What are Open Educational Resources (OERs)?

- Open = fully accessible, electronic, free of charge
- Books, videos, activities... any material designed for teaching and learning
- Open Courseware – subset of OER
  - Specific materials produced by instructional designers
  - Massive Open Online Courses (MOOCs)
  - Learning modules
  - Resources linked to a learning management system

OERs for Geoscience

- Great potential, but usage among natural science faculty is less than 30%
- Ever-growing collection at Science Education Resource Center (SERC)
- Most online catalogs link to SERC collection
  - OERCommons, MERLOT
- University catalogs and Courseware
  - LibreTexts (Cal State), OpenSUNY
  - MIT Open Courseware, Coursera and Udacity

Pedagogical value of OERs

- Flexibility for instructors – facilitates backward design
- Potential for community development
- Resource-based learning (with courseware)
- Variety of delivery formats
- Integrate active learning into asynchronous activities
  - Improve student engagement in and out of class
- Customization and integration with learning management systems

Potential challenges of OERs

- Perceived time burden for instructors
  - Lack of incentive and/or motivation
- Concerns about quality of OERs and availability
- Lack of comprehensive catalog (except for SERC)
- Awareness among faculty remains low
  - Needs university buy-in, marketing on par with textbook publishers

Examples of OERs for Geoscience

- Integrated with Learning Management Systems
- MOOCs
- Open textbooks
- Vignettes
- Learning modules
Example of Customized OER

- Top Hat set of apps for higher ed
- NDSU Geoscience course, The Geology of Climate Change and Energy
  - Learning modules with links to OERs
  - Lectures and in-class activities
  - Asynchronous active learning