

Exploring Geology on the World Wide Web – Geophysics, Plate Tectonics, and Structural Geology

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INTRODUCTION

This issue's column is a mixed assortment of World-Wide Web resources for learning about geophysics (excluding seismology, which was discussed in the previous issue), plate tectonics, and structural geology. Compiling sites for this column proved somewhat challenging since many sites are too technical for those not actively involved in research in these areas. I attempted to choose sites which were not too technical yet provided useful information for both the student and the instructor.

All of the URL addresses in this article are available as hypertext links from a Web page I maintain at: <http://www.geology.uiuc.edu/~schimmri/geology/geology.html>

Connecting to the resources below from this single Web page will save you a substantial amount of typing. Also, due to the lead time between the writing of this article and its publication, along with the volatile nature of the World-Wide Web, URL addresses may change periodically and the Web page will be maintained to reflect any such changes in the resources described below, whereas the printed copy may go out of date.

An increasing number of sites, including some listed below, maintain information encoded as Adobe Acrobat PDF (Portable Document Format) files. For information on PDF files, and how to view them, connect to the Acrobat page at: <http://w1000.mv.us.adobe.com/Acrobat/>

TECTONICS

The following are some general resources for learning about plate tectonics – the unifying theme of modern geology.

Active Tectonics

<http://www.muohio.edu/tectonics/ActiveTectonics.html>

The Active Tectonics Initiative is dedicated to understanding the deformational processes that currently shape the earth and threaten human life and property. Their web site is hosted by Miami University of Ohio and contains information about the Initiative and neotectonic processes.

Plate Motion Calculator

http://manbow.ori.u-tokyo.ac.jp/tamaki-html/plate_motion.html

This is an on-line program at the Ocean Research Institute at the University of Tokyo for calculating present-day tectonic plate motions. Plate motions may be calculated with respect to each other or with respect to an absolute hot-spot reference frame.

Plate Tectonics

<http://Nwww.seismo.unr.edu/ftp/pub/louie/class/100/plate-tectonics.html>

This site features several Web pages of tutorial material from the University of Nevada at Reno's Seismological Laboratory. Topics covered are the earth's interior and plate tectonics in addition to the information on seismology and earthquakes as discussed in my previous column. These are interesting pages with many high-quality images (making the site a bit slow but well worth the wait).

Tectonic Plate Motion

<http://cddis.gsfc.nasa.gov/926/slrTECTO.html>

This site, maintained by NASA, contains information on how various space geodetic technologies (for example, satellite laser ranging, very long baseline interferometry, and global positioning systems) are used to track present-day tectonic plate motions.

SEA FLOOR STUDIES

Following are a few resources for learning about how geophysics has been used to investigate the deep sea and has provided evidence and support for plate-tectonic theory.

World Data Center

<http://www.ngdc.noaa.gov/mgg/aboutmgg/wdcamgg.html>

The National Geophysical Data Center (NGDC) of the National Oceanic and Atmospheric Administration (NOAA) maintains an archive of geology and geophysical data collected from the world's sea floors. Information is available on how to obtain bathymetric, magnetic, gravity, and geothermal data in addition to geological cores and samples.

JOIDES

http://servant.geol.cf.ac.uk/www_jo~1/joides~1.htm

The Joint Oceanographic Institutions for Deep Earth Sampling maintains information on its on-going research, the history of the Ocean Drilling Program, and an on-line version of JOIDES Journal.

LDEO

<http://www.ldeo.columbia.edu/>

The Lamont-Doherty Earth Observatory maintains a large amount of high-quality information and graphic images of their many on-going research projects in marine geology and geophysics.

Marine Geophysics

<http://www.ngdc.noaa.gov/mgg/othermarine/othermarine.html>

This is a general resource list for Web sites on marine geology and geophysics maintained by the National Oceanic and Atmospheric Administration (NOAA).

Ocean Floor Tectonics

http://triton.ori.u-tokyo.ac.jp/~tamaki/ref_search3.html

This is an on-line program by Kensaku Tamaki of the Ocean Research Institute at the University of Tokyo that allows you to search for papers on ocean floor tectonics by journal, keyword, or geographic area.

RIDGE

<http://copper.whoi.edu/>

The Ridge Inter Disciplinary Global Experiment at Woods Hole Oceanographic Institute maintains a site containing information about the program and

an interesting image gallery of volcanic topography at the mid-Atlantic ridge.

GEOPHYSICS

Following is a mixed assortment of resources on various aspects of geophysics. Unfortunately, there is not much tutorial information on the Web about these topics and many subjects (for example, U-Pb radiometric dating) are not represented.

Earth's Interior

<http://bang.lanl.gov/solarsys/earthint.htm>

This brief tutorial on the interior of the earth, along with some information on plate tectonics, is part of a larger Web tour called Views of the Solar System at Los Alamos National Laboratory. This is an interesting site with informative graphic images.

Exploration Geophysics

<http://sepwww.stanford.edu/seg/consort.html>

This site, maintained by the Society for Exploration Geophysics, is a listing of all known academic consortia, university research groups, institutes, and government laboratories doing nonproprietary exploration geophysics research with links to their Web pages.

Geophysics Resources

<http://www.eas.yorku.ca/eas/IRLAG/Default.html>

This is a very comprehensive Internet resource list for geophysicists maintained by Nobuhiro Furuse. Links to resources are listed alphabetically and by country.

Middle East

http://www.geo.cornell.edu/geology/me_na/main.html

The Cornell Middle East and North Africa Project at the Institute for the Study of the Continents at Cornell University maintains geophysical information about interesting tectonic areas in the Middle East and North Africa. Available information includes the geology of the areas, digital maps, seismic refraction profiles, gravity surveys, and earthquake focal mechanisms.

NGDC

<http://www.ngdc.noaa.gov/ngdc.html>

The National Geophysical Data Center is a part of the National Oceanic and Atmospheric Administration (NOAA) and maintains a large amount of information on solid-earth geophysics and marine geology and geophysics (among other things). Information and graphic images of topography, magnetic, gravity, and geothermal data are available.

PaleoMag

<ftp://mantle.colorado.edu/pub/PaleoMag1>

This is an archive of free programs for performing paleomagnetic analysis on the Macintosh by Craig Jones at the University of Colorado at Boulder. The

