Collections Assessment: What’s In NSDL???

2010 Annual Meeting
Collections Assessment: 2009 Results

- Information on library size, # of collections
- Showed impact of deaccessioning 2 million items in 4 months on search results:
  - Learning resources doubled.
  - K-12 resources tripled, general & informal doubled and undergrad rose slightly while graduate decreased threefold.
  - Number of inaccessible resources dropped and resources that just go to a metadata record decreased by half.
Guiding Questions for 2010 Assessment

- What is in the NSDL collection? Are there gaps? What is the distribution of resources?
- Which individual collections are providing which metadata information? Does this affect access and use?
- What is the nature of growth of the NSDL collection as a whole and in the individual collections?

**NSDL: Supporting Teaching & Learning**

- Which collections are ready to embed in learning applications?
Library Scope and Goals

**Library scope**: support teaching and learning of STEM concepts, and research on STEM learning

**Goal**: provide access to materials that foster demonstrable educational impact on:

- Learning called for in educational standards and initiatives
- Learning on a topic of societal importance
- Mastering of foundational STEM skills and concepts
- Understanding of linkages and interactions among or within STEM disciplines, or between STEM and other disciplines
Presentation Contents

1. NSDL Collection Policy Activity
2. Collections Assessment Process
3. **Result**: Collection Size Snapshots
4. **Result**: Metadata Field Analysis
5. **Result**: NSDL Collections for Learning Applications
NSDL Collection Policy Activity

- NSDL Collection Policy updated
- NSDL Accessioning Board (NAB) established
- NSDL Resource Quality Guidelines updated

Note: 2009 completed de-accessioning about 2.1 million items (impacts shown at 2009 meeting)
# NSDL Resource Quality Guidelines

1. The Resource is scientifically accurate
2. The origin of the resource is attributed
3. The resource is robust, functional and accessible
4. The resource has complete documentation, including:
   4.1. Reference documentation,
   4.2. Educational documentation,
   4.3. Rights and use documentation,
   4.4. Technical documentation,
   4.5. Data documentation
   4.6 Model and simulation documentation.
5. The resource is pedagogically effective
6. The resource is easy to use for educators and learners
7. The resource is free of distracting or off-topic advertising

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**NSDL Resource Quality Guidelines**

February 15, 2010

The National Science Digital Library (NSDL) has resource quality guidelines to assist in resource identification and selection, define a level of expectation/performance, and provide best practices for resource and collection development. The expectation is that NSDL resources, in keeping with their specific natures, will reflect as many as possible of the quality characteristics described below. Contributors to NSDL should consider these guidelines when initially creating resources and accessioning them into digital repositories.
Collections Assessment Process

- Examined individual metadata records to get:
  - Collection size, growth & metadata format
  - Collection use of educational metadata fields
  - Readiness to embed collection in learning app

- Analyzed educational metadata (fields in next slide)

- Combined existing NSDL vocabularies & actual metadata values to create benchmark term set for assessment/categorization.
### Metadata Info

<table>
<thead>
<tr>
<th>Metadata Info</th>
<th>Maximum # of unique terms analyzed</th>
<th>% of records with any value</th>
<th>% of records categorized &amp; not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Rights</td>
<td>36</td>
<td>9.4%</td>
<td>100%</td>
</tr>
<tr>
<td>Audience</td>
<td>157</td>
<td>41.3%</td>
<td>99.1% (562 not)</td>
</tr>
<tr>
<td>Education Level</td>
<td>82,951</td>
<td>55.7%</td>
<td>99.2% (2,798 not)</td>
</tr>
<tr>
<td>Educational Stds</td>
<td>1,078</td>
<td>3.78%</td>
<td>94.5% (304 not)</td>
</tr>
<tr>
<td>Language</td>
<td>60</td>
<td>75.4%</td>
<td>99.9% (34 not)</td>
</tr>
<tr>
<td>Mime Type</td>
<td>1,345</td>
<td>48.7%</td>
<td>94.0% (4,410 not)</td>
</tr>
<tr>
<td>Resource Type</td>
<td>565</td>
<td>78.3%</td>
<td>99.7% (397 not)</td>
</tr>
<tr>
<td>Subject</td>
<td>82,722</td>
<td>81.0%</td>
<td>91.9% (10,133 not)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>168,915</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

142,600 Records; 131,342 Resources; 121 Collections
Sample of Education Level Terms Analyzed

"11-14 year olds", "12 year old", "14-18 year olds", "18 years and older individuals", "4-6 year olds", "5-8", "6-
 class='vocabprefix'>Elementary School :&lt;span class='vocabprefix'>Elementary School &lt;/span&gt;Early Elementary", ",&lt;span class='vocabprefix'>Elementary School &lt;/span&gt;Administrators", "Adult", "Advanced placement Students", "All", "College", "College (13 - 14)", "College (15 -
 "Early Elementary", "Education and Training Resources -- Texts, Manuals, Other Media -- Automotive technology", "Elementary / Middle School", "Elementary Education", "Elementary School", "Elementary School :Early El-
College", "First-Year Undergraduate / General", "Fourth Grade", "Fourth grade", "Fourth-Year College", "Gen-
Undergraduate_Freshman Undergraduate_Sophomore Undergraduate_Junior Undergraduate_Senior", "Grad-
Undergraduate_Sophomore Undergraduate_Junior Undergraduate_Senior Technical_Education_Lower_Div-
Graduate_Professional Elementary_School_Programming Middle_School_Programming High_School_Progr-
5-8", "Grades 6-12", "Grades 6-8", "Grades 6-9", "Grades 7 - 9", "Grades 7-10", "Grades 7-9", "Grades 8-
Graduate_Professional", "Grandparents", "Higher Education", "High School", "High School (9-12)", "High Sch-
:Graduate/Professional", "Higher Education :Undergraduate (Lower Division)", "Higher Education :Under-
"Librarians", "Lifelong learners", "Middle (6-8)", "Middle School", "Middle School (6-8)", "Middle School Program-
Professionals", "Other educational professionals", "Pre-STEM educators", "Parent", "Parent/Guardian", "Para-
Development", "Professional Education", "Professional Teaching and Learning Cycle (PTLC)", "Professional-
"Technical Education (Lower Division)", "Technical Education (Upper Division)", "Technical School First Cycles-
"Undergraduate (Lower Division)", "Undergraduate (Upper Division)", "Undergraduate Students", "Undergra-
"University Second Cycle", "University instructors", "Upper Elementary", "Upper-Division Undergraduate", "Vow-
"women", "educator", "educators", "elementary", "elementary education", "gradschool", "graduate education", "I
Benchmark Term Set: Audience

- Administrator
- Educator
- General Public
- Learner
- Parent/Guardian
- Professional/Practitioner
- Researcher
Collections Assessment: 2010 Result Trends

- **Period**: Oct 1, 2009 to Sept 2010 (unless otherwise noted)

- **General results**:
  - *Educational metadata*: 25% of library collections have none but actually even more don’t have it
  - *Number of items*: grew by 10.52% (12,507 items)
  - *Number of collections & growth*: 6 deaccessioned; 9 new, 66 static, 38 growing, 8 decreasing – 121 active
  - *Learning App Ready*: several NSDL collections are ready
Collection Contributors:
Pathways: 56% of collection
Non-pathways: 44% of collection

Early 2009: 2.75% of library
Late 2009: 56% of library
Sept 2010: 56% of library

131,342 Resources in NSDL;
Grew by 12,507 resources
Pathways and Pathway Affiliates – Change from 2009

- **Items in Collection 2009**
- **Items in Collection 2010**

- AMSER: 12,000
- BEN: 13,000
- ChemDL: 6,000
- comPADRE: 7,000
- CSERD: 10,000
- DLESE: 25,000
- Engineering: 13,000
- MatDL: 25,000
- Math: 6,000
- MSP2: 7,000
- Ensemble, CLEAN, MathPath: 0
- SMILE: 0
- Teaching with Data: 0
- Teachers’ Domain: 0
- Teach the Earth: 3,000

The chart shows the change in the number of items in the collection from 2009 to 2010 for various pathways and pathway affiliates.
## Library Size

<table>
<thead>
<tr>
<th>month</th>
<th># of managed resources</th>
<th># of collections</th>
<th># of new collections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 1, 2010</td>
<td>131,342</td>
<td>121</td>
<td>3</td>
</tr>
<tr>
<td>May 1, 2010</td>
<td>125,083</td>
<td>117</td>
<td>0</td>
</tr>
<tr>
<td>Dec 1, 2009</td>
<td>120,919</td>
<td>114</td>
<td>1</td>
</tr>
<tr>
<td>Nov 1, 2009</td>
<td>115,692</td>
<td>113</td>
<td>0</td>
</tr>
<tr>
<td>Oct 1, 2009</td>
<td>118,835</td>
<td>114</td>
<td>1</td>
</tr>
<tr>
<td>Sep 1, 2009</td>
<td>153,725</td>
<td>131</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Library</th>
<th>Refocus</th>
<th>Begins With</th>
<th>Deaccessioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 1, 2009</td>
<td>1,657,659</td>
<td>160</td>
<td>2</td>
</tr>
<tr>
<td>July 1, 2009</td>
<td>2,186,256</td>
<td>170</td>
<td>2</td>
</tr>
</tbody>
</table>
Collection Longevity

NAB Affect on 2010: 8 collections reviewed, 7 accepted
Collections with the Most Page Views

Most page views based on user input at NSDL.org

Nov 1, 2009 to Sep 14, 2010

1. Internet Scout
2. AMSER
3. BEN
4. DLESE Community Collection
5. MSP2

Dup resources are tracked to each collection

Page views does not always reflect quality or usefulness of resource or metadata.
Collection Vitality: URL Link Checking

- **NSDL Collection**
  - ~17% of resources have **LOW** (6.4%) or **UNKNOWN** (10.6%) vitality, i.e. broken URLs, forbidden or other non-access errors

- **Individual Collections (121 collections)**
  - 77 collections have unknown vitality errors
  - 57 collections have low vitality errors
  - Was not able to complete intersection of these
  - In Dec 2010, this goes live to collection contacts
Education Level (55.67% of records have this data)

- Pre-Kindergarten: 0.16
- Elementary School: 11.47
- Early Elementary: 5.24
- Upper Elementary: 7.77
- Middle School: 20.01
- High School: 28.05
- Technical Education (Lower Division): 6.73
- Technical Education (Upper Division): 6.17
- Graduate/Professional: 11.45
- Informal Education: 11.30
- Vocational/Professional Development: 18.49
- Student: 7.09

September 2010
Audience: (41.34% of records have this data)

- Researcher: 3.16%
- Professional/Practitioner: 2.25%
- Parent/Guardian: 0.26%
- Learner: 35.97%
- General Public: 3.13%
- Educator: 16.34%
- Administrator: 1.13%

Audience
52 collections use this field
Records: 59,511
41.34% of records

September 2010
Subject (81.01% of records have this data)

Technology: 7.41%
Space Science: 13.34%
Social Sciences: 12.42%
Physics: 16.23%
Military Science: 1.69%
Mathematics: 25.27%
Life Science: 32.50%
History/Policy/Law: 15.62%
Geoscience: 22.82%
General: 11.32%
Engineering: 6.42%
Education: 27.79%
Ecology, Forestry and Agriculture: 11.59%
Computing and Information: 6.98%
Chemistry: 6.97%
Automotive: 0.29%
Architecture: 0.73%

Subjects: Disciplinary
117 collections use this field
Records: 125,652
81.01% of records

September 2010
Educational Standards (3.78% of records have this data)

- Math Common Core: 0.08
- New York: 0.03
- Virginia: 0.01
- NSES: 0.46
- AAAS: 0.08
- ASN: 3.11

Library %

Educational Standards
20 collections use this field
Records: 5,573
3.78% of records

September 2010
Access Rights (9.41% of records have this data)

- Free access: 7.36
- Available for purchase: 0.56
- Free access with registration: 0.45
- Available by subscription: 1.20
- Limited free access: 0.34

Access Rights
29 collections use this field
Records: 13,420
9.41% of records

Library %

September 2010
Mime Type (48.74% of record have this data)

- Video: 3.67%
- Text: 30.24%
- Image: 5.65%
- Audio: 0.71%
- Application: 19.94%

September 2010

Library %

Mime Type
91 collections use this field
Records: 73,908
48.75% of records
## Language (107,423 records have this data)

<table>
<thead>
<tr>
<th>Language</th>
<th>Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkish</td>
<td>2</td>
</tr>
<tr>
<td>Thai</td>
<td>3</td>
</tr>
<tr>
<td>Russian</td>
<td>52</td>
</tr>
<tr>
<td>Romanian</td>
<td>3</td>
</tr>
<tr>
<td>Swedish</td>
<td>14</td>
</tr>
<tr>
<td>Slovak</td>
<td>1</td>
</tr>
<tr>
<td>Spanish</td>
<td>718</td>
</tr>
<tr>
<td>Serbian</td>
<td>1</td>
</tr>
<tr>
<td>Portuguese</td>
<td>121</td>
</tr>
<tr>
<td>Polish</td>
<td>15</td>
</tr>
<tr>
<td>Norwegian</td>
<td>7</td>
</tr>
<tr>
<td>Multiple...</td>
<td>1</td>
</tr>
<tr>
<td>Malayalam</td>
<td>2</td>
</tr>
<tr>
<td>Korean</td>
<td>14</td>
</tr>
<tr>
<td>Japanese</td>
<td>85</td>
</tr>
<tr>
<td>Italian</td>
<td>149</td>
</tr>
<tr>
<td>Indonesian</td>
<td>4</td>
</tr>
<tr>
<td>Icelandic</td>
<td>1</td>
</tr>
<tr>
<td>Hungarian</td>
<td>8</td>
</tr>
<tr>
<td>Hebrew</td>
<td>1</td>
</tr>
<tr>
<td>German</td>
<td>275</td>
</tr>
<tr>
<td>French</td>
<td>577</td>
</tr>
<tr>
<td>Finnish</td>
<td>10</td>
</tr>
<tr>
<td>Estonian</td>
<td>1</td>
</tr>
<tr>
<td>Dutch</td>
<td>43</td>
</tr>
<tr>
<td>Danish</td>
<td>13</td>
</tr>
<tr>
<td>Czech</td>
<td>8</td>
</tr>
<tr>
<td>Croatian</td>
<td>4</td>
</tr>
<tr>
<td>Chinese</td>
<td>79</td>
</tr>
<tr>
<td>Catalan</td>
<td>1</td>
</tr>
<tr>
<td>Arabic</td>
<td>32</td>
</tr>
<tr>
<td>English</td>
<td>107,156</td>
</tr>
</tbody>
</table>

91 collections use this field
Records: 107,457
75.35% of records

September 2010
Collection Reports:

See the 8 variables for your own collection.

URL at end of talk
Collections for Learning Applications

K-12 & Higher Ed reports emphasize critical missing pieces for educational technologies & digital resources particularly:

- Lack of coherent integration
- Lack of platform interoperability

NSDL’s experience with learning applications (e.g. CCS) begins to address these needs
Determine Collections for Learning Apps

The Goal is to support contextualized learning experiences, allowing users to find and use or deliver just the right digital content.

- Used *Curriculum Customization Service (CCS)* as learning application. Resources could:
  - support a curriculum
  - be the curriculum
  - be for professional development

- Developed criteria to meet above goal
- Analyzed which collections met criteria
- Excluded DLESE collection in analysis since they already support CCS
Learning App Criteria – the **RESOURCES**

- **21st Century contexts**: resources advance critical thinking, problem solving, collaboration; support the interdisciplinary nature of knowledge

- **Collection relevance and quality**: content supports STEM; current, reliable and authored; sufficiently to meet needs of educators and researchers

- **Contextuality**: resources are fully described, in standard formats, and structured in such a way that users can easily draw upon and embed them

- **Accessibility**: Rights, licenses, permissions stated; and needed technical requirements are available
# Learning App Criteria – the **METADATA**

*Used to make resource criteria decisions programmatically*

<table>
<thead>
<tr>
<th>Field</th>
<th>Actual NSDL Record</th>
<th>Learning App Ready Record</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td>Rainwater Harvesting Service Learning Project</td>
<td>Rainwater Harvesting Service Learning Project</td>
</tr>
<tr>
<td><strong>Descrip</strong></td>
<td>In this service learning project, students, teachers and community members will work together to design and construct a rainwater harvesting system for their school campus. Research RWH design basics and local conditions. Explore how RWH could be used on your campus and develop a basic design. Present findings and action plan to community partners, school administration and student body. Enact the action plan to construct a RWH system on your campus and raise community awareness for water conservation.</td>
<td><em>Use the same description or here is another:</em> Students will gain an understanding of the history, benefits, and components of a rainwater harvesting system and partner with community members to design and build a rainwater harvesting system for their school. Students will learn about rainfall patterns, the relationship between catchment area and rainwater volume and water use.</td>
</tr>
<tr>
<td><strong>Res Type</strong></td>
<td>Project, Service Learning</td>
<td>Instructional Material: Project</td>
</tr>
<tr>
<td><strong>Audience</strong></td>
<td>None listed</td>
<td>Educators, Students</td>
</tr>
<tr>
<td><strong>Ed Level</strong></td>
<td>None listed but the actual resource has it on the 1st page.</td>
<td>Middle School, High School, Higher Ed, Informan</td>
</tr>
<tr>
<td><strong>Access Rts</strong></td>
<td>None listed</td>
<td>Free access</td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td>None listed</td>
<td>en-US</td>
</tr>
</tbody>
</table>
Collections Most Ready for Learning Apps

- TeachEngineering
- Math Common Core Collection
- NSDL Science Refreshers
- Harvard Smithsonian Digital Library

Also:
- TeachingWithData
- Teachers' Domain
- Compadre
- SMILE
- MSP2
Contacts

- **Katy Ginger**: NSDL Collections Manager, Technical Network Services (ginger@ucar.edu)

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Individual Collection Reports