



Good Collections, Good Connections

Science, Technology, Engineering, and Mathematics
<http://nsdl.org>

Highlights: October 2011 – September 2012

Repositioning NSDL for the Next Generation of Digital Learning

This summary outlines accomplishments supported under National Science Foundation grant #114560 to UCAR/NSDL, leveraging NSDL's established technical and collaborative achievements to best position NSDL for STEM services and content delivery in today's dynamic educational market.

The work...three goals:

Transitioning Library Collections – expanding Common Core Math and English Language Arts-aligned collections; adding new collections of paradata (usage data) from NSDL providers; preparing for release of Next Generation Science Standards in March 2013; establishing collaborative structure. *Ongoing*

Transitioning Library Infrastructure – consolidating core tools, systems, and services from Cornell University to cloud-based and UCAR servers. *Completed*

Redefining NSDL Network Effects – leveraging NSDL services, innovations, and alliances for agile responsiveness to standards-based education needs; evolving digital content and services for personalized learning; developing business plans and strategies for long-term success. *Ongoing*

The highlights...

Transitioning Library Collections:

In a fast-track production period from January – September 2012, NSDL and selected provider partners enabled new standards-aligned and usage data collections contributions to NSDL.

- First steps: *Metadata frameworks, policy and guidelines* were developed, enabling collection builders to provide high-quality, well-described and contextualized resources in NSDL, including:
 - Learning Application Readiness (LAR) metadata framework finalized—allowing rigorous, education level-appropriate resource characterization
 - New NSDL Collection Policy developed
 - Rubrics developed for collection builders to guide selection and description of resources:
 - NSDL Collection Development Blueprint

- NSDL Resource Quality Checklist
- NSDL Resource Metadata Rubric (LAR)
- NSDL Annotation Rubric
- NSDL Paradata Rubric
- NSDL Weeding Plan

- Expansion of *Common Core Math (CCM)* and *English Language Arts (ELA)* aligned collection via contributions from partners:
 - **ChemEd DL** - University of Wisconsin; John Moore, PI
 - **Climate Literacy and Energy Awareness Network (CLEAN)** - TERC/University of Colorado/Carleton College; Tamara Ledley, PI
 - **ComPADRE Physics & Astronomy Digital Library**; American Association of Physics Teachers (AAPT); Bruce Mason, PI
 - **Science & Math Informal Learning Educators (SMILE) Pathway**; University of California Lawrence Hall of Science; Darrell Porcello, PI
 - **TeachEngineering**; University of Colorado; Jaquelyn Sullivan, PI
 - **Teachers' Domain/ PBS Learning Media**; WGBH/PBS; Ted Sicker, PI

Supporting services provided by:

- **Digital Library Projects/Middle School Portal**; Ohio State University; Kim Lightle, PI – standards alignment expertise for Math Common Core and ELA & Technical Subjects correlation
- **Internet Scout Projects**; University of Wisconsin; Rachael Bower, PI – overall collection assessment of gaps; collaboration on weeding process over entire NSDL collection to remove aged, inaccurate, out-of-scope, or non-working resources.

Milestones:

- Oct-Dec 2011: Project management and collaboration structure adopted, with biweekly teleconferences.
- Two partner meetings – January 2012 kickoff (adoption of *NSDL production network* concept) and July 2012 business planning meeting
- Apr 2012: LAR and ELA/Math Common Core standards metadata frameworks and interfaces completed; weeding application tool completed
- Ohio State partners create standards alignment criteria

- May 2012: NSDL Science Literacy Maps enhanced with new features: AAAS assessment links; student misconceptions; user tutorial videos
- April – Sep 2012: Content partners provide LAR-aligned and LAR-like resources (see Fig. 1); weeding of NSDL collection by Internet Scout
- Sep 2012: New features added on NSDL Search: 1) *Faceted search* - filtering by educational level, resource type, subject, audience; and 2) *Browse-by-standards* (Common Core; NSES; Geography for Life, more)

Business Planning:

- July partner meeting focus on understanding key ‘pain points’ for K20 educators, K12, and higher education; defining key NSDL services and products
- Elements of a business plan drafted for the most promising NSDL product clusters: Science Literacy Maps; Digital Library Technical Infrastructure and Curation Services; highly curated content; consultation services
- One-year timeline drafted to test markets for these concepts with prospective funders and clients with the intent of obtaining funding by Fall 2013

Transitioning Infrastructure

NSDL technical services, systems, and related content were moved from Cornell University servers to UCAR-managed cloud servers during October-December 2011.

Benefits:

- Streamlines NSDL’s technical management
- Eliminates duplication of functions
- Improves NSDL repository services
- Reduces service maintenance and personnel costs
- Consolidates and simplifies overall library management

Redefining NSDL Network Effects

Year 2 (FY2013) focus: Continuing business planning and funding opportunities furthering NSDL’s collaborative expertise, relationships, and alliances to re-frame, re-brand, and re-message NSDL for Next Generation learning:

- Reserving *STEM Exchange* as future rebranding possibility for some aspects of NSDL content and services delivery.
- Next Gen collections growth features more rigorous resource characterization via new metadata frameworks; incorporating paradata and annotations from providers; enables options for service to state and district education systems adopting Common Core and Next Generation standards.
- NSDL conducting preliminary conversations with the Gates Foundation-sponsored Shared Learning Collaborative (SLC) to explore possibilities for collaboration.

- Engaging in analysis of education-related funding opportunities from both federal agencies and private foundations

Next Gen collection building data:

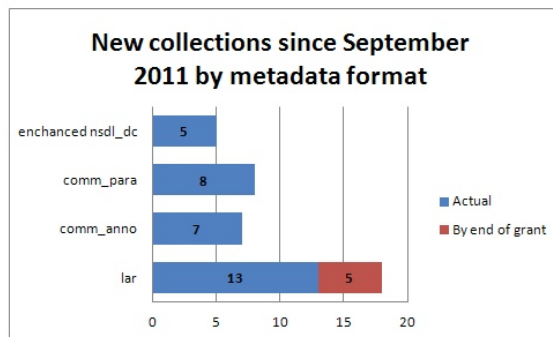


Fig. 1. Growth in number of collections in NSDL, by metadata framework. *LAR* = Learning Application Readiness metadata—high precision, most rigorous framework available for characterizing learning resources; *enhanced nsdl_dc* enables a “near-LAR” or “LAR-like” designation—uses additional optional metadata fields to improve description; *comm_para* is the paradata framework for characterizing countable integer-based user activities; *comm_anno* enables annotations to existing and new collections.

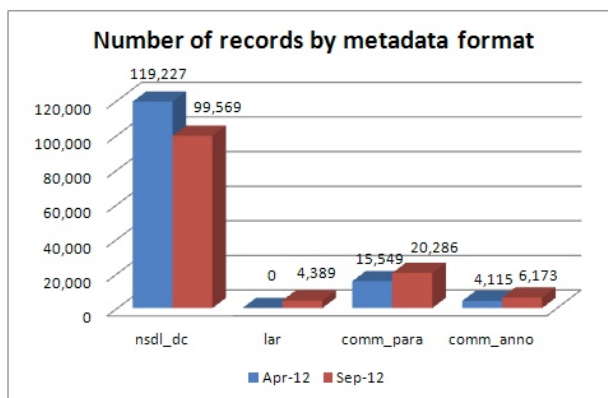


Fig. 2. Records by metadata format. Curation efforts show reduction in *nsdl_dc* metadata format records and growth in formats offering more context and precision for characterizing resources (*LAR*, *comm_para*, *comm_anno*).

Resource Quality Measures	Number of records
Monthly average of new or updated resource urls (over past three months)	1,706
Number of resources individually weeded from library during grant period	2,938
Number of resources in collections deaccessioned during grant period	19,675

Fig. 3. Jun-Jul-Aug 2012 average of curation activities—eliminating out-of-scope, inaccurate, non-functional resources (collection weeding); reduces collection quantity of resources in favor of resource quality.