

Environmental Education: Back to Basics

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Concerns about our environment, in recent years, have become issues of international interest and global concern. Topics such as hazardous waste, environmental equity, acidic deposition, climate change, deforestation once were academic curiosities or thought as pet peeves of the reactionary group-of-the-month. Now these same issues are the core of international and national debates and policy initiatives around the world.

The importance of a sound technical background to the scientific and social principles of environmental studies is needed most in our classrooms. From elementary through graduate studies, the training of future generations of environmental researchers, policymakers, managers, and information specialists is the all-essential ingredient for preserving and restoring the integrity of our environment.

Providing basic resources to teachers and students alike is critical to the success of any classroom adventure. The Electronic Green Journal, like its predecessor the Green Library Journal, serves as a forum bringing to the attention of its readers resources on general environmental education. These resources are intended to serve as starting points for initial inquiries about issues and events related to the environment. Hopefully, enhanced access to information will allow teachers at all levels to stimulate and sustain their student's interests in the environment, and provide a strong technical background and understory for their students.

U.S. Environmental Protection Agency The U.S. Environmental Protection Agency (EPA) was created in 1970 from an Executive Reorganization Plan (No. 3 of 1970) by President Richard M. Nixon. The EPA is responsible for the broad mandate of studying the impacts of various forms of pollution on human health and the environment. EPA is also responsible for implementing federal laws designed to protect the environment. In addition to supporting basic research and policy development, a major activity of the EPA is the production, organization, and dissemination of information.

The Public Information Center (PIC) is operated by the EPA's Information Management and Services Division under a contract with Labat-Anderson, Inc. (LAI). The PIC provides a wide range of general, non-technical information about the environment and EPA programs. The primary audience for the PIC is the general public and EPA staff who interact with the public-at-large.

The PIC serves as the primary point of contact between EPA and the public. It responds to more than 5,000 inquiries per month on all major environmental topics. A small inventory of publications is maintained on site. PIC services include the routine handling of inquiries regarding EPA program activities and environmental issues and concerns; acting as a referral center for technical and non-EPA inquiries; providing on-site information services to EPA visitors and staff; networking with EPA Project Officers to offer public information services where possible; and assisting EPA staff with compiling informational packets.

PIC was relocated from its former site in Washington, DC's Waterside Mall basement (with access gained through the below-ground parking garage) to space previously occupied by the National Bank of Washington

on the street level of the Mall. The "new and improved" PIC includes a 35-seat auditorium for showing films and slide programs to small groups; an exhibit area for photographs, publications, and three-dimensional displays; and workstations for the demonstration of environmental databases.

In its new offices the PIC is in a better position to promote the agency's interaction with the public. If you are ever in the DC area, you should plan a visit to the EPA Headquarters Library (10:00 a.m. to 2:00 p.m.) and the PIC (8:00 a.m. to 4:30 p.m.). You will be warmly treated and leave with a personal connection to the best access point of the vast array of information resources available from the nation's environmental agency.

In addition to educators, librarians and information specialists are encouraged to use the PIC as a resource for appropriate environmental education purposes. Teachers can obtain resources for the preparation of in-class programs and activities or bulk quantities of brochures, pamphlets, information flyers, and such for use as handouts or curriculum aids for their students. Libraries can also obtain limited numbers of materials for vertical files or for special programs.

A sample of non-technical publications available from the EPA PIC:

For Youth:

Recycle Today!
Environmental Education Materials for Teachers and Young People
The President's Environmental Youth Awards
General Resources:

Environmental Stewardship
Glossary of Environmental Terms and Acronyms List
Lead and Your Drinking Water
Consumer's Guide to Radon Reduction: How to Reduce Radon Levels in Your Home
Protecting the Nation's Wetlands, Oceans, and Watersheds: An Overview of Programs and Activities

Reports:

Economic Incentives: Options for Environmental Protection
Environmental Investments: The Cost of a Clean Environment -- A Summary

The EPA also publishes an extremely useful newsletter, INFOACCESS, which provides information about and progress reports on information management across the entire spectrum of services provided by the EPA. This newsletter is produced by the Information Access Branch of the EPA's Information Management and Services Division.

In addition to its headquarters library in Washington, DC, the EPA maintains a national network of ten Regional Offices and specialized scientific laboratories throughout the country. It is a worthwhile networking

effort to get to know your regional EPA Office and its staff of librarians. If you have an opportunity to visit your regional office, ask for a tour and if it would possible to meet some of the key people in your special areas of interest. Such networking can be invaluable in the future.

The EPA also maintains highly specialized collections of information related to the agency's rulemaking activities and decisions. Information obtained and maintained as a result of these regulatory programs are collected in "rulemaking information docket" and are made available to EPA staff, other government agencies, and the public at-large.

The EPA Information Access Branch also provides a comprehensive listing of all information-related activities of the agency in its acclaimed reference work, Access EPA. Availability, price, and ordering information is available from the EPA's PIC.

EPA Contacts:

Public Information Center (PIC),
U.S. Environmental Protection Agency,
401 M Street, SW, Washington, DC 20460 USA.
Attn: LAI/PIC Director; TEL: 202-260-7751.

EPA National Library Network,
Information Access Branch,
U.S. Environmental Protection Agency,
401 M Street, SW, Washington, DC 20460 USA.
Attn: LAI/NLN Program Manager; TEL: 202-260-7762.

Tackling Outdoor Education Through Fishing

I fondly remember my very first fishing trip at the age of five with my Dad (I recollect catching my first brook trout, which Dad says happened sometime later, to which he adds, it was about 7 or 8 inches long, not 17 or 18, as I have insisted...). I have a distinct warm recollection of my last outing on the Great Sacandaga Lake with my Grandfather, several years before his death -- we both caught some handsome small mouth bass on fly rods, and I managed to catch a rather impressive walleye pike on a crayfish pattern. My Grandmother turned that catch into a delicious summer's dinner. I hope my daughter, Kaeti, remembers our fishing trips as fondly as I cherish them.

In 1992 movie goes and anglers alike were treated to the Robert Redford's academy award winning (Best Cinematography) adaptation of Norman Maclean's A River Runs Through It. It is the story of two boys growing up in Montana during the first half of this century, and the lessons they learned from the tutelage of their Presbyterian-minister father, who thought that the binding force of all that was good was transferred through the gentle and persuasive activity of fly fishing.

The connectedness one gains from being out of doors and in a communal relationship with nature is awe inspiring. For many an angler, and I must side with the Rev. Maclean with his thoughts about the flyfisher,

fishing is an almost religious experience itself -- a constant reminder of our place in The Creation, providing an opportunity to enjoy the beauty of our God-given natural world.

A lot can be learned about life with a fishing rod in hand (and you can read a lot more about that in Howell Raines's best selling Fly Fishing Through the Mid-Life Crisis. Through sportfishing, a lot can be taught and learned about the environment and the intricacies and balances of ecology, ethics, the appreciation of natural resources, and wildlife conservation.

Fishing is also fun! It is simple and easy to learn. You don't need to know everything about fish before you going fishing for the first time. You can discover new things -- about nature, about your child, about yourself when you go fishing. The Future Fisherman Foundation (a few years ago some one got the idea of looking at the politically correctness of sportfishing and inquired among a group of female anglers -- what did they prefer being called? Fisherwomen? Female anglers? Lady fishers? Overwhelmingly, the choice was Fisherman) has produced a colorful 33 page fishing booklet that is convenient for kids' fishing derbies, youth fishing clinics (outdoor sporting exhibitions, clinics, demonstrations), summer camp, and other nature programs. This inexpensive booklet (US\$1.25) Fishing Fun for Kids, by Sharon Coe and Bob Knopf, is written for elementary to middle school children and is produced in a cartoon format. It provides a simple introduction to the first-time fisherman -- equipment, ecology, ethics -- they are all covered in this story about Lisa and Joe and their first fishing trip. For an additional fee the inside front cover can be custom printed with the name of an individual, agency, or organization -- a great promotional and educational vehicle. Contact: Sue Wiesbrook, Future Fisherman Foundation, 1250 Grove Street, Barrington, IL 60010 USA; TEL: 708-381-4061.

The Future Fisherman Foundation is a non-profit organization that was formed to promote participation and education in fishing as the enhancement and protection of aquatic resources. Several years ago, when first founded, the Future Fishermen Foundation carried a theme of "Hooked on Fishing, not on Drugs." Not a bad premise. Who knows what can happen to a young fisherman. My first trip to a fish hatchery was at the age of two (it is my earliest vivid memory and Dad and Grandad were there). A graduate degree in fisheries and aquatic science was earned some 22 years later, an M.L.S. 8 years after that! I'm sure stranger things have happened...

Where does the instruction of our future generation of anglers rank on the agendas of our state wildlife bureaus? If New York serves as the example, it is quite high. In 1989 the New York State Department of Environmental Conservation announced a new and innovative program to be organized by the 4-H clubs of New York and in cooperation with Cornell University: SAREP, the New York Sportfishing and Aquatic Resources Education Program. Since then more than 400 instructors have been certified, reaching more than 14,000 youth annually! In addition to teaching the basics about fishing, these instructors are trained in all aspects of aquatic ecology, water-quality sampling techniques, activities planning, teaching skills, leadership training, and angling ethics.

Not only are the youth exposed to the actual practice of fishing, they are also able to tackle more rigorous projects in stream restoration, water quality monitoring studies, ecosystem studies, and other projects related to freshwater and marine fisheries. For additional information about this exciting program contact SAREP at the Department of Natural Resources, Fernow Hall, Cornell University, Ithaca, NY 14853 USA; TEL: 607-255-2814, FAX: 607-255-2815.

If you are looking for more comprehensive and more technical information services, the Fish and Wildlife Reference Service (FWRS, 5430 Grosvenor Lane, Suite 110, Bethesda, Maryland 20814 USA; TEL: 1-800-582-3412 or 301-492-6403) has recently expanded its reference and referral outreach. The Service performs reference services, including online searches and document delivery of research reports and educational materials from the Cooperative Fishery and Wildlife Research Units, Endangered Species Recovery Teams, Anadromous Sport Fish Conservation Programs, and state fish and wildlife agencies. Some services are subject to cost recovery fees. Contact Geoffrey Yeadon at FWRS for details about the Service and services it provides.

Water, Water Every Where!

The quality and quantity of water resources is perhaps the most important environmental issue facing the scientific and policymaking communities worldwide. From local resources for individual homes to water supplies for large metropolitan areas, abundant and clean water is a pressing matter. Efforts to promote water conservation and purity are typically found at all levels of government and public interest activities.

The American Water Works Association (AWWA) is a professional organization of more than 50,000 water utility managers, superintendents of water works, and includes a full range of disciplinary interests in the life, physical, and social sciences. With a staff of more than 120, the AWWA develops standards for drinking water quality, supports research and assists in the development of policies to assure safe and clean sources of drinking water. Over the past several years the AWWA has dramatically increased its already excellent devotion to the topic of environmental education, and has greatly expanded its efforts in the area of education and training from elementary levels through continuing education and certification programs for the water quality professional.

The AWWA's Youth Education program is geared to stimulating and sustaining interests in issues related to drinking water. A variety of education materials have been created to present basic facts about water in terms that school-aged children can understand. These education materials have tremendous potential in the classroom of formal education settings in the public and private sectors. However, these materials also have great potential for programs in a variety of youth organizations: scouting, 4-H, summer camp programs, nature center and science museum programs. Materials available for use at kindergarten to third grade levels include: *Splash! Activity Book* (an activity book with cross-curriculum activities, word and number games, coloring pages) is available in both English and Spanish; *Water Magic: Water Activities for Students and Teachers, Grades K-3* (an innovative teachers resource describing 23 hands-on water-related activities introducing the basic scientific principles of water, including: the water cycle, pollution, and water conservation). *The Story of Drinking Water* is available in English, French, or Spanish and is a resource useful at the 4th to 9th grade levels. This booklet begins to introduce more advanced concepts of the biology and chemistry of water, and explaining the role of water utilities in assuring a constant supply of safe drinking water. This work is available in both U.S. and metric version. For the same 4th-9th grade level a number of posters, "Career Education," "A Water System," "A Treatment Plant," and "The Water Cycle" would be tremendous aids for classroom use before visiting a local water treatment plant. For the junior and senior high school student, *Water Can Be Fun! How to Create a Successful Science Fair* may be the book that stimulates an award-winning entry at the local, regional, or national level of science fair competitions. A series of colorful book covers is also available from the Youth Education Program, with each supporting a greater understanding of the role of water in our every day lives. For more information about the AWWA's

Youth Education Program and a copy of its Water Education 101: AWWA Youth Education Materials catalog contact Kimberly M. Knox, Youth Education Manager, AWWA, 6666 W. Quincy Avenue, Denver, CO 80235 USA; TEL: 303-794-7711, FAX: 303-794-7310.

The Water Resources Education Initiative of the American Water Resources Association (AWRA) recently received the Outstanding Achievement Award by the Renewable Natural Resources Foundation (a consortium of 17 leading U.S. natural resources organizations). The award was granted for the AWRA's initiatives in developing education materials for grades K-12. The Water Resources Education Initiative is made up of a number of colorful information and education posters and curriculum materials designed for specialists in water resources research and planning for classroom visits. The posters provide an examination of the core sciences related to water resource issues: wetlands, wastewater, water quality, and resource management. For more information about the Water Resources Education Initiative contact AWRA at 5410 Grosvenor Lane, Ste. 220, Bethesda, MD 20814 USA; TEL: 301-493-8600.

Think Globally, Educate Now

The topics related to global change research are multidisciplinary in nature and are central to numerous international debates and coordinated research efforts. The International Council of Scientific Unions' (ICSU) Committee on Teaching of Science (CTS) has undertaken efforts to develop an international program to assist curriculum development in its project, Education in Global Change.

The underlying thought behind this project is the International Geosphere-Biosphere Programme's (IGBP) concerns about the future of science as an actively sought career option by young people. The CTS was persuaded to develop a program at all levels of education from elementary through post-graduate. The CTS tackled the high school student for its first initiatives, hosting a number of workshops bringing together practicing scientists and science educators. A series of teaching materials in the form of booklets (with copyrights waived) will bring to the teacher and their students a firm understanding of the scientific aspects related to the issues of global change. For more information about this initiative contact D.J. Waddington, Chairman, CTS, Department of Chemistry, University of York, Heslington, York YO1 5DD, UK; +44-904-432500, FAX +44-904-432516 or J. Stoltman, Secretary, CTS, Department of Geography, Western Michigan University, Kalamazoo, MI 49008-5053 USA; TEL: 616-387-3429, FAX: 616-38 7-0958.

The Ohio State University has developed a highly specialized program, Earth Systems Education, to increase the general understanding of Earth systems through a comprehensive environmental education initiative. The Ohio State University program has evolved from a conceptual framework established in 1990. Curriculum materials have been developed and tested in a variety of settings. As a result of these activities, Activities for the Changing Earth System has recently been published as a curriculum guide for education programs in the middle through high school levels.

This book provides 20 activities using an integrated learning approach to teach the basic concepts of Earth, Biological, and Environmental Sciences. Each activity is organized to include sections on: Objectives, Earth Systems Understandings, Procedures, Extensions, Teacher Background Information, and References. These classroom activities include the major topics related to global change: greenhouse gases and global warming, ozone depletion, freshwater resources, deforestation, sea-level rise, and volcanic emissions and climate change. The 291-page book is available for US\$10.00 per copy.

The Ohio Sea Grant Education Office, also at Ohio State University, has introduced a series of short publications designed to help teachers, students, and the general public better understand the complexities of global change and how the Great Lakes region may be affected by such change. Global Change in the Great Lakes Scenarios explains the possible implications of global change for this region, the world's largest freshwater ecosystem. The publications in this information packet are called "scenarios" (there are ten of them) and each describes the scientific community's prevailing interpretations of what might happen to the Great Lakes in the face of global warming. The scenarios are written in a style and at a level the general public can understand. The content of these scenarios has been reviewed for accuracy by a panel of experts in public and private agencies and institutions in Canada and the U.S.

For additional information about the Earth Systems Education project, Activities for the Changing Earth System, or the Global Change in the Great Lakes Scenarios contact Rosanne W. Fortner, Earth Systems Education Program, The Ohio State University, 59 Ramseyer Hall, 29 W. Woodruff Avenue, Columbus, OH 43210 USA; TEL: 614-292-3750.

The Atmospheric and Geophysical Sciences Division and the Education Program at Lawrence Livermore National Laboratory has recently produced a comprehensive global climate change curriculum, The Greenhouse Effect. This curriculum serves advanced high school students and college students for a 16-day program. It has been designed as an interdisciplinary study guide and integrates science (including laboratory and field studies), mathematics, language arts, and social science activities. Special readings, homework assignments, activities, "green collar" career opportunities, handouts, and a teachers' resource guide are included. Contact the Education Program at Lawrence Livermore National Laboratory, P.O. Box 808, Livermore, CA 94550 USA; TEL: 510-422-1100.

Science is the area of educational curricula that is common to all countries and knows no borders. Science Across Europe uses this premise as common ground to link students and teachers. Science Across Europe has published a series of education units on a variety of science issues and provides an associated database of participating schools. The project provides a forum through which students and educators may exchange facts and opinions. Countries covered are: Austria, Belgium, Denmark, England, France, Germany, Greece, Hungary, Italy, Luxembourg, Malta, N. Ireland, Netherlands, Norway, Poland, Portugal, Scotland, Slovenia, Sweden, Switzerland, and Turkey.

A series of books have been developed to introduce these scientific concepts, including maps, data, information sources. The student (high school level) pages are printed in ten different languages (e.g., global warming, global opvarmning, efecto invernadero, efecto hivernacle, effetto erra, het broeikaseffect, etc.). Titles of the six books produced thus far are: Acid Rain Over Europe, Using Energy at Home, Renewable Energy in Europe, Drinking Water in Europe, What Did You Eat? and Global Warming. U.S. teachers and librarians can benefit from these resources for extending across the Atlantic the intended purpose of exchange programs and projects, and also have access to multi-lingual curriculum materials.

For additional information contact Evelyn Van Dyk, The Association for Science Education (ASE), College Lane, Hatfield, Herts AL0 9AA England; FAX: +(0)707 266532.