LTER Network Cyberinfrastructure

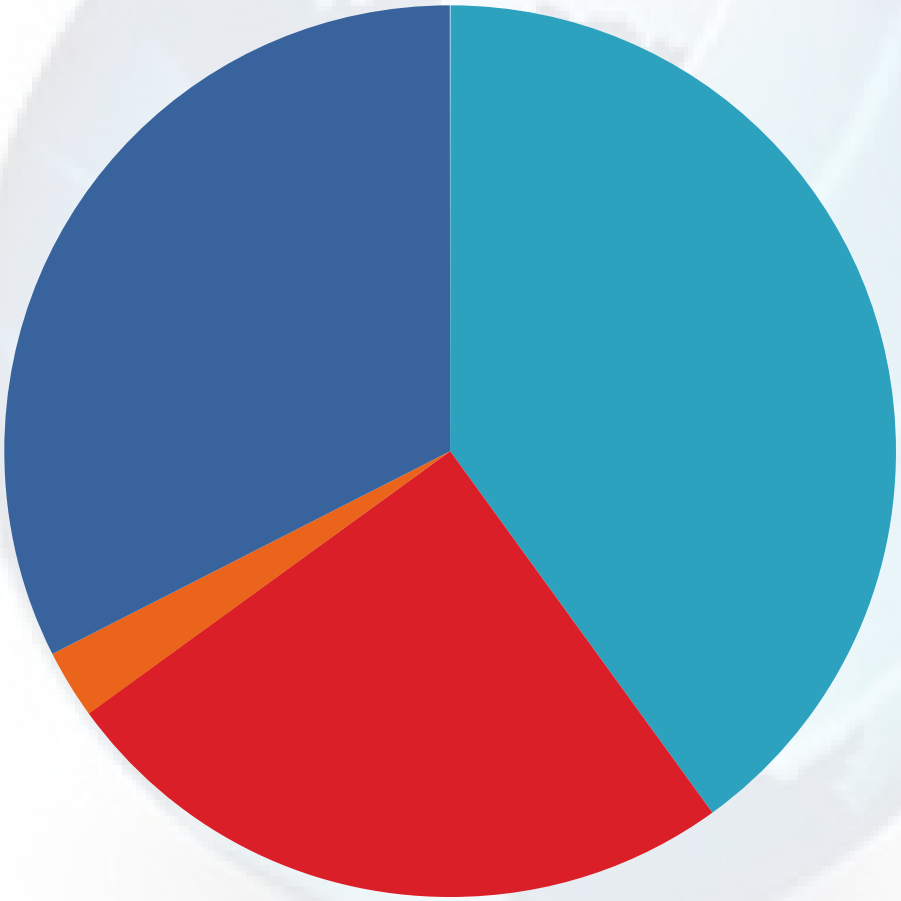
James Brunt – Chief Information Officer

2012 Mid-term Review

Scope

- Support for Computing and communication infrastructure
  - Servers, storage, software, facilities, security
  - Desktop computing and Training Lab
  - Application and Technical Support
- Interactions with and facilitation of IM committee
  - Annual meetings
  - Product-oriented working groups
- Creation, management and curation of Network databases and web presence
- Development of and support for the Network Information System
- Database and IT consulting

CIO Time


LNO interaction
Network interaction
External interaction
Combined hands-on

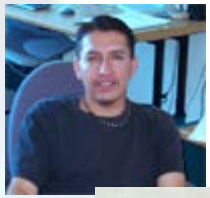
Roadmap

- 3.2.1 Basic cyberinfrastructure support
- 3.2.4 Web, database, and IT consulting
- 3.2.2 Information management
- 3.2.3 Network Information System
  - Overview
  - Management

Basic Cyberinfrastructure Support

- Video teleconferencing support
- Web improvements
- Technology improvements
- Rich media recording and streaming
- Cybersecurity and data management briefings
- Training lab support

Staffing



- Marshall White – Sr. Web Designer
  - Web application support

- Dez Wyman – Systems Administrator
  - Servers and Storage

- James Williams – Systems Analyst
  - Desktop and communications

- Leanne Yanabu – Web designer
  - Web creation and maintenance

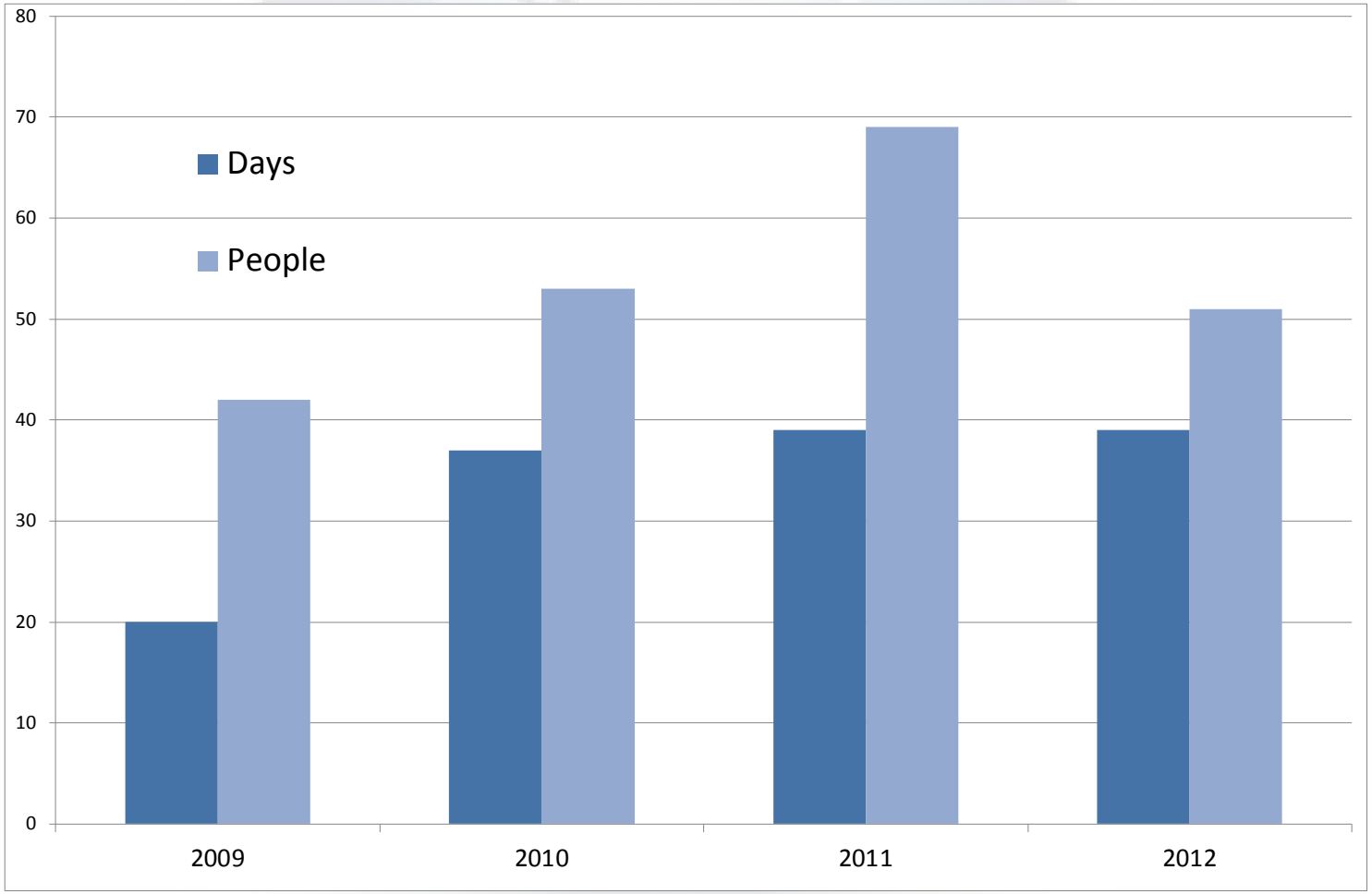
LNO Infrastructure

- 20 physical servers, 30 virtual servers
  - Email, LDAP, web, database, data catalog, request tracker, ClimDB, development, testing, standby, unit registry, controlled vocabulary, ftp, file server, system monitor, NIS components, irc, etc.
- 21Terabytes of primary, 30 Tb secondary, 250 Tb tertiary storage
- 13 desktops, 11 laptops, and 3 rich media recorders
- 8 websites
  - www, news, databits, im, lno, intranet, search, dbadmin
- Information Technology Training Lab w/ 25 desktop computers and AV

Basic Cyberinfrastructure Support Accomplishments

- New web infrastructure in place
- Computing infrastructure evolving towards the clouds
- Offsite backup storage for sites online
- Confidence in the security of LNO site and databases increasing
- Training lab seeing increasing LTER use

Training Lab Use



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Web, Database and IT consulting

- Technical support
- Site visits

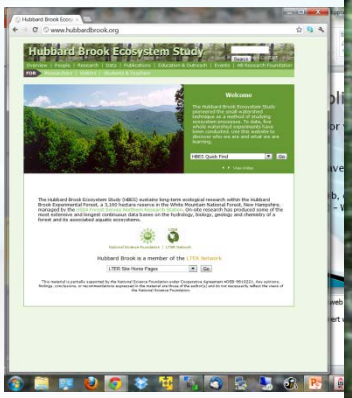
Web, IT, and Database Consulting Accomplishments

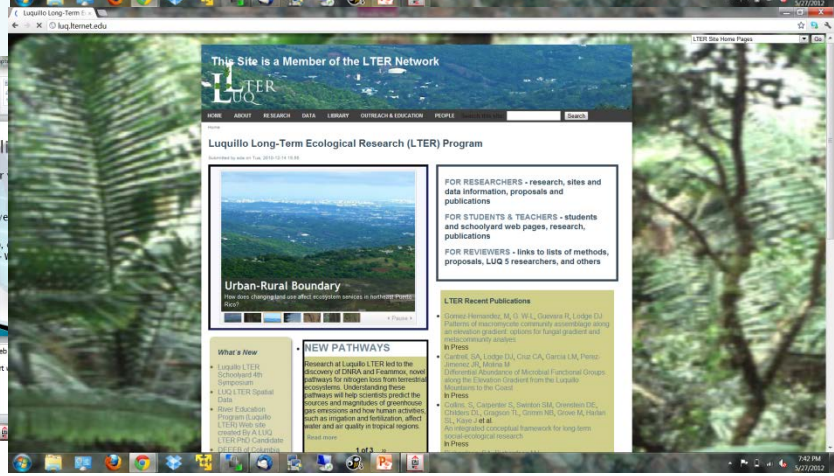
- Process for vetting requests developed and approved
- 4 sites helped
  - HBR – Web, database
  - SEV, LUQ – Web, drupal
  - JRN – EcoTrends migration
- 5 sites visited

  SGS, NWT

  MCM, GCE

  CWT





LTER Network Office

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Information Management

- Information management committee meetings
- Product-oriented working groups and site compensation projects
- Network database maintenance
- Network database migration and creation
- Derived data products

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Staffing

- Yang Xia – Research Scientist II
  - Information Manager for Network databases

Product-oriented Working Groups

- LTER Controlled Vocabulary – John Porter – LTER Controlled Vocabulary
- Network Database Web Services – Karen Baker – Requirements for Personnel Database
- LTERMaps Phase II – Theresa Valentine – Map-based interface to site characteristics
- NIS Workflow best practices – Corinna Gries – in progress
- Data Package quality definitions – Margaret O'Brien – in progress
- Site Characteristics re-design – Don Henshaw – in progress

Product-oriented Working Groups

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- Network Database Web Services – Karen Baker – Requirements for Personnel Database
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- **NIS Workflow best practices – Corinna Gries – in progress**
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IM Site Compensation

- EML reports and congruency – Margaret O'Brien – report of EML quality across sites
- Network Database Web Services phase 1 – Mason Kortz – first iteration of personnel database code
- EML diagnosis and best practices mentorship – Mary "Gastil" Gastil-Buhl – in progress
- LTER Atlas – Jamie Hollingsworth – interactive LTER atlas, demonstrated for Science Council in May 2012

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Network Database Management

- Personnel – all LTER personnel (LPI through undergraduate)
- Bibliography – all site publications
- Data catalog – all site metadata documents
- Site characteristics – descriptive site information
- ClimDB/HydroDB – climatological and hydrological data

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Data Catalog Interfaces

LTER Data Portal - Mozilla Firefox

File Edit View History Bookmarks Tools Help

LTER Data Portal

metacat.lternet.edu/das/lter/advancedsearch.jsp

Google Calendar AT-del AT-gra AT-lav AT-tep AT-tro DI-624 DP-del DP-gra DP-lav

LTER Home | Intranet | LNO

LTER Site Home Pages Go

The US

Long Term Ecological Resea

A founding member of the International Long Term Ecological Research Ne

Login

Search

Browse

LTER Data Portal Advanced Search

LTER Sites

Andrews LTER
Arctic LTER
Baltimore Ecosystem Study
Bonanza Creek LTER

Subject

Keywords Only contains All Te

Add more specific terms Add related terms Add related terms and their more s

Owners/Creators

Individual's Last Name: contains

Organization: contains

Spatial Criteria

Zoom in to the region you would like to search

North 90.0

West -180.0

South -90.0

Dataset must be fully contained

Geographic Place Name:

Terms of Use

Taxonomic Criteria

LTER Data Portal - Mozilla Firefox

File Edit View History Bookmarks Tools Help

LTER Data Portal

metacat.lternet.edu/das/lter/browseforward.jsp

Google Calendar AT-del AT-gra AT-lav AT-tep AT-tro DI-624 DP-del DP-gra DP-lav DP-tep DP-tro EVO Google Java SE 6

LTER Home | Intranet | LNO

LTER Site Home Pages Go

Google Custom Search Search

The US

Long Term Ecological Research

Network

A founding member of the International Long Term Ecological Research Network

Login

Search

Browse

333 data packages found

Total data packages	333
LTER data packages	333
CAP	333

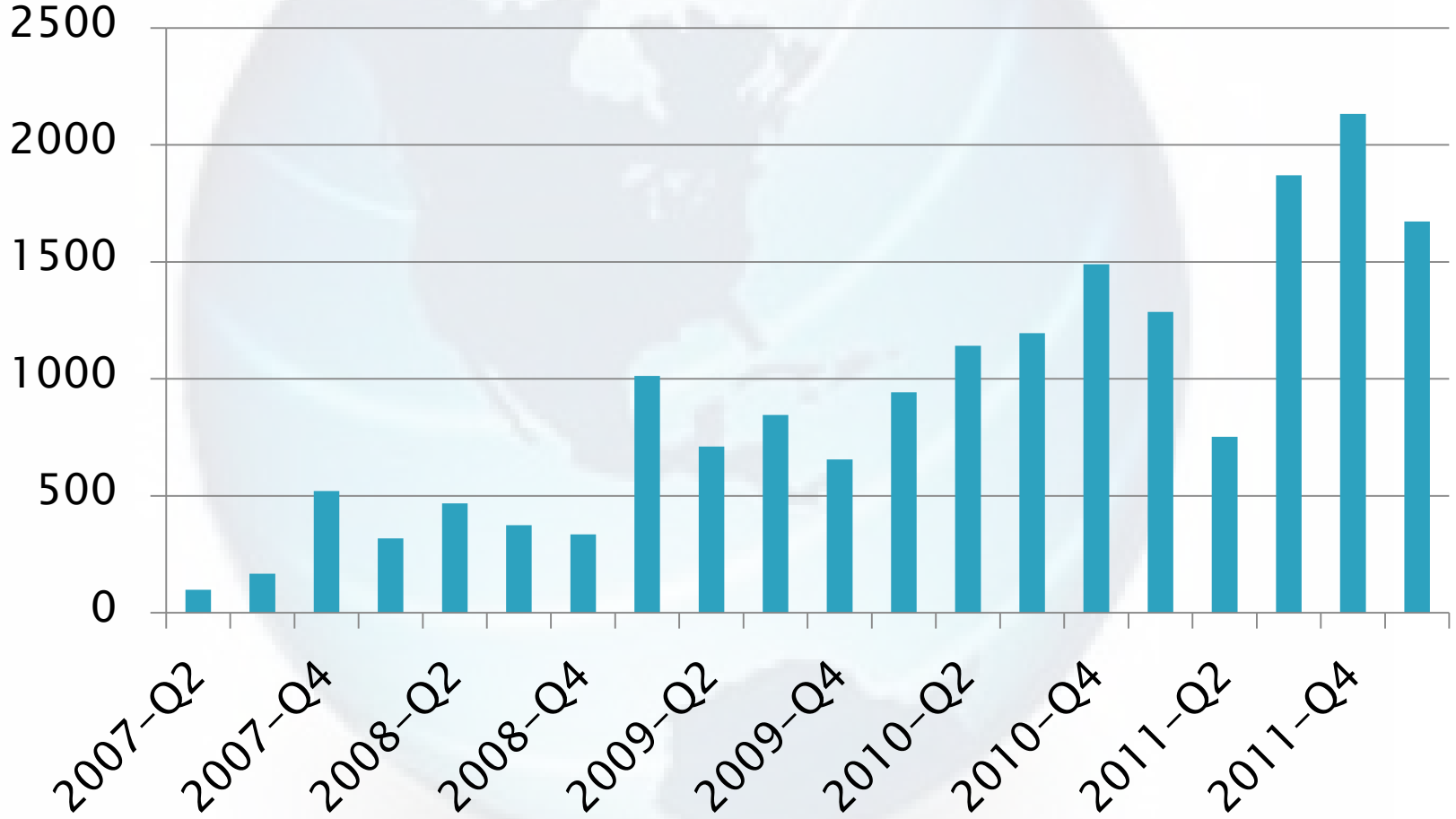
Search Results (*click on title for more information*)

- Package includes URL(s) that should link directly to data
- Package includes a URL that may link to information, metadata, or data

Show All Hide All

View	LTER Site	Data Package Title/Owners/Creators	Data
+/-	CAP LTER	*"Arbuscular mycorrhizal fungal diversity and functioning in urban desert preserves and surrounding deserts" - Stutz Ontiveros*	
+/-	CAP LTER	*"Hierarchical regulation of nitrogen export from urban catchments: Interactions of storms and landscapes." - Lewis Grimm*	
+/-	CAP LTER	*"Phoenix Area Social Survey (PASS)" - Harlan*	
+/-	CAP LTER	*"Lichen Resurvey with Heavy Metal Analysis: Distribution of Praseodymium concentration in lichen tissue in Maricopa County" - Gries Zschau*	
+/-	CAP LTER	*"Residential completions in Maricopa County" - Walton*	
+/-	CAP LTER	*"False Color Landsat Image of Greater Phoenix" - National Aeronautic and Space Administration, Geology Remote Sensing Lab, ASU*	
+/-	CAP LTER	*"Environmental Risk and Justice: Facilities 2000 with Toxic Release Inventory data" - Bolin Atwood*	
+/-	CAP LTER	*"Environmental Risk and Justice: Facilities 2000 with Toxic Release Inventory data in 1970 tracts" - Bolin Atwood*	
+/-	CAP LTER	*"Environmental Risk and Justice: Facilities 1995 with Toxic Release Inventory data in 1970 tracts" - Bolin Atwood*	
+/-	CAP LTER	*"Environmental Risk and Justice: Facilities 1995 with Toxic Release Inventory data" - Bolin Atwood*	
+/-	CAP LTER	*"Environmental Risk and Justice: Facilities 1990 locations from Toxic Release Inventory" - Bolin Atwood*	

Data Catalog Data Downloads

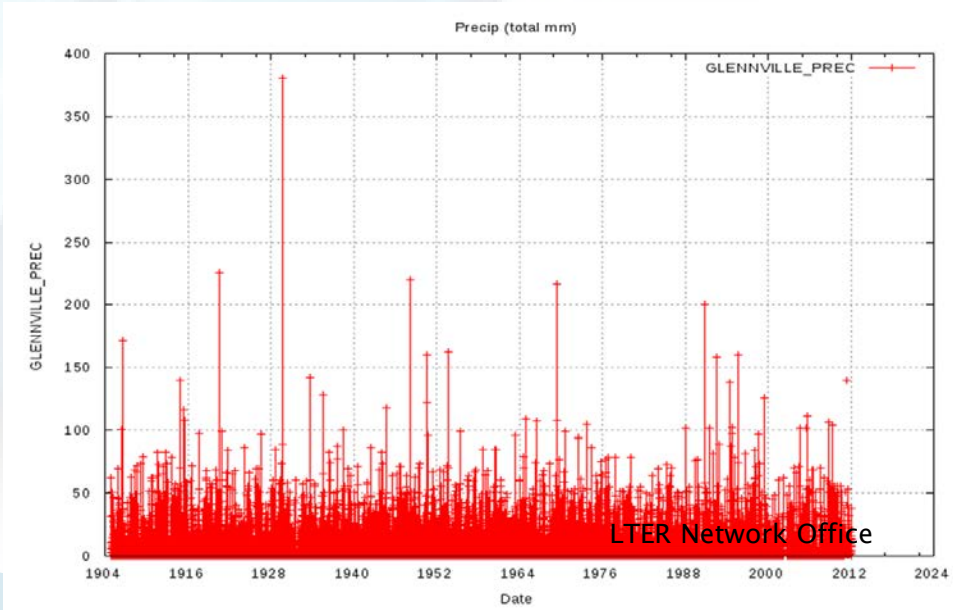


ClimDB/HydroDB

- Migration from Andrews LTER complete in 2010

- Since then we have added:
  - 104 measurement stations (385 total)
  - 185 meteorological, 200 stream gauging
  - 6 Million daily values (13.2 M total)
  - 6 LTER sites (26 total)
  - 10 USGS sites (21 total)

- 10,353 Downloads
  - Since 2003
  - 803 in 2012 so far



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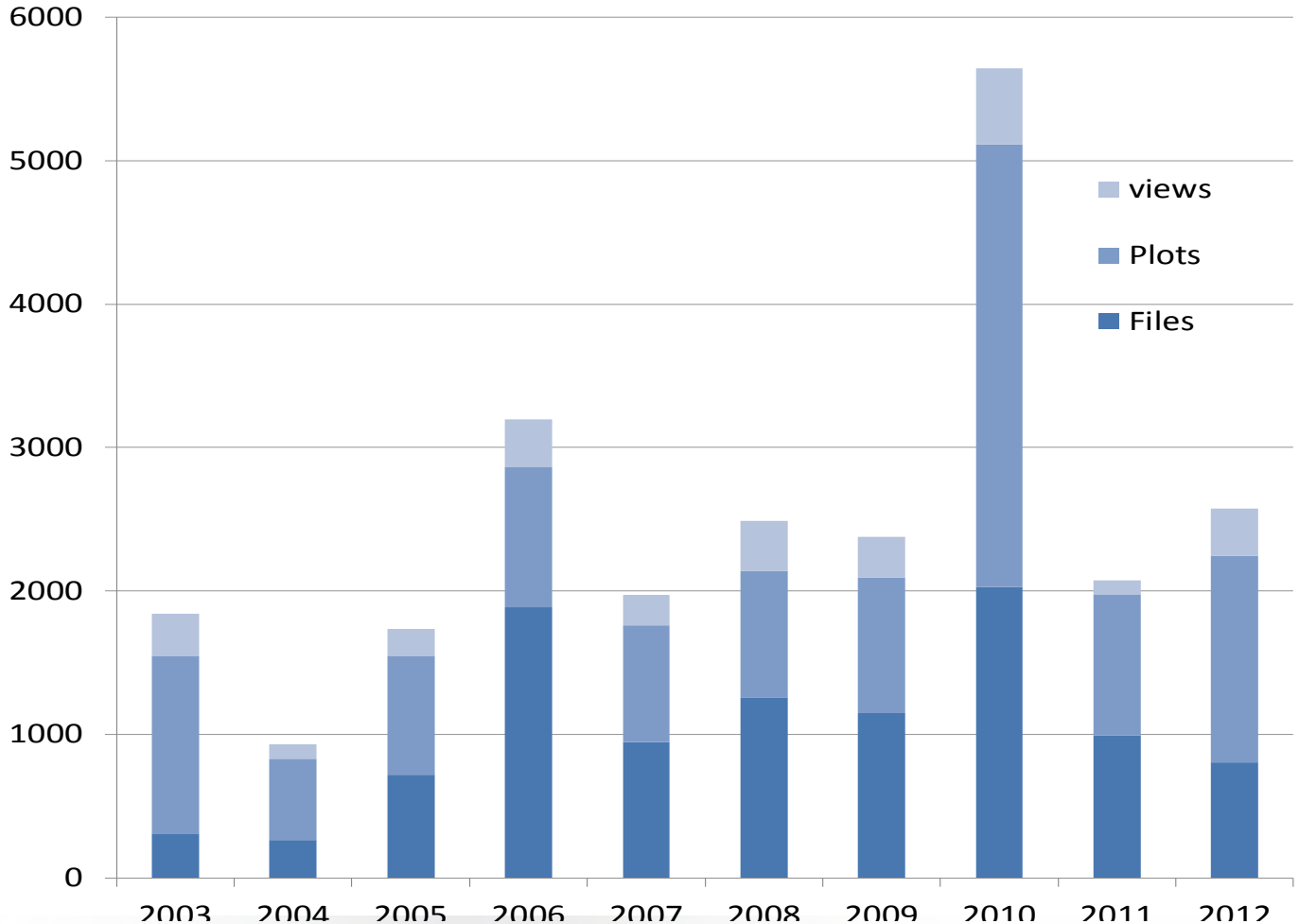

Information Management Accomplishments

- LNO actively coordinating Network information management activities among sites
- IMC product-oriented working groups are productive on Network Information System tools (e.g., data metrics, workflow practices)
- LNO actively curating Network databases (e.g., ClimDB/HydroDB, personnel, site characteristics, bibliography)
- LNO enabling adoption of community standards (e.g., EML, DOI, InCommon/CILogon)

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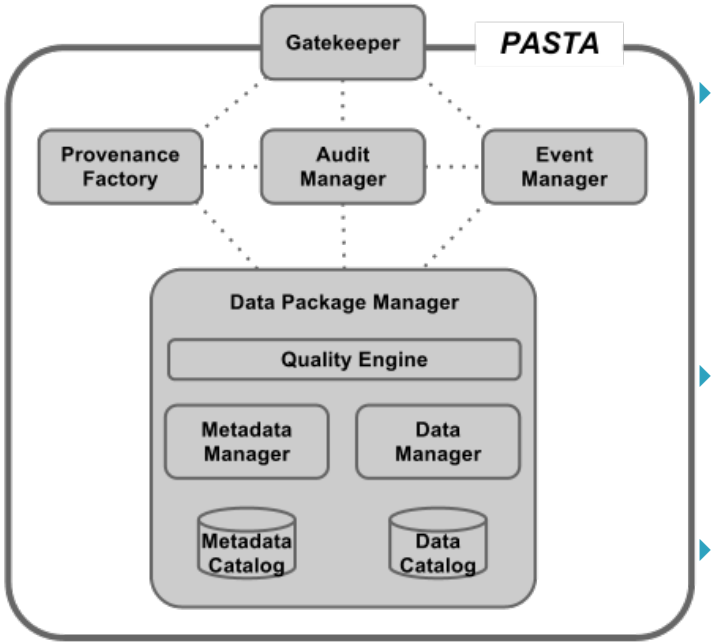
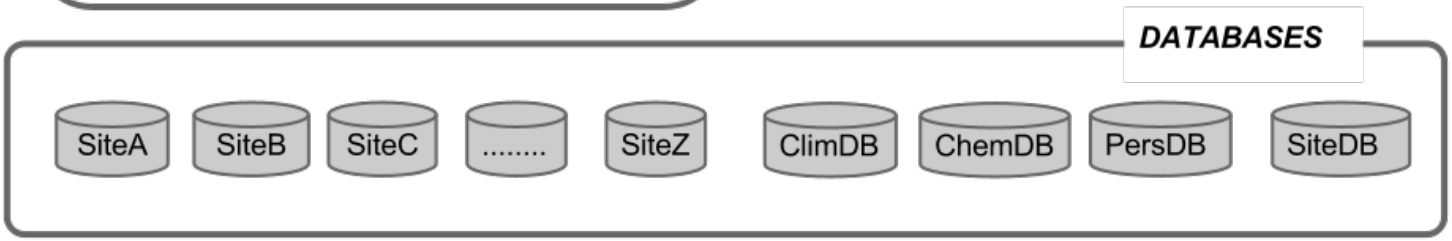
Network Information System



- The NIS includes site data, applications, synthetic and descriptive databases, workflow, end-user, system, and web-service applications
- PASTA provides consistent and stable access to data; data within PASTA adhere to known quality constraints
- Operational Plan focuses primarily on the development of PASTA



Network Information System

Goals are to increase:

- Availability and quality of data from LTER sites
  - by the use and support of standardized approaches to metadata management and access to data
- Timeliness and number of LTER derived data products
  - by creating a suite of middleware programs and workflows that make it easy to create and maintain integrated data sets derived from LTER data
- Knowledge generated from the synthesis of LTER data
  - by creating standardized access and easy to use applications to discover, access, and use LTER data

NIS Design Considerations

- NIS Strategic Plan (2005)
- LTER Cyberinfrastructure Strategic Plan (2007)
- NISAC, IMC, Working groups, EcoTrends
- Internal influences
  - Network data policies and standards
- External influences
  - Knowledge Network for Biocomplexity (1999)
    - Metacat
    - Ecological Metadata Language
  - DataONE (2010)
  - Related programs and communities

Knowledge Network for Biocomplexity, ca. 1999

- Brought ecological informatics community together (NCEAS, LTER, OBFS, PISCO, ESA)
- Furthered development of Ecological Metadata Language
- Developed Metacat metadata database
- Facilitated adoption of EML by LTER sites

Staffing

- Mark Servilla – Research Asst. Professor
  - Lead NIS developer

- Duane Costa – Analyst/Programmer III
  - Lead NIS Programmer

- Danielle Stevens – Technical Writer

- Analyst/Programmer II
  - Recent Vacancy

NIS Accomplishments

- PASTA development on schedule for beta release this fall.
- IM community actively engaged (e.g., Tiger teams spawning product-oriented working groups to continue development on workflows, data quality)
- PI community actively engaged (e.g., Tiger teams, NISAC, EB)

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Critical Elements of Managing NIS Development

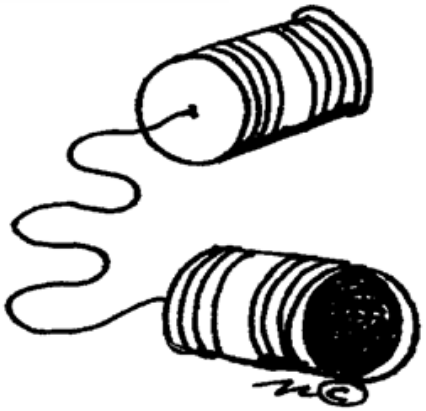
- Communication
  - internal and external
- Managing Risk
  - identifying, monitoring, mitigation, contingency
- Evaluation
  - milestones and metrics
  - progress and success

Internal Communication

- Executive Director
  - fiscal responsibility, monthly engagement, contingency and resource reallocation
- Chief Information Officer
  - project oversight, weekly engagement, architecture/policy/timeline changes
- NIS Developer
  - project management, daily engagement, fte allocation, supervisor, release schedule

External Communication (Community Engagement)

- Stakeholder Bi-directional Communication
  - Broad cross-section (information managers, scientists, graduate students)
  - Broad range of activities (Tiger Teams, RFC, working groups, focus groups, surveys)
- NISAC
  - advisory and evaluation
- LTER Executive Board
  - endorsement and evaluation
- Outreach



Monitoring and Managing Risk

- Development risks
  - Analyst/Programmer staffing
  - Software integration challenges
  - ~~Workflow product complexity~~
  - ~~Data Portal product complexity~~
- Operations risks
  - Transition to operations
  - Site metadata quality
  - Site data policy restrictions

Metrics of Progress and Success

- Iterative software process milestones
- Software release milestones
- Trailing metrics of success
- User satisfaction from surveys
- Descriptive statistics on use
- Software development metrics