DELOS
NETWORK OF EXCELLENCE ON DIGITAL LIBRARIES

Digital Library Evaluation

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Evaluation of Digital Libraries Outline

- What is evaluation of digital libraries?
- Different models
- Evaluation cycle
- What to evaluate?
- How to evaluate?
- Good practice

What is evaluation of digital libraries?

- Evaluation is a fact finding, evidence based value measuring, integrated in the management process of digital libraries

What is the purpose of evaluation of digital libraries?

- Accountability: evidence of resources spent
- Effectiveness: understanding basic phenomena (information seeking)
- Impact: increased learning, research, dissemination

Outcomes assessment

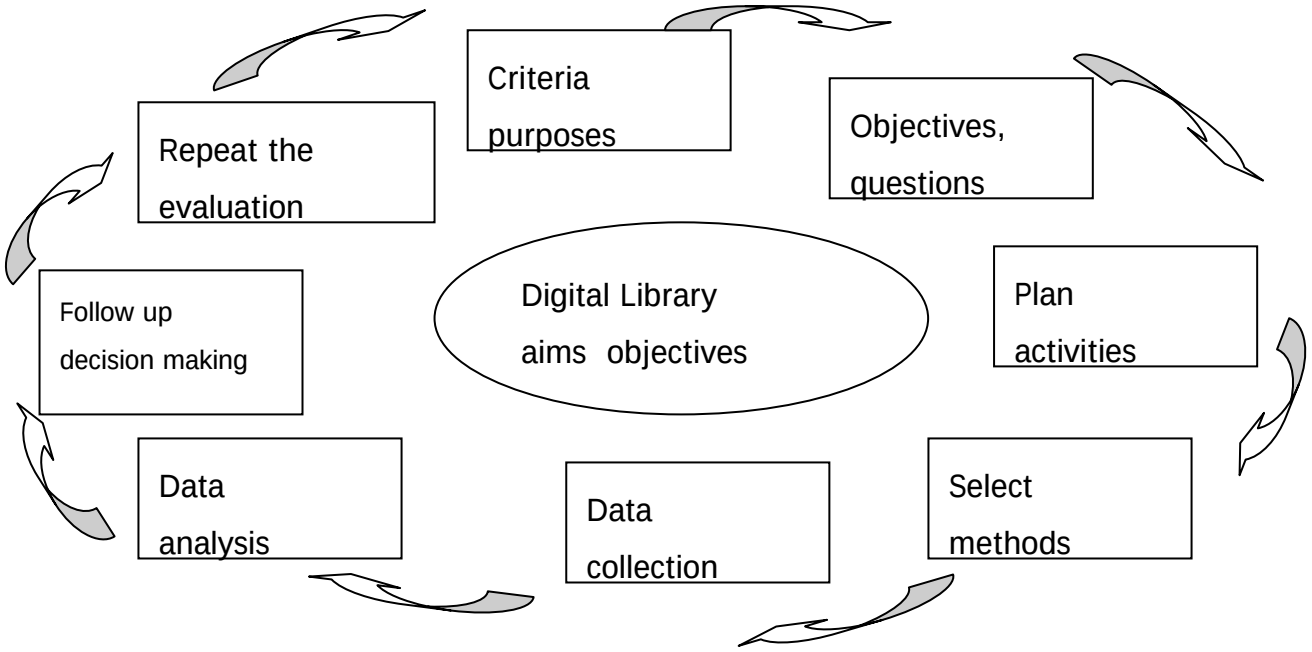
The ways in which library users are changed as a result of their contact with the library resources and programs (ARL 1998)

The ultimate question for evaluation is:

“How are digital libraries transforming research, education, learning and living?”

(Saracevic 2002, p. 368)

Evaluation planning cycle



What can be evaluated?

- Content
- Services/system
- Users and uses

Content centered evaluation

- Content quality (subject coverage, relevance)
- Content scope (what is included? online journals, ebook)
- Content organisation (bibliographic organisation, indexing)
- Effectiveness (management, user support)
- Efficiency (cost)

System centered evaluation

- Content interface (design, navigation support)
- System performance (interactivity, algorithms for searching, processing time)
- System configuration (networks, security, authentication)

User centered evaluation

- Who are they? (researchers, students, remote, etc.? What is their context?)
- How do they access the digital library? (infomation seeking behviour, usability)
- Why do they need the digital library? (activities, expectations)
- What type of resources do they need? (subject, etc.)
- What is the value of digital library? (impact, outcomes, potential for community building)

How to evaluate?

- Survey
- Focus group
- Interviews
- Transaction logs
- Observation
- Ethnographic evaluation
- Usability
- Combined methods
- Longitudinal studies
- Crosscultural assessment
- Benchmarking

International collaboration on evaluation of digital libraries

- Standard approach
  - COUNTER, SUSHI (NISO standard usage statistics harvesting initiative)
- No benchmarking or longitudinal studies (for the rate of change)

Good practice

- DigiQual
  - http://www.digiqual.org/
- PEAK
  - http://www.dlib.org/dlib/june99/06bonn.html
- E-valued
  - http://www.evalued.uce.ac.uk

Further readings

- Tefko Saracevic, Kantor, P. (1997). Studying the value of library and information services. I. Establishing a theoretical framework. II. Methodology and Taxonomy. *Journal of the American Society for Information Science, 48* (6), 527-542, 543-563.
- Tefko Saracevic, 2000. "Digital library evaluation: Toward an evolution of concepts," *Library Trends,* volume 49, number 2 (Fall), pp. 350–369
- Marchionini, G.; Plaisant, C.; & Komlodi, A. (199...) The people in digital libraries: Multifaceted approaches to assessing needs and impact. Chapter in Bishop, A. Buttenfield, B. & VanHouse, N. (Eds.) *Digital library use: Social practice in design and evaluation.* MIT Press. (http://ils.unc.edu/~march/revision.pdf)

To further complicate things….

- Paolo Galluzzi
  - Contextualized information
  - Community of contributors
  - Responsibility for stewardship
- Vittore Casarosa
  - Framework for DL
- Kaye Howe
  - Educational impact and DLs as cognitive tools
- Pat Dixon
  - Project management

To further complicate things…

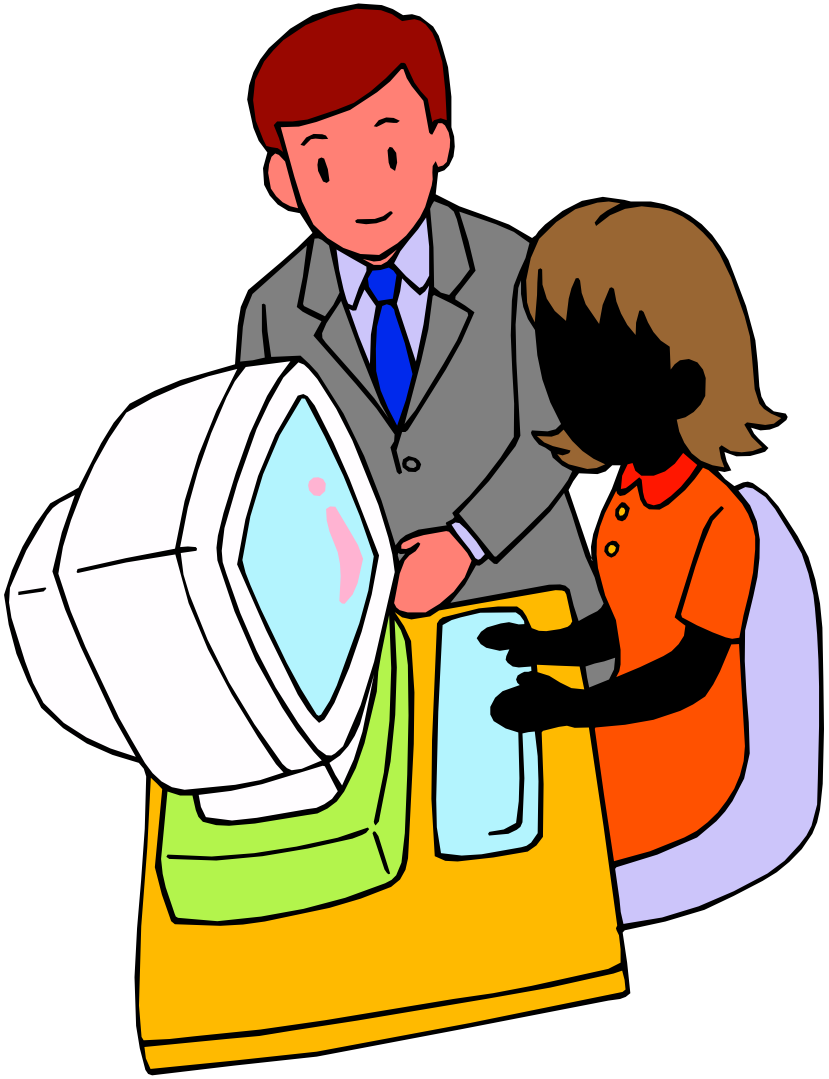
- Dean Krafft, Donna Castelli, David Millman
  - Technical approaches
- Paul Weston
  - Metadata practices
- Sandy Payette
  - Architecture to support evolving user needs
- John Akeroyd
  - e-Learning

Practical strategies (and pitfalls)

- Keep description as a primary goal
- Embrace complexity; resist the temptation to oversimplify
- Render judgment carefully
  - description preserves complexity
  - judgment forces decisions of acceptance or rejection
  - (e.g.,ACTLS, Apple)

4 Major Questions for Evaluation

- What actually occurred?
- How can it be improved?
- Did it accomplish the objectives?
- What impact did it have?



Four Facets of Evaluation Model

- What actually occurred? → Documentation Evaluation
- How can it be improved? → Formative Evaluation
- Did it accomplish its objectives? → Effectiveness Evaluation
- What impact did it have? → Impact Evaluation

Practical strategies (and pitfalls)

- Understand the impact of multiple publics
  - Evaluating is essentially a political activity
    - www.globalwarming.org

Bad News

There is no single, easy to administer, inexpensive, reliable, and valid approach to evaluating interactive learning from DLs.

Good News

There are practical strategies for documenting the development and use of interactive learning, improving it, and building a case for its effectiveness and impact.

And finally…

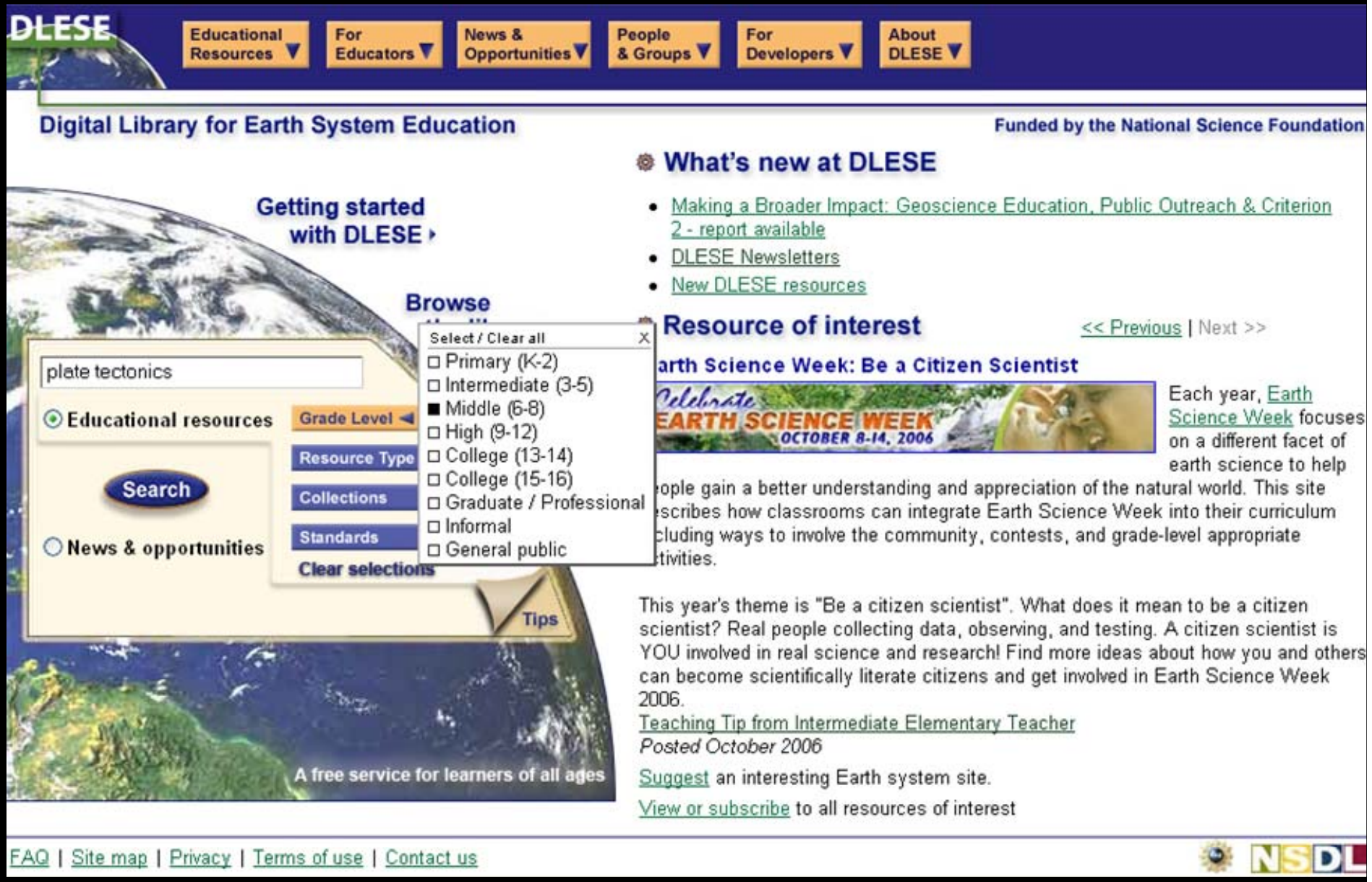
- Evaluation doesn't "prove" anything!
  - People, not data, make decisions
    - evidence is the source of deliberation, but ultimately, you are responsible for the impact of your decisions

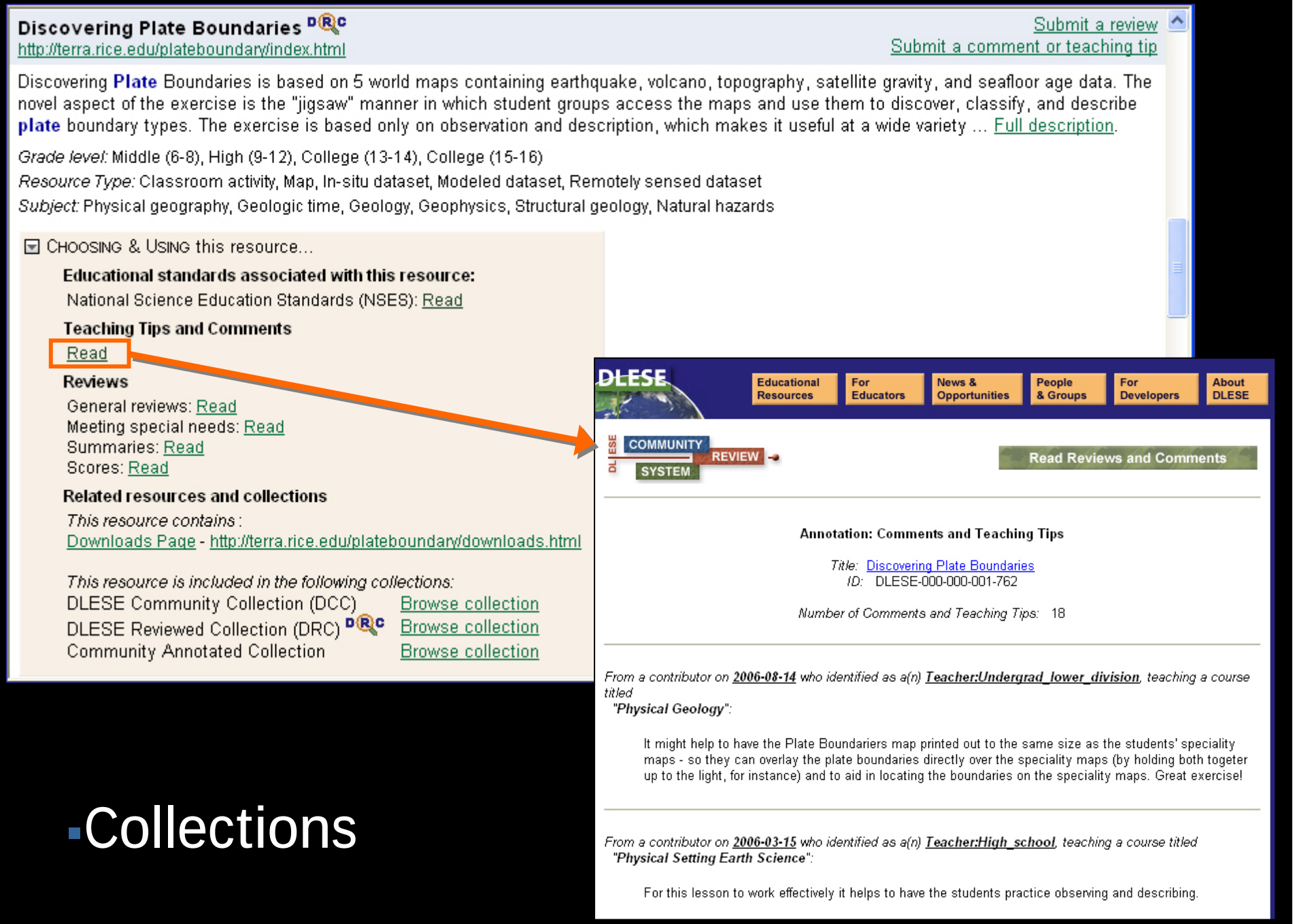
DLESE as a case study

- Ongoing evaluation over 7 year period
  - User-centered design process
  - Collections
  - Operations
  - Users
  - Community Input
  - Contextualization Services

www.dlese.org

User-Centered Design





- Collections

DLESE

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Home
New to DLESE?

Find a Resource

plate tectonics

Resources News Search

Grade Level | Resource Type | Collections | Standards | Clear selections

Tips

Your selections: Grades: 6-8

Have a second? Please tell us why you're here today

Educational resources > Find a resource

Results 1 - 10 of 327 for 'plate tectonics'

1 2 3 4 5 >>

Plate Tectonics

Submit a comment or teaching tip

http://volcano.und.nodak.edu/vwdocs/vwlessons/plate_tectonics/introduction.html

This lesson about the theory of **plate tectonics** begins with a description of the chemical and physical layers of the Earth featuring text and scientific illustrations. It then discusses the historical development of the **plate** tectonic theory, and concludes with descriptions of the locations and types of **plate** boundaries. Students will learn the three layers of the Earth, observations that support ... Full description.

Grade level: Middle (6-8), High (9-12)

Resource Type: Tutorial, Illustration - scientific

Subject: Geology, Geophysics

CHOOSING & USING this resource...

Plate Tectonics

Submit a comment or teaching tip

http://zebu.uoregon.edu/1996/ph123/l13a.html

This site provides an introduction to **plate tectonics** using color maps and text descriptions. Links are also provided for maps of recent earthquakes in the western United States, the world and in the Los Angeles area. Full description.

Grade level: Middle (6-8), High (9-12)

Resource Type: Tutorial, Imagery - remotely sensed, Map

Subject: Geology, Geophysics

CHOOSING & USING this resource...

Plate Tectonics: A Continuous Process

Submit a comment or teaching tip

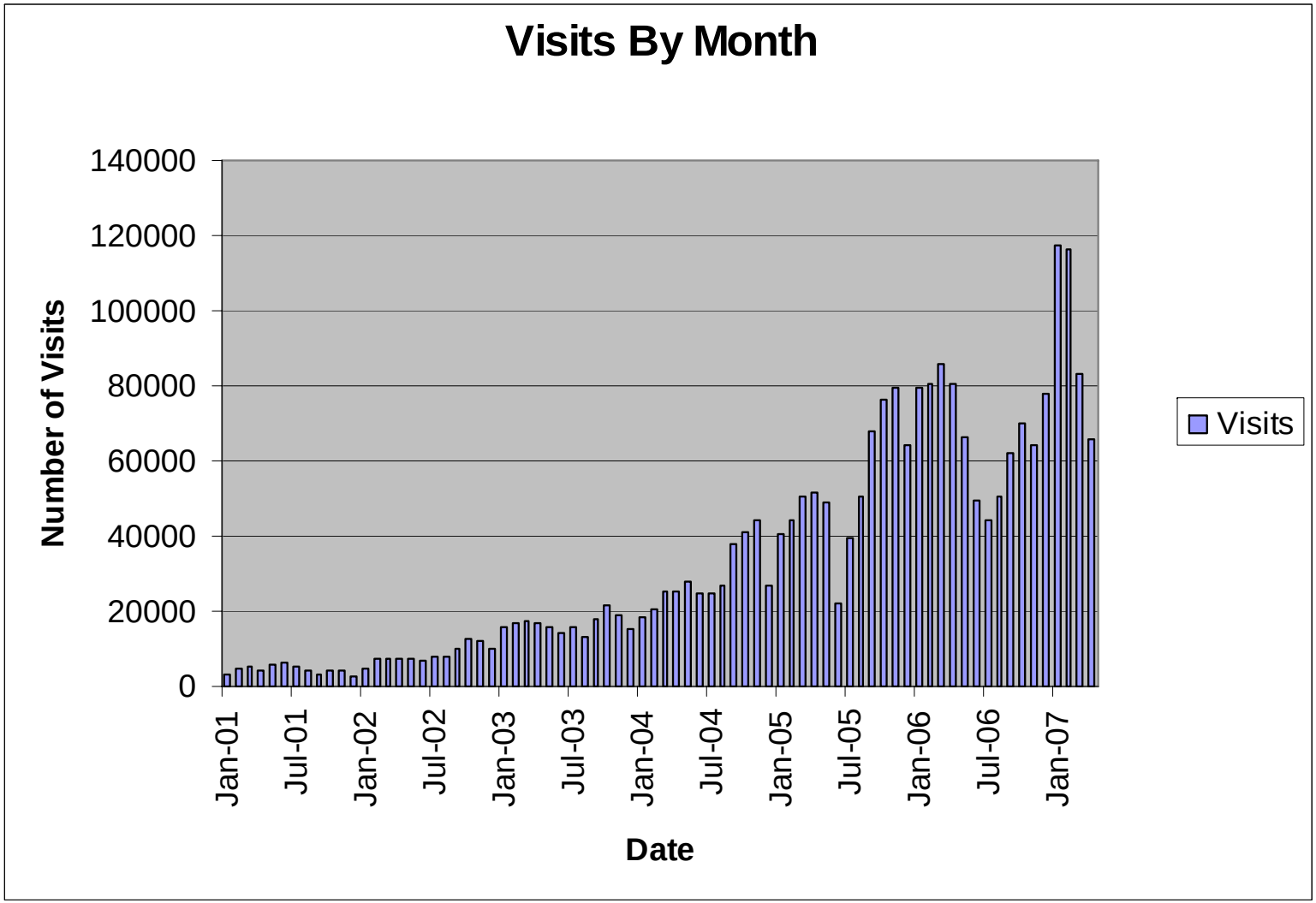
http://library.thinkquest.org/17701/high/tectonics/

This page provides an introduction to **plate tectonics** for secondary students. Topics include **plate** motions, the layers of the Earth and oceanic versus continental plates. A set of links provides access to material on the processes of **plate tectonics** occuring at **plate** boundaries, zones of movement and instability. Full description

Operations

- Ongoing
  - Documentation of technical components and maintenance processes
  - Link checking
  - Metrics collection (quality of service and usage)
    - 99.6% uptime over 9 months (24 hours 43 minutes downtime)
    - Prior to reduction in staff: 99.9% over 12 month period

Users: Metrics



Users: ongoing studies

- Usability studies
- Task-orientated studies
  - Google users unable to complete any task in allotted time; DLESE users completed all tasks, even novices
- Pop-up survey
  - 98% express satisfaction
  - (what about users who don't bother to respond?)
- Support @ dlese
  - Addresses common questions and concerns

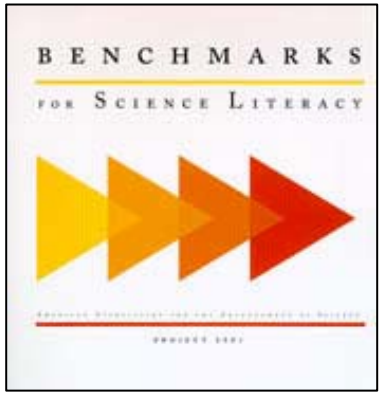
Community Input

- Resources contributed
  - 12% of total collection (14,000) comprised of individual resources contributed by community
  - 88% of collection contributed by primarily NSF-funded grants
- Annotations and reviews contributed
  - 5000

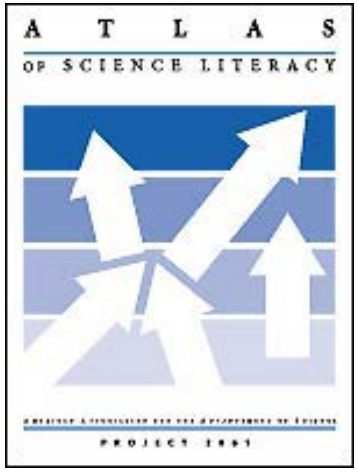
Contextualization Services:

AAAS Benchmarks and Strand Maps

- **Benchmarks**: Describe what learners should know, or be able to do, at key stages in their education across the STEM disciplines



- **Strand maps**: Node-link diagrams illustrating how student understanding changes over time



What is a Benchmark?

3-5

When warmer things are put with cooler ones, the warm ones lose heat and the cool ones gain it until they are all the same temperature.

K-2

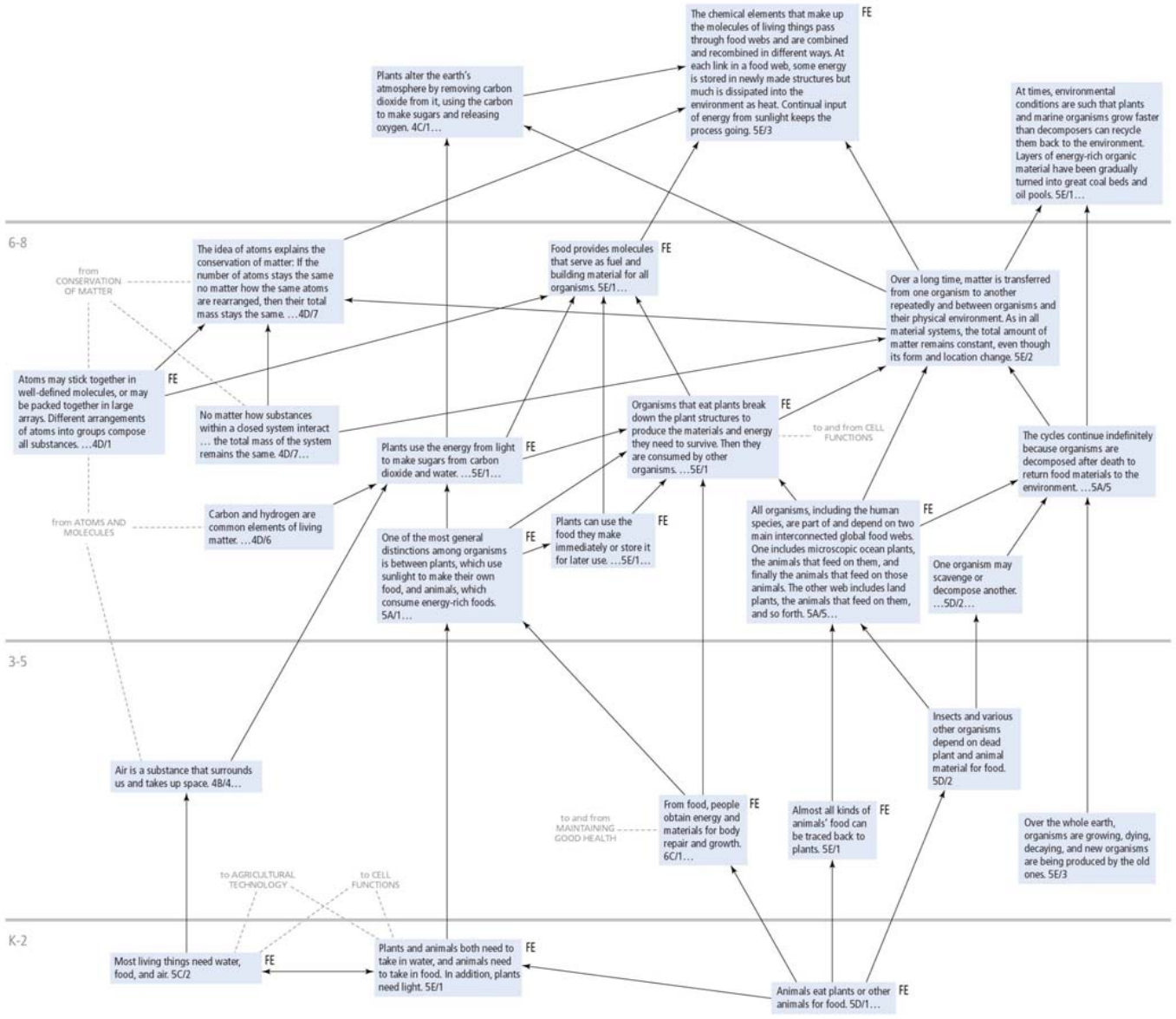
The sun warms the air, land and water.

Research on the cognitive and scientific basis

Research on student (mis-)conceptions

Strategies to check student understanding

Assessment activities



matter cycle *food web* *plants making food*

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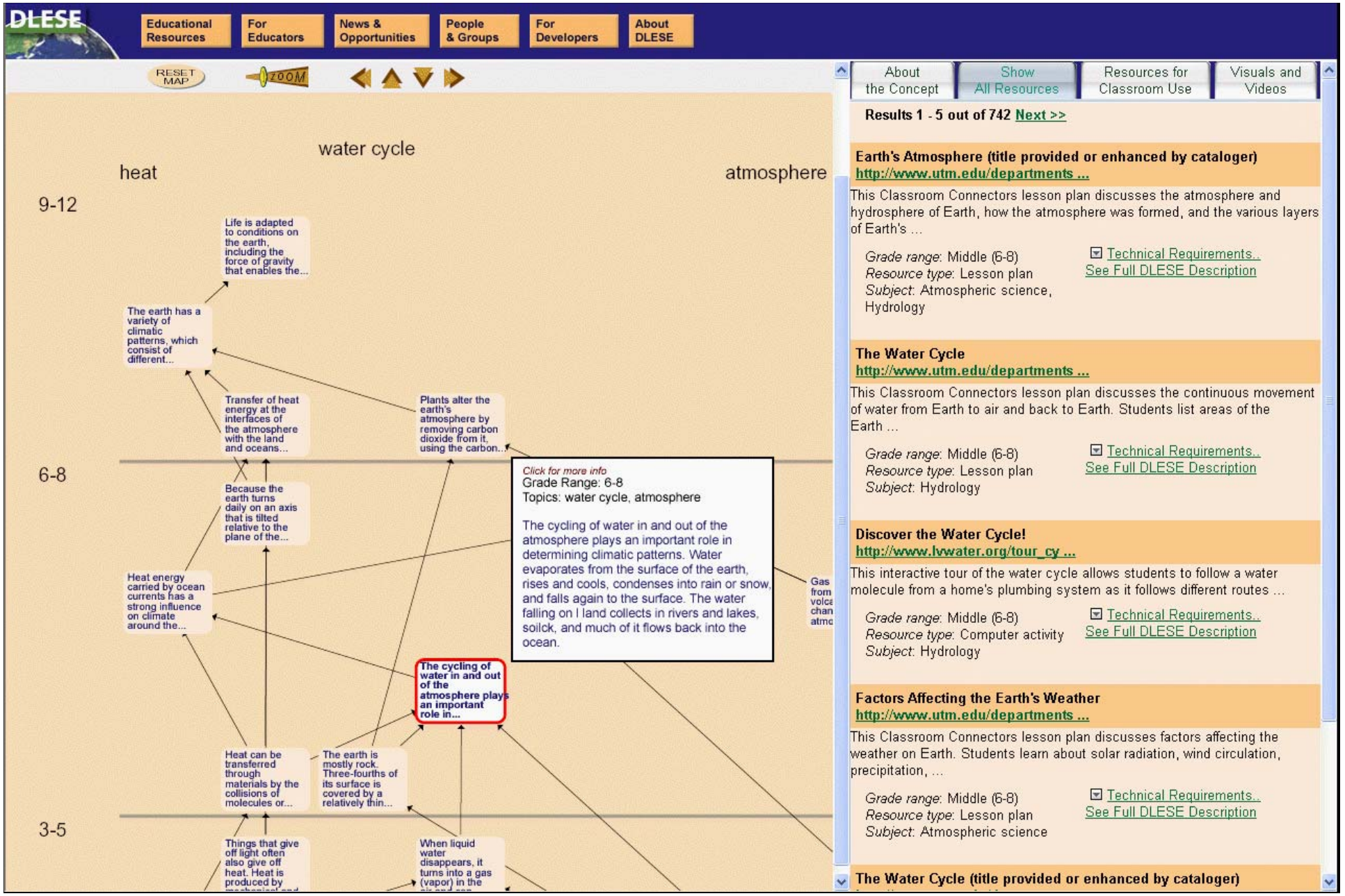
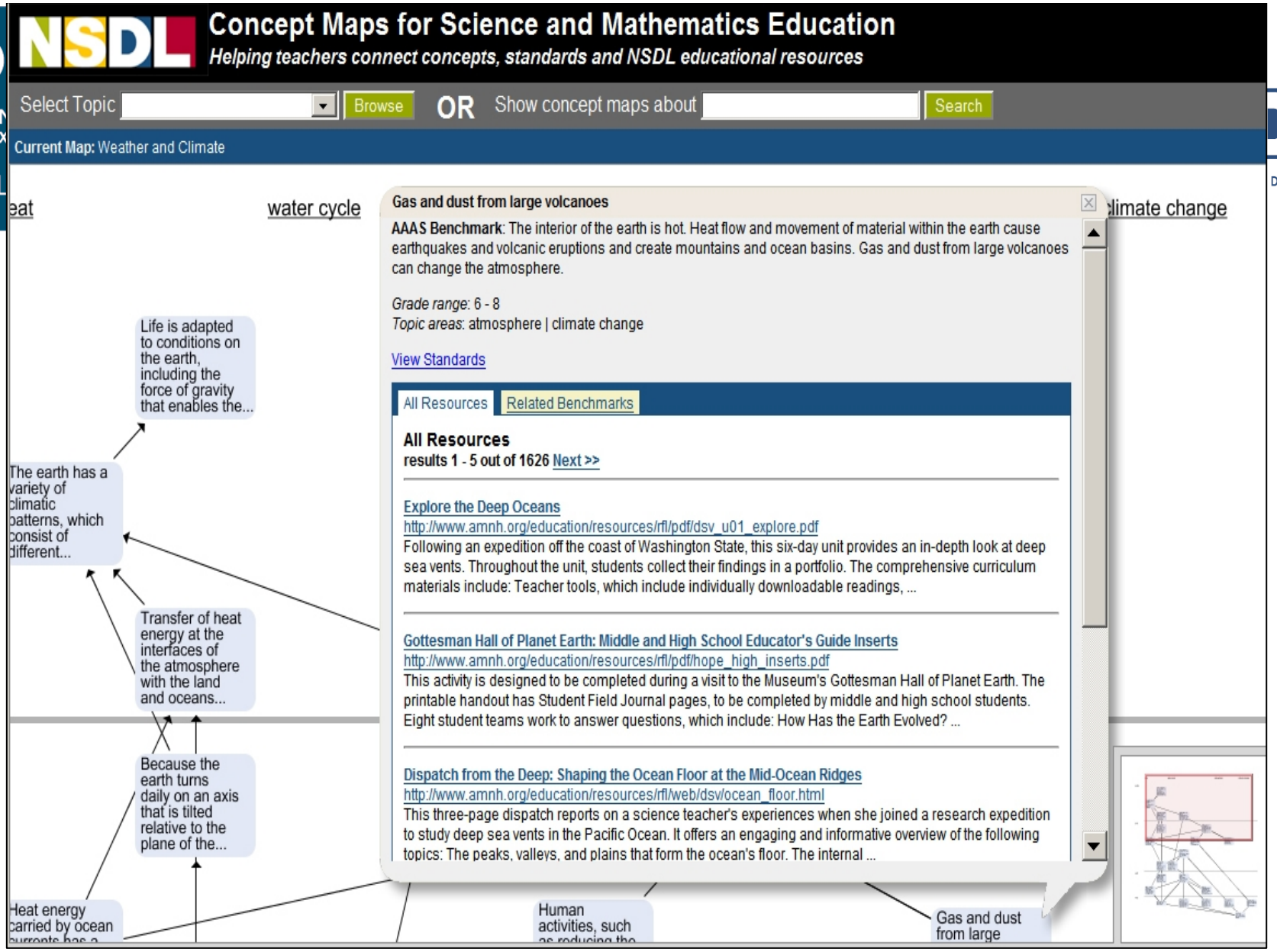
Flow of Matter in Ecosystems Map



Strand Map Service in DLESE



Strand Map Service in NSDL.org

Outcomes of this Service Effort

- Evaluation results – *a useful cognitive tool*
  - Controlled study examined influence of interface on cognitive processes of undergraduates
  - Compared visual interface and keyword-based interface
  - Students focused on science content, twice as much using visual interface, as opposed to query construction and surface features

Butcher, K, S. Bhushan, and T. Sumner (2006). "Multimedia displays for conceptual search processes: Information seeking with strand maps." ACM Multimedia Systems Journal (Special issue on Multimedia in Education and eLearning), Vol. 11, No. 3, 236-248

NSDL Strand Map Service

- Supports internationally-recognized science learning goals
  - Based on the *Benchmarks for Science Literacy* and *Atlas of Science Literacy* published by Project 2061 at the American Association for the Advancement of Science
- Enables teachers and learners to
  - Visualize and explore interconnected learning goals on important science topics
  - Locate online teaching and learning resources that support specific learning goals or science standards

What's Been Our Impact?

- We save teachers and learners time
- We provide a trusted source
- We remove barriers of physical and social isolation
- We support the development of new technical skills and scientific knowledge

What's Been Our Impact?

- Teachers tell us that:
  - Lesson plans are richer because of information from the Internet and experiences of other teachers
  - Students are more engaged in learning
  - They are better able to meet the varying needs of their students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Questions?


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Content


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Contextualization

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DLESE Teaching Boxes

- Evidence for Plate Tectonics
- Essentials of Weather
- Feeding Frenzy: Seasonal Upwelling
- Global Ups and Downs: Changing Sea Level
- Living in Earthquake Country
- Mountain Building

What are Teaching Boxes?

Teaching boxes are classroom-ready instructional units created by collaboration between teachers, scientists, and designers. Each box helps to bridge the gap between educational resources and how to implement them in the classroom. The Teaching Boxes contain materials that model scientific inquiry, allowing teachers to build classroom experiences around data collection and analysis from multiple lines of evidence, and engaging students in the process of science. - focusing on gathering and analyzing scientific evidence. All educators may use DLESE Teaching Boxes free of charge.

http://www.teachingboxes.org/

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DLESE Teaching Boxes

HOME

Overview: About this teaching box

Print...

This Teaching Box is an online assembly of interrelated learning concepts that focuses on finding the evidence for plate tectonics using digital resources, education standards, and comprehensive lesson plans . It is meant to provide an inquiry-based exploration of each of three lines of evidence:

- **Fossil distribution**
- **Locations, depths, and types of earthquakes**
- **Locations and types of volcanoes**

For each line of evidence there is a map showing supporting concepts and their associated standards, pre-conceptions, lessons organized into teachable units, and a section describing the resources used in the box for ready reference.

An **introductory activity** is designed to engage the students and to provide a segue into the theory first proposed by Alfred Wegener.

At the end of this unit on Exploring the Evidence for Plate Tectonics, students will have constructed an understanding of the three lines of evidence. An optional **culminating activity**, In Support of Wegener, is included that can be used to assess this understanding.

As an understanding of latitude and longitude is essential for several of the activities, an optional teaching unit on this topic is also included.

Goals of the teaching box: These activities are presented in a way as to emphasize the process of science – how evidence is gathered and hypotheses are tested. Guided inquiry has been used throughout, and where possible, we have tried to replicate the discoveries of science that have led to our understanding of plate tectonics. Taken as a whole, the activities within the teaching box demonstrate the inter-relatedness of Earth's processes and the lines of evidence, thus reinforcing the overarching concept: **the Earth is a system**.

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DLESE Teaching Boxes

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Overview: Concepts and standards for this box as a whole

Print...

Multiple lines of evidence support the theory of plate tectonics.

1.  The distribution of fossils provide evidence for plate tectonics.
2.  The location, depth, and type of earthquake provide evidence for plate tectonics.
3.  The location and types of volcanoes provide evidence for plate tectonics.

California State standards:

6th grade Earth Science: 1a, 1c, 1d, 1e Investigation and Experimentation: 7a,b,d,e,f,g

National Science Standards:

Lithospheric plates on the scales of continents and oceans constantly move at rates of centimeters per year in response to movements in the mantle. Major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions. Fossils provide important evidence of how life and environmental conditions have changed. Scientists formulate and test their explanations of nature using observation, experiments, and theoretical and mathematical models. Although all scientific ideas are tentative and subject to change and improvement in principle, for most major ideas in science, there is much experimental and observational confirmation. These ideas are not likely to change greatly in the future. Scientists often change their ideas about nature when they encounter new experimental evidence that contradicts existing explanations.

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DLESE Teaching Boxes

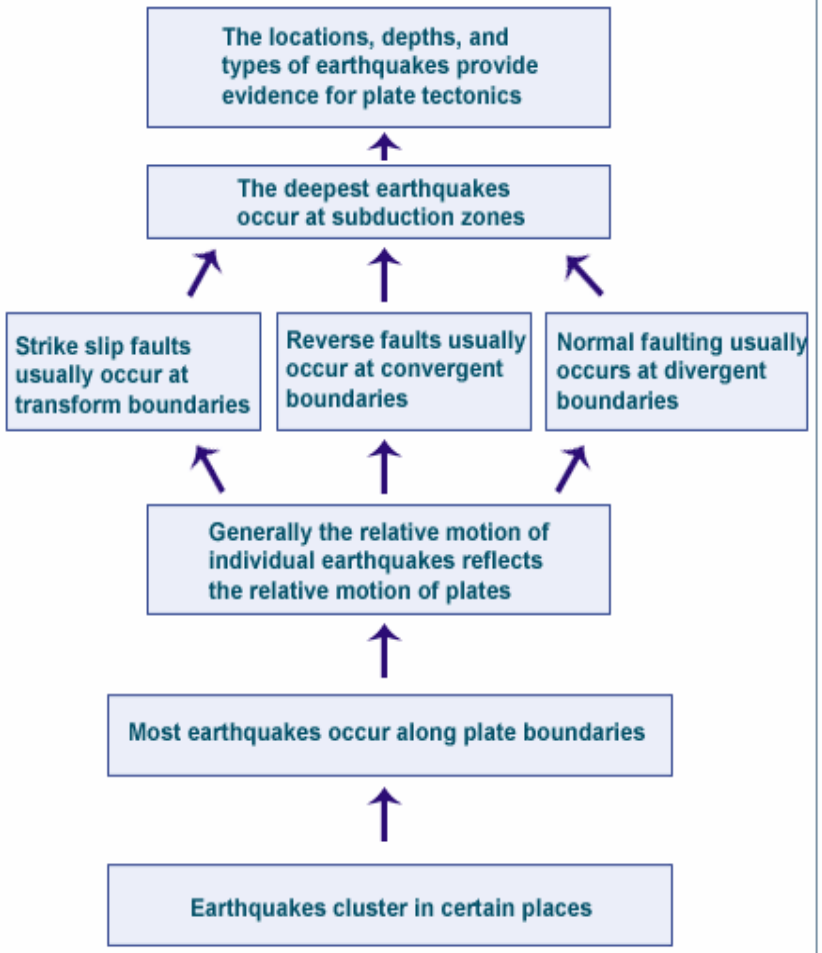
Earthquakes as evidence: Concepts & Standards

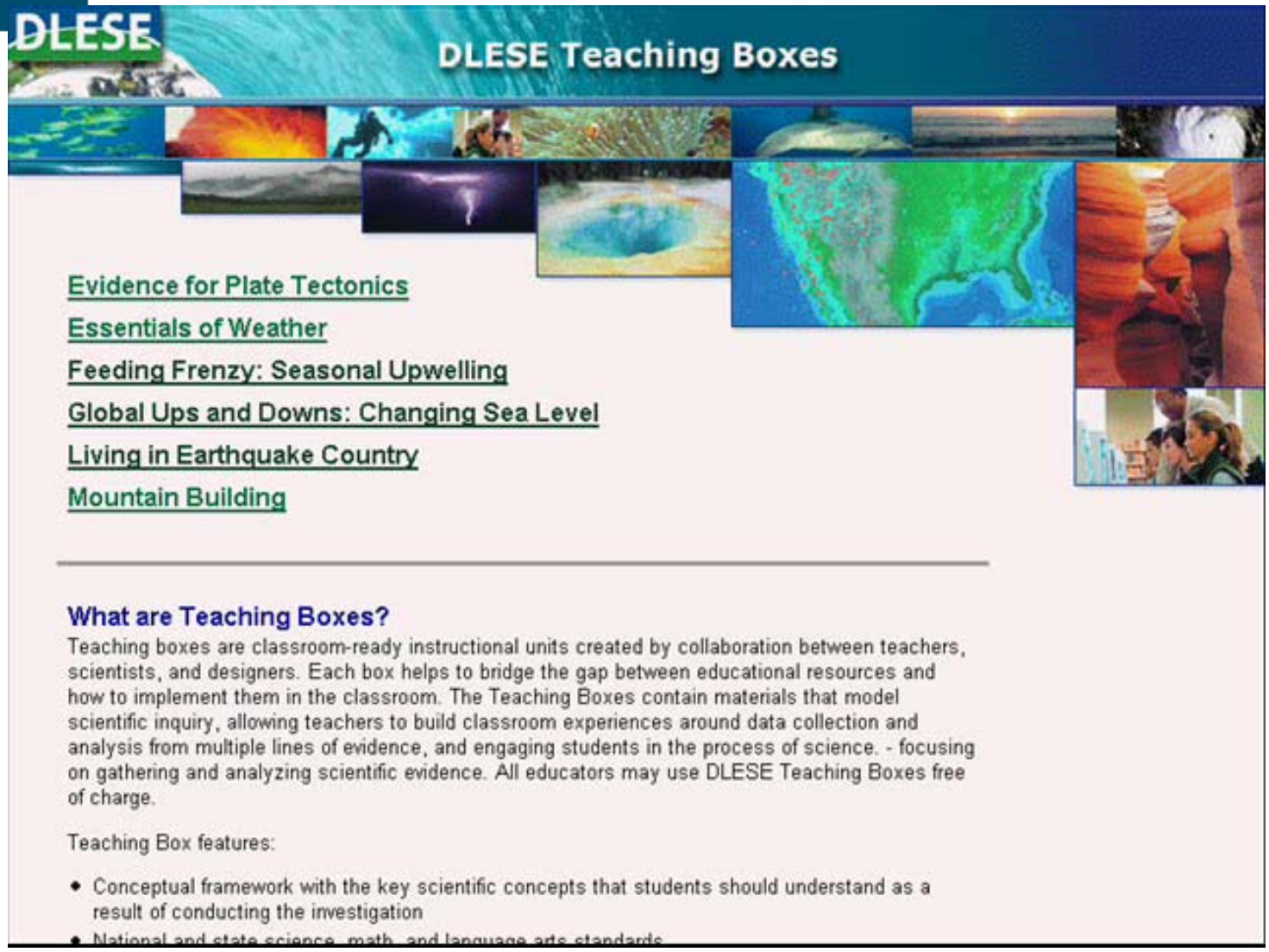
Print...

The following concepts are associated with the California State Science Standards and with the lessons shown.
There are also National Science Education Content Standards represented in this teaching box.

CONCEPTS:	GRADES:	EARTHQUAKE LESSONS:
The locations, depths, and types of earthquakes provide evidence for plate tectonics	6: 1a	Lesson 4: Earthquakes as evidence: Tying it all together
The deepest earthquakes occur at subduction zones	6: 1c	Lesson 3: How deep is the earthquake?
- Strike slip faults usually occur at transform boundaries - Reverse faults usually occur at convergent boundaries - Normal faulting usually occurs at divergent boundaries	6: 1d	Lesson 2: Fault types & plate boundaries
Generally the relative motion of individual earthquakes reflects the relative motion of plates	6: 1c - 1d	Lesson 2: Fault types & plate boundaries
Most earthquakes occur along plate boundaries	6: 1e	Lesson 1: Plotting earthquakes from real-time data
Earthquakes cluster in certain places	6: 1a	Lesson 1: Plotting earthquakes from real-time data

EARTHQUAKE CONCEPT MAP

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Teaching Box features:
Conceptual framework with the key scientific concepts that students should understand as a result of conducting the investigation
National and state science, math, and language arts standards