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Trends in Open Educational Resources in the Earth Sciences: Emerging Roles for the Academic Library

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Abstract

Students have cited the cost of textbooks and other class materials as a barrier to majoring in certain subjects, often in the sciences where costs are most prohibitive. In an effort to curb the high cost of textbooks on students, many universities are investigating the promotion and adoption of Open Educational Resources (OERs). These are free or low-cost materials such as textbooks or other resources that can be used as class material. This poster will examine the state of OERs in the Earth Sciences and give suggestions for adoption of OERs. Many institutions have concerns about the quality of materials for educational purposes and also encounter a lack of support for widespread adoption of many open resource materials. However, we will highlight a number of sources for high quality materials, many of which have already been adopted for use. There are also ways to use less expensive resources in your class without sacrificing quality, such as using popular geology books that cover core concepts instead of the typical textbook. This poster will examine current trends in OERs and present case studies demonstrating the use of OERs in the Earth Sciences at institutions who have supported the practice, as well as the possibilities for future use at other institutions with currently available resources. Survey data of librarians involved in OER efforts will be presented, as well as ideas of how your library can help you in adopting OERs in your classroom through licensing, support, and promotion.

Background/affordability

The rising costs of textbooks have led many universities to explore other options for use in their classrooms to decrease the burden on students. As shown by the graph below, the cost of textbooks has risen at a much higher rate than any of the other costs associated with attending a university, including tuition and room and board. Helping students by offering low-cost or free educational resources to use in their classes can improve the number of students who remain in the earth sciences field by making the options less cost prohibitive and ensure that they have access to the resources they need.

Textbooks in the Earth Sciences

These ten textbooks were assigned most frequently in Earth Sciences and Geology courses in the US.

Rank	Text	Author	Publisher	Cost	Year
1	Earth Science	Tarbuck	Pearson	\$191.00	2015
2	Physical Geology	Plummer	McGraw Hill	\$227.00	2016
3	Earth Science and the Environment	Thompson, G	Cengage	\$228.95	2007
4	The Earth Through Time	Levin	Wiley	122.95	2017
5	Earth: Portrait of a Planet	Marshak	Norton	\$146.25	2015
6	The Earth: An Introduction to Physical Geology	Tarbuck	Pearson	183.20	2017
7	Understanding Earth	Press	Freeman	Out of print	2004
8	Applied Hydrogeology	Fetter	Prentice Hall/Pearson	\$226.54	2001
9	Understanding Earth	Grotzinger	Freeman	\$146.00	2014
10	Earth System History	Stanley	Macmillan	\$140.43	2015

Source: [opensyllabus.org](#).

SURVEY RESULTS

Members of the Geoscience Information Society were surveyed regarding trends and programs related to open educational resources in the earth sciences, and specifically participation and collaborations involving librarians in academic settings.

ONE

Most respondents (86%) are academic librarians who support earth or geoscience programs

But few have budgets to acquire textbooks for their collections

DOES YOUR LIBRARY PURCHASE TEXTBOOKS?

TWO

Librarians are more likely to manage traditional course reserves ...

90%

put earth science related course content on reserve (print or physical copies), including library owned books, personal faculty copies or print course readers.

THREE

... than to provide content through course management systems.

63%

make earth science related course content accessible through a course management system, electronic reserves system or other system of sharing content electronically.

FOUR

Examples of local Open Educational Resource use cases were limited, but growing.

25%

have encountered earth or geoscience specific open educational resource examples or use cases at their institutions.

Recommendations

- 1** Contact your library to learn about using library-licensed ebooks in your course. Your library may have access to relevant titles from publishers such as Geological Society of America, Geological Society of London, Cambridge, Elsevier, Springer Nature, and Wiley.

- Example: *Solid Earth* by Fowler [Cambridge]
- Example: *Geochemistry* by White [Wiley]

- 2** Use less expensive, **popular geology books** to cover core concepts

- 3** Adopt an Open Educational Resource

- Openstax.org → Astronomy text includes planetary geology topics <https://openstax.org/details/books/astronomy>

- Opengeology.org → Free Textbook for College-Level Introductory Geology Courses

- Open textbook library → Physical Geology <http://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=269>

- 4** Create your own OER

- Rebus Community → Collaborative model for open textbook publishing.

- Grant funded opportunities to help defray the cost of self-publishing.

Example: UC Berkeley Affordable Course Content Pilot Program <http://www.lib.berkeley.edu/scholarly-communication/publishing/affordable/campus-initiatives>

- Look for a model at other institutions <https://sparcopen.org/our-work/list-of-oer-policies-projects/>

Looking Ahead

- Open textbook use in the geosciences is **open for innovation and growth**.
- Expand your research and teaching impact** by creating open, accessible textbooks that can be used widely.
- Consult** with the **library** about the availability of licensing open resources.
- As costs rise, look for more **funding opportunities** for using and creating open educational resources.

Contact Us!

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