

AQUATIC SYSTEMS

Annotated Bibliography of K-12 Educational Resources

Wisconsin Center for Environmental Education (5/10)

The following list consists of selected resources of the general topic of Aquatic Systems. All materials are available for loan at the WCEE Resources Library. Many more resources are available on this and other topics, and there are many resources for the studies in specific water systems (lakes, rivers, wetlands, etc.) and specific water issues (pollution, invasives, etc.). Materials are also available for purchase from a variety of book stores, Acorn Naturalist, or Amazon.com. Please call or visit the WCEE for assistance or visit our web site at www.uwsp.edu/wcee/library for additional information on borrowing resources.

Teaching Activity Guides

Great Lakes in My World Alliance for the Great Lakes, Chicago, IL. (2005).

A K-8 curriculum that includes wetland activities appropriate for various grade levels and classroom subjects. The 6 specific units are: Lakes, Sand Dunes, Wetlands, Human Communities, History, and Geology & Water Flow. Also see the Creature Cards (DEM WR 1) and the CD in the back of the book.

Grade levels: K-8 Length: 471 pages

Available for purchase from: www.greatlakes.org (\$43.25)

Borrowing: Check your local library or the WCEE (call number: AC WR 103)

Project WET by The Watercourse and The Western Regional Environmental Education Council. The Watercourse, Bozeman, MT. (1995).

Like Project WILD and Project Learning Tree, one of the most used and usable, comprehensive EE activity guides. Also see the associated resources listed below.

Grade levels: K-12 Length: 92 activities, 517 pages

Only available through Project WET workshops – visit: www.projectwet.org

Borrowing: Check your local library or the WCEE (call number: AC WR 56)

Project Wild Aquatic by Project WILD. Project WILD, Gaithersburg, MD. (2000).

The aquatic supplement to one of the definitive activity/curricula guides in environmental education. Numerous subjects, learning styles, topics, etc. covered. Easy to use format.

Grade levels: K-12 Length: 48 activities, 260 pages

Only available through Project WILD workshops – visit: www.projectwild.org

Borrowing: Check your local library or the WCEE (call number: AC WR 2)

WET in the City by The Council for Environmental Education. Council for Environmental Education, Houston, TX. (2002).

An urban water education version of the Project WET listed above. Also very comprehensive and high-quality.

Grade levels: K-12 Length: 69 activities, 484 pages

Only available through WET in the City workshops – visit: www.wetcity.org

Borrowing: Check your local library or the WCEE (call number: AC WR 50 2)

Wisconsin Supplement to National Project WET by Ilene Grossman. Project WET-Wisconsin, et. al. Project WET-Wisconsin Stevens Point, WI. (1997).

A Wisconsin-focused adaptation of many of the lessons in Project WET, created to help make WET more relevant to Wisconsin students. Includes lists for local resources.

Grade levels: K-12 Length: 222 pages

Borrowing: Check your local library or the WCEE (call number: AC WR 57)

WOW! The Wonders of Wetlands and **POW! The Planning of Wetlands** by Environmental Concern, The Watercourse, and Alan Kesselheim, et. al. Environmental Concern. St. Michaels, MD. (1995 and 2000).

Two very usable activity guides set up in formats similar to WET and other national curricula.

Chapters of activities include subjects such as Plants and Animals, Water, Soil, and Issues. POW! focuses specifically on the planning and creation of school site wetlands, including student activities related to such. Both include lists of additional resources.

Grade levels: K-12 Length: 330 and 346 pages

WOW! available for purchase from: www.wetland.org/index.htm or AcornNaturalist.com (\$21.95)

POW! Only available through Environmental Concern courses – visit: www.wetland.org/index.htm

Borrowing: Check your local library or the WCEE (call number: AC BC AQ 30 and 34)

Field Manual for Water Quality Monitoring by Mark Mitchell and William Stapp.

Kendall/Hunt, Dubuque, IA. (2000).

A water quality lesson guide that is a favorite among teachers. Includes many science-based experiments and activities. Written with William Stapp, one of the leaders in the field of Environmental Education. See also the “low cost” version Field Manual for Global Low-Cost Water Quality Monitoring (AC WR 11).

Grade levels: 5-12 Length: 272 pages

Available for purchase from: www.lamotte.com (\$32.50)

Borrowing: Check your local library or the WCEE (call number: AC WR 1 2000)

Earth Trails: Mississippi River GPN, Lincoln, NE. (2000).

An incredibly well-researched and well-produced CD-ROM dealing with numerous issues surrounding water resources. Very in-depth, therefore it may take dedication to incorporate into classroom curricula. Includes teacher and student guides. Also very relevant to technology classes or units. Lesson plans are free online.

Grade levels: 6-8 Length: CD-ROM

Available for free in Iowa and for purchase elsewhere – visit: www.iptv.org/mississippi/

Borrowing: Check your local library or the WCEE (call number: COM WR 3)

Healthy Water Healthy People: Field Monitoring Guide by Project WET. Project WET International Foundation, Bozeman, MT. (2003).

A supplement to the HWHP activity guide, this field monitoring guide highlights eleven common water quality parameters, including their relevance to water quality, possible remedies, case studies, and activities to demonstrate the effect on water quality.

Grade levels: 9-12, adult Length: 84 pages

Available for purchase from: www.projectwet.org (\$7.95)

Borrowing: Check your local library or the WCEE (call number: AC WR 100 suppl.)

Rivers Curriculum Project: Earth Science, Chemistry, Geography, Mathematics, Language Arts and Biology by Robert Williams. Dale Seymour Publications, Palo Alto, CA. (1997-2001).

A series of school subject-based curriculum guides centered on water topics. Activities follow a very usable setup.

Grade levels: 9-12 Length: Varies

Available for purchase from: www.siue.edu/OSME/river/Ordering%20Materials/RPCur_Guides.html (\$23.95 each)

Borrowing: Check your local library or the WCEE (call number: AC BC AQ 35 vol. 1-6 3)

Streamkeeper's Field Guide by Tom Murdoch and The Adopt-A-Stream Foundation, et. al. Adopt-A-Stream Foundation, Everett, WA. (2001).

One local teacher calls this "one of the best 9-12, freshwater ecology books I have had the pleasure of reading." The bulk is background information; thorough and readable. Also includes field activities. See associated video, AV WR 26.

Grade levels: 9-12 Length: 252

Available for purchase from: www.streamkeeper.org/catalog/books.htm or AcornNaturalist.com (\$29.95)

Borrowing: Check your local library or the WCEE (call number: AC WR 79)

Watershed Investigations by NSTA Press, Arlington, VA. (2009)

This resource provides high school students with twelve hands-on labs that builds skills to investigate watersheds in a holistic manner.

Grade levels: 9-12 Length: 175

Available for purchase from: NSTA www.nsta.org/store (\$27.95)

Borrowing: Check your local library or the WCEE (call number: AC BC AQ 62)

Videos/DVDs

Into the Outdoors (Series) Discover Mediaworks and WI DNR. (2006).

A great outdoor television series filmed in and around Wisconsin, and geared toward and presented by kids. Water-specific episodes are: Got Water?, Carvin' Nature's Niche, The Stream of Life, On the Water's Edge, and Have an Ice Day.

Grade levels: K-9 Length: 25 minutes each

Borrowing: Check your local library or the WCEE (call number: AV DVD BC AQ 1-3, WR 1-2)

Bill Nye the Science Guy (Series) Disney Educational Productions, Elk Grove Village, IL. (1994).

Water-themed specials from the popular and fast-paced children's show. Topics include "Lakes and Ponds," "Water Cycle," "Oceanography," "Wetlands," and "Rivers and Streams." Many experiments are demonstrated.

Grade levels: 4-9 Length: Approx. 45 minutes each

Available for purchase from: Amazon.com (approx. \$25 per DVD)

Borrowing: Check your local library or the WCEE (call number: AV WR 32-34)

Cadillac Desert (Series) KTEH-TV, San Jose, CA. (1997).

Lengthy but very complete. A four part PBS series exploring the (water) issues facing civilizations in the deserts of the Western US. Very well-produced and interesting.

Grade levels: 5-12 Length: 85 minutes (each)

Borrowing: Check your local library or the WCEE (call number: AV WR 29 pts. 1-4)

Water Above Water Below: The Connection Between Wisconsin's Waters by Clean Wisconsin. Sustain. (2004).

An introduction to the water cycle and the threats to water quality, set in a Wisconsin context.

Grade levels: 5-12, adult Length: 24 minutes

Available for purchase from: http://www.cleanwisconsin.org/publications/video_WaterAbove.html (\$10)

Borrowing: Check your local library or the WCEE (call number: AV DVD WR 3)

Journey to Planet Earth: Rivers of Destiny Screenscope. (2009).

A well-produced PBS documentary focusing on case studies of 4 major rivers: The Mississippi, Amazon, Jordan, and Mekong. Helps highlight the relationships between humans and water resources.

Grade levels: 7-12 Length: 57 minutes

Available from PBS: <http://www.pbs.org/journeytoplanetearth/about/purchase.html> (\$149/episode)

Borrowing: Check your local library or the WCEE (call number: AV DVD WR 07)

After the Storm: A Citizen's Video Guide to Understanding Storm water EPA, Washington, D.C. (2004).

This video provides 3 U.S. case studies of specific watersheds, water quality, water use, and environmental degradation. Clearly explains what a watershed is and what needs to be done to preserve them.

Grade levels: 9-12, adult Length: 22 minutes

Available for free from EPA: <http://water.epa.gov/action/weatherchannel/video.cfm>

Borrowing: Check your local library or the WCEE (call number: AV WR 39)

Books for Youth

In the Small, Small Pond by Denise Fleming. Henry Holt and Company, New York, NY. (1993).

This book introduces the diversity of pond life. It illustrates animals and their actions such as how tadpoles wriggle, heron plunge, minnow scatter, and swallows scoop. Vivid illustrations tell the story and stimulate the senses as well as the words that accompany them.

Grade levels: PK-4 Length: 29 pages

Available for purchase from: Amazon.com (\$7.95)

Borrowing: Check your local library or the WCEE (call number: BY BC AQ 30)

Water Dance by Thomas Locker. Harcourt Brace and Company, Orlando, FL. (1997).

An exploration of the many forms in which water occurs on Earth. Gorgeous illustrations. Also includes an appendix discussion of the water cycle.

Grade levels: PK-4 Length: 32 pages

Available for purchase from: Amazon.com (\$7.00) AcornNaturalist.com (\$16.95)

Borrowing: Check your local library or the WCEE (call number: BY WR 26)

One Well by Rochelle Strauss, Kids Can Press Ltd., Tonawanda, NY. (2007).

This vibrant and informative children's book explains the role of water on Earth, and how all life is connected through its relationship with water. With sections for using on the water cycle, water use by plants and animals, and numerous facts interspersed, the book offers a fun and easy to read introduction to water and the need to conserve it.

Grade levels: K-4, 4-6 Length: 32 pages

Available for purchase from: Amazon.com (\$12.89)

Borrowing: Check your local library or the WCEE (call number: BY WR 33)

Frog in a Bog by John Himmelman, Charlesbridge, Watertown, MA. (2004).

This simple children's book shows the connections among numerous life forms inhabiting a bog, in short, easy to read lines with colorful illustrations.

Grade levels: K-6 Length: 28 pages

Available for purchase from: Amazon.com (\$15.95)

Borrowing: Check your local library or the WCEE (call number: BY BC AQ 41)

Tessa and the Fishy Mystery by Carole Douglis. United Nations Environment Programme. (2004).

Tessa investigates why fish and other sea life are no longer frequenting the beach near her home. She then encourages her community to take better care of the environment so that the fish will return home. In the back of the book there are facts and figures about seas and oceans as well as a list of things young people can do.

Grade level: K-6 Length: 30 pages

Available for purchase from: Amazon.com (\$27.98)

Borrowing: Check your local library or the WCEE (call number: BY BC AQ 43)

A Drop Around the World by Barbara Shaw McKinney. Dawn Publications, Nevada City, CA (1998).

Take a journey from Maine to Mumbai with just one raindrop, as it touches plants, animals and human life all around the world.

Grade levels: 2-6 Length: 26 pages

Available for purchase from: Amazon.com (\$8.95)

Borrowing: Check your local library or the WCEE (call number: BY WR 24)

The Drop in My Drink: The Story of Water on Our Planet by Meredith Hooper and Chris Coady. Penguin Group, New York, NY. (1998).

This story helps learners understand where water comes from, how it behaves, why it matters. Each new drop in my drink is a different drop, but each drop can stand for any drop.

Grade levels: 2-6 Length: 28 pages

Available for purchase from: Amazon.com (\$8.90)

Borrowing: Check your local library or the WCEE (call number: BY WR 25)

Butternut Hollow Pond by Brian J. Heinz. The Millbrook Press, Brookfield, Connecticut. (2000).

Heinz describes the course of the day, from morning to night. Two concepts are demonstrated in this book: the hunter becomes the hunted, and all living things are players in a complex cycle of interdependence. Beautiful water color pictures.

Grade levels: 4-6 Length: 31 pages

Available for purchase from: Amazon.com (\$6.95)

Borrowing: Check your local library or the WCEE (call number: BY BC AQ 32)

Life in a Lake by Melissa Stewart. Lerner, Minneapolis, MN. (2003).

This non-fiction book describes how Lake Superior was formed and the interdependence of the plants and animals that live in and around it. Also discusses how the lake has been affected by humans throughout history, and what we can now do to preserve it.

Grade levels: 4-9 Length: 72 pages

Available for purchase from: Amazon.com (\$26.60)

Borrowing: Check your local library or the WCEE (call number: BY BC AQ 39)

The Sea, the Storm, and the Mangrove Tangle by Lynne Cherry. Farrar Straus Giroux, New York, NY. (2004).

A great tale about the development of a mangrove island and how its inhabitants rely on it for food and shelter.

Grade levels: 4-9 Length: 32 pages

Available for purchase from: Amazon.com (\$12.95)

Borrowing: Check your local library or the WCEE (call number: BY BC AQ 42)

Water Stewardship: A 30 Day Program to Protect and Conserve Our Water Resources by David Gershon, Empowerment Institute, Woodstock, NY. (2008).

This 30-day program (suitable for your household, or as part of a group - peer supports, neighborhood, etc.) will help you take actions to better steward your communities water sources. Contains 32 behavior change actions and actions plans for each of 3 topics: water quality, water conservation, and community volunteering/advocacy.

Grade levels: 5-9, 9-12, Adult/University Length: 96 pages

Available for purchase from: Amazon.com (\$11.00)

Borrowing: Check your local library or the WCEE (call number BY WR 37)

Reference/Background Books

The Great Lakes Great Lakes National Program Office, Chicago, IL. (1995).

An atlas and "resource book" covering the natural processes, people, and management of the Great Lakes. Very beneficial for adding local relevance to water units. Great maps, charts, and pictures.

Grade levels: 9-12, adult Length: 46 pages

Available on-line from: <http://www.epa.gov/greatlakes/atlas/>

Borrowing: Check your local library or the WCEE (call number: BA WR 14)

What Do You Think: The Debate On Water Quality Issues by Scott Richardson, Earth Force, Alexandria, VA. (2002).

A primer on water quality issues set up to help with valve clarification. Each chapter presents a question and two opposing views about it. Good for upper level class discussion/debate.

Grade levels: 9-12, adult Length: 56 pages

Borrowing: Check your local library or the WCEE (call number: BA WR 20)

Catching the Rain: A Great Lakes Resource Guide for Natural Storm Water Management by American Rivers. American Rivers, Washington D.C. (2004).

Guide for citizens, developers, and municipalities interested in natural storm water management. Explains the impacts of conventional storm water practices and the value of soft path approaches. Provides a thorough introduction to numerous techniques.

Grade levels: Adult Length: 65 pages

Available on-line from: <http://www.americanrivers.org/assets/pdfs/CatchingTheRaine4a1.pdf>

Borrowing: Check your local library or the WCEE (call number: BA WR 44)

Wetlands In Danger Oxford University Press, New York, NY. (1993).

A very visual look at wetlands worldwide. Provides useful information, but the best attribute is the stunning pictures.

Grade levels: Adult Length: 187 pages

Available for purchase from: Amazon.com (\$50.53)

Borrowing: Check your local library or the WCEE (call number: BA WR 15)

When the Rivers Run Dry: Water – The Defining Crisis of the Twenty-first Century by Fred Pearce. Beacon Press, Boston, MA. (2006).

Pearce shines a light on the under publicized global water crisis with horrific facts of poisoned wells and wasted water. He traveled all over the globe to document the tragedy and passionately advocates for greater awareness and better water ethnics.

Grade levels: Adult Length: 311 pages

Available for purchase from: Amazon.com (\$10.88)

Borrowing: Check your local library or the WCEE (call number: BA WR 46)

Worldwatch Paper 154 by Payal Sampat. Worldwatch Institute, Washington, DC. (2000).

Titled “Deep Trouble: The Hidden Threat of Groundwater Pollution,” this primer on groundwater issues is published by the well-respected Worldwatch Institute. Includes many tables and figures.

Grade levels: Adult Length: 55 pages

Available for purchase from: www.worldwatch.org (\$9.95)

Borrowing: Check your local library or the WCEE (call number: SER WW 154)

Demonstration Materials

Groundwater Model by UW-Stevens Point Student Chapter of AWRA

The Groundwater Model is an interactive classroom tool that is designed to show the flow of water and toxins through differing gradients. It can be used in front of the classroom and is easily used by students themselves. It may demonstrate flowage through confined and unconfined aquifers as well as the effects of pumping on these aquifers.

Grade levels: 6-adult

Available for purchase from: (\$500-700/model)

Borrowing: Check your school library or the WCEE.

Note: When borrowing from the WCEE, this item does not ship and must be picked up and dropped off.

EnviroScape by EnviroScape

EnviroScape® models create a real sense of understanding through hands-on demonstrations. This demonstration kit is a portable, table-top environmental education model that provides unique, interactive learning experiences.

Grade levels: 4-12

Available for purchase from: www.envirosapes.com (\$800/model)

Borrowing: Check your school library or the WCEE has the “watershed/non-point source” model.

(<http://www.envirosapes.com/nonpoint-source.html>)

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Websites

Groundwater Kids Corner by the Groundwater Foundation (2010)

This site includes groundwater basics with several lesson plans available for all grades.

Grade levels: K-adult

Web link: <http://www.groundwater.org/kc/kc.html>

Teaching Resources - Water by the Environmental Protection Agency (2010).

The EPA has highlighted a list of web-based resources for educators related to water resources. Each resource link indicates intended grade level and a brief summary of the site.

Grade Levels: K-adult/university

Web link: <http://www.epa.gov/teachers/water.htm>

Drop of Water in 2000 Frames by flixxy.com (2009)

Watch this 2 min. 30 sec. video as scientists examine a drop of water slowed down to 2000 frames a minute. This clip can also be found on YouTube.com.

Grade levels: 6-adult

Web link: <http://www.flixxy.com/water-drop.htm>

Water Science for Schools by U.S. Geological Survey (2008).

USGS provides an easy to use site to help students explore water issues. They even have a section in Spanish and Chinese for different language learners in your class.

Grade Levels: 9-adult

Web link: http://water.usgs.gov/wsc/wshed_education.html

Earthtrends by the World Resources Institute (2007).

Under the “Water Resources and Freshwater Ecosystems” link you can have access to maps, country profiles, feature articles, and current research findings all related to the world’s water supply.

Grade Levels: adult/university

Web link: www.earthtrends.wri.org

International Rivers Network (2010).

This site provides a “Tools for Educators” section under their Get Involved link. This section provides several water related lessons and activities for students age 6-adult. These lessons are changed often and there is a new ‘word of the week’ each week.

Grade Levels: adult/university

Web link: www.irn.org

Vital Water Graphics by the United Nations Environment Programme (2002).

Detailed information with charts and graphs on freshwater resources and coastal and marine waters. Also provide links to a wide variety of water related sites.

Grade Levels: adult/university

Web link: www.unep.org/vitalwater