



# Big Ideas

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## Resources

### Books

- Donovan, S., & J. Bransford, 2005, *How Students Learn: Science in the Classroom*, National Academies Press, Washington, DC, [http://books.nap.edu/catalog.php?record\\_id=10126](http://books.nap.edu/catalog.php?record_id=10126).
- Wiggins, G. P., & J. McTighe, 2005, *Understanding by Design, 2nd edition*, Association for Supervision and Curriculum Development, Alexandria, VA, 382 pp.
- Wiske, M. S., ed., 1998, *Teaching for Understanding: Linking Research with Practice*, Jossey-Bass, San Francisco, CA, 379 pp.

### Websites

- Exploring Geoscience Methods with Secondary Education Students*, by J. Ebert, S. Linneman, & J. Thomas,  
[http://serc.carleton.edu/integrate/teaching\\_materials/geosci\\_methods/index.html](http://serc.carleton.edu/integrate/teaching_materials/geosci_methods/index.html).



## Resources

## Resources

### General Books on Geologic History

- Bjornerud, M., 2005, *Reading the Rocks: The Autobiography of the Earth*, Westview Press, Cambridge, MA, 237 pp.
- Fortey, R. A., 2004, *The Earth, An Intimate History*, HarperCollins, London, 509 pp.
- Hazen, R. M., 2012, *The Story of Earth: The First 4.5 Billion Years, from Stardust to Living Planet*, Viking, New York, 306 pp.
- Kious, J., & R. I. Tilling, 1996, *The Dynamic Earth: The Story of Plate Tectonics*, US Geological Survey, Washington, DC, <http://pubs.usgs.gov/gip/dynamic/dynamic.html>.
- Maddougall, J. D., 1996, *A Short History of Planet Earth: Mountains, Mammals, Fire, and Ice*, Wiley, New York, 266 pp.
- Morton, J. L., 2004, *Strata: The Remarkable Life Story of William Smith, the Father of English Geology, new edition*, Brocken Spectre, Horsham, UK, 171 pp.
- Powell, J., 2001, *Mysteries of Terra Firma: The Age and Evolution of the Earth*, Free Press, New York, 256 pp.
- Winchester, S., & S. Vannithone, 2001, *The Map That Changed the World: William Smith and the Birth of Modern Geology*, HarperCollins, New York, 329 pp.

### General Websites on Geologic History

- Color-coded Continents!*, US Geological Survey. [Reconstructions of color-coded continental motions from 620 million years ago through the present; maps from C. Scotese.] <http://geomaps.wr.usgs.gov/parks/pltec/scplseqai.html>.
- Earth Viewer*, by BioInteractive at Howard Hughes Medical Institute. [Free iPad app; an interactive paleogeographic atlas of the world; state and country overlays allows tracking the development of the Western States.] <http://www.hhmi.org/biointeractive/earthviewer>.
- Geologic Maps of the 50 United States*, by Andrew Alden, <http://geology.about.com/od/maps/iq/stategeomaps/>.
- North America During the Last 150,000 Years*, compiled by J. Adams, <http://www.esd.ornl.gov/projects/gen/mercNORTHAMERICA.html>.
- The Paleomap Project*, C. R. Scotese, <http://www.scotese.com>.
- Paleogeography*, R. Blakey. [The older, but free, version of the site.] <https://www2.nau.edu/rcb7/RCB.html>.
- Reconstructing the Ancient Earth*, Colorado Plateau Geosystems. [R. Blakey, updated site.] <http://cpgeosystems.com/index.html>.
- Tour of Geologic Time*, University of California Museum of Paleontology. [Online interactive geologic calendar exhibit.] <http://www.ucmp.berkeley.edu/help/timeform.php>.

### Books and Articles on Geologic History of the Southwest

- Baldrige, W. S., 2004, *Geology of the American Southwest: A Journey through Two Billion Years of Plate-Tectonic History*, Cambridge University Press, 314 pp.
- Peal, R. H., 1978, *Colorado Stratigraphic Correlation Chart*, Colorado Geological Survey, <http://store.coloradogeologicalsurvey.org/product/colorado-stratigraphic-correlation-chart/>.
- Rasmussen, J. C., 2012, Geologic History of Arizona, *Rocks & Minerals*, 87(1): 56–63, [http://www.janrasmussen.com/pdfs/geol\\_hist\\_az\\_Rasmussen\\_2012%20preprint.pdf](http://www.janrasmussen.com/pdfs/geol_hist_az_Rasmussen_2012%20preprint.pdf).
- Timmons, M. J., & C. A. Manduca, eds., 2012, Grand Canyon geology: Two billion years of Earth's history, *Geological Society of America Special Paper* 489, 156 pp.

For more resources on geologic history, see the section "General geology resources by state" at the end of this volume.



# Geologic History

## Resources

### Websites on Geologic History of the Southwest

- The Great Unconformity of the Grand Canyon and the Late Proterozoic-Cambrian Time Interval: Part I - Defining It*, by J. Share, 2012, <http://written-in-stone-seen-through-my-lens.blogspot.com/2012/01/great-unconformity-of-grand-canyon-part.html>.
- The Great Unconformity and the Late Proterozoic-Cambrian Time Interval: Part II - The Rifting of Rodinia and the "Snowball Earth" Glaciations That Followed*, by J. Share, 2012, [http://written-in-stone-seen-through-my-lens.blogspot.com/2012\\_02\\_01\\_archive.html](http://written-in-stone-seen-through-my-lens.blogspot.com/2012_02_01_archive.html).
- The Great Unconformity at Baker's Bridge: Part III - Regional Geological and Global Bio-Evolutionary Significance*, by J. Share, 2014, <http://written-in-stone-seen-through-my-lens.blogspot.com/2014/01/the-great-unconformity-at-bakers-bridge.html>.
- Sedimentary Rock Formations of the Grand Canyon, In the Playground of Giants*, by Ken Bevis (Department of Geology, Hanover College), <http://intheplaygroundofgiants.com/geology-of-the-grand-canyon-region/sedimentary-rock-formations-of-the-grand-canyon-region/>.

### Activities

- Okland, L., 1991, Paleogeographic mapping, in: R. H. Macdonald, & S. G. Stover, eds., *Hands-on Geology: K-12 Activities and Resources*, Society for Sedimentary Geology (SEPM), Tulsa, OK. [Constructing paleogeographic maps for elementary and middle school students.] [https://www.beloit.edu/sepm/Fossil\\_Explorations/Paleogeographic\\_Mapping.html](https://www.beloit.edu/sepm/Fossil_Explorations/Paleogeographic_Mapping.html).
- Toilet Paper Analogy for Geologic Time*, by J. Wenner, in: Teaching Quantitative Skills in the Geosciences, at Resources for Undergraduate Students and Faculty, SERC. [Demonstration of geological time using a 1000 sheet roll of toilet paper.] <http://serc.carleton.edu/quantskills/activities/TPGeoTime.html>.
- Understanding Geologic Time*, Texas Memorial Museum at the University of Texas at Austin. [Timeline activity for middle school students.] <http://www.jsq.utexas.edu/glow/files/Understanding-Geologic-Time-6-8.pdf>.



## Resources

## Resources

### Rock and Mineral Field Guides

- Bonewitz, R. L., 2008, *Rock and Gem*, Dorling Kindersley, NY, 360 pp.
- Chesterman, C. W., 1979, *National Audubon Society Field Guide to North American Rocks and Minerals*, Knopf, New York, 850 pp.
- Dixon, D., & R. L. Bernor, 1992, *The Practical Geologist: The Introductory Guide to the Basics of Geology and to Collecting and Identifying Rocks*, Simon and Schuster, New York, 160 pp.
- Hausel, W.D., 2014, *A Guide to Finding Gemstones, Gold, Minerals, and Rocks*, Gemhunter Publications: Gilbert, AZ, 370 pp.
- Mitchell, J., 2008, *The Rockhound's Handbook, revised edition*, Gem Guides Book Company, Baldwin Park, CA, 299 pp.
- Pellant, C., 2002, *Rocks & Minerals*, Dorling Kindersley (Smithsonian Handbooks), New York, 256 pp.
- Prinz, M., G. Harlow, & J. Peters, eds., 1978, *Simon & Schuster's Guide to Rocks & Minerals*, Simon and Schuster, New York, 607 pp.

For additional resources on minerals, see the resources section in Chapter 5: Mineral Resources.

### General Books and Websites on Rocks

- Atlas of Igneous and Metamorphic Rocks, Minerals and Textures*, University of North Carolina Geology Department, <http://leggeo.unc.edu/Petunia/IgMetAtlas/mainmenu.html>.
- Raymond, L., 2007, *Petrology: The Study of Igneous, Sedimentary and Metamorphic Rocks*, Waveland Press, Long Grove, IL, 768 pp. [College textbook.]
- Rocks*, Kentucky Geological Survey and University of Kentucky, <https://www.uky.edu/KGS/rocksmn/rocks.htm>.
- Rock Types*, by S. Sepp, Sandatlas, <http://www.sandatlas.org/rock-types>.
- Vernon, R. H., 2000, *Beneath Our Feet: The Rocks of Planet Earth*, Cambridge University Press, Cambridge, UK, 216 pp.

### Books, Articles, and Websites on Rocks of Specific Areas of the Southwest

#### Multistate areas

- Romaine, G., 2014, *Rocks, Gems, and Minerals of the Southwest*, FalconGuides, an imprint of Globe Pequot Press: Guilford, CT, 160 pp.
- Rygle, K. & S. Pedersen, 2016, *Southwest Treasure Hunter's Gem and Mineral Guide: Where and How to Dig, Pan and Mine Your Own Gems and Minerals, 6th edition*, GemStone Press: Woodstock, VT, 224 pp.

#### Arizona

- Anthony, J., 1995, *Mineralogy of Arizona, 3rd edition*, University of Arizona Press, Tucson, AZ, 508 pp.
- Bearce, N., 2006, *Minerals, Fossils, and Fluorescents of Arizona: a Field Guide for Collectors*, Arizona Desert Ice Press, Tempe, AZ, 401 pp.
- Blair, G., 2008, *Rockhounding Arizona: a Guide to 75 of the State's Best Rockhounding Sites*, Falcon Guides, Guilford, CT, 232 pp.
- Kappele, W. & G. Warren, 2014, *Rockhounding Utah: a guide to the State's Best Rockhounding Sites*, FalconGuides, Guilford, CT, 208 pp.
- Lynch, B. & D. Lynch, 2010, *Arizona Rocks & Minerals: a Field Guide to the Grand Canyon State*, Adventure Publications, Cambridge, MN, 252 pp.




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Resources

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**Colorado**

- Eckel, E., R., Cobban, & S. Mosburg, S., 1997, *Minerals of Colorado*, Fulcrum Publishers, Golden, CO, 676 pp.
- Eckel, E.B., & Mendenhall, C., 2015, *Minerals of Colorado: A 100-Year Record*, CreateSpace Independent Publishing Platform, North Charleston, SC, 484 pp.
- Kappele, W. & C. Kappele, 2004, *Rockhounding Colorado*, Falcon Press, Helena, MT, 256 pp.
- Mitchell, J., 2007, *Gem Trails of Colorado*, Gem Guides Book Company, Baldwin Park, CA, 224 pp.
- Romaine, G., 2014, *Rocks, Gems, and Minerals of the Rocky Mountains*, FalconGuides, an imprint of Globe Pequot Press, Guilford, CT, 176 pp.

**New Mexico**

- Lynch, D. & Lynch, B., 2014, *New Mexico Rocks & Minerals: a Field Guide to the Land of Enchantment*, Adventure Publications, Cambridge, MN, 320 pp.
- Mitchell, J., 2010, *Gem Trails of New Mexico*, Gem Guides Book Company, Baldwin Park, CA, 280 pp.
- Rockhounding Guide to New Mexico*, New Mexico Bureau of Geology and Mineral Resources, 111 pp., <http://geoinfo.nmt.edu/publications/guides/rockhound/RockhoundGuide.pdf>.
- Vaskys, R. & M. Freed, 2008, *Rockhounding New Mexico: a Guide to 140 of the State's Best Rockhounding Sites*, Globe Pequot Press, Guilford, CT, 272 pp.
- Voynick, S., 1997, *New Mexico Rockhounding: a Guide to Minerals, Gemstones, and Fossils*, Mountain Press Publishing Company, Missoula, MT, 309 pp.

**Utah**

- Kappele, W. & G. Warren, 2014, *Rockhounding Utah: a Guide to the State's Best Rockhounding Sites*, FalconGuides., Guilford, CT, 208 pp.
- Mitchell, J., 2006, *Gem Trails of Utah*, Gem Guides Book, Baldwin Park, CA, 232 pp.
- Wilson, J. R., 1995, *A Collector's Guide to Rock, Mineral, & Fossil Localities of Utah*, Utah Geological Survey Miscellaneous Publication, 148 pp.



## Resources

## Resources

### General Books on the Fossil Record and Evolution

- Allmon, W. D., 2009, *Evolution & Creationism: a Very Short Guide, 2nd edition*, Paleontological Research Institution, Ithaca, NY, 128 pp.
- Benton, M. J., 2008, *The History of Life: a Very Short Introduction*, Oxford University Press, Oxford, UK, 170 pp.
- Fenton, C. L., & M. A. Fenton, 1958, *The Fossil Book: A Record of Prehistoric Life*, Doubleday, Garden City, NY, 482 pp. (A well-illustrated classic.)
- Fortey, R. A., 1998, *Life: A Natural History of the First Four Billion Years of Life on Earth*, Alfred A. Knopf, New York, 346 pp.
- Knoll, A. H., 2003, *Life On a Young Planet: The First Three Billion Years of Evolution on Earth*, Princeton University Press, Princeton, NJ, 277 pp.
- Lockley, M.G., 1991, *Tracking Dinosaurs: a New Look at an Ancient World*, Cambridge University Press, Cambridge, 238 pp.
- Nudds, J.R., & P.A. Selden, 2008, *Fossil Ecosystems of North America: a Guide to the Sites and their Extraordinary Biotas*, University of Chicago Press, Chicago, 288 pp.
- Prothero, D.R., 2006, *After the Dinosaurs: the Age of Mammals*, Indiana University Press, Bloomington, 362 pp.
- Sampson, S. D., 2011, *Dinosaur Odyssey: Fossil Threads in the Web of Life*, University of California Press, Berkeley, CA, 352 pp.
- Shubin, N., 2009, *Your Inner Fish: a Journey into the 3.5-Billion-Year History of the Human Body*, Vintage Books, NY, 256 pp.
- Switek, B., 2010, *Written In Stone: Evolution, the Fossil Record, and Our Place In Nature*, Bellevue Literary Press, New York, 320 pp.
- Thomson, K. S., 2005, *Fossils: a Very Short Introduction*, Oxford University Press, Oxford, UK, 147 pp.

### Guides to Collecting and Identifying Fossils

- Arduini, P., G. Teruzzi, & S. S. Horenstein, 1986, *Simon & Schuster's Guide to Fossils*, Simon and Schuster, New York, 317 pp.
- Garcia, F. A., & D. S. Miller, 1998, *Discovering Fossils: How To Find and Identify Remains of the Prehistoric Past*, Stackpole Books, Mechanicsburg, PA, 212 pp.
- Lichter, G., 1993, *Fossil Collector's Handbook: Finding, Identifying, Preparing, Displaying*, Sterling Publishing Company, New York, 160 pp.
- Macdonald, J. R., 1983, *The Fossil Collector's Handbook: a Paleontology Field Guide*, Prentice-Hall, Englewood Cliffs, NJ, 193 pp.
- Murray, M., 1967, *Hunting for Fossils: a Guide to Finding and Collecting Fossils in All Fifty States*, Macmillan Company, Toronto, Canada, 348 pp.
- Nudds, J. R., & P. A. Selden, 2008, *Fossil Ecosystems of North America: a Guide to the Sites and their Extraordinary Biotas*, University of Chicago Press, Chicago, 288 pp.
- Parker, S., 1990, *The Practical Paleontologist: a Step-By-Step Guide To Finding, Studying, and Interpreting Fossils*, Simon and Schuster, New York, 159 pp.
- Parker, S., 2007, *Fossil Hunting: an Expert Guide to Finding and Identifying Fossils and Creating a Collection*, Southwater, London, 96 pp.
- Ransom, J. E., 1964, *Fossils In America: their Nature, Origin, Identification and Classification and a Range Guide To Collecting Sites*, Harper and Row, New York, 402 pp.
- Thompson, I., 1982, *The Audubon Society Field Guide To North American Fossils*, Knopf, New York, 846 pp.
- Walker, C., D. Ward, & C. Keates, 2009, *Fossils*, Dorling Kindersley (Smithsonian Handbooks), New York, 320 pp.



## Resources

### Books, Articles, and Websites on Fossils of Specific Areas of the Southwest

#### Multistate areas

- Foster, J., 2007, *Jurassic West: The Dinosaurs of the Morrison Formation and Their World*, Indiana University Press, Bloomington, 416 pp.
- Lockley, M. G., & A. P. Hunt, 1995, *Dinosaur Tracks and Other Fossil Footprints of the Western United States*, Columbia University Press, New York, 338 pp.
- Ratkevich, R. P., 1976, *Dinosaurs of the Southwest*, University of New Mexico Press, Albuquerque, 115 pp.
- Sadler, C., 2007, *Life in Stone: Fossils of the Colorado Plateau*, Grand Canyon Association, Grand Canyon, AZ, 72 pp.
- Tidwell, W. D. 1998, *Common Fossil Plants of Western North America*, Smithsonian Institution Press, Washington, DC, 299 pp.

#### Arizona

- Fossils*, Grand Canyon National Park, National Park Service, <http://www.nps.gov/grca/learn/nature/fossils.htm>.
- Fossils*, Petrified Forest National Park, National Park Service, <http://www.nps.gov/pefo/naturescience/fossils.htm>.
- Heckert, A. B. & S. G. Lucas, eds., 2005, Vertebrate paleontology in Arizona, *New Mexico Museum of Natural History and Science Bulletin*, 29: 210 pp. [Technical]
- Ratkevich, R. P., 1979, *Field Guide to Arizona Fossils*, Dinograph Southwest, Alamogordo, NM, 114 pp.
- Sedimentary Rock Formations of the Grand Canyon, In the Playground of Giants*, by Ken Bevis (Department of Geology, Hanover College), <http://intheplaygroundofgiants.com/geology-of-the-grand-canyon-region/sedimentary-rock-formations-of-the-grand-canyon-region/>.
- Thayer, D., 2009, *An Introduction to Grand Canyon Fossils*, Grand Canyon Association, Grand Canyon, AZ, 64 pl.
- Timmons, M. J., & C. A. Manduca, eds., 2012, Grand Canyon geology: Two billion years of Earth's history, *Geological Society of America Special Paper* 489, 156 pp. [Technical]

#### Colorado

- Ancient Denvers*, Denver Museum of Nature and Science, 2002, <http://www.dmns.org/main/minisites/ancientDenvers/landscapes.html>.
- Dinosaur National Monument*, National Park Service, <http://www.nps.gov/dino/index.htm>.
- Grande, L., 2013, *The Lost World of Fossil Lake: Snapshots from Deep Time*, University of Chicago Press, Chicago, 432 pp.
- Jenkins, J. T., & J. L. Jenkins, 1993, Colorado's dinosaurs, *Colorado Geological Survey Special Publication* 35, 74 pp.
- Johnson, K. R., & R. G. Reynolds, 2006, *Ancient Denvers: Scenes from the Past 300 Million Years of the Colorado Front Range*, Denver Museum of Science and Nature, Denver, CO, 32 pp.
- Leopold, E. B., & H. W. Meyer, 2012, *Saved in Time: the Fight to Establish Florissant Fossil Beds National Monument, Colorado*, University of New Mexico Press, Albuquerque, 139 pp.
- Lockley, M. G., 2001, *A Field Guide to Dinosaur Ridge, 3rd edition*, Friends of Dinosaur Ridge/University of Colorado at Denver Dinosaur Tracker Research Group, Denver, CO, 32 pp.
- Lockley, M., 2003, *Fossil Footprints of the Dinosaur Ridge and Fossil Trace Areas, 2nd edition*, Friends of Dinosaur Ridge/University of Colorado at Denver Dinosaur Tracker Research Group, Denver, CO, 66 pp.
- Meyer, H. W., 2003, *Fossils of Florissant*, Smithsonian Institution Press, Washington, DC, 272 pp.
- Milito, S., 2010, A survey of fossils and geology of Red Rock Canyon Open Space, Colorado Springs, Colorado, *The Mountain Geologist*, 47(1): 1–14.
- Wright, J. L., 2004, Walking with dinosaurs (and other extinct animals) along Colorado's Front Range: a field trip to Paleozoic and Mesozoic terrestrial localities, *GSA Field Guides*, 5: 219–234. [Technical]




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Resources

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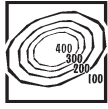
**New Mexico**

- Colbert, E. H., 1995, *The Little Dinosaurs of Ghost Ranch*, Columbia University Press, New York, 250 pp.
- Ghost Ranch Geologic Tour*, New Mexico Bureau of Geology and Mineral Resources, [https://geoinfo.nmt.edu/tour/landmarks/ghost\\_ranch/home.html](https://geoinfo.nmt.edu/tour/landmarks/ghost_ranch/home.html).
- Kues, B., 2008, *The Paleontology of New Mexico*, University of New Mexico Press, Albuquerque, 446 pp.
- Lucas, S. G., & A. B. Heckert, eds., 2000, Dinosaurs of New Mexico, *New Mexico Museum of Natural History and Science Bulletin* 17, 230 pp. [technical]
- Lucas, S. G., G. S. Morgan, & K. E. Ziegler, eds., 2005, New Mexico's ice ages, *New Mexico Museum of Natural History and Science Bulletin* 28, 280 pp. [technical]

**Utah**

- Barnes, F. A. 1997, *Canyon Country Dinosaur Tracks and Trackers*, Canyon Country Publications, Moab, UT, 176 pp.
- Cleveland-Lloyd Dinosaur Quarry*, Utah, Geologic Site Seeing, Bureau of Land Management, [http://www.blm.gov/wo/st/en/res/Education\\_in\\_BLM/Learning\\_Landscapes/For\\_Travelers/go/geology/cleveland-lloyd.print.html](http://www.blm.gov/wo/st/en/res/Education_in_BLM/Learning_Landscapes/For_Travelers/go/geology/cleveland-lloyd.print.html).
- DeCourten, F., 2014, *Dinosaurs of Utah, 2nd edition*, University of Utah Press, Salt Lake City, 336 pp.
- Dinosaurs and Fossils*, Utah Geological Survey, <http://geology.utah.gov/popular/general-geology/dinosaurs-fossils/>.
- Gillette, D. D., ed., 1999, Vertebrate paleontology in Utah, *Utah Geological Survey Miscellaneous Publication* 99-1, 554 pp. [Technical]
- Harris, J. D., & A. R. C. Milner, 2015, *Tracks in Deep Time: the St. George Dinosaur Discovery Site at Johnson Farm*, University of Utah Press, Salt Lake City, 99 pp.
- Mesozoic Fossils*, Glen Canyon National Recreation Area, National Park Service, <https://www.nps.gov/glca/learn/nature/copy-of-mesozoicfossils.htm>.
- Robison, R. A., L. E. Babcock, & V. G. Gunther, 2015, Exceptional Cambrian fossils from Utah: a window into the age of trilobites, *Utah Geological Survey Miscellaneous Publication* 15-1, 97 pp.
- Squatting Dinosaur Tracks at Johnson's Farm in St. George (Basal Jurassic Dinosaur Footprints, Fishes, and Plants, Whitmore Point Member of the Moenave Formation)*, by Nancy Carruthers, Utah Geological Survey, <http://www.sunstar-solutions.com/AOP/fieldtrips/Juratracks/BasalJurassic.htm>.
- Titus, A. L., & M. A. Loewen, 2013, *At the Top of the Grand Staircase: the Late Cretaceous of Southern Utah*, Indiana University Press, Bloomington, 634 pp. [technical]
- Wilson, J. R., 1995, A collector's guide to rock, mineral and fossil localities in Utah, *Utah Geological Survey Miscellaneous Publication* 95-4, 148 pp.





# Topography

## Resources

## Resources

### Books on Topography

- de Blij, H. J., P. O. Muller, J. E. Burt, & J. A. Mason, 2013, *Physical Geography of the Global Environment*, Oxford University Press, New York, 626 pp.
- Trimble, D.E., 1980, *The Geologic Story of the Great Plains*, Geological Survey Bulletin 1493, US Government Printing Office, Washington, D.C., <http://library.ndsu.edu/exhibits/text/greatplains/text.html>.
- Wyckoff, J., 1999, *Reading the Earth: Landforms in the Making*, Adastral West, Mahwah, NJ, 352 pp.

### Topographic Maps

- Color Landform Atlas of the US*, <http://fermi.jhuapl.edu/states/states.html>. (Low resolution shaded relief maps of each state.)
- Topoquest*, <https://www.topoquest.com/>.

### Websites on Topography

- OpenLandform Catalog*, Education Resources, OpenTopography. [High resolution topographic images that may be useful in teaching.] <http://www.opentopography.org/index.php/resources/lidarlandforms>.
- Physiographic Provinces*, in: Earth Science Concepts: Geology by Region, National Park Service, [http://www.nature.nps.gov/geology/education/concepts/concepts\\_regional\\_geology.cfm](http://www.nature.nps.gov/geology/education/concepts/concepts_regional_geology.cfm).
- Teaching Geomorphology in the 21st Century*, On the Cutting Edge, Strong Undergraduate Geoscience Teaching, SERC. [A set of resources for college level, some of which may be adaptable to secondary education.] <http://serc.carleton.edu/NAGTWorkshops/geomorph/index.html>.
- Teaching with Google Earth*, On the Cutting Edge, Starting Point: Teaching Entry Level Geoscience, SERC, [http://serc.carleton.edu/introgeo/google\\_earth/index.html](http://serc.carleton.edu/introgeo/google_earth/index.html).
- United States Geography*, by S.S. Birdsall & J. Florin, <http://countrystudies.us/united-states/geography.htm>.
- US Geography: The Land Geography, Landscape, and Landforms of the US, 50 State Guide*, eReference Desk. [Includes state-by-state information on geography.] <http://www.ereferencedesk.com/resources/state-geography/>.

### Topography Resources for the Southwest

- Davis, W., 2013, *River Notes: a Natural and Human History of the Colorado*, Island Press, Washington, D.C., 176 pp.
- Owen, D., 2015, Where the river runs dry: the Colorado and America's water crisis, *The New Yorker* (May 25, 2015), <http://www.newyorker.com/magazine/2015/05/25/the-disappearing-river>.
- Physiographic Provinces*, Virtual Geologic Tour of New Mexico, New Mexico Bureau of Geology and Mineralogical Resources, <http://geoinfo.nmt.edu/tour/provinces/home.html>.
- Sand Dunes of the Southwest*, by Peter Olsen, <http://sand.xboltz.net/>.

For additional resources relevant to topography, see the section "General Geology Resources by State" at the end of this volume.



## Resources

## Resources

### Books and Articles on Mineral Resources

- Frank D., J. Galloway, & K. Assmus, 2005, The life cycle of a mineral deposit – a teacher's guide for hands-on mineral education activities, *US Geological Survey General Information Product 17*, 40 pp.
- Johnsen, O., 2002, *Minerals of the World*, Princeton University Press, Princeton, NJ, 439 pp.
- Long, K.R., B.S. Van Gosen, N.K. Foley, & D. Cordier, 2010, The principal rare earth elements deposits of the United States: a summary of domestic deposits and a global perspective, *US Geological Survey Scientific Investigations Report 2010–5220*, 96 pp., <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf>.
- Skinner, B. J., 1989, Mineral resources of North America, in A.W. Bally & A.R. Palmer, eds., *The Geology of North America: An Overview, vol. A*, The Geological Society of America: Boulder, CO, pp. 575-584.
- Stevens, R., 2010, *Mineral Exploration and Mining Essentials*, Pakawau GeoManagement, Port Coquitlam, BC, 322 pp.
- Wark, J., 2012, *The World of Mining*, CRC Press/Balkema, Boca Raton, FL, 250 pp. [Coffee-table book]

For mineral field guides, see the Resources section in Chapter 2: Rocks.

### Websites on Mineral Resources

- [Copper] Education, Copper Development Association, <https://www.copper.org/education/>.
- Handbook of Mineralogy*. [Technical information on 420 minerals available as free individual pdfs.] <http://www.handbookofmineralogy.org>.
- Mineral Data*, Hudson Institute of Mineralogy. [Claims to be the world's largest public database of mineral information.] <http://www.mindat.org>.
- Mineral Gallery*, Amethyst Galleries, <http://www.galleries.com/>.
- Mineralogy Database*, <http://webmineral.com>.
- Mineralpedia—A Mineral Photo Database and Identification Guide*, by T. Loomis & V. Loomis, Dakota Matrix Minerals, <http://www.dakotamatrix.com>.
- Mining History Association, <http://www.mininghistoryassociation.org/links.htm#museums>.
- Mining Museums and Tours*, National Mining Association, <http://www.nma.org/index.php/mining-resources/mining-museums-and-tours>.
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- Drought Monitoring, Climate Assessment for the Southwest*, The University of Arizona, <http://www.climas.arizona.edu/sw-climate/drought-monitoring>.
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- Dust Storm and Haboob Safety Tips*, National Weather Service, [http://www.nws.noaa.gov/airquality/dust\\_storm.shtml](http://www.nws.noaa.gov/airquality/dust_storm.shtml).
- Environmental Mediation of Valley Fever*, Department of Geography, US Geological Survey, and University of Arizona, <http://www.casa.arizona.edu/~peter/valleyfever/web/index.html>.
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- Thomas, M., The mysterious fungus infecting the American Southwest, *The Atlantic*, August 8, 2014, <http://www.theatlantic.com/health/archive/2014/08/the-mysterious-fungus-infecting-the-american-southwest/375191/>.

### Tornados

- Edwards, R., *Tornado Safety*, Storm Prediction Center, National Weather Service, <http://www.spc.noaa.gov/faq/tornado/safety.html>.
- Historical Records and Trends [in Tornados in the US]*, National Centers for Environmental Information, National Oceanic and Atmospheric Administration, <https://www.ncdc.noaa.gov/climate-information/extreme-events/us-tornado-climatology/trends>.
- The Most "Important" US Tornadoes by State*, Tornado Project Online, <http://www.tornadoprotect.com/alltorns/worstts.htm>.
- Tornado History Project. [Searchable database of reported US tornadoes since 1950.] <http://www.tornadohistoryproject.com/>.
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## Resources on Landscape-related Earth Hazards

### Expansive Soils

- Harris, R. C., and P. A. Pearthree, 2002, Problem soils, in: *A Homebuyer's Guide to Geologic Hazards in Arizona*, Down-To-Earth 13, Arizona Geological Survey, Tucson, AZ, pp.11–15, [http://www.azgs.az.gov/HomeOwners-OCR/HG4\\_problemsoils.pdf](http://www.azgs.az.gov/HomeOwners-OCR/HG4_problemsoils.pdf).
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### Landslides

- Burt, C. B., 2014, *Worst Landslides in U.S. History*, Weather Underground, March 25, 2014, <https://www.wunderground.com/blog/weatherhistorian/worst-landslides-in-us-history>.
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## Resources

Landslide Hazards Program, US Geological Survey, <http://landslides.usgs.gov/>.  
*Landslides in the United States Since 2007* (map), National Geographic, <http://news.nationalgeographic.com/news/2014/04/140422-surveying-american-landslides-interactive/>.  
 Wald, L., *Reconstruction of an Avalanche: The West Salt Creek Rock Avalanche, Colorado, May 25, 2014*, Landslide Hazards Program, USGS, <http://landslides.usgs.gov/research/featured/2015-westsaltcreek/>.

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Arizona's Earth Fissure Center, The Arizona Geological Survey, <http://www.azgs.az.gov/EFC.shtml>.  
 Hill, C. A., 2003, Caves and karst in New Mexico, New Mexico Bureau of Geology and Mineral Resources, *New Mexico Earth Matters*, 3(1): 1–4, [https://geoinfo.nmt.edu/publications/periodicals/earthmatters/3/n1/em\\_v3\\_n1.pdf](https://geoinfo.nmt.edu/publications/periodicals/earthmatters/3/n1/em_v3_n1.pdf).  
 Lindberg, P. A., 2009, *Devil's Kitchen Sinkhole—Sedona, AZ: a Potential Geohazard*, The Arizona Geological Survey, [http://www.azgs.az.gov/arizona\\_geology/winter09/article\\_devilskitchen.html](http://www.azgs.az.gov/arizona_geology/winter09/article_devilskitchen.html).

## Resources on Tectonics-related Earth Hazards

### Earthquakes

*A Brief History of Earthquake Activity in Arizona*, AZ Central, <http://www.azcentral.com/story/news/arizona/2014/06/30/arizona-earthquake-timeline/11787839/>.  
*Earthquakes [in Colorado]*, Colorado Geological Survey, <http://coloradogeologicalsurvey.org/geologic-hazards/earthquakes/>.  
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*Induced Earthquakes*, Earthquake Hazards Program, US Geological Survey, <http://earthquake.usgs.gov/research/induced/>.  
*IRIS Seismic Monitor*, Incorporated Research Institutions for Seismology (IRIS), <http://www.iris.edu/seismon/>.  
*Putting Down Roots in Earthquake Country: Your Handbook for Earthquakes in Utah*, 2008, Utah Seismic Safety Commission, 33 pp., [http://www.utah.gov/beready/documents/roots\\_earthquake\\_low.pdf](http://www.utah.gov/beready/documents/roots_earthquake_low.pdf).  
 Stover, C. W., and J. L. Coffman, 1993, Seismicity of the United States, 1568–1989 (revised), *US Geological Survey Professional Paper 1527*, 418 pp., <http://pubs.usgs.gov/pp/1527/report.pdf>.  
 Eldredge, S. N., 1996, The Wasatch Fault, *Utah Geological Survey Public Information Series 40*, 17 pp., <http://files.geology.utah.gov/online/pdf/pi-40.pdf>.  
*Today in Earthquake History*, Earthquake Hazards Program, US Geological Survey. [Content abridged from Stover & Coffman, 1993.] <http://earthquake.usgs.gov/learn/today>.  
*U of U Seismic Stations*, Earthquake Center, University of Utah, <http://quake.utah.edu/earthquake-center/quake-map>.  
*US Earthquake Information by State/Territory*, USGS Earthquake Hazards Program, <http://earthquake.usgs.gov/earthquakes/states/>.  
*US Earthquake Monitor*, US Geological Survey, <http://earthquake.usgs.gov/earthquakes/map/>.  
*Utah Faults*, Utah Geological Survey, <http://geology.utah.gov/hazards/earthquakes-faults/utah-faults/>.

### Volcanoes

Duffield, W., 1997, *Volcanoes of Northern Arizona: Sleeping Giants of the Grand Canyon Region*, Grand Canyon Association, Grand Canyon, AZ, 68 pp.  
*Frequently Asked Questions about New Mexico Volcanoes*, New Mexico Bureau of Geology and Mineral Resources, <https://geoinfo.nmt.edu/faq/volcanoes/>.  
 Hagadorn, J., 2015, *Colorado's Volcanoes, Just the Facts*, Front Porch Stapleton [News], <https://frontporchstapleton.com/article/colorados-volcanoes/>.  
 Pfeiffer, T., *Volcanoes of Canada and USA (Mainland)*, Volcano Discovery. [Volcanos active within the past 10,000 years.] <https://www.volcanodiscovery.com/north-america.html>.



*The Volcanoes of New Mexico*, Online Exhibits, New Mexico Museum of Natural History and Science,

<http://www.nmnaturalhistory.org/online-exhibits-geoscience/volcanoes-new-mexico>.

*U.S. Volcanoes and Current Activity Alerts*, Volcano Hazards Program, US Geological Survey,

<http://volcanoes.usgs.gov/index.html>.

## Resources on Materials-related Earth Hazards

### Radon

*Radon*, Colorado Department of Public Health and Environment, <https://www.colorado.gov/pacific/cdphe/categories/services-and-information/environment/radon>.

*Radon Fact Sheet*, Air Check Inc., 2009, [http://www.radon.com/radon/radon\\_facts.html](http://www.radon.com/radon/radon_facts.html).

*Radon: Health Risks*, Environmental Protection Agency, 2013,

<http://www.epa.gov/radon/healthrisks.html>.

*Radon Information*, Environmental Protection Agency, <http://www.epa.gov/radon/index.html>.

*Radon levels for [any US state]*, [http://\\*\\*-radon.info/](http://**-radon.info/) [in which \*\* = two-letter state code, such as AZ, CO, NM, or UT].

*Radon (Rn)*, United States Environmental Protection Agency (EPA). [Includes state radon maps with county-level data.] <http://www.epa.gov/radon/whereyoulive.html>.

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Van Gosen, B. S., 2008, Reported historic asbestos mines, historic asbestos Prospects, and natural asbestos occurrences in the southwestern United States (Arizona, Nevada, and Utah), *US Geological Survey Open-File Report 2008-1095*, 1 plate, <http://pubs.usgs.gov/of/2008/1095>.

## Earth Hazards Teaching Resources

*Investigating Speed and Acceleration Using Tornado Tubes*, Hamline University Graduate School of Education MnSTEP Teaching Activity Collection, <http://serc.carleton.edu/sp/mnstep/activities/27202.html>.

*Karst Formation*, City of Austin Youth Education resources, [http://austintexas.gov/sites/default/files/files/Watershed/youth\\_education/karst\\_lesson\\_high\\_school.pdf](http://austintexas.gov/sites/default/files/files/Watershed/youth_education/karst_lesson_high_school.pdf).

Radke, J., *Impact of Natural Disasters on the Earth*, Hamline University Graduate School of Education MnSTEP Teaching Activity Collection, <http://serc.carleton.edu/sp/mnstep/activities/19789.html>.

*Radon Activities from the Alabama Radon Program*, Alabama and Auburn Universities Extension, <http://www.aces.edu/fcs/hndh/radon/alradon.php>.

*Teaching Quantitative Concepts in Floods and Flooding*, SERC Resources for Undergraduate Students and Faculty, <http://serc.carleton.edu/quantskills/methods/quantlit/floods.html>.



## Resources

## Resources

### Field Geology Teaching Practices

- Greene, J. P., Kisida, B., & Bowen, D. H., 2014, The Educational Value of Field Trips, *Education Next*, 14(1), 78–86.
- Issigonis, M., 2006, Field trips as an aid to teaching Earth science courses, *The Earth Scientist*, 22(3): 14–16.
- Johnson, J.K., and Reynolds, S.J., 2005, Concept sketches—using student- and instructor-generated annotated sketches for learning, teaching, and assessment in geology courses. *Journal of Geoscience Education*, 53: 85–95.
- Orion, N., and Hofstein, A., 1994, Factors that influence learning during a scientific field trip in a natural environment, *Journal of Research in Science Teaching*, 31: 1097–1119.
- Russell, H.R., 1998, *Ten-Minute Field Trips*, 3rd edition, National Science Teachers Association: Alexandria, VA. [Focused on elementary and junior high; chapter on Earth science on pp. 113–137.]
- Shulman, L. S., 2005, Signature pedagogies in the professions, *Daedalus*, 134(3): 52–59.
- Whitmeyer, S.J., Pyle, E.J., Mogk, D.W. (eds.), 2009, *Field Geology Education: Historical Perspectives and Modern Approaches*, GSA Special Papers 461. [29 articles, focused on undergraduate education.] <http://specialpapers.gsapubs.org/content/461.toc>.
- Extraordinary Science Field Trips, *NSTA Reports*, Summer 2013, 25(1): 1–2. <http://www.nsta.org/docs/NSTARReports201307.pdf>.
- My Geologic Address: Locating Oneself in Geologic Time and Process, by Ault, K., SERC InTeGrate workshop "Teaching the Methods of Geoscience" activities, <http://serc.carleton.edu/integrate/workshops/methods2012/activities/ault.html>.
- Teaching in the Field, National Association of Geoscience Teachers. [Set of resources for teaching field geology.] [http://nagt.org/nagt/teaching\\_resources/field/index.html](http://nagt.org/nagt/teaching_resources/field/index.html).

### Guides to Fieldwork

(Mostly focused on post secondary education, but useful as references)

- Coe, A., T. Argles, D. Rothery, and R. Spicer, 2010, *Geological Field Techniques*, Wiley Blackwell, Chichester. [This is a current standard.]
- Compton, R. R., 1962, *Manual of Field Geology*, John Wiley & Sons, New York. [An old classic.]
- Compton, R., 1985, *Geology in the Field*, Wiley, New York. [An updated version.]
- Lambert, D., 2006, *The Field Guide to Geology*. The Diagram Group.
- Lisle, R., P. Brabham, and J. Barnes, 2011, *Basic Geological Mapping*, Wiley-Blackwell, Hoboken, NJ.
- Maley, T. S., 2005, *Field Geology Illustrated*, 2nd edition, Mineral Land Publications, Boise, ID.
- Mathur, S. M., 2004, *Guide to Field Geology*, Prentice Hall of India, New Delhi.
- Spencer, E., 2006, *Geologic Maps : a Practical Guide to the Preparation and Interpretation of Geologic Maps*, Waveland Press, Long Grove, IL.
- Walker, J. & H. Cohen, 2009, *The Geoscience Handbook: AGI Data Sheets*, American Geological Institute, Alexandria, VA.
- Walker, J. D., and H. A. Cohen, 2007, *The Geoscience Handbook: AGI Data Sheets*, 4th edition, American Geological Institute.
- How to Read a Geologic Map*, Wisconsin Geological and Natural History Survey, <http://wgnhs.uwex.edu/wisconsin-geology/bedrock-geology/read-geologic-map/>.

# Appendix

## Resources

Following are some of the most commonly used and cited publications on science education standards and benchmarks.

- AAAS, 1993, *Benchmarks for Science Literacy*, Oxford University Press. [AAAS is American Association for Advance of Science.]  
<http://www/rpkect2-61.org/publications/bsl/online/index.php>.
- Bransford, J. D., Brown, A. L., and Cocking, R. R., eds., 2000, *How People Learn: Brain, Mind, Experience, and School, expanded edition*, National Academies Press, Washington, DC,  
[http://www.nap.edu/openbook.php?record\\_id=9853](http://www.nap.edu/openbook.php?record_id=9853).
- Common Core State Standards Initiative. [While not focused on science education directly, standards on math and non-fiction reading impact are importantly related.]  
<http://www.corestandards.org>.
- NCSE, 2013, *Evolution and Climate Change in the NGSS*, National Center for Science Education, <http://ncse.com/news/2013/04/evolution-climate-change-ngss-0014800>.
- NGSS@NSTA website, National Science Teacher Association, <http://ngss.nsta.org/>.
- NRC, 1996, *National Science Education Standards*, National Academies Press, Washington, DC. [NRC is National Research Council, and body of the National Academy of Sciences.]  
[http://www.nap.edu/openbook.php?record\\_id=4962](http://www.nap.edu/openbook.php?record_id=4962).
- NRC, 2011, *Successful K-12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics*, National Academies Press, Washington, DC.  
[http://www.nap.edu/openbook.php?record\\_id=13158](http://www.nap.edu/openbook.php?record_id=13158).
- NRC, 2012, *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*, National Academies Press, Washington, DC.  
[http://www.nap.edu/openbook.php?record\\_id=13165](http://www.nap.edu/openbook.php?record_id=13165).
- NRC, 2013, *Next Generation Science Standards: For States, By States*, National Academies Press, Washington, DC, <http://www.nextgenscience.org/>.
- Wyssession, M., 2013, The Next Generation Science Standards and the Earth and Space Sciences, *The Science Teacher*, April/May issue. [Duggan-Haas, author of this Appendix, worked with Wyssession on NRC's Conceptual Framework for New Science Education Standards.] [http://nstahosted.org/pdfs/ngss/resources/201304\\_NGSS-Wyssession.pdf](http://nstahosted.org/pdfs/ngss/resources/201304_NGSS-Wyssession.pdf).



# General Resources

## On the Earth System Science of North America

### Books and Websites

- Bally, A. W., and Palmer, A. R., eds., 1989, *The geology of North America—An Overview, vol. A of The Geology of North America*, Geological Society of America, Boulder, CO, 619 p.
- Birdsall, S. S. & J. Florin, United States Geography, <http://countrystudies.us/united-states/geography.htm>.
- National Park Geologic Resources, <http://www.nature.nps.gov/geology/>.

### Maps (printed)

- Thelin, G. P. and R. J. Pike, 1991, *Landforms of the Conterminous United States—A Digital Shaded-Relief Portrayal*, USGS Miscellaneous Investigations Series Map I-2206, <http://pubs.usgs.gov/imap/i2206/>.
- Muehlberger, W. R., compiler, 1992, *Tectonic Map of North America, Scale 1:5,000,000*, American Association of Petroleum Geologists, Tulsa, OK.
- Reed, J.C., and C.A. Bush, 2007, *Geology: the National Atlas of the United States 32" x 28"*, <http://pubs.usgs.gov/circ/1300/>.
- Reed, J.C., and C. A., Bush, 2007, About the geologic map in the National Atlas of the United States of America, *US Geological Survey Circular 1300*, 52 pp., [http://pubs.usgs.gov/circ/1300/pdf/Cir1300\\_508.pdf](http://pubs.usgs.gov/circ/1300/pdf/Cir1300_508.pdf).
- USGS, 2005, *Resources for the Geologic Map of North America*, <http://ngmdb.usgs.gov/gmna/>.
- Vigil, J.F., R. J. Pike, and D. G. Howell, 2000, *A Tapestry of Time and Terrain*, US Geological Survey Geologic Investigations Series 2720, 1 plate scale 1:2,500,000, 1 pamphlet, <http://pubs.usgs.gov/imap/i2720/>.

### Maps (online)

- American Geological Institute's *Earth Comm 2nd edition*, Map Resources. [A compilation of online map resources.] <http://www.agiweb.org/education/earthcomm2/maps.html>.
- Geologic Maps of the 50 United States*, by A. Alden, About.com, <http://geology.about.com/od/maps/ig/stategeomaps/>.
- Geologic Provinces of the United States: Records of an Active Earth*, US Geological Survey, <http://geomaps.wr.usgs.gov/parks/province/>.
- Geology of the Conterminous United States*, <http://mrddata.usgs.gov/geology/us/>.
- Google Earth, <http://www.google.com/earth/>.
- The National Atlas of the United States*. [Custom-make maps.] <http://nationalatlas.gov/mapmaker>.
- The National Map*, <http://nationalmap.gov>.
- The National Map: Historical Topographic Map Collection*. [Online historic topographic maps.] <http://nationalmap.gov/historical/index.html>.
- OneGeology. [A collaboration among many national geological surveys to create a dynamic digital geological map data for the world.] <http://portal.onegeology.org/>.
- US Topo Quadrangles—Maps for America*. [Online topographic maps.] <http://nationalmap.gov/ustopo/index.html>.
- Vigil, J. F., R. J. Pike, & D. G. Howell, 2000, *A Tapestry of Time and Terrain*, US Geological Survey, Geologic Investigations Series 2720, <http://pubs.usgs.gov/imap/i2720/>.

## Other General Resources on Earth System Science

### Geologic Time Resources

- Gradstein, F. M., J. G. Ogg, M. D. Schmitz, & G. M. Ogg, *The Geologic Time Scale 2012*, 2 vols., Elsevier, New York, [https://engineering.purdue.edu/Stratigraphy/charts/Stratigraphic\\_Chart\\_GTS2012.pdf](https://engineering.purdue.edu/Stratigraphy/charts/Stratigraphic_Chart_GTS2012.pdf).
- International Commission on Stratigraphy, <http://www.stratigraphy.org/>.
- Janke, P. R., 2013, *Correlated History of the Earth Chart (laminated)*, vol. 8, Pan Terra, Hill City, SD.

- The Paleontology Portal, <http://paleoportal.org>.
- Walker, J. D., J. W. Geissman, S. A. Bowring, & L. E. Babcock, compilers, 2012, *Geologic Time Scale Poster*, Geological Society of America, Boulder, CO.

## • Dictionaries

- Allaby, M., 2013, *A Dictionary of Geology and Earth Sciences*, Oxford University Press, Oxford, UK.
- Bates, R. L., & J. A. Jackson, 1984, *Dictionary of Geological Terms, 3rd edition*, Anchor Press, Garden City, NY.
- McGraw-Hill Education, 2003, *McGraw-Hill Dictionary of Geology and Mineralogy*, McGraw-Hill, New York.
- Neuendorf, K. K. E., J. P. Mehl, Jr., & J. A. Jackson, 2011, *Glossary of Geology, 5th edition, revised*, American Geological Institute, Alexandria, VA, 800 pp.

## • Earth System Science Organizations

- American Association of State Geologists, <http://www.stategeologists.org/>.
- American Geological Institute (AGI is an umbrella organization representing over 40 other geological organizations), <http://agiweb.org>.
- American Geophysical Union, <http://agu.org>.
- Association for Women Geoscientists, <http://awg.org>.
- Geological Society of America, <http://geosociety.org>.
- Natural Resources Conservation Service, <http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/> (NRCS helps US farmers, ranchers and forest landowners conserve soil, water, air and other natural resources).
- Paleontological Research Institution, <http://priweb.org> (publisher of this volume).
- Paleontological Society, <http://paleosoc.org>.
- US Geological Survey, <http://usgs.gov>.

## • General Earth Science Education Resources

### • Websites

- *Digital Library for Earth System Education (DLESE)*, <http://dlese.org>.
- *Earth Science World Image Bank*, American Geological Institute, <http://www.earthscienceworld.org/imagebank/>.
- *Resources for Earth Science and Geography Instruction*, by Mike Francek, Central Michigan University, <http://webs.cmich.edu/resqi/>.
- *Science in Your Backyard*, US Geological Survey. [State-by-state compilation of Earth science-related data, most of which will need to be adapted for education uses.] <http://www.usgs.gov/state/>.
- *SERC (The Science Education Resource Center) K-12 Resources*. [Hundreds of classroom activities organized by grade level and topic as well as guidance on effective teaching.] <http://serc.carleton.edu/k12/index.html>.
- *SERC Earth Exploration Toolbook*. [A collection of online Earth system science activities introducing scientific data sets and analysis tools.] <http://serc.carleton.edu/eet/index.html>.
- *Windows to the Universe*, from the National Earth Science Teachers Association, <http://www.windows2universe.org/>.

### • Blogs

- AGU Blogosphere, American Geophysical Union. [A collection of over a dozen blogs by geoscientists on recent events and perspectives on the geosciences.] <http://blogs.agu.org/blogs/>.
- *The Best of Geology and Earth Science on the Web: the Latest from the Blogosphere*, <http://all-geo.org/>.
- *Geobulletin: News from the Geoblogosphere*, stratigraphy.net, <http://www.geobulletin.org/?action=news>.
- *Geotripper: News and Views from the Geologic Realm*, by Garry Hayes, Modesto Junior College. [Many, but not all, pertain to the western US.] <http://geotripper.blogspot.com/>.

### • Science education organizations

- National Association of Geoscience Teachers. [Focused on undergraduate geoscience education, but includes active secondary school educators.] <http://nagt.org>.
- National Earth Science Teacher Association. [Focused on secondary school Earth science education.] <http://nestanet.org>.
- National Science Teacher Association, <http://nsta.org>.

# General Resources by State

Geologic maps of individual US states. (Digital geologic maps of US states with consistent lithology, age, GIS database structure, and format.)  
<http://mrddata.usgs.gov/geology/state>.

## Multistate Areas of the Southwest

### Books

- Abbott, L. & T. Cook, 2004, *Hiking the Grand Canyon's Geology*, The Mountaineers Books, Seattle, WA, 301 pp.
- Baars, D. L., 2000, *The Colorado Plateau: a Geologic History, revised edition*, University of New Mexico Press, Albuquerque, 268 pp.
- Baars, D. L., 2002, *A Traveler's Guide to the Geology of the Colorado Plateau*, The University of Utah Press, 294 pp.
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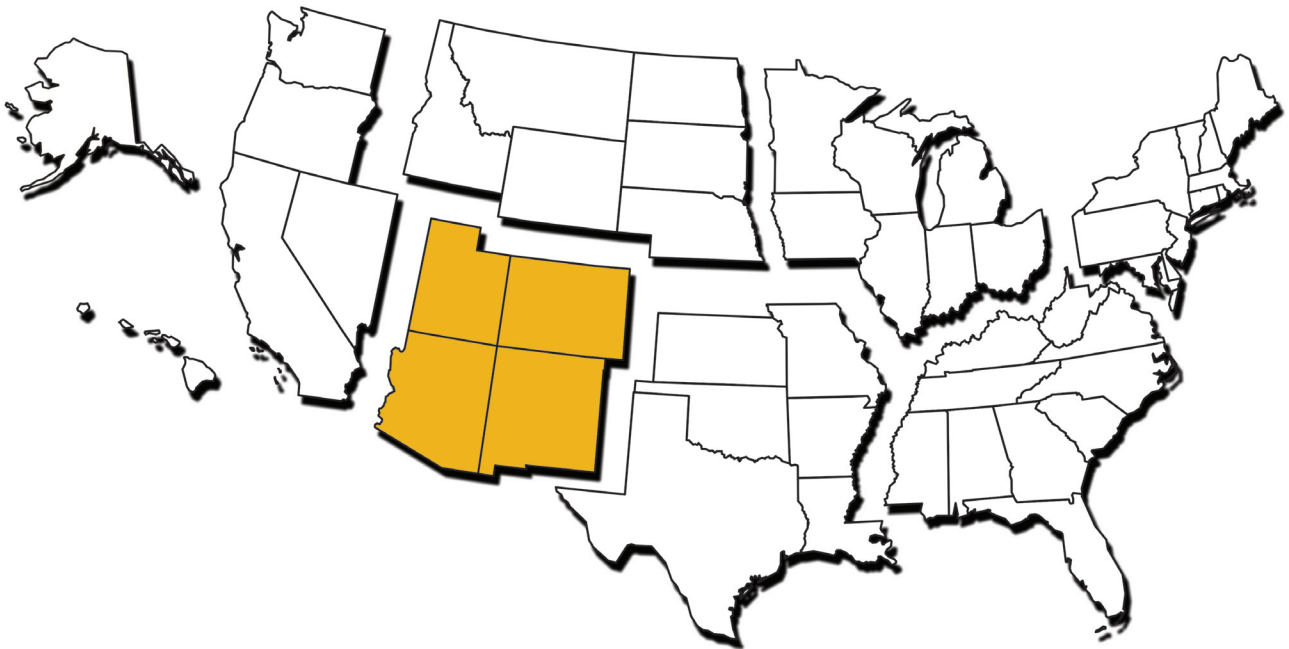
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The  
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Guide™

to the Earth Science of the  
Southwestern US



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