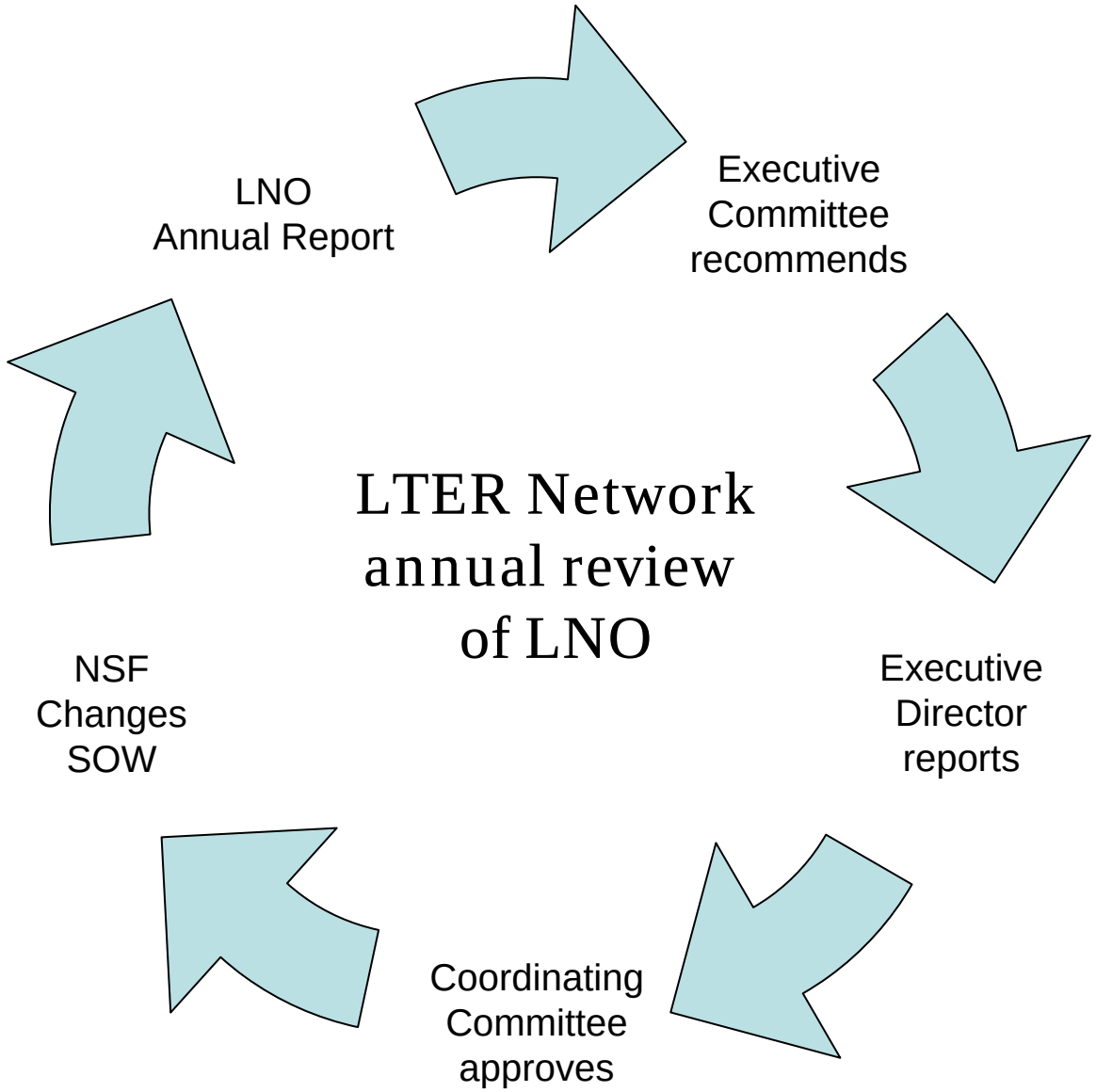
Long Term Ecological Research
Network Office

A Review of the Accomplishments of the LTER Network Office 2005-06

Steps Taken – Assessment and Evaluation



Other LNO reviews

UNM reviews

- Annual review of Executive Director
- Annual review of research faculty
- Annual review of staff
- Annual review of CREST

NSF reviews

- Mid-term reviews
- Renewal site visits
- Annual report to NSF
- Oversight by Program Officer

Independent reviews

- Annual review by the LTER National Advisory Board
- 10 Year Reviews of LTER

2005 EC Recommendations

1. Procedures for document archiving, searching, and retrieval need to be improved.
2. LNO assistance to sites, upon request, with website development should be encouraged.
3. LNO should continue to assist sites with EML implementation, to the degree possible given budget constraints.
4. As the role of LNO continues to evolve (e.g. during the planning process), LNO should routinely clarify the roles, responsibilities, and expectations of both staff and senior management.

2005 EC Recommendations

5. LNO should continue to be creative and flexible with the kinds of synthesis activities that can be funded through LNO (e.g. cross-site working group activities).
6. The LNO Director should investigate alternative funding mechanisms for support of the 2006 All Scientists Meeting, in the event that NSF supplemental support is inadequate.

High Points of Mid-Term Review

- NSF should solicit renewal proposal
- “Long and impressive list” of progress in key areas
- Develop metrics appropriate to the dual mission of serving a community while also providing leadership
- Be more proactive in developing a changing role for the LNO as LTER continues to evolve
- Develop strategies for meeting synthesis goals across a range of funding scenarios

High Points II

- Establish mechanism to assess success of small-grant synthesis efforts
- Match LNO activities and staffing to specific needs of the LTER Network to shorten the lag between development and implementation if IM technologies
- Improve communications among scientists, project and information managers, site staff and the LNO through additional meeting, workshop, or training formats
- Increase use of new training lab (ITTL) to implement recommendations from report

Proactive efforts by the LNO to increase the pace of synthesis

Increase the pace of synthesis

- Annual science themes at CC meetings
  - Climate-disturbance interactions – Chapin
  - Ecosystems in transition – Knapp/Briggs
- Multi-site syntheses and working groups
  - Five funded in 2005
- Site volumes (24 by the end of the decade)
  - Funding to assist sites with indexing and figures
- Database development
  - TRENDS book
- Support of the Network Planning effort
  - managing finance and logistics of multiple meetings
  - collaborating with the STF
  - participating in working groups (Science/Social science, Governance, Cyberinfrastructure)
  - conducting surveys and analyses of infrastructure and needs
  - providing technical support

Support

- Grow the pot
  - Triple available funds in LNO by fund-raising, re-allocation, and economies
- Use existing monies more effectively
  - Smaller awards, but more of them
- Leverage other meetings to piggyback synthesis activities
  - Add time to CC meetings for interested groups
- Continue conversations with NCEAS
- Try to score big
  - Foundations, other NSF programs, other agencies

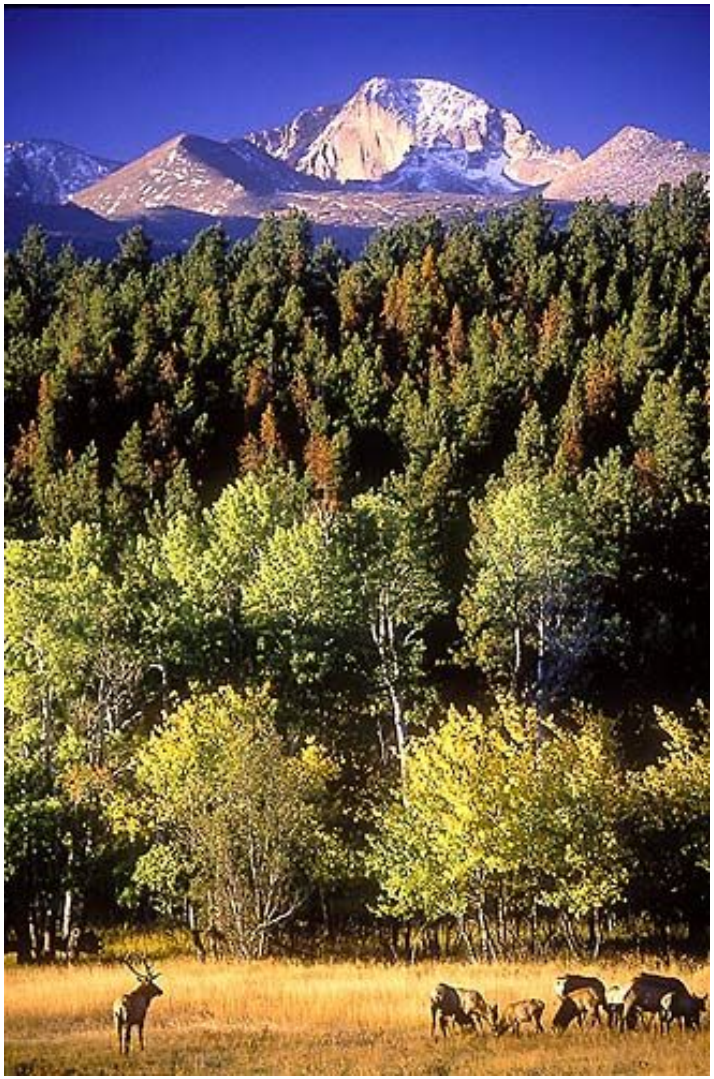
Facilitate

- Fund and implement the Polycom bridge and encourage use of technology
- Facilitate use of other interaction technologies like collaboration portals and wiki pages
- Help define and implement the steps leading to effective collaboration
- Help plan and build relevant databases
- Facilitate proposals focusing on synthesis
- Use the training lab
- Implement lessons learned at NCEAS

Enhance

- Construct and implement Plan B
  - Incremental approach to Planning Grant goals
- Encourage continued strategic planning beyond the end of the Planning Grant
- Reach out to decision makers to make Planning Grant goals achievable
- Stimulate discussions of new governance structures that put the coordinating back in the Coordinating Committee

2006 ASM



The next 25 years of LTER: Contributions to understanding ecological change

YMCA of the Rockies

Estes Park, CO

September 20-23, 2006

LTER

Progress to Date

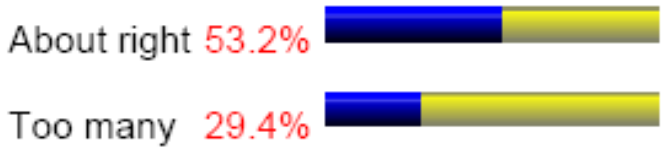
- Venue selected and reserved
- Dates agreed upon
- Program Committee and sub-committees formed and several teleconferences held
- Basic program agreed upon
- Meeting organizers contracted
- 50 workshop proposals received
- $440K in funding received or requested

ASM Program Committee

Tim Seastedt – Co-Chair
Bob Waide – Co-Chair
Tiffany Gann – Grad students
Chelsea Crenshaw – Grad students
Bill Michener - IM
Kristin Vanderbilt – IM/International
Brian Kloeppel – International

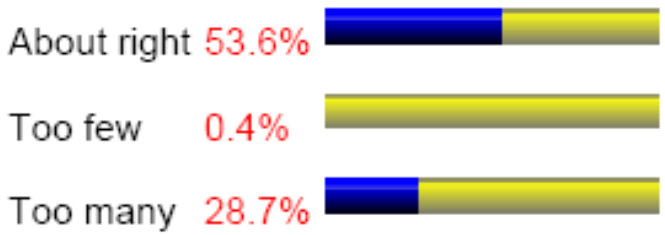
Matt Wilson – Social Science
Ali Whitmer - Education
Gene Kelly - Science
Hugh Ducklow - Science
Tim Hollibaugh - Science
Sarah Hobbie - Science
Jill Thompson - Science
John Vande Castle - LNO

21) Number of concurrent working groups



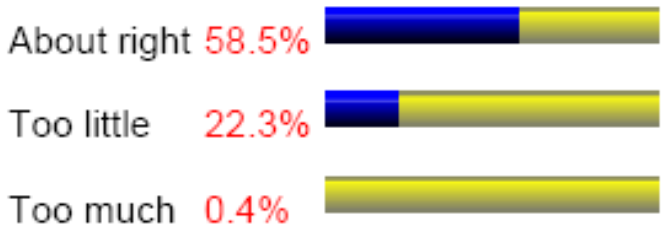
Left unanswered by 17.4% of respondents

22) Number of concurrent posters



Left unanswered by 17.4% of respondents

23) Amount of unscheduled time



Left unanswered by 18.9% of respondents

Informed by survey

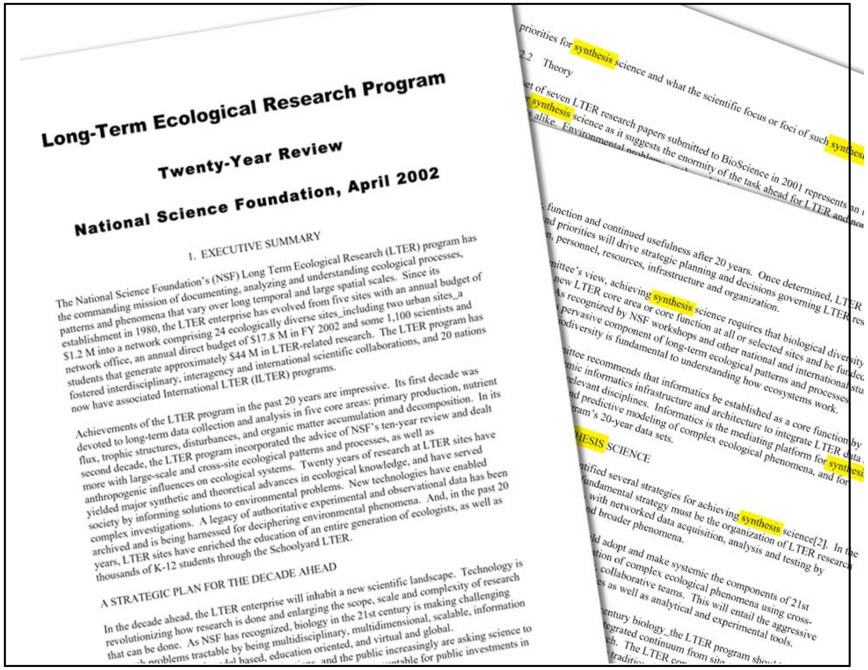
LTER

Key Points

- Full day devoted to Research Plan roll out and discussion
- Three plenaries focusing on goals set out by LTER planning activity
- Working group time flexible (1, 2, 4 hours)
- Different classes of working groups (information, product, brainstorming); 50 in total
- Site information through posters and informal lunch meetings
- Posters all day, organized by core area with additional “grand challenge” theme
- History of LTER presentation
- TRENDS book presentation
- Several business meetings including CC?

Summary

Do we need NCEAS-like Centers?



Long-Term Ecological Research Program

Twenty-Year Review

National Science Foundation, April 2002

1. EXECUTIVE SUMMARY

The National Science Foundation's (NSF) Long Term Ecological Research (LTER) program has the commanding mission of documenting, analyzing and understanding ecological processes, patterns and phenomena that vary over long temporal and large spatial scales. Since its establishment in 1980, the LTER enterprise has evolved from five sites with an annual budget of $1.2 M into a network comprising 24 ecologically diverse sites_including two urban sites_a network office, an annual direct budget of $17.8 M in FY 2002 and some 1,100 scientists and students that generate approximately $44 M in LTER-related research. The LTER program has fostered interdisciplinary, interagency and international scientific collaborations, and 20 nations now have associated International LTER (ILTER) programs.

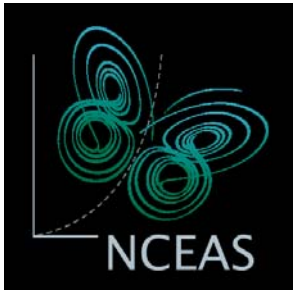
Achievements of the LTER program in the past 20 years are impressive. Its first decade was devoted to long-term data collection and analysis in five core areas: primary production, nutrient flux, trophic structures, disturbances, and organic matter accumulation and decomposition. In its second decade, the LTER program incorporated the advice of NSF's ten-year review and dealt more with large-scale and cross-site ecological patterns and processes, as well as anthropogenic influences on ecological systems. Twenty years of research at LTER sites have yielded major synthetic and theoretical advances in ecological knowledge, and have served society by informing solutions to environmental problems. New technologies have enabled complex investigations. A legacy of authoritative experimental and observational data has been archived and is being harnessed for deciphering environmental phenomena. And, in the past 20 years, LTER sites have enriched the education of an entire generation of ecologists, as well as thousands of K-12 students through the Schoolyard LTER.

A STRATEGIC PLAN FOR THE DECADE AHEAD

In the decade ahead, the LTER enterprise will inhabit a new scientific landscape. Technology is revolutionizing how research is done and enlarging the scope, scale and complexity of research that can be done. As NSF has recognized, biology in the 21st century is making challenging ... problems tractable by being multidisciplinary, multidimensional, scalable, information ... based, education oriented, and virtual and global. ... and the public increasingly are asking science to ... for public investments in

- We are entering an era of collaboration and synthesis
- Time to focus, concentrate is difficult to carve out
- Massive amounts of data will become available
- Complex knowledge required for comprehensive solutions
- Similar centers evolving
- ...NCEAS has become an important element in the intellectual infrastructure of this and allied disciplines

Why does it work ?



- Provides opportunity scientists knew they wanted/needed
- Actually encourage synthesis, analysis – “here to do this”
- Give work, not money
- Proximity of scientists – especially from many disciplines
- Intellectual ambience stimulates creativity
- Neutral, distant location
- Good people, free time – front end management
- Lowers activation energy - logistic support, comprehensive computing and analytical assistance
- Internal social control
- Serendipity

LTER

Achievements

- The LNO underwent a successful mid-term review of operations by NSF.
- The LNO managed the transition to an interim Chair of the Coordinating Committee upon the retirement of Jim Gosz.
- The LNO staff continued to develop and troubleshoot the new Ecoinformatics Training and Usability Testing Lab.
- The LNO formed and facilitated the activities of the 2006 All Scientists Meeting Program Committee.

Achievements

- John Vande Castle continued to manage the acquisition of Very High Resolution Reconnaissance Imagery, MODIS time series subsets, International Space Station photography, and the deployment of Aerosol Robotic Network (AERONET) sun photometers at LTER sites.
- William Michener, Associate Director for Development for LNO, served as co-director of the National Ecological Observatory Network (NEON) Project Office.
- LNO Senior Staff participated in the development of a $300,000 supplement proposal to the LTER planning grant to develop a strategic plan for Cyberinfrastructure to complement the Network Strategic Plan.

Achievements

- LNO staff developed a new LTER Network News Portal
- LNO staff completed major revisions of the LTER Network brochure, the LTER document archive, the LTER web page, the electronic version of the Network News, and the LTER display.
- LNO staff continued to make improvements and increased the participation in the LTER Network Metadata Catalog. This work has resulted in the registration of over 3,500 metadata documents from the LTER Network. The Metacat Harvester automatically harvests EML documents from 20 LTER Network sites.

Achievements

- Inigo San Gil produced an EML/NBII Metadata Crosswalk that greatly improves the existing metadata crosswalk between the EML and the government standard, the Biological Data Profile (BDP).
- LNO staff led the development of an EML Custom-unit Registry database. This network resource for metadata standardization contains both standard and custom scientific units defined in the Scientific, Technical, and Medical Markup Language (STMML) syntax and as required by the Ecological Metadata Language standard.
- LNO staff improved the search interface for the bibliography to include the ability to export EML for citations or groups of citations.

Achievements

- LNO staff produced a new administrative interface to the bibliography database that allows sites to upload or harvest their bibliographies to the all-site bibliography.
- LNO staff completed a major revision to the LTER Network Data Policies in collaboration with NISAC and the IM Committee.
- LNO staff developed an Advanced Query Interface to the metadata catalog that provides researchers the ability to formulate complex query strings when searching the LTER Metacat database to quickly narrow search results.

Achievements

- LNO staff greatly increased the level of metadata standardization in the network by providing direct on-site and remote assistance to individual LTER sites to transform the site's metadata to the network standard EML.
- LNO continued a major partnership with the National Biological Information Infrastructure (NBII) to develop an LTER/NBII metadata initiative and fund a new position in ecological informatics.
- LNO staff completed a successful NIS pilot study using grid technologies.
- LNO staff completed a Network Information System Strategic Plan working with the Network Information System Advisory Committee (NISAC).

LTER Network Goals

LNO Goals

	Understanding	Synthesis	Information	Legacies	Education	Outreach
Research and Education Environment	●	●			●	
Outreach to other research communities		●	●			●
Information management support and development		●	●	●		
Public outreach						●
Administrative and logistic support	●	●	●		●	●
Computational and communication infrastructure	●	●	●	●	●	●

Outreach to other research communities

- Organization of Biological Field Stations
- National Biological Information Infrastructure
- Canopy Network Database Project
- National Partnership for Advanced Computer Infrastructure (NPACI)
- National Center for Supercomputer Applications (NCSA)

Steps Taken - NIS

1. Development of Network Information System (NIS) Advisory Committee
2. Addition of NIS Lead Scientist and NIS Programmer Analyst to LNO staff
3. Completion and approval of NIS Strategic Plan
4. Budget for future NIS development
5. Inventory of cyberinfrastructure needs

Information management support and development

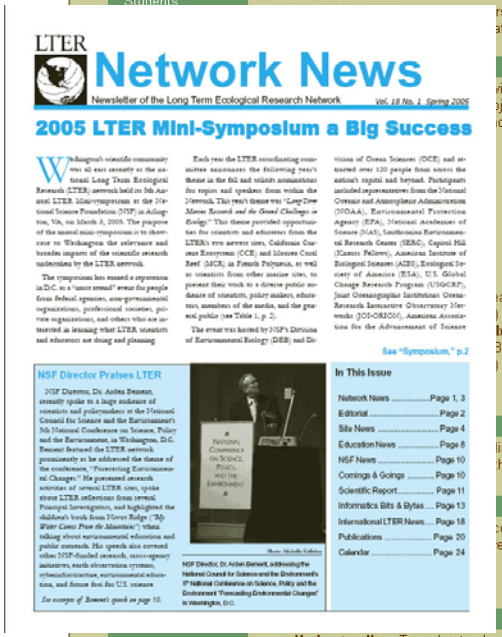
- Facilitated LTER Network Information System
- Formed Partnership for Biodiversity Informatics (PBI)
  - Knowledge Network for Biocomplexity (KNB)

  - Science Environment for Ecological Knowledge (SEEK)

LTER

Public outreach

- Revised LTER displays and brochures



Administrative and logistic support

Computational and communication infrastructure

How does LNO prioritize activities?

Background:

- Currently, LNO priorities combine core activities and discretionary goals
- In the near future, the Network Strategic Plan will exert the strongest influence on LNO priorities
- In the more distant future, other factors will influence LNO priorities:
  - Changing site needs
  - Emerging national networks such as NEON and CLEANER
  - Funding of the LTER Program
  - Potential policy changes in the Division of Environmental Biology
  - Changing National priorities
  - As yet unknown opportunities

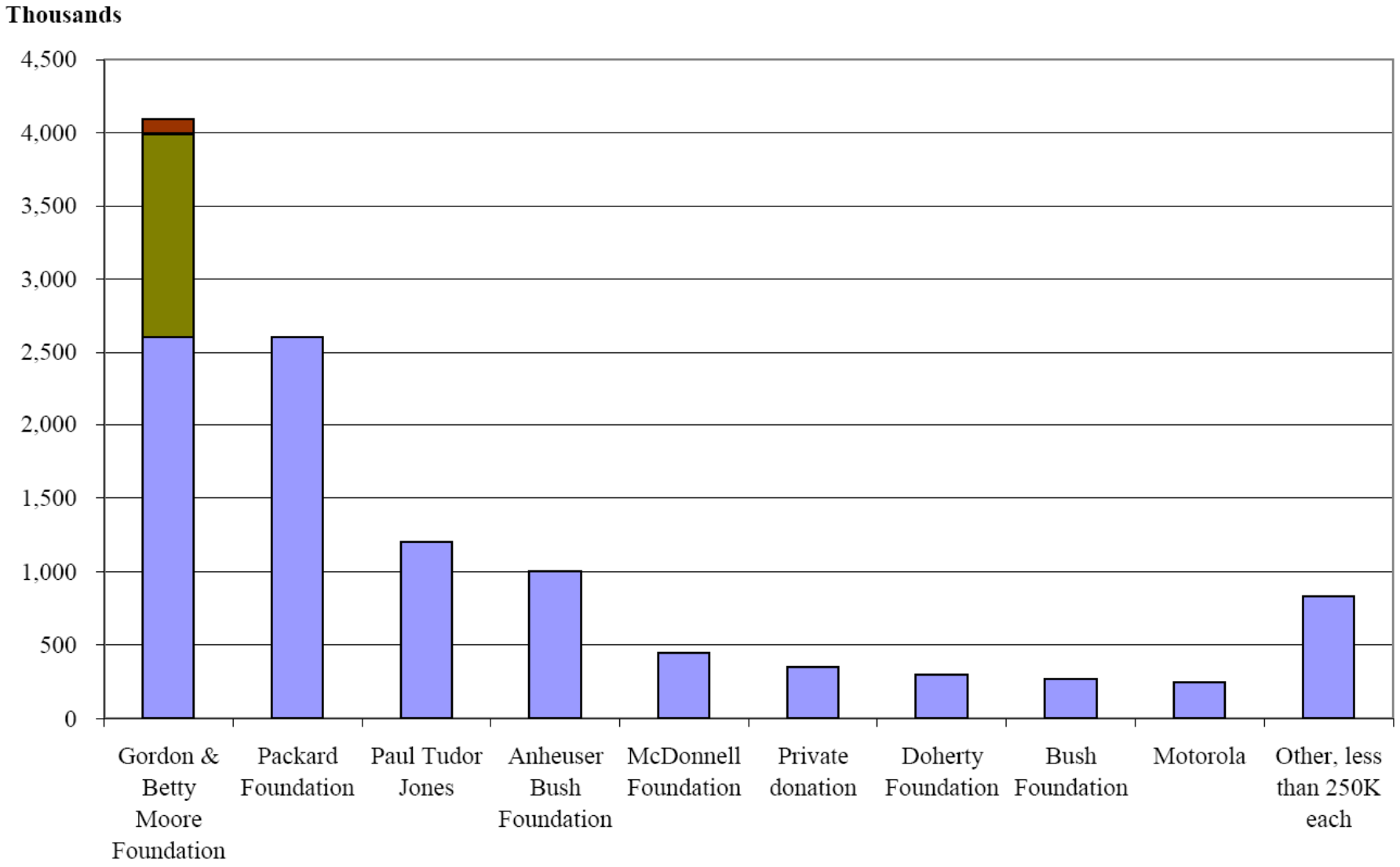
Examples of priority activities 2006-2009

- Perform core activities
- Lead development of the NIS
- Leverage developments in emerging networks
- Increase the pace of synthesis
- Develop a communication plan
- Participate in Network strategic planning

Developing Outreach 2006-2009

- Emerging National Networks
  - National Ecological Observatory Network (NEON)
  - Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI)
  - Collaborative Large-Scale Engineering Analysis Network for Environmental Research (CLEANER)
  - Integrated Ocean Observing System (IOOS)
- Internet2 Collaborative Wireless Infrastructure Initiative
  - UNM is a member of Internet2
- University of Massachusetts-Boston
  - Ecoinformatics IGERT proposal
- Earth & Sky
  - Human World radio series
- Developing relationship with the Society for the Advancement of Chicanos and Native Americans in Science

Support by Foundation



Increase the pace of synthesis

- All Scientist Meetings – every three years
- Annual science themes at CC meetings, including production of value-added databases
- Multi-site syntheses and working groups (6-8 a year)
- Site volumes (24 by the end of the decade)
- Database development and informatics – a global IT infrastructure
- Ongoing planning effort for site and cross-site synthesis