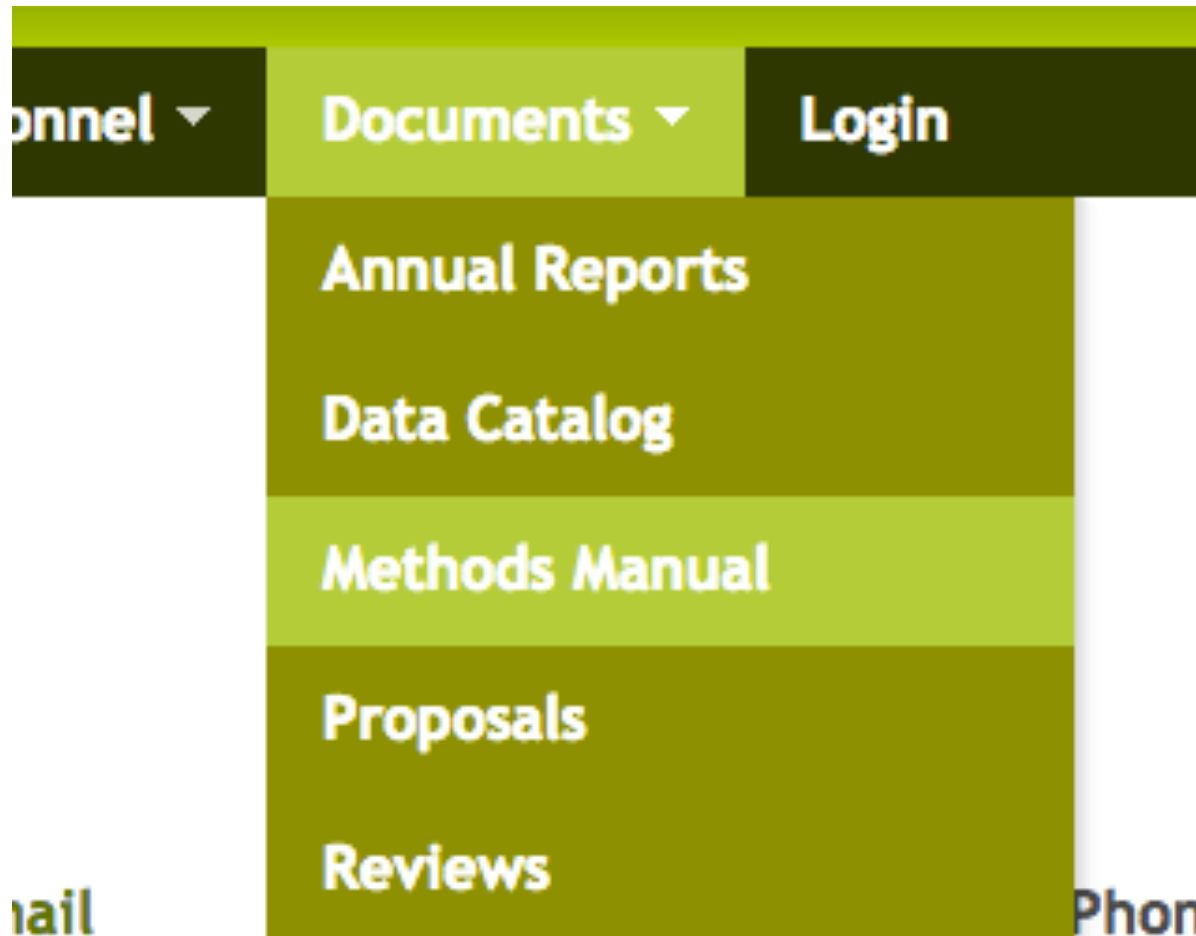


# Research Highlights

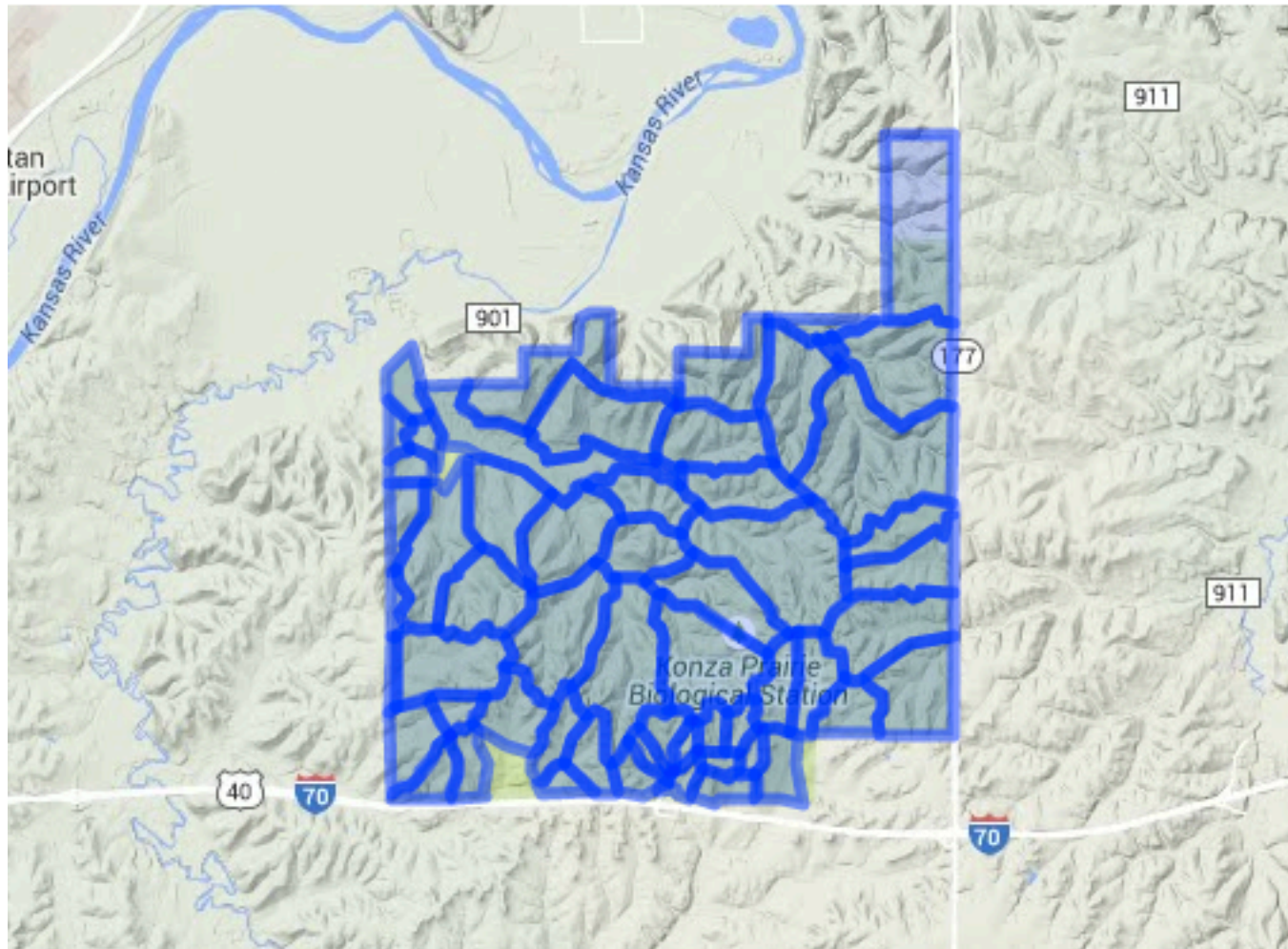


the most productive grasslands in North America -  
the first six site-based LTER programs funded by the  
term ecological phenomena ([www.lternet.edu](http://www.lternet.edu))  
grazing and climatic variability as three critica

# Document Repository



# Konza Watersheds



# Faceted Data Search

Data

Fulltext search

Apply

## Data Set Results

### AET01 Konza Prairie Grass Reference Evapotranspiration

DOI: 10.6073/pasta/176ffaf4444eb2663efb326e44134f30

Data set ID: 94

Estimated evapotranspiration from a hypothetical short grass with a height of 0.12 m, a surface resistance of 70 s m<sup>-1</sup>, and an albedo of 0.23 (no water stress), this record type contains daily total estimated evapotranspiration.

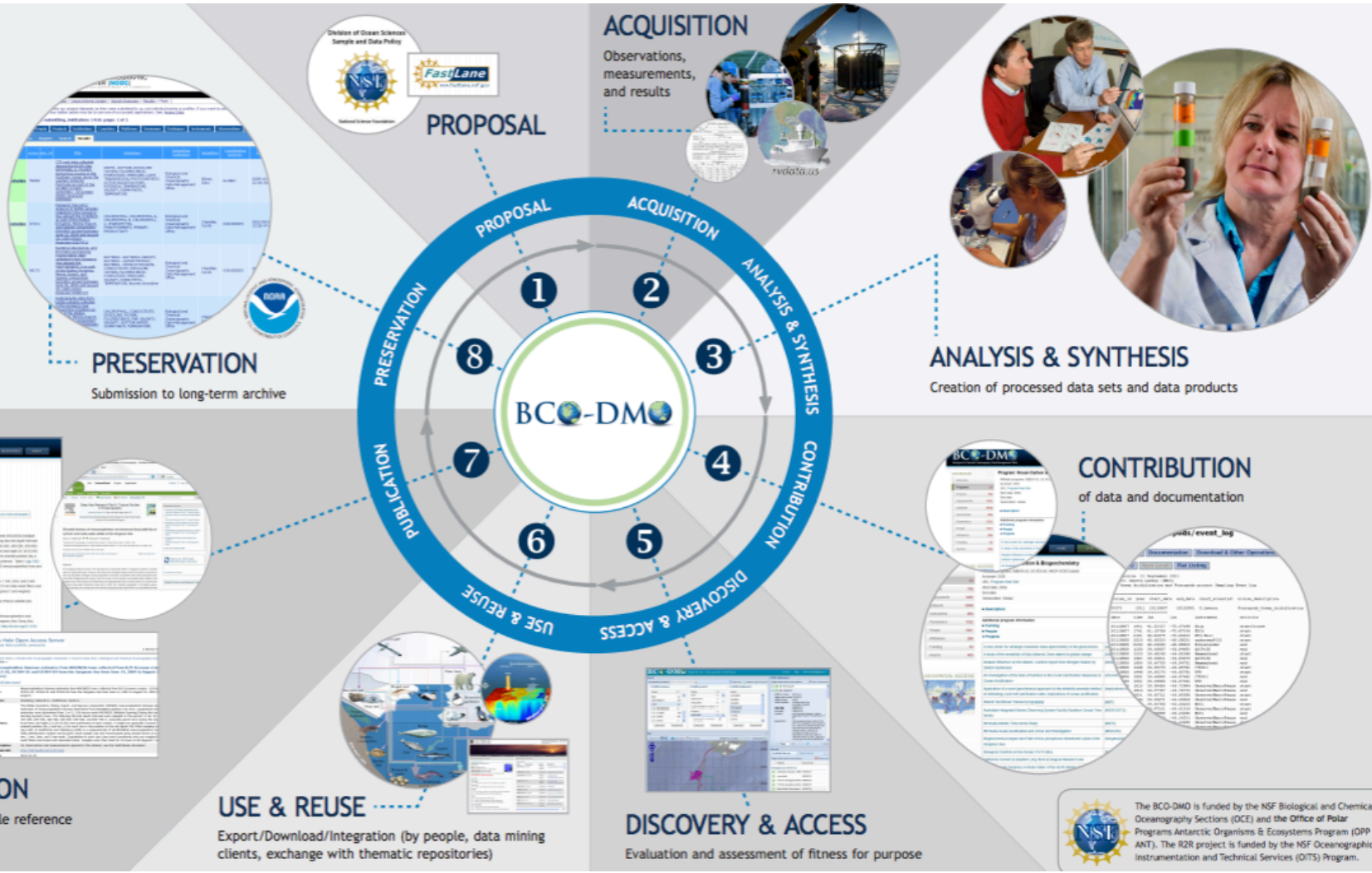
#### Filter by owner/creator:

- Dr. John M. Blair (13)
- Dr. Walter K. Dodds (12)
- Dr. John M. Briggs (10)
- Dr. Anthony Joern (6)
- Dr. David C. Hartnett (6)
- Dr. Donald W. Kaufman (6)

BCO-DMO

# BCO-DMO

The data life cycle includes phases that span proposal to preservation. BCO-DMO staff members work in partnership with researchers to improve data stewardship throughout the data life cycle.



The BCO-DMO is funded by the NSF Biological and Chemical Oceanography Sections (OCE) and the Office of Polar Programs Antarctic Organisms & Ecosystems Program (OPP ANT). The R2R project is funded by the NSF Oceanographic Instrumentation and Technical Services (OITS) Program.



*"Come and find  
data, my  
community..."*



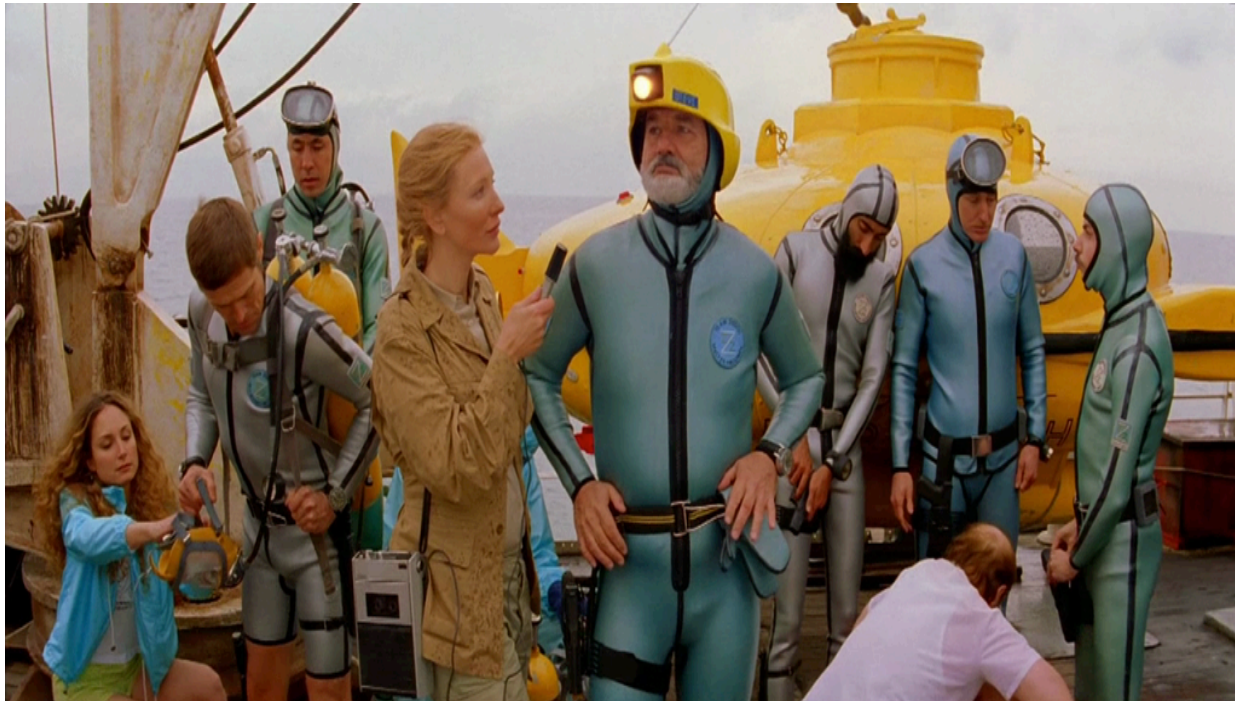


# The Grand Challenges of Science



“*...like its 1999...*”

- “Grand Challenges” require **data**
- *Right* data has been hard to find



# CONTENT without CONTEXT





“STILL HAVEN’T FOUND  
WHAT I’M LOOKING FOR...”

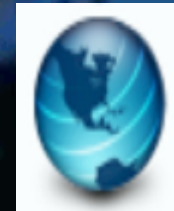


[http://4.bp.blogspot.com/-mTbIH1leLpw/Uxvh-es\\_if/AAAAAAAAAFeg/BtRDO0w9U6w/s1600/I-wonder-if-it-remembers-me.-life-aquatic-with-steve-zissou-2004.gif](http://4.bp.blogspot.com/-mTbIH1leLpw/Uxvh-es_if/AAAAAAAAAFeg/BtRDO0w9U6w/s1600/I-wonder-if-it-remembers-me.-life-aquatic-with-steve-zissou-2004.gif)

# Semantics for Data Discovery



BCO-DMO



DataONE

# Perspectives are going to differ...

Marine  
Geology

Marine  
Ecosystems



Publications

Biogeochemistry

Paleoclimatology



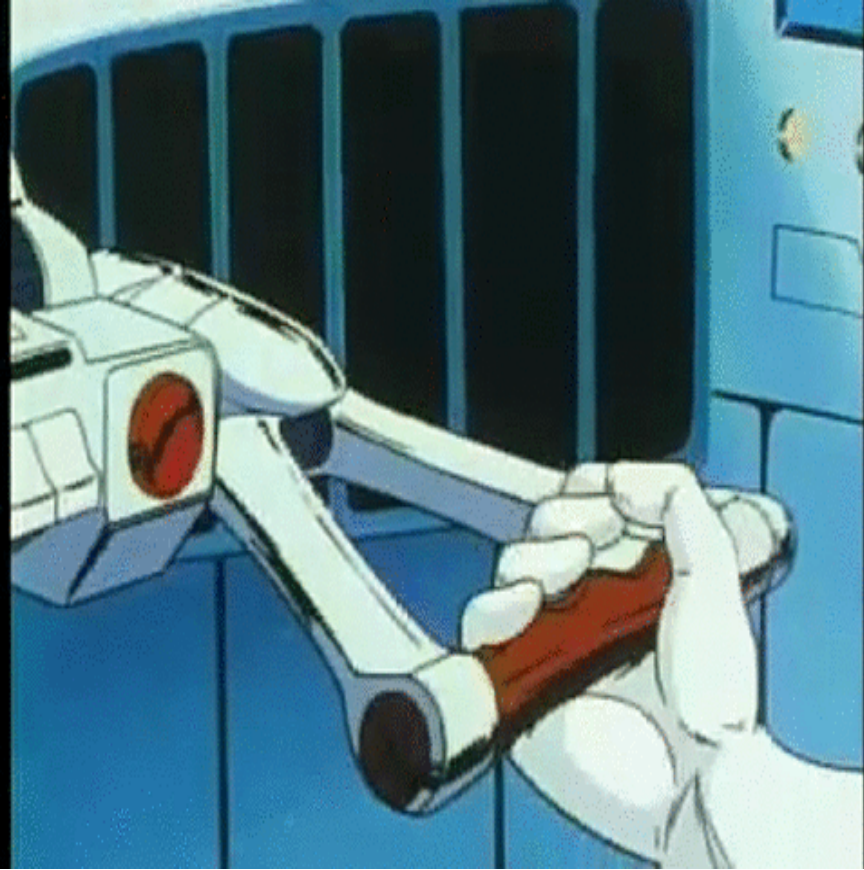


***HOW SOMETHING APPEARS  
IS ALWAYS A MATTER OF PERSPECTIVE...***

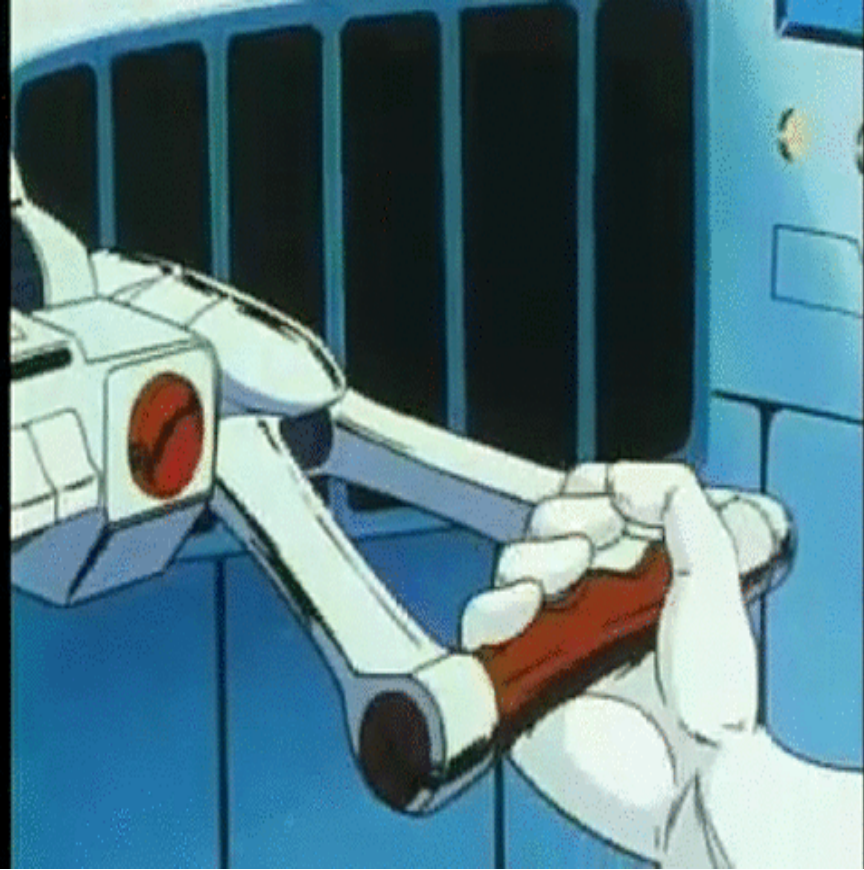


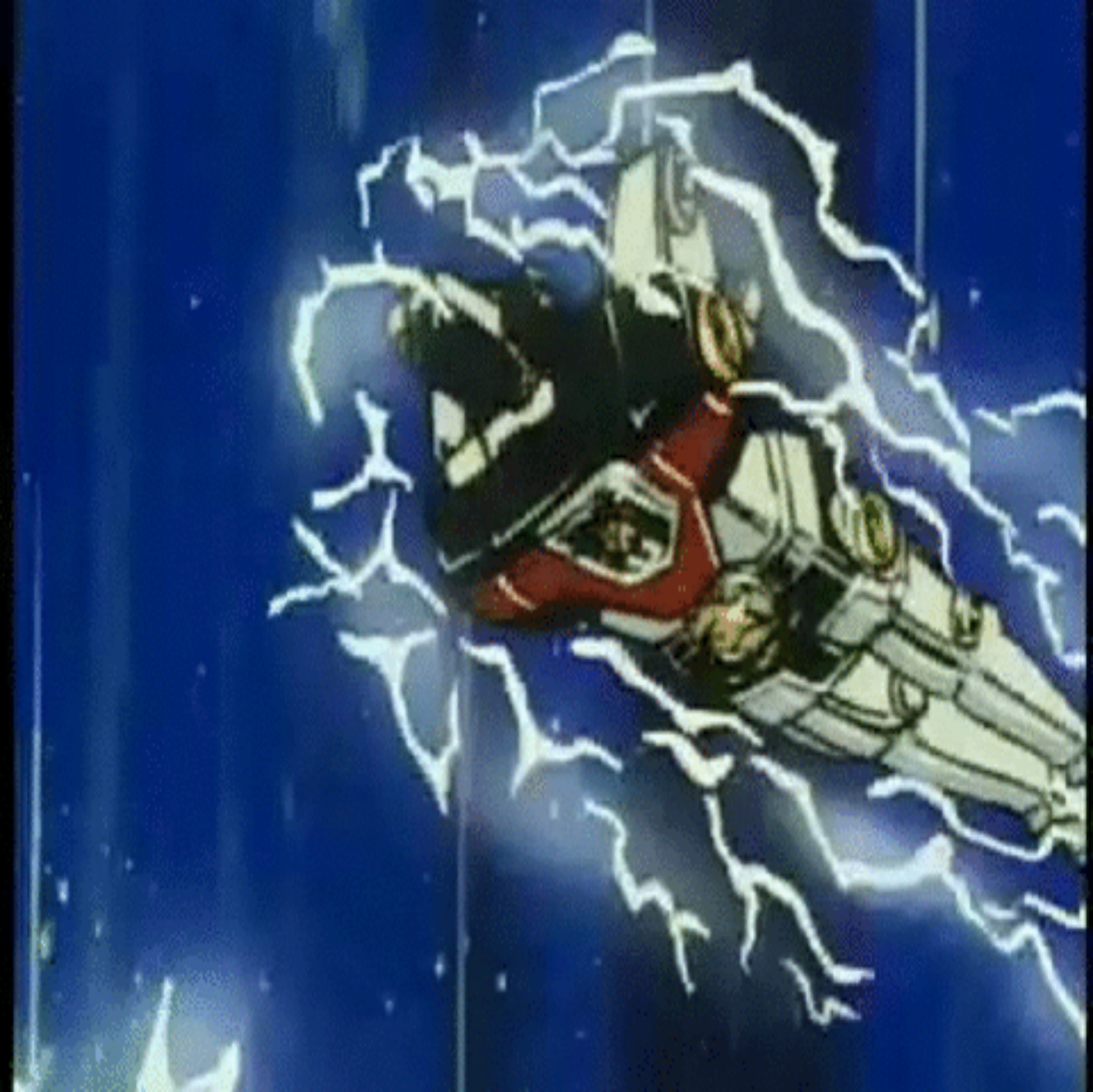
**HOW SOMETHING APPEARS  
IS ALWAYS A MATTER OF PERSPECTIVE...**



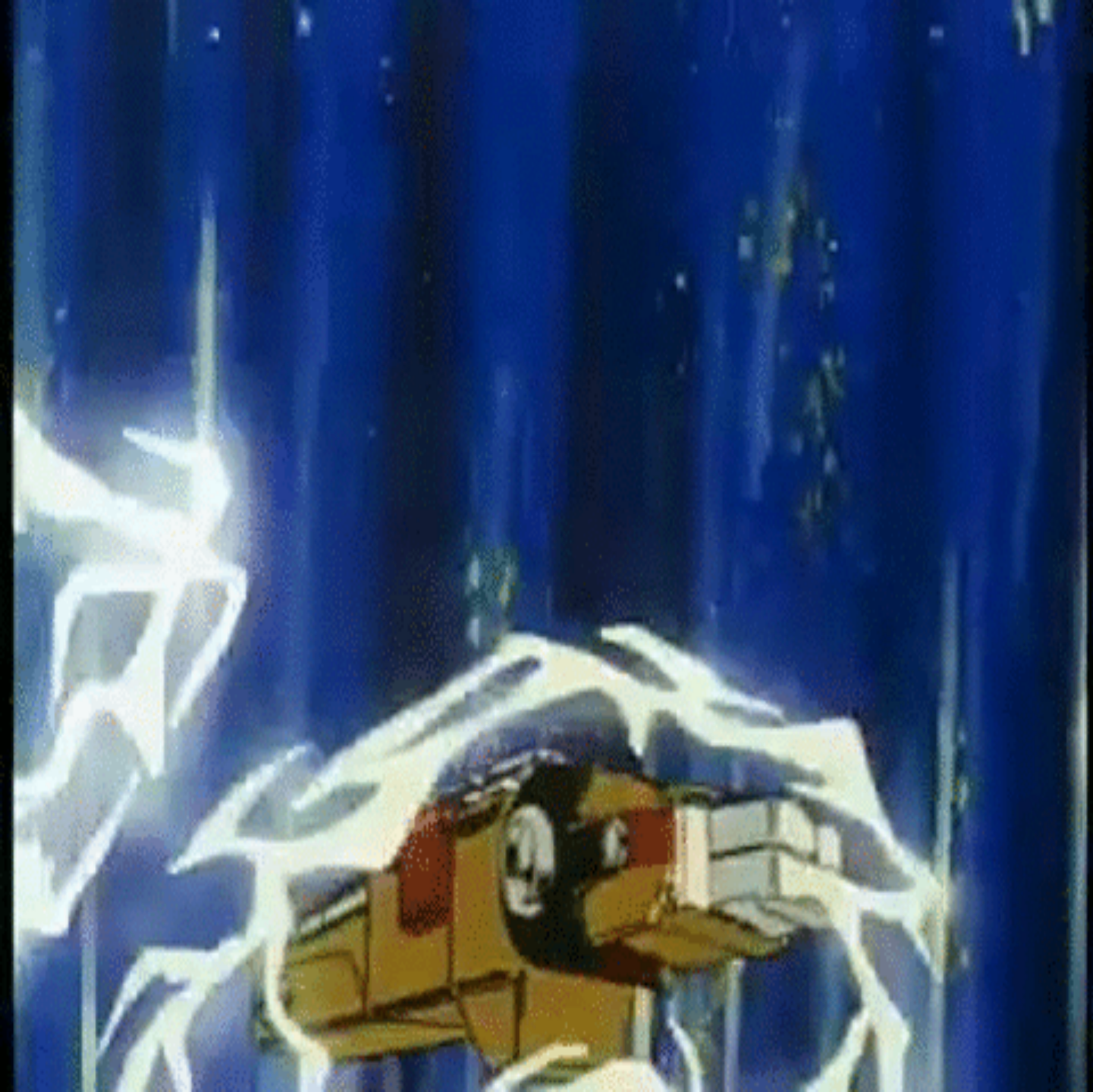














Paleoclimatology

Marine  
Geology



Publications

Marine  
Ecosystems

Biogeochemistry

# New York Times: Innovation Report

*on implementing Semantics:*

“...there are *substantial* costs to waiting.”

# New York Times: Innovation Report

**RECIPES** aren't properly *tagged*

by **ingredients** and **cooking time**

*“We can do it now,*

*but only after spending a huge sum*

*to retroactively structure the data.”*

# New York Times: Innovation Report

“The *lack of structured data* helps explain why we are...”

1. unable to **automate** the sale of our photos
2. continually struggle to attain **higher rankings** on search engines.



## WHAT WE DO

Share ideas & knowledge

Collaborate

Synergize



## CURRENT PROJECTS

DOIs for Drupal-hosted documents

DataONE member node module

Code Sprints • PROV-O for Drupal revisions



# Drupal Working Group



The Long Term Ecological Research Network



## WHAT WE CAN DO FOR YOU

Host Drupal experts

Provide funds for attending Drupalcon/Drupal Camps

Share knowledge



## GET INVOLVED



Monthly telecons



@scienceondrupal



YouTube channel



Google+





# ESIP Drupal Working Group

## STRATEGIC VISION

To *share knowledge* and *solve science-related* Drupal issues through virtual and personal *collaborations*.



# ESIP Drupal Working Group

*Telecons* 4<sup>th</sup> Wed of month @ noon PT / 3pm ET

*Drupal.org* <https://groups.drupal.org/science-on-drupal>

*YouTube* <http://goo.gl/B0t57T>

*Twitter* @ScienceOnDrupal



# ESIP Drupal Working Group

*US LTER* is already an ESIP member

- win a trip to DrupalCon NA
- win support to local DrupalCamps or ESIP meetings