



## Education Resource List for Soil, Water, and Habitat

*A list of web resources to aid formal and non-formal educators with lessons and programs*

### Soil Resources

<http://www.soil-net.com> An educational resource about soil with extensive teacher aids supporting many curriculum-based interactive student activities. Developed by Cranfield University, UK.

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/edu/> Some good general soils information. Check out State Soils, the Twelve Orders of Soil Taxonomy, and Webinars and Videos, including a good video explaining water movement through the soil.

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/edu/Kthru6/> Good background information for teachers; activities for K-6 (e.g. *S.K. Worm and Soil Biological Communities, Just for Kids*).

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/edu/7thru12/> Good background information for teachers or middle/high school students. Look for *Soil Biology Primer* as well as the link to *From the Surface Down* (pdf).

<http://school.discoveryeducation.com/schooladventures/soil/index.html> A good introduction to soil for upper elementary through middle school ages. *Down & Dirty* teaches about soil layers, how soil is formed (a “soil recipe”), and soil texture. *Field Guide* provides a closer look at microorganisms in the soil. For an animated trip underground, take the *Soil Safari* and shrink down as small as 0.003 mm to explore the soil’s wonders up close in this fun and interactive journey. Uses Flash (free install available).

<http://utah.agclassroom.org/htm/student/soil-center> Utah Ag in the Classroom – Dirt: Secrets in the Soil – free downloadable lesson plans covering all aspects of soil, complete with clear teacher and student pages. This and other materials are also available for purchase. Also, two lesson plans deal with erosion: *The Dust Bowl Is Not Played on New Year’s Day*, and *Slip Slidin’ Away*.

<http://www.youtube.com/> Search on “Formed this Way (song parody)” created by a junior high science teacher, and “Fossil Rock Anthem” for You Tube Resources on geology and rock types.

[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/?cid=nrcs142p2\\_053956](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/?cid=nrcs142p2_053956)

*Understanding Soil Risks and Hazards* – an intimidating-looking technical manual, but concise and understandable. When you open it, the chapters are shown on the left. Click on “Erosion by Wind and Water” (p. 36); skip “Wind Erosion” (p. 38) unless you are reading about the Dust Bowl; “Erosion and Sedimentation on Construction Sites” (p. 40) is pertinent to Franklin County, especially “Offsite Impacts”; also pertinent is “Erosion of Streambanks” (p. 43). There are good photographs and maps interspersed – it’s not all text.

<http://kansashistory.us/dustbowl.html> Great links for Dust Bowl sites including photographs and oral histories.

<http://www.cals.ncsu.edu/course/ent525/> Click on *The Ground Crew* for soil organisms including a *Picture Gallery* and an ID key; from North Carolina State University, Department of Entomology, Professor John R. Meyer’s “Entomology for Educators”.

<http://www.urbanext.uiuc.edu/worms> “The Adventures of Herman” (the worm) provides all kinds of useful and interesting worm facts on many topics, including building worm bins.

<http://www.cals.uidaho.edu/soilorders/index.htm> “The Twelve Soil Orders - Soil taxonomy”; includes excellent photos of soil profiles of all kinds of soils; world soil map; soil links.

<http://forces.si.edu/soils/index.html> Based on the Smithsonian Exhibit “Dig It! Secrets in the Soil”, this website offers excellent interactive tools such as *Soil Order Explorer* (photos and distinguishing characteristics of all the 12 soil orders of the world), *Where in the World Game* (detecting soil type based on given clues), *State Soil Interactive* (a great way to virtually travel to see soil profiles around our country), and the *Big Picture Game* that is full of quiz questions along with fascinating facts to help students explore the wonders of soil and related environmental issues around the world.

<http://www.nrcs.usda.gov/wps/portal/nrcs/site/soils/home/> Links to NRCS's technical resources on soils, for upper level students. Look under "Helping People Understand Soils" and click on *Web Soil Survey* for online soil survey maps and other information, and the *Official Soil Series Descriptions* to look up soil profile details on a soil series in your county. Click on *Watch "Water Movement in Soil"* video at bottom of page for a good explanation of why water movement through soil behaves differently in different soils (good for any audience).

<http://soilandwater.ohiodnr.gov/soil-conservation/about-ohios-soils#INT>

A brief but good, basic overview of soil.

<http://soilandwater.ohiodnr.gov/soil-conservation/about-ohios-soils#PHO>

Photo gallery of soil profiles of the Ohio Soil Series (separated into glaciated and unglaciated soils).

[http://www.harcourtschool.com/menus/science/index\\_oh.html](http://www.harcourtschool.com/menus/science/index_oh.html) For some simple interactive learning tools for kids, click on 3 (for grade 3), then Soil Formation, to explore soil composition, formation and composting. Or click on Science Up Close, then Grade 3, for more about soil horizons.

<http://www.exploratorium.edu/gardening/feed/dirt/index.html> "The Dirt on Dirt" (part of the Science of Gardening series) is written in a clear and friendly style, and briefly explains about minerals, humus, and microorganisms in the soil and answers other soil-related questions. (Note: Web page is worth zooming in on for ease of reading.)

<http://nationalzoo.si.edu/education/conservationcentral/walk/> Take virtual walks through the forest with scientists from the Smithsonian Institute and learn how they do field research; presented in a very user-friendly format, easily navigated and understood by even lower elementary students. Click on *Narrated* or *No Narration* to open the "Dirt Detective: Trees & Soils Walk" to measure the texture and pH of soils in different forest areas. Several other forest-related walks are also available.

## Water Resources

<http://kkeljo.wix.com/streamsamplingdatafswcd/> A Web site developed by Franklin Soil and Water Conservation District for teachers or organizations who want to share their collected data from stream monitoring field trips. A way to get involved and encourage your students to be a part of a larger conservation effort!

<http://water.epa.gov/learn/resources/waterspdf.cfm> *What's Up With Our Nation's Waters?* is a great resource for upper elementary students on nonpoint source pollution.

<http://water.epa.gov/polwaste/nps/kids/index.cfm> From the *Nonpoint Source Kids Page*, click on *What's Wrong with this Picture?* or click on *Articles and Activities for Middle School Students*.

<http://www.epa.gov/owow/nps/qa.html> Q and A about nonpoint source pollution.

<http://water.epa.gov/polwaste/nps/> Good background information on nonpoint source pollution from a variety of land uses; click on items (listed in right-hand side NPS Categories box) such as abandoned mine drainage, agriculture, forestry, and urban areas. Some include fact sheets too.

[http://cfpub.epa.gov/npstbx/files/NPS\\_Urban-facts\\_final.pdf](http://cfpub.epa.gov/npstbx/files/NPS_Urban-facts_final.pdf) Great fact sheet on issues covered in our program. Designed to be read by middle/high school students, but also good teacher information.

<http://education.usgs.gov/> U. S. Geologic Survey. Click on "Grades K-6" or "Grades 7-12" and scroll down to "Water"; includes lots of useful web links like *USGS Water Science for Schools*, interactive learning tools like the *Water Cycle for Kids*, plus educational color posters, science experiment ideas and more.

<http://water.usgs.gov/data/> Look under "Water Now" and click on *Real-time streamflow* to access real-time stream data for any U.S. state, or follow other links for other real-time data. Good technical resource for teachers and middle/high school students.

<http://www.epa.gov/healthywatersheds> Technical information about watersheds and water quality issues.

<http://www.air-n-water.com/water-conservation-resources.htm> Water conservation resources with many informative links (collected from a variety of sources) on ways to save water; mostly

technical information for teachers and older students to research, but a few, like the *Kid's Activity* and the *Water Cycle Game*, are great for a younger audience.

<http://nationalmap.gov/streamer/webApp/streamer.html> The Streamer Dynamic Map is an interactive tool which allows you to trace any U.S. stream to its origin or its final destination and calculates, for example, the miles it covers, the number of cities, counties and states it passes through and other interesting facts.

<http://water.epa.gov/learn/kids/drinkingwater/index.cfm> Lessons, activities, interactive games, and teaching tool resources related to drinking water, featuring the drinking glass character, Thirstin'; organized by grade-level group for both students and teachers.

## Habitat Resources

<http://www.cals.ncsu.edu/course/ent525/> "Entomology for Educators" (a syllabus from North Carolina State University, Department of Entomology, Professor John R. Meyer). Click on *Water Wonders* for aquatic macroinvertebrates. Click on *Insects to Order* for alphabetical compendium.

<http://www.dec.ny.gov/animals/35772.html> New York State Department of Environmental Conservation: Aquatic Macroinvertebrates (color photos)

<http://water.epa.gov/polwaste/nps/kids/index.cfm> From the *Nonpoint Source Kids Page* click on *Masterbug Theatre* for a good introduction to aquatic macroinvertebrates, or click on *Darby Duck and the Aquatic Crusaders* and try Experiment 1 or 7.

[www.arborday.org](http://www.arborday.org) National Arbor Day Foundation website contains an on-line tree identification guide (scroll down and click on "Tree Guide"). Also information on resources that connect children with nature, as well as workshops, conferences related to nature exploration and much more.

[www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/features/?&cid=nrcs143\\_023574](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/features/?&cid=nrcs143_023574) The Natural Resources Conservation Service has a backyard conservation program with information, tips, and ideas.

[www.nwf.org](http://www.nwf.org) National Wildlife Federation offers background information and activities on the topics of wildlife. Under "Wildlife" (right upper tab in top menu) and then on the left-hand column click on "Wildlife Library" for information on a wide variety of animals, or "Threats to Wildlife" for information on "Global Warming" and much more.

<http://www.nwf.org/What-We-Do/Kids-and-Nature/Educators/Lesson-Plans.aspx> Another NWF webpage that offers lesson plans on habitat, energy conservation, ecosystems, and wildlife (grade levels indicated for each lesson plan).

<http://www.naturalinquirer.org/> The "Natural Inquirer" contains articles on scientific research conducted by scientists at USDA on nature, such as trees, forests, wildlife, insects, outdoor activities, and water. Choose "Articles by Topic" in the left-hand column and check out their Climate Change Articles, Water Articles, and many others, all of which walk the reader through the scientists' research exploration, methods, and results. Articles are well-formatted pdf's, written for grade levels 5-8, and have plenty of photos and illustrations, and often include other teaching tools (quizzes, glossaries, etc).

<http://nationalzoo.si.edu/education/conservationcentral/walk/> Take virtual walks through the forest with scientists from the Smithsonian Institute and learn how they do field research; presented in a very user-friendly format, easily navigated and understood by even lower elementary students. Virtual walks cover topics such as forest soils, tree identification, biodiversity and habitat, seasonal changes, and forest health.

<http://education.usgs.gov/> U.S. Geological Survey. Go to "Grades K-6", then click on *USGS Kids* for activities, games, coloring pages, projects, and stories that teach younger children about animals, climate change, bee population declines, wild birds, and more. Or go to "Grades 7-12", then click on *Become a Phenology Observer* to help scientists monitor plants and animals across the U.S by contributing to the national phenology database.