

**The NSF National Science, Technology,
Engineering, and Mathematics
Education Digital Library
(NSDL) Program**

***Consortium Projects:
At Home and Abroad***

**2002 AMIA Conference
November 23, 2002**



NSDL Programmatic History

NSDL Initially
Operational
Fall, 2002

NSDL Program
NSF, FY00 - continuing

*DLI-2 Special Emphasis
in UG Education* FY98-99

Digital Libraries Initiative - Phase 2 (DLI-2) -
NSF/DARPA/NASA/NLM/LOC/NEH with
Smithsonian, National Archives and Record
Administration (NARA), Institute for Museum
and Library Services (IMLS), FY98 - continuing

Digital Libraries Initiative (DLI) - NSF/NASA/ARPA, FY94-97

Background Reports

- *Information Technology: Its Impact on Undergraduate Education in Science, Mathematics, Engineering, and Technology* (NSF 98-82), April 18-20, 1996
- *Developing a Digital National Library for Undergraduate Science, Mathematics, Engineering, and Technology Education*, NRC workshop, August 7-8, 1997
- *Report of the SMETE Library Workshop* (NSF 99-112), July 21-23, 1998
- *Serving the Needs of Pre-College Science and Mathematics Education: Impact of a Digital National Library on Teacher Education and Practice*, NRC workshop, September 24-25, 1998
- *Digital Libraries and Education Working Meeting*, January 4-6, 1999
- *Portal to the Future: A Digital Library for Earth System Education*, workshop report, August 8-11, 1999
- *The Digital Libraries Initiative: Update and Discussion*, ASIS Bulletin, October, 1999

NSDL Vision

A Learning Environments and Resources Network for STEM Education (LEARNS)

- Designed to meet the needs of learners, in both individual and collaborative settings
- Constructed to enable dynamic use of a broad array of materials for learning, primarily in digital format
- Managed actively to promote reliable anytime - anywhere access to quality collections and services, available both within and without the network

Working Assumptions

- The WWW is the primary medium (for now)
- Content is a mix of “born digital” and analog
- There is no lack of “great piles of ‘stuff’ ”
- There is a need for “piles of great ‘stuff’ ”
- The “unit” of content can and will shrink
- Users will increasingly be creators, and vice versa
- While much of the use will be “free”, there is a need to explore multiple models of sustainability
- Experimental nature of distributed digital library building - “one library, many portals”

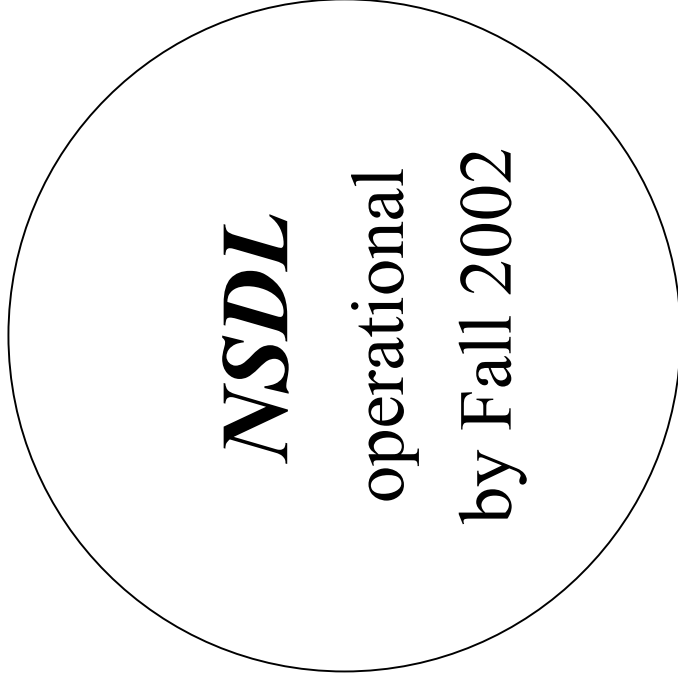
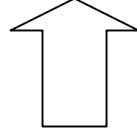
Goal

Core Integration Track
(FY00 pilots, FY01 full)

Collections Track

Services Track

Targeted Research Track



Expectations of NSDL Program Tracks

- *Core Integration*: to coordinate a distributed alliance of resource collection and service providers, and to ensure reliable and extensible access to and usability of the resulting network of learning environments and resources
- *Collections*: to aggregate and actively manage a subset of the digital library's content within a coherent theme or specialty
- *Services*: to increase the impact, reach, efficiency, and value of the digital library in its fully operational form
- *Targeted (Applied) Research*: to have immediate impact on one or more of the other three tracks

Project Characteristics

- Current content domains include: various engineering disciplines, life sciences, physics, mathematical sciences, geosciences, chemistry, materials science, anthropology, computer science, plus multiple cross-disciplinary collections
- Thematic projects growing: e.g. video collections, services for targeted audiences, etc.
- Increased involvement of professional societies
- Nascent private sector and publisher involvement
- Numerous formal collaborative projects
- 28 with explicit pre-K to 12 links, 19 with strong potential for application to the pre-K to 12 sector

New Projects of Interest

- [0226323](#), “*Viewing the Future: Aligning Internet2 Video to K-12 Curriculum*,” Marcia Mardis, Merit Network, Inc.
- [0226140](#), “*The Moving Image Gateway*,” Grace Agnew, Rutgers University New Brunswick
- [0226184](#), “*Teachers’ Domain - Physical Science and Engineering*,” Michele Korf, WGBH Educational Foundation (and FY01 project in Life Sciences)
- [0226354](#), “*Harvard-Smithsonian Digital Video Library*,” Matthew Schneps, Smithsonian Institution Astrophysical Observatory

Distributed library building

- All-Projects meetings: 9/2000 and 12/2001; next meeting is 12/2-4/2002
- Collective identity, self-organization
- Engaging new collections and services
- Evaluation pilot on-going
- IP/Sustainability workshop(s) underway
- <http://comm.nsdlib.org> - Communications Portal

Additional Information

- <http://comm.nsdlib.org> - Communications Portal - user and developer exchange and community building
- <http://www.nsdlib.org> - About NSDL

D-Lib Magazine articles:

- <http://www.dlib.org/dlib/march01/zia/03zia.html> - a look at the “big picture”
- <http://www.dlib.org/dlib/november02/zia/11zia.html>
(FY02 awards)
- <http://www.dlib.org/dlib/november01/zia/11zia.html>
(FY01 awards)
- <http://www.dlib.org/dlib/october00/zia/10zia.html>
(FY00 awards)

NSDL Program in FY03

- Proposal deadline mid-April 2003 (anticipated)
- Letters of intent mid-March 2003 (anticipated)
- Next solicitation expected: early January 2003
(refer to site below)
- *due-nsdl-program@nsf.gov* (contact point)
- <http://www.ehr.nsf.gov/EHR/DUE/programs/nsdl/>
(links to background reports and related projects)

FY00 Award Information

- 89 proposals (~ \$59M) for 84 different projects (several proposals for collaborative projects)
- 29 awards (~ \$14M)
- 6 Core Integration pilot projects, 13 projects in Collections, 9 in Services, 1 in Targeted Research
- Three NSDL projects co-funded by MPS (\$1M) and one co-funded by GEO (\$500K)
- Co-funded two international projects (NSF-DFG) in DLI-2 (\$250K)

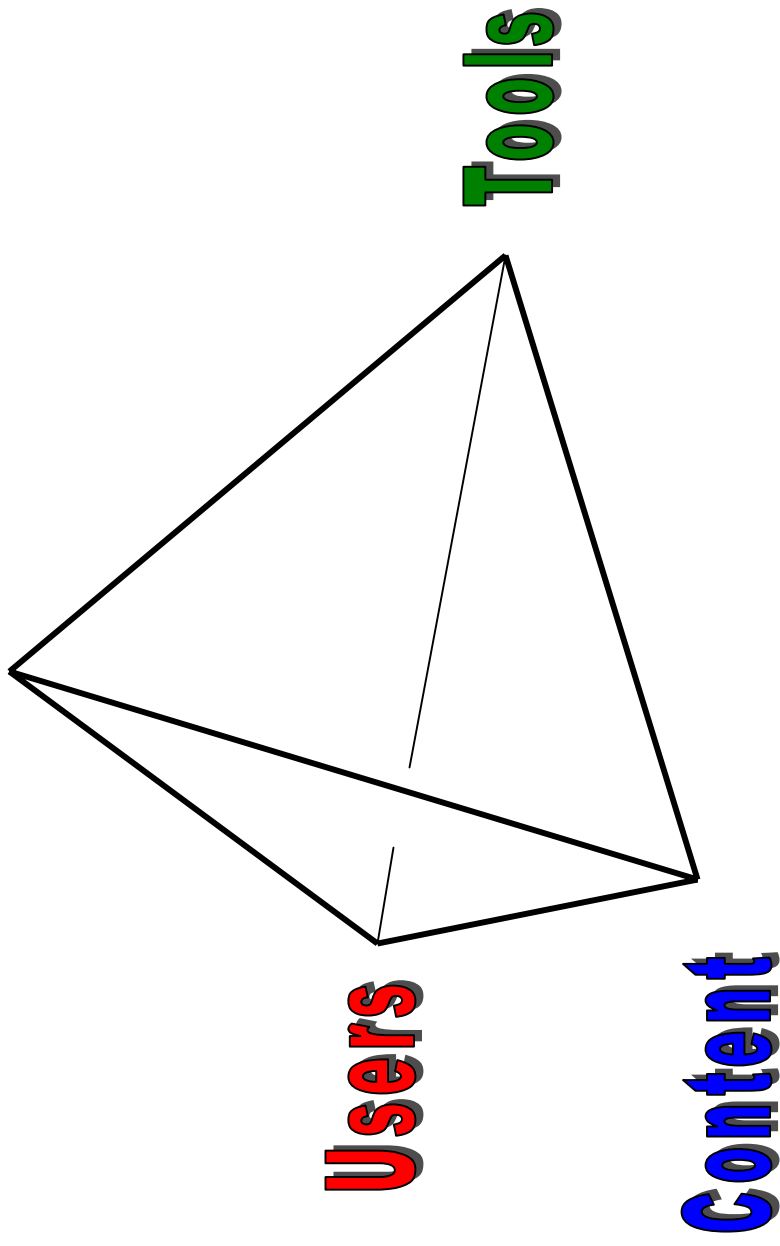
FY01 Award Information

- 109 proposals (~ \$74M) for 103 different projects (several proposals for collaborative projects)
- In Collections, Services, and Targeted Research: 104 proposals (~ \$64M) for 101 different projects - a 25% increase over FY00 in these three areas!
- 35 new projects funded (~ \$24.7M)
- 1 Core Integration, 18 in Collections, 13 in Services, 3 in Targeted Research
- Five projects co-funded by MPS (\$1M) and five co-funded by GEO (\$500K)

FY02 Award Information

- In Collections, Services, and Targeted Research: 156 proposals (~ \$92M) for 139 different projects - a 50% increase over FY01 in these three areas!
- 41 new projects funded (~ \$24.5M)
- 25 in Collections, 10 in Services, 6 in Targeted Research
- Five projects co-funded by MPS (\$1M), five co-funded by GEO (\$700K), one co-funded by BIO (\$100K)

MSDL



“The network is the library.”

NSDL Connects:

Users: students, educators, life-long learners

Content: structured learning materials; large real-time or archived datasets; audio, images, animations; primary sources; digital learning objects (e.g. applets); interactive (virtual, remote) laboratories; ...

Tools: search; refer; validate; integrate; create; customize; publish; share; notify; collaborate; ...

NSDL Supports:

Learning communities

Users

(profiles)

Application services

Tools

(protocols)

Customizable collections

Content

(metadata)

NSDL Enables:

Environments for

- Communication
- Collaboration
- Creation
- Validation
- Evaluation
- Recognition
- ...

AND

- Discovery
- Stability
- Reliability
- Reusability
- Interoperability
- Customizability
- ...

of Resources

Core Integration System

- Maintain the premier gateway to the network;
- Supplement and coordinate services developed to enable effective use of and access to the network's content;
- Provide leadership in the development of standards for including resource collections and services in the network;
- Work with resource collection providers to establish a suite of review systems for inclusion of material;
- Coordinate the formulation of requirements – in conjunction with appropriate standards organizations and/or consortia – for interoperability, reusability, reliability, and stability of resources and services;
- Seek out new resource collections to join fully, or otherwise be affiliated with, the library

Collections

- Discovery of content
- Classification and cataloguing
- Acquisition and/or linking; referencing
- Disciplinary-based themes define a natural body of content, but other possibilities are also encouraged
- Access to massive real-time or archived datasets
- Software tool suites for analysis, modeling, simulation, or visualization
- Reviewed commentary on learning materials and pedagogy

Services

- Help services, frequently asked questions, etc.
- Synchronous/asynchronous collaborative learning environments using shared resources
- Mechanisms for building personal annotated digital information spaces
- Reliability testing for applets or other digital learning objects
- Audio, image, and video search capability
- Metadata system translation
- Community feedback mechanisms

Targeted Research

- Digital library usage studies
- Building and sustaining user communities
- Automated annotation of audio, image, or video resources
- Applications of simulation or virtual world technology for virtual assistants
- User interface construction and implementation

Issues/Questions

- In what ways will this resource be of value to constituent institutions?
- In what ways can we improve the value of this resource?
- In what ways might this virtual facility become a sustainable resource?

Issues/Questions cont.

- New role for and relationship between librarians and faculty
- Implications for K-12 sector?
- Implications museums and other informal learning venues?
- Implications for graduate programs?

Issues/Questions cont.

- Role and nature of public/private partnerships
- What about non-science, mathematics, engineering, and technology domains?
- International collaborations

International dimensions

- DLI2 has begun international pgm.
- JISC/UK, DFG
- EU, Brazil, Korea, Singapore, Japan, Finland, China, ...
- I(nternational)SDL??

Issues/Questions cont.

- Intellectual property
- Federal inter-agency coordination and collaboration



e-Government Project

Governmental Affairs Committee

Senators Lieberman and Thompson

http://www.senate.gov/~gov_affairs/egov/

See entry on “Citizen Services” menu for:

Online National Library

Web-based Education Commission

<http://www.hpcnet.org/webcommission>

- Congressionally established
- Report published (late 2000)
- <http://www.webcommission.org/report>

Additional Federal Interest

- Lieberman-Burns (Senate) legislation on “E-government”
- Boehlert (House) science legislation
- Web-based Education Commission
<http://www.hpcnet.org/webcommission>, December 2000
- “Digital Libraries: Universal Access to Human Knowledge” - PITAC Report, February 2001
(<http://www.itrd.gov>)

di·gi·tal li·bra·ry

“A managed environment of multimedia materials in digital form, designed for the benefit of its user population, structured to facilitate access to its contents, and equipped with aids to navigate the global network ... with users and holdings totally distributed, but managed as a coherent whole.”

(Mel Collier, ISDL '97)