Big Ideas

Resources

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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.

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.

Resources

Books

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.

Macdougall, 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.

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AAPG, 1968, *Pacific Southwest Region Geological Highway Map* (California, Nevada). AAPG, Tulsa, OK.

AAPG, 1995, *Pacific Northwest Geological Highway Map* (Washington, Oregon). AAPG, Tulsa, OK.

Websites

North America During the Last 150,000 Years, compiled by J. Adams, http://www.esd.ornl.gov/projects/qen/nercNORTHAMERICA.html.

Color-coded Continents!, US Geological Survey, http://geomaps.wr.usgs.gov/parks/pltec/scplseqai.html. (Reconstructions of color-coded continental motions from 620 million years ago through the present; maps from C. Scotese.)

Earth Viewer, by BioInteractive at Howard Hughes Medical Institute, http://www.hhmi.org/biointeractive/earthviewer. (Free iPad app; an interactive paleogeographic atlas of the world; state and country overlays allows tracking the development of the Western States.)

The Paleomap Project, C. R. Scotese, http://www.scotese.com.

Paleogeography, R. Blakey, https://www2.nau.edu/rcb7/RCB.html. (The older, but free, version of the site.)

Reconstructing the Ancient Earth, Colorado Plateau Geosystems, http://cpgeosystems.com/index.html. (R. Blakey's updated site.)

Tour of Geologic Time, University of California Museum of Paleontology, http://www.ucmp.berkeley.edu/help/timeform.php. (Online interactive geologic calendar exhibit.)

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), Tula, OK, https://www.beloit.edu/sepm/Fossil_Explorations/Paleogeographic_Mapping.html.

1 Geologic History

Resources

(Constructing paleogeographic maps for elementary and middle school students.)

Toilet Paper Analogy for Geologic Time, by J. Wenner, in: *Teaching Quantitative Skills in the Geosciences, at Resources for Undergraduate Students and Faculty*, SERC, http:// serc.carleton.edu/quantskills/activities/TPGeoTime.html. (Demonstration of geological time using a 1000 sheet roll of toilet paper.)

Understanding Geologic Time, Texas Memorial Museum at the University of Texas at Austin, http://www.jsg.utexas.edu/glow/files/Understanding-Geologic-Time-6-8.pdf. (Timeline activity for middle school students.)

Resources

Rock and Mineral Field Guides

Brown, V., D. Allan, & J. Stark, 1987, *Rocks and Minerals of California, 3rd revised edition*, Nautregraph Publishers, Happy Camp, CA, 200 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.

Johnsen, O., 2002, *Minerals of the World,* Princeton University Press, Princeton, NJ, 439 pp.

Mitchell, J., 2008, *The Rockhound's Handbook, revised editioin,* 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.

Books

Vernon, R. H., 2000, *Beneath Our Feet: The Rocks of Planet Earth,* Cambridge University Press, Cambridge, UK, 216 pp.

Websites

Atlas of Igneous and Metamorphic Rocks, Minerals and Textures, University of North Carolina Geology Department, http://leggeo.unc.edu/Petunia/IgMetAtlas/mainmenu.html. (Older but still useful resource.)

Resources

General Books on the Fossil Record & 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.

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.

Books and Articles on Fossils of Specific Areas

Allison, R. C., 1978, Late Oligocene through Pleistocene molluscan faunas in the Gulf of Alaska region, *The Veliger*, 21(2): 171–188.

Bishop, E. M., 2003, *In Search of Ancient Oregon: A Geological and Natural History,* Timber Press, Portland, OR, 288 pp.

Blodgett, R. B., & G. D. Stanley, eds., 2008, The Terrane Puzzle: new perspectives on paleontology and stratigraphy from the North American Cordillera, *Geological Society of America Special Paper* 442, 326 pp.

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Fletcher, C. H., C. Bochicchio, C. L. Conger, M. Engels, E. Feirstein, E. Grossman, R. Grigg, J. N. Harney, J. B. Rooney, C. E. Sherman, S. Vitousek, K. Rubin, & C. V. Murray-Wallace, 2008, Geology of Hawaii reefs, pp. 435–488, in: B. M. Riegl & R. E. Dodge, *Coral Reefs of the USA*, Springer, London, 803 pp.

Gangloff, R. A., 2012, *Dinosaurs Under the Aurora,* Indiana University Press, Bloomington, IN, 176 pp.

Hilton, R. P., 2003, *Dinosaurs and Other Mesozoic Reptiles of California,* University of California Press, Berkeley, CA, 356 pp.

Kohn, A. J., 1980, *Conus kahiko*, a new Pleistocene gastropod from Oahu, Hawaii, *Journal of Paleontology*, 54(3): 534–541.

Manchester, S. R., 1987, Oligocene fossil plants of the John Day Formation, Fossil, Oregon, *Oregon Geology,* 49(10): 115–127.

Manchester, S. R., 1994, Fruits and seeds of the Middle Eocene Nut Beds flora, Clarno Formation, Oregon, *Palaeontographica Americana* 58, 205 pp.

Orr, E. L., & W. N. Orr, 1999, *Oregon Fossils*. Kendall/Hunt Publishing Company, Dubuque, IA, 381 pp.

Raynolds, B., 1999, Rhino revelation, http://fossilnews.com/1999/rhino.html.

Retallack, G. J., E. A. Bestland, & T. J. Fremd, 1996, Reconstructions of Eocene and Oligocene plants and animals of central Oregon, *Oregon Geology*, 58(3): 51–69.

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Alaska Paleontological Database, http://www.alaskafossil.org.
John Day Fossil Beds National Monument (Oregon), National Park Service, http://www.nps.gov/joda/index.htm.
Oregon Paleo Lands Institute (OPLI), http://www.oregonpaleolandscenter.com/.
Page Museum, La Brea Tar Pits, http://www.tarpits.org/.

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.

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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.

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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.

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Wyckoff, J., 1999, *Reading the Earth: Landforms in the Making*. Adastra West, Mahwah, NJ, 352 pp.

Sawyer, J. O., 2006, *Northwest California: A Natural History.* University of California, Berkeley, CA, 247 pp. (Chapter 1, The Klamath: Land of Mountains and Canyons, http://www.ucpress.edu/content/pages/9691/9691.ch01.pdf.)

Websites

The Cascade Episode: Evolution of the modern Pacific Northwest, Burke Museum, http://www.burkemuseum.org/static/geo_history_wa/Cascade%20Episode.htm.

Color Landform Atlas of the US, http://fermi.jhuapl.edu/states/states.html. (Low resolution shaded relief maps of each state.)

OpenLandform Catalog, Education Resources, OpenTopography, http://www.opentopography.org/index.php/resources/lidarlandforms. (High resolution topographic images that may be useful in teaching.)

Teaching Geomorphology in the 21st Century, On the Cutting Edge—Strong Undergraduate Geoscience Teaching, SERC, http://serc.carleton.edu/NAGTWorkshops/geomorph/index.html. (A set of resources for college level, some of which may be adaptable to secondary education.)

Teaching with Google Earth, On the Cutting Edge—Starting Point: Teaching Entry Level Geoscience, SERC, http://serc.carleton.edu/introgeo/google_earth/index.html.

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Skinner, B. J., 1989, *Mineral Resources of North America,* pp. 575–584, in: A. W. Bally, & A. R. Palmer (eds.), *The Geology of North America—An Overview*, The Geology of North America, vol. A, Geological Society of America, Boulder, CO.

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Frank, D. G., A. R. Wallace, & J. L. Schneider, 2010, Western Mineral and Environmental Resources Science Center—providing comprehensive earth science for complex societal issues, *US Geological Survey Circular* 1363, 32 pp.

Mineral Resources [of California], California Geological Survey, Department of Conservation, http://www.consrv.ca.gov/cgs/geologic_resources/mineral_resource_mapping/Pages/Index.aspx.

USGS Minerals Yearbook, Volume II—Area Reports: Domestic, State and Territory Chapters, http://minerals.usgs.gov/minerals/pubs/state/index.html#pubs. (State-by-state information about mineral mining and production.)

Gold

Hill, M., 1999, *Gold: the California Story*, University of California Press, Berkeley, 306 pp.

Gold Geology and Prospecting, Alaska, Gold in Alaska (Blogspot), 10 February 2010, http://goldalaska.blogspot.com/2010/02/gold-geology-and-prospecting-alaska.html.

Gold Prospecting in the United States, Geology.com, http://geology.com/usgs/gold-prospecting/.

Kirkemo, H., 1991, *Prospecting for Gold in the United States*, *US Geological Survey Unnumbered Series General Interest Publication*, 19 pp., http://pubs.usgs.gov/gip/prospect2/prospectgip.html.

Mendahl, K. H., 2008, *Hard Road West: History and Geology along the Gold Rush Trail*, University of Chicago Press, Chicago, 329 pp.

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Books

Alley, R. B., 2000, *The Two-Mile Time Machine: Ice Cores, Abrupt Climate Change, and Our Future*, Princeton University Press, Princeton, NJ, 229 pp.

Benn, D. I., & D. J. Evans, 2010, *Glaciers and Glaciation, 2nd edition*, Hodder Arnold, London, 816 pp.

Fagan, B. M., 2009, *The Complete Ice Age: How Climate Change Shaped the World*, Thames & Hudson, New York, 240 pp.

Ferguson, S. A., 1992, *Glaciers of North America: A Field Guide*, Fulcrum Publishers, Golden, CO, 176 pp.

Imbrie, J., & K. P. Imbrie, 1979, *Ice Ages: Solving the Mystery*, Enslow Publishers: Short Hills, NJ, 224 pp.

Macdougall, J. D., 2004, *Frozen Earth: The Once and Future Story of Ice Ages,* University of California Press, Berkeley, 256 pp.

Mickelson, D. M., L. J. Maher Jr., & S. L. Simpson, 2011, *Geology of the Ice Age National Scenic Trail*, University of Wisconsin Press, Madison, 305 pp.

Pidwirny, M., 2006, Landforms of Glaciation, in: *Fundamentals of Physical Geography, 2nd edition*, http://www.physicalgeography.net/fundamentals/10af.html.

Ruddiman, W. F., 2001, *Earth's Climate: Past and Future*, W. H. Freeman, New York, 465 pp.

White, C., 2013, *The Melting World: A Journey Across America's Vanishing Glaciers*, St. Martin's Press, New York, 272 pp.

Books and Articles on Glaciers in the Western US

Fountain, A. G., & E. Safran, 2010, Imperiled glaciers of the American West, *American Paleontologist*, 18(4): 10–14.

Guyton, B., 2001, *Glaciers of California: Modern Glaciers, Ice Age Glaciers, Origin of Yosemite Valley, and a Glacier Tour in the Sierra Nevada,* University of California Press, Berkeley, 223 pp.

Post, A., & E. LaChapelle, 2000, *Glacier Ice, revised edition*, University of Washington Press, Seattle, 160 pp. (Aerial photographs of glaciers along the North Pacific Coast of North America and into the interior ranges of Alaska.)

Rennick, P. (ed.), 1993, *Alaska's Glaciers, revised edition*, Alaska Geographic Society, Anchorage, 144 pp.

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Glaciers on Mauna Kea, Mauna Kea—from Mountain to Seas, Na Maka o ka Aina, http://www.mauna-a-wakea.info/maunakea/A3_glaciers.html.

Ancient Hawaiian Glaciers Reveal Clues to Global Climate Impacts, Oregon State University News and Research Communications, http://oregonstate.edu/ua/ncs/archives/2010/aug/ancient-hawaiian-glaciers-reveal-clues-global-climate-impacts.

Activities

Beyond Penguins and Polar Bears, College of Education and Human Ecology, The Ohio State University, http://beyondpenguins.ehe.osu.edu/issue/icebergs-and-glaciers/hands-on-lessons-and-activities-about-glaciers. (Lesson plans for grades K–5, including topics such as glacial ice, ice movement, and glacial erosion.)

Glacier Power, Earth Observing and System Data and Information System (EOSDIS), NASA, https://earthdata.nasa.gov/featured-stories/featured-research/glacier-power. (Middle school glacier education resources.)

Impact of Change in Glacier Ice, Alaska Seas and Rivers Curriculum, Alaska Sea Grant, https://seagrant.uaf.edu/marine-ed/curriculum/grade-8/investigation-2.html. (Grade 8 lesson plan on glacier retreat.)

Learning about Glaciers, Glacier Research Group, Glacier Research Group, Portland State University Geology Department, http://glaciers.us/Learning-About-Glaciers. (High school and college level educational resources.)

Modeling Glacier Dynamics with Flubber, by L.A. Stearns, National Association of Geoscience Teachers (NAGT) Teaching Activities, http://nagt.org/nagt/programs/teachingmaterials/11337.html.

National Snow and Ice Data Center (NSIDC) Educational Resources, http://nsidc.org/cryosphere/education-resources/. (High school- and college-level educational resources.)

Resources

Books: General Resources on Energy

Bird, K.J., 1989, North American fossil fuels, pp. 555–574, in: A. W. Bally, & A. R. Palmer (eds.), *The Geology of North America—An Overview*, The Geology of North America, vol. A, Geological Society of America, Boulder, CO.

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Wohletz, K., & G. Heiken, 1992, *Volcanology and Geothermal Energy,* University of California Press, Berkeley, http://ark.cdlib.org/ark:/13030/ft6v19p151/.

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American Association of Petroleum Geology (AAPG), http://aapg.org.

Energy Literacy: Essential Principles and Fundamental Concepts for Energy Education, at Energy.gov, http://www1.eere.energy.gov/education/energy_literacy.html.

History of Energy Use in the United States, by Hobart King at Geology.com, http://geology.com/articles/history-of-energy-use/.

Renewable and Alternative Fuels, US Energy Information Administration, http://www.eia.gov/renewable/state/.

State-by-state CO_2 Emissions Data From Fossil Fuel Combustion, http://www.epa.gov/statelocalclimate/documents/pdf/CO2FFC_2011.pdf.

US Department of Energy (DOE), http://energy.gov.

US Energy Information Administration (EIA), http://www.eia.gov/.

US Energy Information Administration (EIA), by state, http://www.eia.gov/state/.

US Geological Survey Energy Resources Program, http://energy.usgs.gov/.

Energy Resources in the Western US

California Renewable Energy Overview and Programs, California Energy Commission, http://www.energy.ca.gov/renewables/.

Houseknecht, D. W., & K. J. Bird, 2005, Oil and Gas Resources of the Arctic Alaska Petroleum Province, US Geological Survey Professional Paper 1732–A, http://pubs.usgs.gov/pp/pp1732/pp1732a/pp1732a.pdf.

McDonnell, T., 2013, *Washington Is Outdoing California and Texas in Renewable Energy—Renewable Energy Consumption by State*, http://www.slate.com/articles/health_and_science/climate_desk/2013/05/renewable_energy_map_wind_solar_hydroelectric_power_use_by_state.html.

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Rintoul, W., 1990, *Drilling Through Time: 75 Years With California's Division of Oil and Gas*, California Department of Conservation, Division of Oil and Gas, Sacramento, 178 pp.

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Alaska Soil Surveys, National Resources Conservation Service, Alaska, US Department of Agriculture, http://www.nrcs.usda.gov/wps/portal/nrcs/main/ak/soils/surveys/.

K-12 Soil Science Teacher Resources, Soil Science Society of America. http://www.soils4teachers.org/.

Michigan State University Soil Profiles, http://web2.geo.msu.edu/soilprofiles/.

Soil Sustains Life, Soil Science Society of America, https://www.soils.org.

The Twelve Soil Orders Soil Taxonomy, University of Idaho College of Agricultural and Life Sciences, http://www.cals.uidaho.edu/soilorders/.

USDA Natural Resources Conservation Service—Soils, http://www.nrcs.usda.gov/wps/portal/nrcs/site/soils/home/.

Soil surveys by state, USDA Natural Resources Conservation Service, http://www.nrcs.usda.gov/wps/portal/nrcs/soilsurvey/soils/survey/state.

Resources

Websites on State- or Region-specific Climate Resources

The Age of Western Wildfires, Climate Central Sept. 18, 2012, http://www.climatecentral.org/news/report-the-age-of-western-wildfires-14873.

Alaska PaleoAtlas Glacier: A Geospatial Compilation of Pleistocene Glacier Extents, by W. Manley & D. Kaufman, Institute of Arctic and Alpine Research (INSTAAR), University of Colorado, Boulder, http://instaar.colorado.edu/groups/QGISL/ak_paleoglacier_atlas/.

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Climate change impacts, the Northwest (WA, OR, ID), http://climatenexus.org/wp-content/uploads/2013/06/ClimateChangeImpactsNW.pdf.

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Giambelluca, T. W., Q. Chen, A. G. Frazier, J. P. Price, Y.-L. Chen, P.-S. Chu, J. K. Eischeid, & D. M. Delparte, 2013, Online rainfall atlas of Hawai'i, *Bulletin of the American Meteorological Society,* 94: 313–316, doi: 10.1175/BAMS-D-11-00228.1.

Western Regional Climate Center, http://www.wrcc.dri.edu/. (A wide variety of weather and climate data and state-by-state climate narratives.)

Resources

General Resources

Macdougall, J. D., 2011, *Why Geology Matters: Decoding the Past, Anticipating the Future,* University of California Press, Berkeley, 285 pp.

NASA Earth Observatory Natural Hazards map, http://earthobservatory.nasa.gov/NaturalHazards/. (Monthly images of Earth hazards occurring globally.)

Websites: Storms

(See also resources on climate change in Chapter 9: Climate)

Floods: Recurrence Intervals and 100-year Floods, US Geological Survey, 2014, http://water.usgs.gov/edu/100yearflood.html.

Effects of Urban Development on Floods, US Geological Survey Fact Sheet FS-076-03, 2012, http://pubs.usgs.gov/fs/fs07603/.

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Hurricanes: Online Meteorology Guide, University of Illinois at Urbana-Champaign, http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/hurr/home.rxml.

Thunderstorms and Flying, National Weather Association, 2003, http://www.nwas.org/committees/avnwxcourse/teachl1.htm.

Tropical Cyclone Tracker, University of Illinois at Urbana-Champaign, http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/hurr/hurtrack/index.html. (Interactive track of cyclones 1950–2007.)

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The Science of Sinkholes, US Geological Survey, 2013, http://www.usgs.gov/blogs/features/usgs_top_story/the-science-of-sinkholes.

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Recent and Historical Tsunami Events and Relevant Data, Pacific Marine Environmental Laboratory, National Oceanic and Atmospheric Administration, http://nctr.pmel.noaa.gov/database_devel.html. (Includes a world map of recent tsunamis.)

Tsunamis—Past and Present, University of Washington, http://earthweb.ess.washington.edu/tsunami/index.html.

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US Volcanoes and Current Activity Alerts, Volcano Hazards Program, US Geological Survey, http://volcanoes.usgs.gov/.

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

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Karst Formation, City of Austin Youth Education resources, https://austintexas.gov/sites/default/files/files/files/Watershed/youth_education/karst_lesson_high_school.pdf.

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Tsunami Teaching Materials, California Department of Conservation, http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Pages/education.aspx.

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Guides to Fieldwork

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

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Compton, R. R., 1962, *Manual of Field Geology*, John Wiley & Sons, New York, 378 pp. (An old classic.)

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Appendix

Resources

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

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Common Core State Standards Initiative, http://www.corestandards.org. (While not focused on science education directly, standards on math and non-fiction reading impact are importantly related.)

National Center for Science Education, 2013, *Evolution and Climate Change in the NGSS*, http://ncse.com/news/2013/04/evolution-climate-change-ngss-0014800.

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National Research Council, 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.

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National Research Council, 2013, *Next Generation Science Standards: For States, By States*. National Academies Press, Washington, DC, http://www.nextgenscience.org/.

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General Resources

On the Earth System Science of North America

Books

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Vigil, J.F., Pike, R.J., and Howell, D.G., 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, http://www.agiweb.org/education/earthcomm2/maps.html (a compilation of online map resources).

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/.

Google Earth, http://www.google.com/earth/.

The National Atlas of the United States, http://nationalatlas.gov/mapmaker (custom-make maps).

The National Map, http://nationalmap.gov.

The National Map: Historical Topographic Map Collection, http://nationalmap.gov/historical/index.html (on-line historic topographic maps).

US Topo Quadrangles—Maps for America, http://nationalmap.gov/ustopo/index.html (on-line topographic maps).

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Gradstein, F. M., J. G. Ogg, M. D. Schmitz, & G. M. Ogg, *The Geologic Time Scale 2012, 2 vols,* Elsevier, NY, https://engineering.purdue.edu/Stratigraphy/charts/Stratigraphic_Chart_GTS2012.pdf.

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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 organizaitons), 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).
The 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/resgi/.
Science in Your Backyard, US Geological Survey, http://www.usgs.gov/state/. (State-by-state compilation of Earth science-related data, most of which will need to be adapted for education uses.)
SERC (The Science Education Resource Center) K-12 resources, http://serc.carleton.edu/k12/index.html. (Hundreds of classroom activities organized by grade level and topic as well as guidance on effective teaching.)
SERC Earth Exploration Toolbook, http://serc.carleton.edu/eet/index.html. (Collection of online Earth system science activities introducing scientific data sets and analysis tools.)
Windows to the Universe, from the National Earth Science Teachers Association, http://www.windows2universe.org/.

Science education organizations

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

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://mrdata.usgs.gov/geology/state.

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Books and articles

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Alaska Geological and Geophysical Surveys, Alaska Department of Nature Resources, http://www.dggs.alaska.gov/.

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Wrangell—St. Elias, National Park and Preserve, Alaska, National Park Service Geology Fieldnotes, http://www.nature.nps.gov/geology/parks/wrst/.

California

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Geology Unique to the Northwest, Nature of the Northwest, http://www.naturenw.org/.
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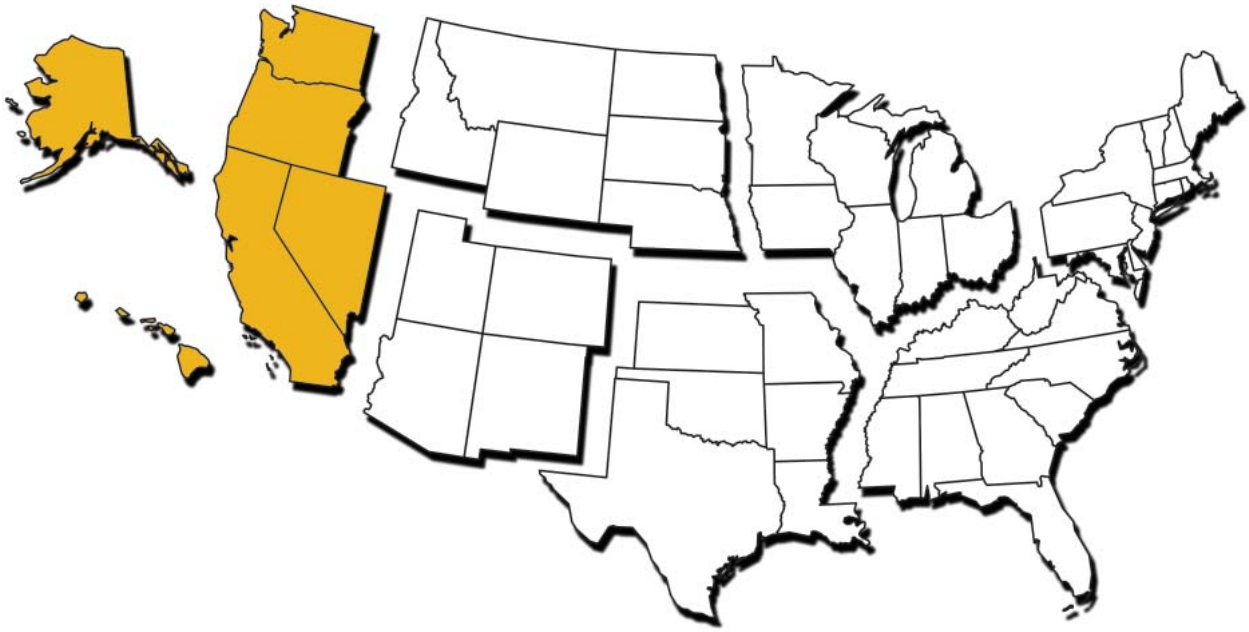
Washington State Geology News, Washington State Geology Survey, https://washingtonstategeology.wordpress.com.

The **Teacher-Friendly** Guide™

to the Earth Science of the Western US



Edited by Mark D. Lucas, Robert M. Ross, & Andrielle N. Swaby

Paleontological Research Institution
2014

ISBN 978-0-87710-509-1
Library of Congress no. 2014959038
PRI Special Publication no. 47

1259 Trumansburg Road
Ithaca, New York 14850 USA
priweb.org

First printing December 2014

This material is based upon work supported by the National Science Foundation under grant DRL-0733303. Any opinions, findings, and conclusions or recommendations are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. The publication also draws from work funded by the Arthur Vining Davis Foundations and The Atlantic Philanthropies.

The interactive online version of this *Teacher-Friendly Guide*™ (including downloadable pdfs) can be found at http://teacherfriendlyguide.org. Web version by Brian Gollands.

The Teacher-Friendly Guide™ series was originally conceived by Robert M. Ross and Warren D. Allmon. Original illustrations in this volume are mostly by Jim Houghton (The Graphic Touch, Ithaca), Wade Greenberg-Brand, and Christi A. Sobel.

Layout and design by Paula M. Mikkelsen, Elizabeth Stricker, Wade Greenberg-Brand, and Katherine Peck.

Cite this book as:
Lucas, M. D., R. M. Ross, & A. N. Swaby (eds.), 2014, *The Teacher-Friendly Guide to the Earth Science of the Western US,* Paleontological Research Institution, Ithaca, New York, xii + 424 pp.

Cite one chapter as (example):
Anderson, B., A. Moore, G. Lewis, and W. D. Allmon, 2014, Fossils of the Western US. Pages 81–123, in: M. D. Lucas, R. M. Ross, & A. N. Swaby (eds.), *The Teacher-Friendly Guide to the Earth Science of the Western US.* Paleontological Research Institution, Ithaca, New York.

On the back cover: Blended geologic and digital elevation map of the Western US. Each color represents the age of the bedrock at the surface. Adapted from Barton, K. E., D. G. Howell, & J. F. Vigil, *The North America Tapestry of Time and Terrain*, US Geological Survey Geologic Investigations Series I-2781, http://pubs.usgs.gov/imap/i2781.