DOCUMENT RESUME

ED 403 146 SE 059 638

TITLE	Report Assessing Environmental Education in the United States and the Implementation of the National Environmental Education Act of 1990.
INSTITUTION	Environmental Protection Agency, Washington, DC. Office of Environmental Education.; North American Association for Environmental Education, Troy, OH.
PUB DATE	Dec 96
NOTE	51p
AVAILABLE FROM	U.S. Environmental Protection Agency, Environmental Education Division, 401 M Street SW (1707), Washington, DC 20460.
PUB TYPE	Reports - Evaluative/Feasibility (142)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*Conservation Education; Elementary Secondary Education; *Environmental Education; Higher Education; Lifelong Learning; Nonformal Education; *Science and Society
IDENTIFIERS	Environmental Literacy; National Environmental Education Act 1990; *Public Interest

ABSTRACT

This report to Congress, prepared by the National Environmental Education Advisory Council with assistance from the North American Association for Environmental Education, has three main objectives: (1) to describe the current status of environmental education in the United States; (2) to update Congress on the EPA's progress in implementing the National Environmental Education Act; and (3) to offer specific recommendations for strengthening environmental education at national, state, and local levels. The report is divided into six main sections, plus references and appendices. Those sections following the Executive Summary are as follows: (1) "Introduction"; (2) "What is Environmental Education and Why Do We Need It?"; (3) "Status of Environmental Education in the United States"; (4) "Implementing the National Environmental Education Act of 1990"; (5) "Recommendations for Action"; and (6) "Conclusion". The appendices contain a summary of the National Environmental Education Act of 1990 (P.L.101-619); lists of the members of the National Environmental Education Advisory Council, EPA Environmental Education contacts, and environmental education contacts in state agencies; model state environmental education legislation; and results of status surveys on comprehensive environmental education programs at the state level. Contains 37 references. (PVD)

REPORT ASSESSING ENVIRONMENTAL EDUCATION IN THE UNITED STATES AND THE IMPLEMENTATION OF THE NATIONAL ENVIRONMENTAL EDUCATION ACT OF 1990

Prepared for Congress
by the
NATIONAL ENVIRONMENTAL EDUCATION ADVISORY COUNCIL

U.S. ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL EDUCATION DIVISION
WASHINGTON, DC

DECEMBER 1996

LETTER FROM THE NATIONAL ENVIRONMENTAL EDUCATION ADVISORY COUNCIL

This report is submitted to Congress as mandated under the National Environmental Education Act of 1990. Under the Act, the Council is charged with describing the status of environmental education in the United States; updating Congress on the U.S. Environmental Protection Agency's progress in implementing the Act; and offering recommendations for strengthening environmental education at the national, state, and local levels.

We believe that environmental education is best developed and implemented at state and local levels. However, the federal government plays a critical role in helping to guide, encourage, and sustain such efforts over the long term. Environmental education should be a life-long learning process for Americans—both young and old. To be a life-long learning process, environmental education must be better integrated in the nation's schools, colleges, and universities as well as an integral part of business transactions and community-based activities. Environmental education is needed to provide community groups, government officials, business and industry, and private citizens with the awareness, knowledge, and problem-solving skills needed to work together to actively and successfully address this nation's environmental challenges and to ensure a healthy and sustainable environment for present and future generations.

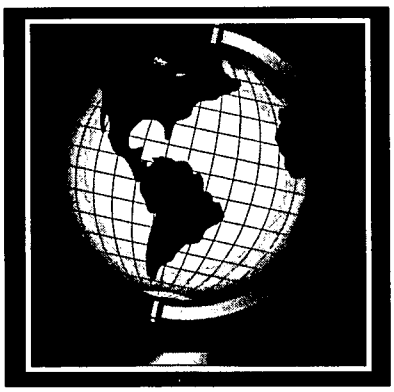
The Council is an eleven-member citizen body with diverse representation from across the country and with a wide range of public and private expertise in environmental education. This report is not a research document, and no new data was collected to produce it. Instead, the report relies on information from earlier studies, surveys, and reviews, as well as interviews with a host of professionals and opinion-makers in the environmental education field. It also reflects our collective expertise as educators and environmental protection specialists from various walks of life. A special acknowledgment is due to the North American Association for Environmental Education for its assistance in the preparation of this report.

We note that since the passage of the Act, there has been an urgency to more finely hone risk assessment and sound management of public mandates. This argues for a richer dialogue with various stakeholders to increase our chance of a healthful environment—today and tomorrow. The Council does not shrink from this charge and continues to work together with other stakeholders to ensure human health and environmental protection through environmental education. It is our intent to seek and share counsel among those many vested American interests to strengthen and expand environmental education as a critical link in our chain of environmental stewardship. We believe this report to Congress is an important link in that chain.

Arva J. Jackson, Chair
National Environmental Education Advisory Council

EXECUTIVE SUMMARY

On November 16, 1990, the President signed into law the National Environmental Education Act (P.L. 101-619). The Act presented the U.S. Environmental Protection Agency (EPA) its first Congressional mandate to strengthen and expand environmental education as an integral part of its mission to protect the environment. The Act mandated various programs and activities, each administered by EPA's Environmental Education Division: an environmental education and training program; a grants program; an awards program; an internship and fellowship program; and a federal task force and national advisory council. This report to Congress, prepared by the National Environmental Education Advisory Council, describes the current status of environmental education in the United States, discusses EPA's progress in implementing the Act, and recommends further steps that Congress and various stakeholders can take to strengthen environmental education nationwide.



The Council believes that environmental education is critical and relevant to the daily lives of all Americans. Environmental education is critical because complex environmental challenges require a well-trained environmental workforce and an educated public who have the knowledge and skills to fully and actively participate in solving these problems. Environmental education is relevant because it can help to ensure the health and welfare of the nation by protecting human health, advancing quality education, expanding employment opportunities, promoting sustainable development, and protecting our natural heritage.

As evidenced by numerous national public opinion polls, citizens are concerned about the environment. The demand for environmental education in schools and communities remains high, as demonstrated by the overwhelming number of applications EPA and other government agencies and foundations have received to support environmental education projects. During the past five years, EPA's Environmental Education Division has received approximately 10,000 applications requesting $300 million, but has only been able to fund approximately 1,200 proposals with the nearly $13 million appropriated by Congress (or 12 percent of all applications received and 4 percent of the total amount of money requested). However, the public presently lacks sufficient knowledge, skills, and motivation to understand and implement the kinds of solutions needed to address today's environmental challenges.

Environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address these challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action. Unlike most formal education efforts, the most effective environmental education programs have a distinct "action" component whose purpose is to encourage responsible, enduring decisions and actions that impact the environment. Encouraging "action" means teaching individuals how to examine a range of possible courses of action to address or resolve an environmental challenge after an investigation and evaluation has determined that action is needed. For example, taking "action" may involve removing lead paint from homes or soil or creating physical barriers to human exposure once testing has determined that lead contamination is present at levels that adversely impact human health. Environmental education programs that include an "action" component should not advocate a particular solution to an environmental challenge. Rather, they should provide individuals with the information, critical-thinking, and decision-making skills they need to make their own responsible decisions among a range of options.

In developing this report, the Council has reviewed a multitude of exciting and innovative environmental education programs taking place across the country. Such programs are supported by a variety of players, including schools, colleges, and universities; federal agencies; state, local, and tribal governments; nongovernmental organizations; business and industry; the media; and others working at national, state, and local levels. In each sector, agencies and organizations are working to enhance formal environmental education programs that target

students, teachers, and faculty, as well as nonformal programs that target adults, communities, senior citizens, and other specific audiences outside the formal education system. These programs vary in scope and effectiveness, but all have contributed to the goals of environmental education.

At the same time, the Council has found that the field of environmental education faces many issues and challenges, such as limited resources to sustain programs over the long-term; gaps in program development and access to quality materials; and inadequate support for in-service and pre-service teacher training. In addition, because environmental education is not viewed as a national priority, universal guidelines do not exist to assure quality program development and implementation, and it is not often well integrated into state and local education reform efforts.

The Council believes that the federal government, and specifically EPA's Environmental Education Division (EED), has an important role to play in strengthening environmental education. During its first five years, EPA's Environmental Education Division has accomplished a great deal. The Environmental Education Division has established an annual grants program; a national training program for education professionals; three advisory committees that link EPA offices and regions, federal agencies, and the field; an awards program; and an internship and scholarship program. The Environmental Education Division also has supported the work of the National Environmental Education and Training Foundation and administered the President's Environmental Youth Awards Program.

The Council also believes that EPA's Environmental Education Division's implementation of the Act has responded to many of the issues and challenges faced by the field. For example, the grant, training, and internship and scholarship programs provide support for teacher training, culturally-diverse and low-income populations, and environmental careers. These programs also support the development of guidelines to ensure quality materials and programs, an electronic network of existing clearinghouses to improve access to materials and information on programs, and state and local education reform initiatives to ensure the long-term sustainability of programs.

However, EPA is only one of many important players and their resources are limited. In addition, much more needs to be done to overcome the increasing challenges facing the field and strengthen the effectiveness of the federal role in supporting state, local, and tribal efforts. Environmental education needs increased support, participation, collaboration, and coordination from all stakeholders—including federal agencies; state, local, and tribal governments; educators and education organizations; schools and their boards and administrators; colleges and universities; foundations; nonprofit organizations; individual citizens and community groups; and the private sector. To succeed, these stakeholders need to work more collaboratively to:

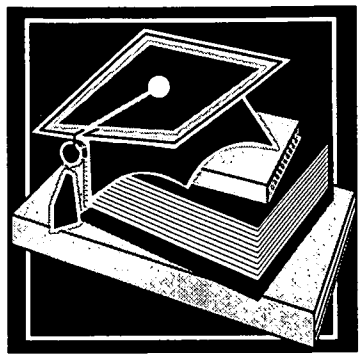
- Make environmental education a priority across the country and enhance EPA's leadership role
- Increase and sustain support for state, local, and tribal efforts in environmental education
- Leverage public and private resources and strengthen long-term, cross-sector partnerships
- Enhance and increase support for professional development for teachers and nonformal educators
- Integrate environmental education into educational reform and improvement
- Target new audiences
- Increase support for evaluation, complete environmental education guidelines, and improve access to quality materials and information on programs
- Encourage and support environmental careers

The Council believes that all Americans must be educated to see themselves as stakeholders who have the knowledge, skills, and motivation to make informed decisions and to take responsible actions in a world of complex environmental challenges.

TABLE OF CONTENTS

I. INTRODUCTION

On November 16, 1990, the President signed the National Environmental Education Act (P.L. 101-619) into law. The Act renewed federal commitment to environmental education and recognized the need to tackle complex environmental challenges with a well educated and trained citizenry that has the knowledge, skills, and motivation to make informed decisions and take responsible actions to ensure environmental quality. Congress placed the responsibility for implementing the Act in the hands of the U.S. Environmental Protection Agency (EPA) and established an environmental education office within EPA to oversee several major initiatives, including:



- a **training program** for education professionals
- an environmental education **grants** program
- an **internship and fellowship** program for students and teachers
- an environmental education **awards** program
- a **federal task force** and a **national advisory council**

This report to Congress, prepared by the National Environmental Education Advisory Council with assistance from the North American Association for Environmental Education (NAAEE), has three main objectives:

- To describe the current status of environmental education in the United States
- To update Congress on EPA's progress in implementing the National Environmental Education Act
- To offer specific recommendations for strengthening environmental education at national, state, and local levels

The Council gathered information for this report from a variety of existing sources, including national and state surveys, professional and popular literature, and interviews with more than 30 researchers, educators, and other professionals working in environmental education and related fields. The Federal Task Force on Environmental Education provided comments. Public notices in the *Federal Register* generated additional input from individuals and organizations representing educational and environmental interests. However, no new research was conducted for this report.

Key terms used throughout this report are defined in the box below. For additional information concerning this report, please contact:

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Key Terms Used in This Report

Environmental Education: a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address these challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action

Formal Education: education involving the formal school system—includes programs and activities taking place in public and private preschools, elementary schools, middle schools, secondary schools, colleges, and universities

Nonformal Education: education that takes place outside the formal school system—includes programs and activities taking place in museums, nature centers, zoos, aquariums, community clubs, science centers, and other community educational institutions and organizations; also includes television, radio, newspapers, and other media-generated educational programs

Pre-Service Training or Pre-Professional Education: training that takes place at colleges and universities before students are certified to teach; can also include pre-professional education for students studying to be park naturalists, zoo educators, and other educators working in nonformal educational settings and institutions

In-Service Training or Professional Development: training that takes place after teachers are in the classroom; can also include professional development for nonformal educators working in zoos, museums, nature centers, and other nonformal educational settings and institutions

II. WHAT IS ENVIRONMENTAL EDUCATION AND WHY DO WE NEED IT?

Environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address these challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration). Environmental education enhances critical thinking, problem solving, and effective decision-making skills and enables individuals to weigh various sides of an environmental issue to make informed and responsible decisions (*Federal Register*, 1996).

Components of Environmental Education

The Tbilisi Declaration, adopted by acclamation at the world's first intergovernmental conference on environmental education, outlined five categories of objectives for environmental education:

1) **Awareness** and sensitivity to the environment and environmental challenges
2) **Knowledge** and understanding of the environment and environmental challenges
3) **Attitudes** of concern for the environment and a motivation to improve or maintain environmental quality
4) **Skills** to identify and help resolve environmental challenges
5) **Participation** in activities that lead to the resolution of environmental challenges

(UNESCO, 1978)

A. GOALS, GUIDING PRINCIPLES, AND DEFINITIONS

To help clarify the relationship between knowledge, skills, and action, educators have developed a framework and set of goal levels that stress a hierarchical approach to environmental literacy.

GOAL LEVELS

- *Ecological concepts*: Provides knowledge to make ecologically sound environmental decisions
- *Conceptual awareness*: Develops awareness of how individual and collective behaviors influence the quality of life and the quality of the environment
- *Issue investigation and evaluation*: Develops the knowledge and skills to investigate environmental issues and evaluate solutions for remediating them
- *Environmental action skills*: Develops skills for taking positive actions to help resolve environmental issues (Hungerford, et al., 1980)

Research findings indicate that in order for individuals and groups to make informed decisions and take responsible actions regarding the environment, they need to be thoroughly exposed to all four goal levels—not just the first two. Findings also indicate that the quality of environmental actions tends to improve when people have learned and used issue analysis and investigation skills (Hungerford, et al., 1980).

B. NEED AND RELEVANCE TO AMERICANS' EVERYDAY LIVES

All members of society depend on natural resources to survive. The availability of these resources has limits. It is essential, therefore, that the public understand the importance of the environment to their quality of life and that they have the knowledge, tools, and ethic to live in ways that minimize the impact of their actions on the environment. In short, to live sustainably. Environmental education provides the public with the knowledge, tools, and ethic to enable them to make informed and responsible decisions to live sustainably.

PUBLIC CONCERN ABOUT THE ENVIRONMENT

The public is concerned about environmental quality. Several public opinion polls conducted in the past

five years demonstrate that U.S. citizens are worried about air and water quality, support an expanded federal role in environmental protection, and are concerned about the links between health and environment (Harris, Tarrance, and Lake, 1989). For example, a 1994 public opinion poll conducted for the National Wildlife Federation indicated that despite concern about crime, the economy, and health care, voters do not want to roll back environmental protection and are especially concerned about clean water, pesticide contamination, and other issues related to human health and the environment. More than 40 percent of those polled felt that current laws and regulations do not go far enough in protecting the environment, which supports earlier surveys that found that environmental concerns are "urgent" and need to be addressed (Hart, 1994).

The environment also is consistently ranked by young people as "one of the most important" issues facing the planet. In a 1994 survey conducted for the National Environmental Education and Training Foundation, students from non-disadvantaged socioeconomic areas ranked concern about the environment second (51 percent)—after concern about AIDS (64 percent)—as the "problem they are most concerned about and want to improve." Other issues that were of concern to those students included kidnaping, guns, the economy, and neighborhood crime and violence. While students from disadvantaged areas cited less concern for the environment (43 percent)—behind AIDS, kidnaping, guns, neighborhood crime and violence, and the economy—concern for the environment was nevertheless significant (Roper, 1994). In another survey conducted for World Wildlife Fund, teens ranked the environment as "one of the most serious problems society will face in the year 2000" (Hart, 1994). The data from these and other surveys also indicated that environmental education programs have an important role to play in the development of sound and effective environmental practices.

THE PUBLIC'S ABILITY TO RESPOND

Although much of the survey data demonstrates public concern about the environment, concern by itself does not necessarily indicate that individuals are taking appropriate actions to ensure environmental protection. Results of a 1991 poll released by *The Wall Street Journal* showed that 80 percent of Americans call themselves environmentalists, yet in that same poll, nearly 55 percent could not recall a single instance during the past six months when they bought one product instead of another for environmental concerns (Wall Street Journal, 1991).

Looking Back: The Historical Roots of Environmental Education

The need for education about the environment has been evidenced in oratory and print over the past century, and has increased in volume and intensity since Rachel Carson's book *Silent Spring* was published in 1962. *Silent Spring* is frequently identified as the catalyst for the environmental movement of the 1960s and 1970s, which differs from earlier conservation movements because it ". . . was far more widespread and popular, involving public values that stressed the quality of the human experience and hence of the human environment."

In the movement's early days a variety of federal and state laws were enacted to address public concerns. Prominent among them were the National Environmental Policy Act of 1969 (P.L. 91-190) and the National Environmental Education Act of 1970 (P.L. 91-516), both of which identified education as a mechanism for improving the quality of the human environment. The National Environmental Education Act of 1990 (P.L. 101-619) is a restatement of that goal.

Environmental education has as its roots the varied and century-old fields of nature study, outdoor education, and conservation education. Since the 1970s, environmental education has been characterized by the development of implicit and explicit interconnections with science, technology, and the issues and problems of society.

Environmental education has been defined and redefined over the last twenty-five years. Definitional issues are inherent in a field this broad and encompassing. It is generally agreed that environmental education is a process that creates awareness and understanding of the relationship between humans and their many environments—natural, man-made, cultural, and technological. Environmental education is concerned with knowledge, values, and attitudes, and has as its aim responsible environmental behavior.

The most commonly accepted definition worldwide was developed in 1975 at a United Nations Educational, Scientific, and Cultural Organization (UNESCO) meeting in Belgrade, Yugoslavia. This definition and its guiding principles were accepted by the twelve federal agencies that participated in a 1993 interagency review of federal environmental education programs. A report of this interagency group states that "environmental education should increase public awareness and knowledge about environmental issues as well as provide the public with the skills necessary to make informed decisions and the motivation to take responsible actions" (FCCSET, 1993).

In September 1993, a federal government interagency working group on environmental education and training concluded that:

". . . the actual level of public understanding about the basic scientific concepts that explain and offer solutions to environmental threats such as those posed by global change and wetlands destruction remains limited. Without sufficient knowledge and training, the public may wish to respond to an environmental challenge, but may not be able to do so effectively because they lack sufficient scientific understanding of the problem."

The working group further concluded that:

"Environmental education and training can help bridge the gap between the public's heightened awareness of and interest in protecting the environment and their need to become more knowledgeable about the scientific concepts that will enable them to more effectively respond to their concerns." (FCCSET, 1993)

DEMAND FOR ENVIRONMENTAL EDUCATION

Recent surveys indicate that there is solid support at local and state levels from educators, parents, and students. In a 1993 survey of science and social studies educators and nonformal educators working in zoos, museums, nature centers, and aquariums, more than 90 percent of the more than 2,000 educators who responded indicated that environmental education should be a priority in schools and nonformal institutions. In that same survey, educators indicated a need for more materials, training, and institutional commitment for environmental education (WWF, 1993).

Many state and national organizations and state and federal agencies also have been inundated with requests for environmental education materials, training, and support. For example, during the past five years, EPA's Environmental Education Division received approximately 10,000 grant proposals requesting approximately $300 million. During this period, Congress appropriated approximately $13 million for this program allowing EPA to support only approximately 1,200 projects. As another example, through a grant from EPA, the University of Michigan established and maintains an electronic system, called "EE-Link," designed to increase the ability of educators and other users to gain access to the wealth of environmental education information and materials that exist in various databases linked through the Internet. The University of Michigan reports that since "EE-Link" was established in 1993, public interest and access to Internet accessible databases and materials through "EE-Link" has grown considerably. By June 1996, for example, the University of Michigan reported receiving approximately 640,000 "hits" over a three month period (or an average access rate of nearly 50,000 per week) on "EE-Link" showing the significant interest for this type of information (NAAEE, 1996).

In nonformal surveys, local and state institutions indicate that they do not have the staff or resources to respond to increasing requests for environmental education materials and training. And in a 1994 survey of parents in Minnesota, researchers found that more than 60 percent of parents surveyed considered the environment to be one of the very important skills for high school graduates (compared to 43 percent for geography, 54 percent for government, 58 percent for science, 43 percent for history, and 19 percent for fine arts) (Simmons, 1995).

WHY ENVIRONMENTAL EDUCATION IS RELEVANT TO AMERICANS' EVERYDAY LIVES

Environmental education is relevant to our everyday lives because it can ensure the health and welfare of our nation by:

- protecting human health
- advancing quality education
- expanding employment opportunities
- promoting sustainable development
- protecting America's natural heritage

Protecting Human Health

The link between environmental challenges and human health is a major cause for public concern about the environment. Lead poisoning in paint and pipes, air pollution, pesticides in water and food supplies, increased threats of skin cancer from depletion of the ozone layer, and related environmental challenges are of growing concern to an increasing number of Americans. The public is especially concerned about the effects of these problems on their children and future generations.

Environmental education helps prevent or mitigate environmental human health problems by providing the public with information on how individual and collective actions lead to environmental pollution, how pollutants may affect one's health, how to assess real versus exaggerated environmental health risks, and how to make informed and responsible decisions that prevent or mitigate the effects of pollution on one's health.

Advancing Quality Education

Educators and public officials generally believe that significant improvements are needed in the nation's public education system to enhance student learning (National Commission on Excellence in Education, 1983). Many educational scholars and practitioners agree that "... our students are not doing well at thinking, reasoning, analyzing, predicting, estimating, or problem solving ..." (Kennedy, 1991). Many goals of the education reform movement emphasize the importance of strengthening core subjects such as math, science, and geography as well as teaching in an interdisciplinary manner across subject areas. Education reformers are also looking for ways to improve student learning through greater use and development of critical-thinking and problem-solving skills. Finally, many reformers emphasize the importance of relating learning in the classroom to the needs and issues of the community.

Environmental education has tremendous potential for contributing to the goals of the education reform movement. For example, environmental education provides an opportunity to strengthen teaching in many core subjects, especially science, because it is the basis for solving many of our environmental challenges. Environmental education also provides an opportunity to strengthen interdisciplinary teaching because environmental topics can be addressed from many different perspectives, including scientific, historical, cultural, and political perspectives. Finally, environmental education can provide an important opportunity for teachers to bring actual local environmental challenges into the classroom for discussion and problem-solving.

In fact, a 1993 federal interagency report on environmental education and training, concluded that:

"... infusing environmental education into all subject areas can lead to overall improvements in the educational system, including improvements in teaching the core subjects."

The report also noted that:

"Understanding the complexities of the interrelationships between the natural environment and human activity—economic, social, and political—is a necessary condition to the maintenance and improvement of environmental quality. Because a goal of environmental education is the fostering of responsible environmental behavior, environmental education necessitates emphasis on higher-order thinking and learning skills. By setting a goal of fostering changes in environmental behavior, environmental educators stress the development of skills that enable students to synthesize and evaluate data from across the spectrum of human knowledge and to develop solutions that are scientifically, economically, and politically sound." (FCCSET, 1993)

Expanding Employment Opportunities

Protecting the environment has the added value of creating new jobs for Americans. Employment opportunities cover the spectrum of careers, from manual labor to high technology and management. For example, there is an increasing demand for individuals with specialized scientific and technical skills to develop more effective environmental pollution prevention and control technologies.

There is also a growing demand for trained workers in environmentally related fields. Projected revenues (1992-1997) show consistent growth for environmental industries such as air pollution control, environmental energy sources, hazardous waste management, resource recovery, and instrument manufacturing. The *Environmental Business Journal* reports a composite annual growth rate of 6 percent for these industries. This growth is also reflected in employment forecasts into the next century.

Environmental education and training can help ensure an adequate supply of well-trained environmental personnel to deal with the nation's increasingly complex environmental challenges. Environmental education also improves the quality of the general work force. Environmental education's emphasis on critical thinking and problem-solving better equips students to deal with rapidly changing technologies in the workplace. And environmental education opens new opportunities as the United States exports its environmental skills and technologies to other nations.

Promoting Sustainable Development

The future health and welfare of our nation depends on our ability to use the Earth's resources sustainably. The United Nations World Commission on Environment and Development defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." It is critical that we provide future generations of Americans with the same abilities and opportunities that current and past generations have had.

In 1992, international leaders came together in Rio de Janeiro to participate in the United Nations

Conference on Environment and Development (UNCED). The product of UNCED, *Agenda 21*, provides guidance to countries so they can meet their own environmental and development goals. The U.S. response to *Agenda 21* is the President's Council on Sustainable Development (PCSD). The PCSD report, *Sustainable America: A New Consensus for Prosperity, Opportunity, and a Healthy Environment for the Future*, is a series of policy recommendations which will help the U.S. achieve national environmental, economic, and social goals. Like Chapter 36 in *Agenda 21*, Chapter 3 in *Sustainable America* focuses on the role of education in sustainability. The recommendations and actions in Chapter 3 have been supplemented with initiatives in another document titled *Education for Sustainability: An Agenda for Action*. Together these reports highlight the important role of education in ensuring a sustainable future.

Sustainable development poses two fundamental education challenges: one is to promote positive attitudes and informed decisions of citizens and government leaders that are conducive to sustainability. The other is to teach people at all levels the benefits of integrating conservation priorities with the need for development.

Environmental education has the potential to make a major contribution to sustainable development by demonstrating ways to overcome these two challenges. First, environmental education research has identified key strategies for developing education programs that lead to responsible decision-making and action. Second, environmental education practitioners have developed program models for incorporating a range of perspectives into the resolution of issues. These tools and strategies, developed over decades by environmental educators and field tested on a range of issues where conflicts exist between different interest groups, can be applied immediately to sustainable development.

Protecting America's Natural Heritage

Interest in protecting America's natural heritage arises from the respect that most Americans hold for the nation's past and a belief in its future. It also stems from a desire to protect our natural areas and scenic landscapes, to enjoy them, and to pass them on to our children.

America's natural heritage also includes the multitude of plant and animal species that inhabit our country. State and privately funded efforts to protect and manage species and their habitats reflect Americans' love for wildlife. Yet many citizens do not understand the ecological and economic importance of preserving biological diversity and that species can be strong indicators of the health of the environment. Environmental education enhances the public's understanding of the need for biodiversity. Environmental education also educates the public about how their actions affect natural ecosystems and how positive steps taken to minimize impacts on these ecosystems will translate into improvements in our overall environment.

III. STATUS OF ENVIRONMENTAL EDUCATION IN THE UNITED STATES

Environmental education is taking place across the country—in classrooms and board rooms, in living rooms and urban education centers, in city halls and congressional chambers. How is it being done and who is doing it? What obstacles must we overcome to ensure that all citizens have the knowledge, skills, and attitudes to make informed decisions about the environment? What do professionals face in trying to create an environmentally literate citizenry? This section provides an overview of environmental education in the United States—its status, current approaches, audiences targeted, and critical issues facing the field.

A. APPROACHES AND AUDIENCES

Since 1970, a variety of educational institutions, environmental organizations, and government agencies have supported the development, delivery, and evaluation of environmental education in the United States. These environmental education efforts have targeted a variety of audiences, including teachers and students in elementary and secondary education, administrators at all levels, college and university teachers and students, adults and the general public, senior citizens, multi-ethnic communities, and political and business leaders.

In general, current environmental education efforts generally fit into one of two sectors:

- **Formal** environmental education, which consists of activities taking place in elementary and secondary schools, colleges, universities, and technical institutions

- **Nonformal** environmental education, which includes activities taking place in businesses, nonprofit organizations, and other institutions that are not considered part of the formal education system, also encompasses activities that involve the media, including newspapers, magazines, television, and computer networks

Within each of these broad sectors, there are several sub-sectors that encompass the majority of environmental education activities taking place today. Collaboration between formal and nonformal sectors is common and widespread, from local nature centers working with school systems to federal agencies working with businesses and universities. Such collaboration is essential and it increases the reach and impact of environmental education programs.

Environmental Education Guidelines

Environmental education . . .

- Considers the environment in its totality
- Is a continuous lifelong process
- Embraces interdisciplinary education
- Examines major environmental issues from local, regional, national, and international points of view
- Focuses on current and potential environmental situations, remembering historical perspectives
- Promotes the value and necessity of local, national, and international cooperation
- Explicitly considers environmental aspects in plans for development and growth
- Acknowledges that learners have a role in planning learning and an opportunity for making decisions and accepting their consequences
- Emphasizes environmental sensitivity, knowledge, problem-solving skills, and values clarification at every age
- Helps learners discover the symptoms and real causes of environmental challenges
- Emphasizes the complexity of problems
- Uses a diversity of experiences and approaches

(UNESCO, 1978)

Environmental Education in the Schools

In 1995, three states had mandates requiring environmental education training for teachers. In addition, eleven states required environmental education to be incorporated into core curricula.

FORMAL ENVIRONMENTAL EDUCATION

Formal environmental education efforts focus on developing awareness, knowledge, skills, and motivation in students, teachers, and school administrators. Activities involve curriculum development; teacher and administrator training initiatives; local, state, and national school reform activities; evaluation; the development of national environmental education guidelines; and other related programs designed to improve elementary, secondary, and post-secondary education. This report divides the formal sector into activities for grades kindergarten through 12 (K-12) and post-secondary education activities. However, there is overlap between the two, especially in regard to teacher training and curriculum development.

K-12 Environmental Education Activities

Delivery of environmental education programs in K-12 education generally takes two approaches, with many school systems adopting some combination of the two. The most prevalent trend in elementary and secondary education is toward an approach called "infusion." This approach integrates environmental education into existing lessons, units, or topics focusing on other subjects such as history, science, and the social sciences. For example, students may learn how to solve a local environmental challenge—such as chemical contamination of a nearby stream—using scientific methods that include testing, identifying, and locating the source of contamination. Students may also learn how to solve this contamination problem by exploring historical dimensions for how this type of problem has been addressed in other communities, how governmental agencies can help, and how citizens can get involved.

Ideally, infusion results in the incorporation of environmental education—an inherently interdisciplinary field—into all aspects of the curriculum at every grade level. Infusion recognizes that environmental issues cut across disciplinary lines, and that environmental responsibility relies on knowledge, skills, and attitudes that incorporate, but also go beyond, basic scientific understanding.

Because no one asks schools to do less—in fact, many demand they do more—infusion is a pragmatic approach to ensuring that environmental education can be incorporated into a crowded curriculum. But despite the arguments in favor of infusion, many environmental educators are wary. Their concern is that environmental education may be short-changed or ignored unless it receives its own place in the curriculum. For this reason, many educators prefer the "second-course" or "block" approach. This approach consists of offering separate and distinct "environmental" courses. Their argument is that the separate course approach can offer depth that is missing in the infusion approach, as well as an identifiable focus for attracting funding, evaluating progress, and encouraging career development.

According to recent data, most states rely on infusion as the main approach for integrating environmental education into the curriculum. However, more distinct environmental courses are being offered in middle and secondary schools, and many educators believe that this trend will continue. In addition, more schools are offering current events classes that include an environmental focus (Marshall, 1987 and NCEET, 1994).

The debate on how to incorporate environmental education continues. The Council believes that both these approaches should complement one another and that efforts to choose an approach should be based on state, local, and individual priorities, needs, and training.

Post-Secondary Environmental Education Activities

At the college and university level, environmental education is addressed in a variety of ways; however, the effectiveness of these efforts varies from state to state, institution to institution, and course to course, just as it does at the K-12 level. In general, universities and colleges emphasize the following strategies to help create environmentally literate citizens:

- **Preparing Students for Environmentally Related Careers:** Courses and programs are offered that prepare students for specific environmental careers, including environmental science, natural resource management, environmental design, environmental engineering, environmental planning, and environmental management. Many universities and colleges also offer degrees in environmental studies, which differ from more technical programs in that they are interdisciplinary and include both the natural sciences (such as biology, resource management,

and biochemistry) and the social sciences (political science, economics, and history). A relatively small number of universities and colleges offer undergraduate and graduate degrees in environmental education, which are designed to train students for careers as professional environmental educators working in formal and nonformal settings.

- **Providing Teachers with Pre-Service Environmental Education Training:** These programs vary widely across the country. Some areas have very limited opportunities for student teachers to receive training in environmental education before they enter the classroom. On the other hand, some states, such as Wisconsin, have mandates requiring nearly all students training to become teachers to achieve environmental education competencies before being licensed to teach. In some institutions, students can take a specific environmental education or environmental studies course. In others, they receive environmental education content and methodologies through other courses—often in science or general methodology classes. Unfortunately, most environmental education training for teachers takes place after they leave the university and start teaching—as a result of in-service training or individual teacher initiative.

- **Providing Environmental Education Training for All University and College Students:** There is a growing trend among universities to include environmental education requirements for all students—not just those majoring in environmentally related fields. For example, Tufts University initiated an Environmental Literacy Institute for university professors from around the world to help them incorporate environmental education into all coursework, from creative writing to politics to law. This program was initiated in 1993 and has involved more than 150 universities and organizations from around the world. In addition, more than 250 universities and organizations have become signatories to the Talloires Declaration, which supports an interdisciplinary approach to environmental literacy at the university level.

- **Providing Environmental Education Training for Students Majoring in Business:** Another trend is the emergence of environmental management education in business schools across the country. Several business schools are currently incorporating environmental content into their curriculum, hoping to influence the attitudes and behavior of current and future business graduates regarding the link between a healthy economy and a healthy environment. One example is the Kellogg Graduate School of Management, which has been offering a course on environmental management since 1992 and is integrating environmental issues into the Kellogg curriculum. There also is a pilot program being sponsored by the Management Institute for Environment and Business, with support from EPA, the U.S. Department of Energy, the Summit Foundation, Bristol-Myers Squibb, General Electric, Phillips Petroleum, Molten Metal Technology, Rockefeller Brothers Fund, and American Telegraph and Telephone Company. Environmental business and management programs are operating at Stanford University, the University of Virginia, the University of Texas, the University of Michigan, and Northwestern University.

The Tufts University Model

Tufts Environmental Literacy Institute (TELI) is one of the nation's first comprehensive university environmental education program integrating environmental issues into undergraduate, graduate, and professional school curricula. TELI is a faculty-based program aimed at enabling Tufts faculty across all disciplines to incorporate environmental perspectives into the courses they teach. The goal is to provide Tufts students with broad and continuing exposure to environmental issues. TELI's faculty-development program offers workshops, seminars, and meetings; financial and intellectual support; and access to resources, information, and environmental experts. Faculty members from other universities have attended parts of TELI's program to help them transfer this model to their universities.

- **Conducting Research and Evaluation:** Universities and colleges have taken the lead in conducting a broad spectrum of environmental education research projects concerning environmental knowledge, skills, attitudes, and action. Findings have been published in a variety of periodicals, such as *The Journal of Environmental Education* and in conference proceedings and monographs such as those produced by the North American Association for Environmental Education (NAAEE). Through NAAEE's North American Commission on Environmental Education Research, faculty from nearly 20 universities, including Rutgers University, Ohio State University, the University

of Wisconsin-Stevens Point, and Northern Illinois University, have cooperated in identifying and addressing research needs in environmental education.

- **Environmental Career Training:** Community and technical colleges have become increasingly active in providing training programs in the environmental field, offering specific degree programs for such careers as water/wastewater technicians and course offerings on a variety of specific topics. At present, these programs focus mainly on technical aspects of job performance and regulatory compliance, but the opportunity exists for a broader environmental education approach that also encompasses the nature of the environmental challenges that prompted the need for regulation. Community colleges, in particular, provide a substantial resource for minority students, many of which graduate and attend universities for advanced degrees.

Links Between K-12 And Post-Secondary Environmental Education

A variety of environmental education activities taking place in the formal sector involve collaboration between university and college programs and the nation's elementary and secondary schools. They also involve collaboration with nonformal institutions, government agencies, and other institutions. For example, many universities and colleges are involved in developing environmental education curriculum for K-12, enhancing in-service training, and evaluating environmental education curriculum materials and training. And many nonprofit organizations, such as environmental organizations and community educational institutions, are involved in training teachers, developing supplementary environmental education materials, and conducting programs for parents, families, youth, and the public.

NONFORMAL ENVIRONMENTAL EDUCATION

Nonformal environmental education activities take place in a variety of settings throughout the country—from zoos, museums, aquariums, nature centers, and science centers to parks, and community centers. Nonformal environmental education programs often complement and enhance formal education programs. In addition, many target adults, the general public, or families. And some are designed for specific adult audiences, such as senior citizens, public policy makers, business leaders, and women's groups.

The goals of nonformal environmental education programs are similar to those in the formal sector—developing environmentally literate young people and adults who have the knowledge, skills, and motivation to make informed decisions about the environment. Activities in this sector involve community action projects sponsored by business and nonformal education organizations; programs in local, state, and national parks, wildlife refuges, and other natural areas; television, radio, and other media programs focused on environmental issues and actions; and a variety of partnership programs designed to improve elementary, secondary, and post-secondary education. In many cases, nonformal environmental education activities are directed toward the solution of specific environmental challenges.

It should be recognized that in reaching adults, there is a potentially strong link between formal and nonformal education. Parents' awareness and understanding of environmental issues are frequently enhanced by their children's involvement in environmental education. As children become involved in the problem solving and action elements of effective environmental education, they frequently take these issues home and involve their parents in discussions about them.

One of the central challenges to nonformal environmental education is how best to reach a non-captive, out-of-school audience with a meaningful and effective program. What kind of education program will prompt behavior change or commitment to get involved in local, national, and global environmental issues? To address this problem, environmental education efforts in the nonformal sector vary widely. Following is an overview of the approaches currently in use around the nation:

- **Using the Media:** Newspapers, magazines, television, movies, and other media can transmit messages to large audiences, and have been gaining popularity as a means for educating the public about environmental issues. There are many excellent examples of media-based environmental education, such as attempts to educate about recycling; however, media efforts face two major challenges. The first is assuring that environmental messages publicized as education really are education rather than hype or propaganda. The second challenge is assuring breadth and depth in examining complex environmental issues. Entertainment and the media often emphasize environmental awareness, rather than education that leads to

personal, organizational, or community participation.

Note: *Many experts feel that the media is different enough from other nonformal education activities that it deserves its own sector. These educators divide environmental education in three sectors: formal, nonformal, and informal, with informal environmental education encompassing media-generated environmental education programming.*

- **Targeting Specific Audiences:** Many nonformal institutions are involved in programs and activities that target specific audiences such as senior citizens, culturally diverse students and adults, preschoolers, tourists, policy makers, and most often, the general public. In some communities, schools, businesses, and nonformal institutions collaborate to reach a specific target audience. Many community institutions offer continuing education programs for adults and families focusing on environmental topics, as well as after-school, summer, and weekend environmental education programs for young people. In addition, some churches, synagogues, and other religious institutions are involved in environmental education activities that link religion with environmental stewardship.

- **Developing Supplementary Materials:** Many organizations and institutions, from government agencies to environmental nonprofit organizations and businesses, have developed supplementary environmental education materials that are used in schools and community settings. These materials include a wide range of topics and approaches, from those dealing with a single subject such as solid waste to those focusing on broad environmental themes such as sustainable development. Some are meant to supplement formal school curricula. Others are meant to be used with students and adults in nonformal settings. The quality of these supplementary materials varies greatly.

- **Training Educators:** Many K-12 educators receive environmental education training as a result of in-service training that takes place after they begin teaching. Much of this training takes place through workshops at national, regional, or state environmental education conferences, or courses sponsored by local university outreach and extension programs, often in conjunction with nonformal partners, such as museums, zoos, or science centers. Many teachers also participate in specialized workshops, such as those offered by Project Learning Tree, World Resources Institute, World Wildlife Fund, and other nonprofit educational organizations. These courses and workshops often provide "continuing education units" or specific college credits that many teachers need to maintain certification to teach.

B. WHO DELIVERS ENVIRONMENTAL EDUCATION PROGRAMS

Many organizations, institutions, agencies, and communities offer environmental education programs. For the purposes of this report, we have grouped the them into the following sectors:

- state, local, and tribal governments
- nongovernmental organizations
- universities, colleges, schools and technical training institutes
- federal government
- business, industry, and the media
- foundations

The following discussion provides an overview of the types of activities in each sector, including sample program highlights to demonstrate the broad spectrum of environmental education activities taking place across the country.

STATE, LOCAL, AND TRIBAL GOVERNMENTS

State and local governments are influential forces in formal environmental education because of their responsibility for public education. In many states, curricula are determined at the state level. In other states, local governments or school districts play a substantial role in curriculum development. State and local funds are often used for teacher-training, evaluation, and materials development. Tribal governments often complement state and local

Council of State Governments

The Council of State Governments—a nonprofit, non-partisan organization dedicated to serving all branches of state government—developed a model for state environmental education legislation. In July 1992, a specially-invited 40-member subcommittee of the Council's National Environment Task Force met to draft the model. It was approved by the Council's full members of elected, appointed, and career state government officials in 1993 and is being widely distributed to state governments to serve as a model for future legislation. See Appendix E.

efforts and play an important role in supporting environmental education programs for Native Americans.

During the 1970s, most state education agencies appointed environmental education coordinators to oversee efforts within the formal education system. Coordinators were involved in developing state guidelines, curriculum materials, and in-service training programs. However, during the 1980s most states followed the federal lead by deemphasizing environmental education. As a result, the responsibilities of full-time coordinators often shifted to one or more individuals who were already burdened with other responsibilities. During this period, accomplishments related to environmental education often reflected the interests of individuals rather than a commitment from state or local governments.

In the 1990s, there has been a reemergence of environmental education as a state governmental priority, as evidenced by the increasing numbers of states with new legislative initiatives. In 1991, the University of Wisconsin-Stevens Point began the National Environmental Education Advancement Project (NEEAP) to help teams of education and environmental education leaders develop comprehensive state environmental education initiatives. In 1995-1996, NEEAP conducted a survey of all 50 states allowing them to develop a state-by-state and composite picture of environmental education programs. Results of this survey are presented in Appendix F. NEEAP has been funded by grants from the U.S. EPA, the National Fish and Wildlife Foundation, and the National Wildlife Federation, among others. Also in 1995, a State Education and Environment Roundtable was established to serve as a resource to state education agencies working to integrate environmental education into K-12 curriculum and schools' educational reform efforts. The Roundtable was established with funding from the Pew Charitable Trusts and is administered by the Council of Chief State School Officers.

Whether through state mandates, state agency efforts, or some type of independent state associations, there is a strong logic for building support for environmental education on a systematic state-by-state basis that ultimately strengthens local program efforts. For specific Council recommendations, please see Section V, beginning on page 24.

Wisconsin — Leading the Way

Wisconsin has been a leader in promoting environmental education at the state level and was recognized by Renew America, Inc. for having the outstanding state environmental education program in the nation. In 1990, the state passed environmental education legislation that created a cooperative program among several state agencies. The program includes a state coordinating board, a grants program, state centers, and a mandatory environmental literacy assessment of students and teachers. Earlier legislation required every school district to develop, implement, and evaluate a sequential K-12 environmental education program. Wisconsin state law also requires teacher training in environmental education as a prerequisite for teacher licensing. Since 1985, more than 30 states have enacted some type of legislative initiative to enhance environmental education at the state level.

Native Americans — Promoting Literacy and Technical Expertise

In many cases, Native American tribal governments are responsible for implementing environmental regulations within established tribal boundaries. Many tribes face a shortage of technically trained professionals to manage their resources. A number of tribes and Native American organizations have developed programs to promote the environmental literacy and technical expertise of their people.

For example, the nonprofit American Indian Science and Engineering Society (AISES) is dedicated to increasing the number of Native American scientists and engineers. It has grown from a professional society to a major national resource for Native American education that is recognized by the National Science Foundation, the American Association for the Advancement of Science, and more than 70 U.S. corporations. Tribal leaders and educators across the country are becoming increasingly aware of the environmental wisdom

NONGOVERNMENTAL ORGANIZATIONS

Nongovernmental organizations (NGOs) have been leaders in environmental education initiatives taking place in the formal and nonformal sector since environmental education began. In some cases, educational activities are directed toward the solution of specific environmental challenges or increasing awareness about national or global issues such as acid rain or ozone depletion. Many NGOs also are involved in curriculum development, teacher training, and evaluation. Programs take place at such diverse sites as zoos, museums, wildlife refuges, parks, and nature centers.

During the 1980s, a number of trends in nonformal environmental education emerged, which have continued into the 1990s. These include an emphasis on urban and rural environmental education, interactive traveling exhibits focusing on environmental issues, eco-tourism education packages, and family and adult-oriented outdoor education camps. These trends are expected to continue, based on market demand, available leisure time, and the spending power of Americans.

NGOs include a variety of organizations, from nonprofit environmental groups, such as World Wildlife Fund and the National Audubon Society, to professional associations that include environmental education activities, such as the North American Association for Environmental Education, the New England Environmental Education Alliance, the National Science Teachers Association, and the National Association for Interpretation. A growing trend is the development of nongovernmental state environmental education associations or councils that provide an opportunity for strengthening state capacity for effective environmental education. Presently, 45 states have environmental education associations (Ruskey and Wilke, 1996).

UNIVERSITIES, COLLEGES, SCHOOLS, AND TECHNICAL TRAINING INSTITUTES

As mentioned previously, formal educational institutions are actively involved in all aspects of environmental education, from in-service and pre-service education to curriculum development and professional development. Please see the section on formal education, beginning on page 8.

FEDERAL GOVERNMENT

Many federal agencies such as EPA, the Departments of Education, Interior, Agriculture, Energy, and State, the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation, and the Peace Corps have ongoing environmental education programs tailored to the missions of their respective agencies. Federal support for environmental education includes teacher training, grants to support state and local projects and to promote equity and diversity across states, the development and dissemination of educational materials, as well as field and laboratory internship programs. A 1993 federal interagency report noted that federal environmental education programs can help the government meet its broader goals for supporting education reform; job creation, training, and economic competitiveness; public health; environmental protection; and sustainable development (FCCSET, 1993).

With passage of the National Environmental Education Act of 1990, EPA was charged with facilitating communication and collaboration across the federal government. This is accomplished, in part, through the Federal Task Force on Environmental Education which is chaired by EPA (see page 20). Increasingly, federal agencies have been working together to set program priorities by serving on interagency advisory committees, review panels, and strategic planning sessions. In addition, federal agencies have been increasingly collaborating on developing and implementing joint projects through interagency agreements. For example, EPA and the Department of Education worked together to add a new priority to EPA's Environmental Education Grant Program which focuses on using environmental education as a catalyst to advance state and local education reform goals. In addition, NASA, the Department of Agriculture, the U.S. Global Change Research Program, EPA and others developed the "Global Change Education State Team Initiative" to improve literacy and teaching capability in global change education among educators and community leaders through statewide systemic education approaches.

The Council believes strongly that the federal government has an important role to play in enhancing environmental education in the United States. For an analysis of EPA's implementation of the National Environmental Education Act of 1990, see page 19 in Section IV.

GLOBE

In 1994, the Vice President launched Global Learning and Observations to Benefit the Environment (GLOBE)—an innovative international environmental education program which coordinates the work of students, teachers, and scientists to study and understand the global environment. The GLOBE program also provides opportunities for students to conduct valuable scientific work, immediately analyze the results of their studies, utilize advanced technologies as an integral part of their work, and have the opportunity to communicate and learn from each other in the U.S. and abroad. GLOBE's federal partners include NOAA, NASA, NSF, EPA, and the Departments of Education and State.

BUSINESS, INDUSTRY, AND THE MEDIA

Business and industry have become increasingly involved in supporting environmental education

activities. Many companies have supported on-going environmental education programs or started their own to increase awareness about environmental issues and to help consumers understand the links between business and the environment. Environmental messages are frequently appearing on everything from bottled water to paper bags, and advertisers are catering to "green" consumers by featuring the environmental advantages of one product over another. Amway, Chevron, Eastman Kodak, Phillips Petroleum, and Shell Oil are just a few examples of corporations that have conducted and supported environmental education activities for several years. Environmental programming is also a regular feature on television, radio, video, computer networks, and other media outlets. The nonprofit Environmental Media Association (EMA) was founded in 1989 to foster the rapidly growing environmental interests of the entertainment industry. EMA works with writers, producers, directors, and others to incorporate environmental themes into film, television, and music.

FOUNDATIONS

Over the past five years, private charitable foundations have increased their funding for environmental education. Some, like the Pew Charitable Trusts, the Geraldine R. Dodge Foundation, and the Rockefeller Brothers Fund, have supported environmental education for many years. Many foundation grants are typically for three years or less, are usually limited to $100,000 per year, and usually advance a single resource conservation program within the foundation's overall goals.

The two Congressionally-funded foundations in the field, the National Fish and Wildlife Foundation (NFWF) and the National Environmental Education and Training Foundation (NEETF), are making major contributions to environmental education. The matching grants awarded by NFWF and NEETF increase private support and partnerships for environmental education. Unlike endowment-based private foundations, these foundations are funded by annual federal appropriations. The future impact of NFWF and NEETF depends on continued support from Congress and other funding partners.

The number of foundations funding environmental projects is growing, and opportunities for environmental education are good. To increase their share of foundation support, the environmental education community will need to build a stronger connection between education and the environmental improvement goals of philanthropic foundations.

Project Learning Tree — A Model Involving Business and Industry

Project Learning Tree (PLT) is a K-12 environmental education program sponsored by the American Forest Foundation and the Council for Environmental Education. For more than 20 years, PLT has worked with state agencies, the U.S. Forest Service, the forest products industry, teachers, school administrators, and other partners to provide environmental education materials and programs throughout North America. Many look to PLT as a model for involving business and industry in the important task of educating students and teachers about the environment.

C. ISSUES AND CHALLENGES

The National Environmental Education Act of 1990 begins with a recognition of the increasing complexity and scope of environmental challenges in the United States, and the importance of environmental education in helping the nation meet these environmental challenges. In the past several decades, federal and state agencies; nongovernmental organizations; educational institutions; and others working at local, state, and national levels have developed a wide variety of effective environmental programs. Despite innumerable program accomplishments, the field of environmental education faces many challenges, as summarized below. The Council has addressed these issues with a series of short- and long-term recommendations outlined in Section V of this report. However, it is important to note that environmental education is a long-term process that requires on-going support and participation from all sectors of society.

Issue

1 Environmental Education Is Not a Priority Across the Country

Despite the wealth of programs and materials, widespread support and funding for environmental education is often lacking. Environmental education is not a clear priority at any level within our education system or society, and many programs face on-going resource, funding, and staff limitations. In addition, many view environmental education as an "add-on" and not part of mainstream education. For these reasons, there needs to be clear and consistent political and legislative support at all levels.

Many experts agree that despite many exemplary efforts, this lack of long-term consistent support and commitment at all levels has created a field that is often fragmented, inefficient, and duplicative. The Council recognizes that the National Environmental Education Act is a critical and needed step in stimulating national support for environmental education and a renewed federal commitment for environmental education. However, much work still needs to be done at national, state, and local levels to institutionalize environmental education and make it a nationwide priority.

Issue
2 State, Local, and Tribal Efforts Need Greater Resources and Support

Although consistent federal leadership and commitment is critical to the success of environmental education in the United States, most environmental education initiatives are best developed and implemented at the state, local, and tribal levels. The federal government's primary role should be to support exemplary state, local, and tribal initiatives that have evolved over the last two decades. Federal support can help institutionalize such programs and promote a sustainable environmental education infrastructure that will function despite shifts in spending priorities.

Many experts believe that the most effective way to enhance state and local capacity to implement effective programs is to support the development of comprehensive state environmental education programs that include statewide environmental education offices, state coordinators, and state coordinating councils. In some states, legislative mandates are the most effective means of institutionalizing environmental education efforts. The Council of State Governments has developed "Model State Environmental Education Legislation" which can help states to explore this option (see Appendix E). Alternative methods, including the creation of independent state environmental education councils or associations, that help serve as focal points for federal, state, and local agencies, as well as nonprofit organizations, business, and industry, can also promote environmental education on a statewide basis.

Issue
3 Resources Are Limited and No One Sector Can Support the Entire Field

Solutions to environmental issues require increased collaboration among all sectors of society—including business, industry, schools, community organizations, citizens, funding institutions, and government. In the past, the responsibility for environmental education rested mainly with nonprofit organizations, community educational institutions, and motivated educators scattered throughout the country. With the passage of the National Environmental Education Act, there was hope that the federal government would supply much of the needed funding. But the federal government cannot supply the amount of funding needed to support the field; rather, it can help leverage support from state, local, and private sources. Today, there are more partnerships and a better understanding that collaboration is the key to sustainability.

Although models exist in almost every state, we need more partnerships that work—across federal agencies, within EPA, among nonprofits, schools, and business, and between the public and private sectors. Specifically, business needs to get more involved—especially in supporting local and state environmental education efforts. Federal agencies and like-minded organizations need to collaborate on more projects of mutual interest to prevent waste and duplication. Zoos, museums, nature centers, and other community educational institutions need to work more closely with the formal education system and with parents and families.

There also is a need to build on existing international partnerships. Environmental challenges are global and will increasingly need international cooperation to find effective solutions. It is critical that countries establish and enhance mechanisms to share success stories and lessons learned to improve national and international environmental education efforts.

Issue
4 Professional Development for Teachers and Nonformal Educators Needs Greater Support and Improvement

Over the long term, one of the most cost-effective efforts that can be undertaken to improve environmental education in the United States is to improve the quality of pre-service and in-service teacher professional development, and training for instructors in environmental education programs outside the classroom (for example, with youth and community groups, zoos and museums, and other nonformal educational institutions). Although good programs exist, most experts agree that teacher and instructor training for environmental education is inconsistently available. Teachers often express misgivings about their competence to conduct environmental education programs and have limited opportunities for training before and after entering

the classroom. Although some states require environmental education training, surveys indicate a notable lack of emphasis on environmental education in pre-service teacher training, as well as in-service instruction.

Issue

5 Environmental Education Is Not Well Integrated into Education Reform and Improvement

Environmental education has the potential to significantly improve the public education system. Many of the goals championed by education reform and improvement advocates—such as the need to strengthen interdisciplinary teaching and critical-thinking and problem-solving skills—can be effectively accomplished using environmental education as a vehicle. Although there are some good efforts under way, environmental education has not consistently been well integrated into education reform and improvement efforts across the country and it has not generally been identified as a priority of the formal education establishment. This is partly a reflection of the environmental education establishment's tendency in the past to focus more on reaching teachers and students rather than state education agencies, local school boards, principals and other school administrators. Consequently, key educational decision makers are not generally knowledgeable of the potential effectiveness of environmental education in achieving many of the basic goals of education reform.

Environmental education, by its nature, draws on and impacts many disciplines, such as science, math, history, and political science. It also is readily identifiable as a critical component of citizenship education, science literacy, career development, and a variety of other initiatives supported by the education reform movement. Education reform can be a mechanism for giving environmental education an established place in the curriculum, making it less subject to funding priority shifts and more likely to be a focus in teacher training.

Issue

6 Important Audiences Are Not Being Reached

Most environmental education efforts have focused on elementary and secondary students—especially in kindergarten through the 6th grade—with some support in community colleges, vocational education, higher education and the Cooperative Extension Service. Important audiences in environmental education are being missed or inadequately reached, such as adults, people of color, low-income populations, and senior citizens. In part, this is due to lack of materials, commitment and organizational support; uncertainties in knowing how to engage these audiences; and difficulties in adapting traditional teaching strategies to nonformal learning environments within communities and diverse cultures. Environmental education materials are rarely available in languages other than English, although some have been translated into Spanish, and such materials are not always sensitive to diverse cultures.

Issue

7 Evaluation, Quality Assurance, and Access to Materials and Information on Programs Is Limited

What works in environmental education? What types of training programs for teachers and nonformal educators and which environmental education materials are most effective and why? What does it mean to be environmentally literate? How do educators gain greater access to quality materials? Where are the gaps in materials and programs?

In general, environmental education programs have not received rigorous evaluation to determine their effectiveness. Several factors have contributed to this, including limited funding to undertake short and long-term evaluations, difficulty in identifying quantitative objectives, and the complexity of measuring long-term educational changes. Experts agree that the field needs more baseline data to evaluate current and future environmental education efforts and to ensure that the highest quality programs and projects are funded and implemented. There is a need for research on methods, materials, and effectiveness; evaluation components for all programs and projects funded; and the establishment of guidelines for program and material evaluation.

In addition, the field has had limited resources to develop nationally accepted guidelines to help practitioners assess the value and effectiveness of both formal and nonformal environmental education methods, materials, and programs, as well as nationally accepted learner outcomes to indicate what a student should know when he or she graduates from high school or national guidelines for teacher training programs. To fill this need, the North American Association for Environmental Education (NAAEE) is currently working with EPA and a variety of educational organizations and agencies across the country to develop environmental education guidelines that focus on three areas:

- materials development (completed October 1996)
- learner outcomes (to be completed September 1997)
- environmental educator competencies (to be completed late 1998)

These guidelines will be consistent with guidelines developed for major disciplines, especially with science and geography guidelines. Access to high quality environmental education materials and programs varies from community to community, and from state to state. In some cases, appropriate materials and programs do not exist—especially for specific audiences, such as urban educators, senior citizens, adults, people of color, and culturally-diverse communities. In other cases, access to existing materials and programs is limited because of limitations in funding and "user-friendly" mechanisms for finding out about new and existing materials and programs.

Another related issue is the proliferation of materials that are duplicative of existing curricula materials and have ineffective implementation strategies. In some cases, the problem for teachers is not access to quality materials, but lack of training in how to effectively use available materials. In other cases, the problem is how to best evaluate and select the most effective and educationally sound materials from the many materials that exist.

Identifying existing gaps in current environmental education materials and programs is another critical issue. Many materials and programs emphasize awareness, appreciation, and knowledge, without a focus on skill development and commitment to informed and responsible action. While it is critical that all environmental education efforts have a sound basis in science, there is a disproportionate emphasis in formal education on science-oriented activities at the expense of other subject areas such as geography and civics. Most curriculum materials developed for K-12 have a very limited topical focus, such as water pollution, resource use/recycling, or energy. Environmental education should be interdisciplinary, with a focus on the learning process and not limited to only one or two specific issues. Experts feel that the field needs to develop a more balanced menu of materials and programs that emphasize skill development and citizen participation, and that stress the interdisciplinary nature of environmental issues.

Issue

More Well-Trained Environmental Professionals Are Needed

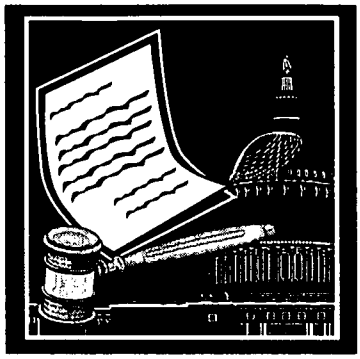
To tackle current and future environmental challenges, experts in the private and public sectors agree that we need a better-trained cadre of environmental professionals—from highly skilled scientists and engineers to city planners and technicians. The environmental work force is especially lacking in representation from communities of people of color.

Universities, community colleges, vocational schools, and other training institutions need to offer more training opportunities in environmental studies, environmental design, environmental engineering, environmental management, conservation biology, and other related courses of study. At the same time, environmental education should be infused into traditional coursework to produce lawyers, business leaders, and planners with the knowledge, skills, and ethic to make informed and responsible decisions about the environment. Unfortunately, many of today's courses lack the interdisciplinary ties that link pure sciences with the social sciences.

Current efforts to provide environmental career opportunities are limited—especially for people of color and students with low incomes. Positive partnerships, among businesses, nonprofits, government, and schools, have increased the number of internships, fellowships, and apprenticeship programs available to students, but many more are needed to meet current and future demands. The challenge is to attract more bright, motivated students to the field and to provide high-quality, interdisciplinary education to all learners.

IV. IMPLEMENTING THE NATIONAL ENVIRONMENTAL EDUCATION ACT OF 1990

A. INTRODUCTION



In passing the National Environmental Education Act of 1990 (P.L. 101-619), Congress was responding to many of the issues and challenges currently facing the field of environmental education, such as the need for improving access to quality educational materials and programs, increasing opportunities for teacher education, reaching new audiences, encouraging environmental careers, and facilitating cooperation and partnerships as discussed in Section III of this report. Since passage of the Act, EPA has established an Environmental Education Division (EED) within the Office of Communications, Education, and Public Affairs (OCEPA) to implement the Act. This chapter:

- Summarizes the major provisions of the Act
- Discusses EPA's philosophy and approach to implementing the Act and highlights the Environmental Education Division's major accomplishments
- Discusses how EPA's implementation of the Act responds to many of the issues and challenges facing the field as outlined in Section III

B. SUMMARY OF LEGISLATIVE REQUIREMENTS

The Act directs EPA to:

- Establish an office of environmental education within EPA with staff support in EPA headquarters and the regions
- Award a grant to an institution of higher education or a nonprofit organization (or a consortia of such institutions) to operate an Environmental Education and Training Program to train education professionals
- Award grants to schools and universities, states and local governments, and nonprofit organizations to support their environmental education programs
- Facilitate internships for college students and fellowships for in-service teachers with agencies of the federal government
- Provide national awards recognizing outstanding contributions to environmental education for educators and young people
- Establish a federal task force and a national advisory council to advise EPA on its implementation of the Act
- Establish and support a National Environmental Education and Training Foundation to encourage private gifts to support environmental education

In 1990, Congress authorized appropriations of between $12 and $14 million per year from FY 1992 - FY 1996, for a total of $65 million over five years, to implement the Act. To date, actual appropriations have, however, been between $5.6 million and $7.8 million per year for the past six years, for a total of $42.7 million. The Act specifies that 25 percent of appropriated funds per year must be used to provide administrative support for the office; 38 percent for awarding grants; 25 percent for operating the training program; 10 percent for supporting the Foundation; and 2 percent for supporting a teacher awards program administered by the Council on Environmental Quality.

C. BACKGROUND ON ENVIRONMENTAL EDUCATION AT EPA

Although EPA has historically focused on regulation, enforcement, and cleanup to protect the environment, it has also supported environmental education for many years through various national initiatives and regionally-based programs. For example, EPA has developed and disseminated educational materials, conducted teacher training workshops, and promoted environmental careers through student internships. With passage of the National Environmental Education Act, for the first time in EPA's history, the Agency now has a Congressional mandate to strengthen and expand environmental education as an integral part of its mission to protect the environment.

EPA believes that environmental education is a necessary ingredient to effective environmental protection and can also be an effective vehicle for teachers and others to advance education reform and improvement. For example, learning about ways to measure, analyze, and solve local environmental challenges through "hands-on" environmental science in the classroom can be an effective way to strengthen efforts to improve math and science education nationwide. "Sound science" is crucial to protecting the environment as well as important to meeting important goals for educational reform.

D. EPA'S ENVIRONMENTAL EDUCATION MISSION AND GOALS

The Council supports EPA's mission statement, which is "to advance and support environmental education efforts to develop an environmentally conscious and responsible public, and to inspire in all individuals a sense of personal responsibility for the care of the environment."

EPA's broad environmental education goals are to:

- Expand communication and partnerships
- Educate and motivate youth
- Promote the pursuit of environmental careers
- Develop an environmentally conscious and responsible public
- Reach across international boundaries

EPA's role in environmental education is to:

- Provide leadership
- Facilitate communication as well as information and resource sharing
- Identify gaps
- Support the nation's environmental education efforts
- Act as an advocate for environmental education nationally and internationally

E. OCEPA ENVIRONMENTAL EDUCATION DIVISION'S MAJOR ACCOMPLISHMENTS (1991 - 1996)

AWARDING GRANTS

The Environmental Education Division and EPA's ten regional offices administer an annual Environmental Education Grants Program to support environmental education projects nationwide. From 1992 through 1996, EPA awarded approximately 1,200 grants worth approximately $13 million to schools, state, local and tribal government agencies, and nonprofit organizations and institutions such as museums, environmental and community groups, and nature centers. Individual grants were awarded for up to $250,000, the vast majority of which were less than $5,000 each.

Projects selected for funding educate students, teachers, communities, and the general public about issues such as air and water pollution, solid waste management, as well as watershed and ecosystem protection. Projects utilize educational approaches that include workshop training, community involvement, and curriculum development. Special care has been given to ensure that the range of projects selected for funding teach individuals problem-solving skills to enable them to make responsible decisions that affect the environment, reach both youths and adults from diverse communities and regions around the country, and support EPA priorities such as building state and local capacity, advancing education reform, protecting human health, and promoting environmental justice.

TRAINING EDUCATION PROFESSIONALS

EPA awards a cooperative agreement every three years to support the development of a nationwide environmental education and training program. The purpose of this program is to train education professionals, such as teachers, faculty, and state and local education officials, to develop and deliver quality environmental education programs. This training program was initiated in 1992 with a three-year cooperative agreement to a consortium of universities and organizations headed by the University of Michigan. Under this program, the consortium supported K-12 in-service teacher training by developing resource materials, establishing an electronic database of information and education materials, and conducting teacher training workshops. In September 1995, EPA awarded this cooperative agreement to a consortium headed by the North American Association for Environmental Education (NAAEE) to operate the second three-year phase of this program. This phase includes and builds upon work initiated by the University of Michigan, and focuses on expanding existing quality training efforts; evaluating and disseminating information on "model" education materials and programs; and strengthening partnerships and networks of environmental education professionals. EPA has made annual awards to support this program ranging from $1.4 to $1.9 million, totaling approximately $8.9 million.

ENCOURAGING ENVIRONMENTAL CAREERS

The Environmental Education Division administers an internship program entitled the National Network for Environmental Management Studies to encourage post-secondary students in all academic disciplines to pursue professional environmental careers. This program provides students from more than 230 participating universities with the opportunity to either work with environmental professionals at EPA on a specific project or to conduct environmental research directed by EPA at their university. Students receive stipends for completing their projects. Since 1992, more than 450 students have participated in the program. Out of a field of more than 1,000 organizations, this program was named "One of America's Top 100 Internships" in the *Princeton Review* (1995 and 1996 editions). The Environmental Education Division leverages resources from participating EPA headquarters and regional offices to finance this program.

The Environmental Education Division also administers the Tribal Lands Environmental Science Scholarship Program to encourage Native American college students to pursue undergraduate and graduate degrees in the environmental sciences. EPA created this program to increase the number of Native Americans trained in the environmental sciences and employed by EPA to improve the environmental protection of Indian lands. Since 1991, more than 223 students have received scholarships totaling nearly $1 million to pursue environmental science degrees. The Environmental Education Division leverages resources from participating EPA offices to finance this program.

The Environmental Education Division also participates in various EPA and university-sponsored internship programs by placing post-secondary students in the Environmental Education Division to work with its environmental professionals. The Environmental Education Division's interns have included students from American University, Stanford University, Howard University, the University of Illinois, the University of Maryland, the University of Rhode Island, the University of the District of Columbia, and the University of Vermont.

In 1992-1993, the Environmental Education Division developed and administered a pilot fellowship program to facilitate the placement of in-service teachers in federal government agencies for year-long environmental projects. Although interest in this program has been high, personnel ceilings and funding limitations have prevented full implementation of the program. More than 200 applications were received. Of these, 24 teachers were selected as fellowship finalists by their state governors through the National Governors Association and 10 were placed in positions with the U.S. Department of Agriculture's Forest Service, the Department of Energy, the Department of Defense, and EPA.

HONORING DEDICATION TO THE ENVIRONMENT

The Environmental Education Division administers the President's Environmental Youth Awards program to encourage and honor young people for their efforts to promote environmental awareness and positive community involvement. Elementary and high school students in all 50 states compete annually in this program. Each year 10 national award winners are selected by EPA's 10 regional offices for those projects that have produced the most significant environmental gains, and the winners receive national recognition from Washington, D.C. Projects selected for national recognition have addressed issues such as watershed cleanup and restoration, energy conservation, and waste management. The President and Vice President of the United States and the EPA Administrator have honored recipients of this awards program. More than 250 national award winners have been honored since EPA began administering this program in 1971.

The Environmental Education Division established the National Environmental Education Awards program to honor individuals for their outstanding contributions to environmental education. The EPA Administrator honors recipients of this awards program every few years. The first awards were presented to four outstanding individuals in the spring of 1993. The awards commemorate Rachel Carson for print, film, or broadcast media; Gifford Pinchot for forestry and natural resources management; Theodore Roosevelt for teaching; and Henry David Thoreau for literature.

FACILITATING INFORMATION EXCHANGE

The Environmental Education Division has hosted or supported various workshops and conferences to expand communication, foster partnerships, and solicit ideas about how the federal government can best support the nation's environmental education efforts. For example, in cooperation with the Federal Task Force on Environmental Education, the Environmental Education Division sponsored a national conference on environmental education in November 1991. As follow-up to the national

conference, EPA's regional offices in New England, the Southwest, the Southeast, and the West, in cooperation with other organizations, have held several regionally-based workshops and conferences.

The Environmental Education Division also has supported and participated in various environmental education organizations' conferences such as those sponsored by the North American Association for Environmental Education (NAAEE); the Environmental Alliance for Senior Involvement; the first Joint National Conference for Project Learning Tree, Project Wild, and Project WET; the New England Environmental Education Alliance; the Midwest Environmental Education Association; and the National Association for Interpretation.

IMPROVING COMMUNICATION AND COORDINATION

The Environmental Education Division has established the National Environmental Education Advisory Council which links EPA with 11 environmental educators and supporters who represent diverse geographic areas and minority interests as well as schools and universities, nonprofit organizations, states, the private sector, and senior Americans. The Council reports to Congress on the state of environmental education nationally, nominates individuals for the National Environmental Education Awards Program, and advises the Environmental Education Division on their overall goals, and on their grant and teacher training programs. The Council has met one to two times a year from 1992-1996.

The Environmental Education Division has established the Federal Task Force on Environmental Education which links EPA with numerous other federal agencies, including the Departments of Education, Interior, Agriculture, Energy, and Health and Human Services as well as the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and the National Science Foundation. Headed by EPA, the Task Force advises the Environmental Education Division on specific topics, facilitates communication across the federal government, and fosters interagency collaboration on specific projects. The Task Force meets periodically. The Environmental Education Division also has operated an ongoing panel of federal agency representatives to assist EPA in reviewing applications and overseeing the implementation of the National Environmental Education and Training Program under Section 5 of the National Environmental Education Act. The federal panel has met one to three times per year from 1991-1995.

The Environmental Education Division also has established the EPA Environmental Education Advisory Board which links EPA's headquarters and regional offices and research laboratories across the country. The Advisory Board facilitates communication between EPA headquarters and regional offices that conduct various national, regional, and local education activities. These activities include awarding grants, developing and disseminating educational materials, conducting teacher training, and promoting environmental careers through student internships, research fellowships, and course development. The Advisory Board holds meetings and conference calls approximately four times per year.

DEVELOPING PUBLIC AND PRIVATE PARTNERSHIPS

The Environmental Education Division supports the efforts of the National Environmental Education and Training Foundation to leverage public and private sector resources for environmental education. The Foundation is a nonprofit, philanthropic organization established by Congress under the National Environmental Education Act to complement and expand federal efforts to foster an environmentally literate citizenry. In addition to EPA, other governmental and corporate partners have included the Departments of Agriculture, Energy, and Interior, Phillips Petroleum, Church & Dwight Co., Inc., and R.R. Donnelley & Sons Company. In the past five years, the Foundation has awarded 110 grants and leveraged $1.9 million in federal funds along with $2.2 million from new non-federal sources, in total supporting more than $4 million worth of national, state, and local environmental education and training projects.

The Environmental Education Division has established partnerships with various nonprofit educational and environmental organizations such as the North American Association for Environmental Education (NAAEE), National Wildlife Federation, National Audubon Society, and various state and regional environmental education organizations. The Environmental Education Division also has established partnerships with various private corporations including Time-Warner, General Motors, Keebler, Dow Chemical, Motorola, Niagara Mohawk Power Company, and Church & Dwight Co., Inc. Specific projects include the development and distribution of educational materials such as videos and teachers' guides and the sponsorship of various youth programs such as the President's Environmental Youth Awards program.

REACHING ACROSS INTERNATIONAL BOUNDARIES

The Environmental Education Division, in cooperation with EPA's Office of International Activities (OIA), negotiated a Trilateral Memorandum of Understanding (MOU) on Environmental Education among Canada, Mexico, and the United States. The MOU was signed in a ceremony in Washington, D.C. in September 1992. The Director of the Environmental Education Division, the President of the National Environmental Education and Training Foundation, and the Curator of the Smithsonian Institution's National Museum of American History have represented the United States on the trilateral committee charged with the implementation of the agreement. Activities covered by the agreement include information sharing on education and training policies, approaches, and materials; support and participation in seminars, workshops, and conferences; and trilateral initiatives or projects involving youth.

The Environmental Education Division also works with EPA's OIA to support public-private initiatives that include environmental education. These initiatives include the establishment of the following centers: the Caribbean Environment and Development Institute (Puerto Rico, 1992), the Regional Environmental Center for Central and Eastern Europe (Budapest, Hungary, 1990), and the Environmental Education and Information Center (Kiev, Ukraine, 1992). The Environmental Education Division also supports OIA's activities in hosting international visitors from around the world and has briefed representatives from more than 100 countries on environmental education over the past five years.

F. HOW EPA'S IMPLEMENTATION OF THE ACT RESPONDS TO ISSUES AND CHALLENGES FACED BY THE FIELD

Congress was aware of many of the issues and challenges discussed above facing the field of environmental education as evidenced by many of the programs created under the National Environmental Education Act. The following discussion highlights how EPA's implementation of the Act responds to many of these issues and challenges such as increasing support for teacher training, increasing access to high quality materials and programs, strengthening state and local government programs, encouraging environmental careers, reaching new audiences, and promoting partnerships.

The Environmental Education Division has designed the Environmental Education Grants Program to respond to many of the issues and challenges discussed above. For example, the Environmental Education Division's 1997 grant solicitation notice targets, among several priorities, those projects which:

- Build state, local, or tribal capacity to develop and deliver environmental education programs
- Use environmental education to advance state, local, or tribal education reform goals
- Improve teaching skills
- Promote environmental careers
- Educate low-income and culturally diverse audiences

The solicitation notice also places emphasis on increasing access to existing materials by encouraging applicants to request funds for projects that use existing environmental curricula rather developing new materials. Because a significant amount of quality curricula have already been developed and are under-utilized, EPA considers funding the development of new curricula only where the applicant demonstrates there is a need.

The Environmental Education Division also has designed the Environmental Education and Training Program to respond to many of the issues and challenges discussed above. For example, the training program increases support for training teachers and other education professionals. The program also places strong emphasis on increasing access to existing materials, increasing support for existing programs, and for promoting partnerships. EPA's 1995 "Invitation for Proposals," which solicited applications from universities and nonprofit organizations to operate the program for the second three year phase of the program, identified the following key goals of the program:

- To support and expand existing quality training efforts
- To identify, evaluate, and disseminate "model" education materials, teaching methods, and programs
- To strengthen and expand partnerships and networks

The "Invitation" strongly encouraged institutions to form a consortium to operate the training program because EPA believes partnerships can help leverage scarce resources, improve effectiveness, and avoid duplication of effort in a field which is highly

fragmented. The "Invitation" also required that training activities meet the needs of diverse ethnic and cultural groups.

The training program also responds to other issues and challenges facing the field such as the need to support environmental education research, to integrate environmental education into education reform activities, and to build state capacity. For example, through the training program, an assessment of student environmental literacy has been designed and conducted to ensure that the field has the proper instruments to determine whether environmental education programs are working (that is, if they provide individuals with the critical thinking skills they need to make responsible environmental decisions). In addition, the training program emphasizes the importance of integrating environmental education into mainstream education by tying environmental education to education reform efforts in the sciences, social sciences, and geography. Finally, the program encourages building coordinated statewide capacity to develop and deliver quality programs.

The Environmental Education Division also undertakes various other activities to respond to issues and challenges such as the need to support and encourage environmental careers and to promote partnerships. For example, the internship and scholarship programs discussed above provide opportunities for post-secondary students to pursue environmental careers, especially in the environmental sciences. Examples of efforts to promote partnerships include sponsorship and support for national, regional, and state-wide conferences. The Environmental Education Division also has established groups such as the National Environmental Education Advisory Council to facilitate partnerships between EPA, states, schools, universities, nonprofit organizations, the private sector, and the Federal Task Force on Environmental Education to facilitate partnerships among federal agencies.

V. RECOMMENDATIONS FOR ACTION

This report to Congress by the National Environmental Education Advisory Council describes the current status of environmental education in the United States and examines EPA's progress in implementing the National Environmental Education Act. In assessing the status of environmental education, the Council examined a wealth of programs comprising an array of approaches and strategies and targeting a range of audiences. Some are longer running, larger in scope, or more effective than others; however, all contribute to the health and welfare of the nation. The nationwide sweep of who is participating in environmental education revealed many players. Federal, state, and local agencies, universities and schools, nongovernmental organizations, museums and nature centers, businesses and corporations—all are engaged in supporting and implementing environmental education programs. ***No single government agency or private entity can manage all these forces at play.***

But a clear, overriding assessment emerged: environmental education is important and necessary to the health and welfare of the nation. It is the federal government's responsibility to: 1) uphold the ideals of environmental education as a process that leads to good citizenship; and 2) provide a supportive climate for the development and implementation of environmental education programs on state and local levels and the pursuit of creative and responsible activity in the private sector.

As the federal agency Congressionally mandated to implement the National Environmental Education Act, the U.S. Environmental Protection Agency (EPA) makes substantial contributions to the success of environmental education nationwide. But it is one among many critical players. During the first five years of the Act's implementation, EPA's Environmental Education Division (EED) has been challenged with developing and managing a large program with diverse activities. During this time, the office and program have been given limited resources. These three factors—a broad field with many players, a diverse program to manage, and limited resources—have affected EPA's ability to implement the Act.

As Congress looks to reauthorize the Act, the Council believes that Congress should be less prescriptive in the way funds are allocated among various sections of the Act and mandated programs, giving EED more control and flexibility in determining the most effective use of funds (e.g., allowing EED to award more grants under Section 6 and to use less for administrative expenses under Section 4). This will also allow EED, with guidance from the Council, to respond better to shifting needs and priorities.

What should be the work of EPA in environmental education? This has been an ongoing question since the Act was first proposed. From professionals in nongovernmental organizations and state programs who for years have been running programs, to others struggling to initiate new ones, all have looked to EPA's new role as a way of boosting their efforts. Some have hoped that a unifying plan would emerge that would bring the nation's diverse activities together into a stronger, effectively managed whole. All have looked to the federal government for leadership in helping to chart a vision for environmental education into the future.

It is the Council's opinion that distinctions should be made between those activities EPA should support as policy and those which it can support through actual funding. The potential for the former is by practical nature more far-reaching. Furthermore, the Council and EED believe that the actual way environmental education is delivered should be determined at the state, local, and tribal levels.

Federal funding, by its nature being limited, should focus on models that can be replicated with state, local, or private money. In this manner, the federal government assumes a role similar to private philanthropy, which serves to help innovate, create new programs, and leverage other support. But unlike private foundations, whose interest in environmental education has been sporadic, focused on specific issues, or serving geographic regions, the federal government's role can be consistent, longer term, supportive of process, and broader based geographically.

Finally, it is the federal government's role to engage in cooperative relations with other nations, particularly Canada and Mexico, with whom the United States shares many of its resources. EED, in cooperation with the EPA Office of International Activities, should seek further cooperation with other nations to promote worldwide awareness and education for sustainable living.

This realistic view of the role the federal government should play in environmental education forces one to ask, "Where does the responsibility for long term financial support for environmental education lie?" The Council believes it is through state and local activity, supplemented by private funds. Here education is at its best, driven by citizens who are in touch with the issues, with the educational needs of their youth, and with the quality of their teachers and effectiveness of their schools. Here the goals of environmental education find immediate expression in the daily exercise of freedoms and responsible actions.

To succeed, the work of environmental education needs increased support and participation from all sectors. People everywhere must see themselves as stakeholders in one clear goal: creating an informed, skilled, and motivated citizenry that can make responsible decisions in a world of complex environmental challenges. This goal can be achieved through persistent, responsible actions by informed citizens whose concern extends to future generations.

Based on the Council's assessment of the status of environmental education in the United States and on the progress of EED to date, the Council recommends the following eight actions:

Recommendation

1 Make Environmental Education a Priority Across the Country and Enhance EPA's Leadership Role

A. State agencies, school districts, and nongovernmental organizations should continue to work together to ensure that environmental education is a priority at the local, state, and national level.

B. Congress should continue to appropriate funding to EPA at the authorized levels to enable EPA to implement the National Environmental Education Act. Congress should ensure that sufficient funds are appropriated to fully staff EPA headquarters and regional offices and to support all programs and activities mandated under the Act.

C. Congress should reauthorize the National Environmental Education Act of 1990 for at least 5 additional years and authorize appropriations at the current authorization level. Congress should provide EPA with greater flexibility in determining how funds are allocated among mandated programs and activities to allow EPA to respond to shifting needs and priorities in the field and to manage the program in a cost-effective manner.

D. The EPA Administrator should make environmental education a priority by: 1) integrating it into every program's mission; 2) giving EED the authority and resources to coordinate all environmental education efforts within EPA; and 3) making the operation of the Federal Task Force on Environmental Education a priority for EED. These actions would ensure consistency in EPA's approach and support for environmental education as well as leverage EPA's and other federal agencies' resources more effectively.

Recommendation

2 Increase and Sustain Support for State, Local, and Tribal Efforts

A. Federal, state, and tribal government agencies, nonprofit organizations, foundations, the private sector, and others should support environmental education programs that are developed and implemented at the state, local, and tribal levels. This includes continued support by EED of such programs under Section 6 of the Act, the Environmental Education Grants Program.

B. Federal, state, and tribal government agencies, nonprofit organizations, foundations, the private sector, and others also should support programs which emphasize the coordinated delivery of environmental education programs, especially on a statewide basis. EED also should make funding the establishment of statewide environmental education offices, coordinators, and coordinating councils a greater priority under Section 5 of the Act, the Environmental Education and Training Program and Section 6, the Environmental Education Grants Program. In addition, Congress should provide EPA with the statutory authority to provide additional support for statewide efforts.

C. States should consider adopting environmental education legislation. For reference, model state legislation has been developed by the Council of State Governments (see Appendix E).

Recommendation

3 Leverage Public and Private Resources and Strengthen Long-Term Cross-Sector Partnerships

A. Congress should reauthorize funding to support the National Environmental Education and Training Foundation and its important work to leverage private sector resources for environmental education.

B. EED should continue to promote effective public and private partnerships through its grant program, and work closely with other federal agencies to coordinate public support for environmental education.

C. Foundations should provide more consistent and multi-year support for all aspects of environmental education.

Recommendation

4 Enhance and Increase Support for Professional Development for Teachers and Nonformal Educators

A. Federal agencies, such as EPA and the U.S. Department of Education, states, local communities, universities, colleges, institutions, businesses, and grantmaking organizations should fund and promote *in-service* teacher education. EED should continue to provide strong leadership and support for the Section 5 Environmental Education and Training Program.

B. The U.S. Department of Education, state agencies responsible for teacher licensing, and groups such as the Council of Chief State School Officers, National Association of Boards of Education, and the National Education Association should promote and improve *pre-service* teacher professional development.

C. Foundations, federal and state agencies, and grantmaking institutions should fund studies that assess teacher preparation in environmental education and evaluate teaching practices as a function of pre-service and in-service environmental education.

Recommendation

5 Integrate Environmental Education Into Education Reform and Improvement

A. EPA and the Department of Education, states, local school systems, the Association for Supervision and Curriculum Development, the American Association of School Administrators, the National Association of Secondary School Principals, the National Association of Elementary School Principals, national teachers organizations, the Council of State Chief School Officers, nonprofit educational organizations and associations, and the National Association of State Boards of Education should help schools promote and enhance environmental education.

B. Federal and state agencies and organizations should also: 1) develop model environmental education outcomes for K-12 and teacher education; 2) encourage environmental literacy testing programs; 3) establish voluntary certification guidelines for professionals in environmental education; and 4) promote environmental education program guidelines.

Recommendation

6 Target New Audiences

A. Nonprofit organizations, educational institutions, government agencies, and individuals should target and reach out to new and non-traditional environmental education audiences such as Native Americans, senior citizens and other adults, as well as culturally-diverse, low-income, and physically-challenged populations. This includes adapting existing environmental education materials for these audiences and targeting environmental education programs.

Recommendation

7 Increase Support for Evaluation, Complete Guidelines, and Improve Access to Materials and Information on Programs

A. EED should continue to support the development or maintenance of an environmental education resource library through the Environmental Education and Training Program under Section 5 of the National Environmental Education Act. The goal is to ensure that quality education materials, teaching methods, and programs that have already been developed are used more fully. A process should be fully established for identifying, evaluating and disseminating information on existing "model" materials, methods, and programs. This resource library should be tied to existing libraries, where possible, and appropriate technology should be

used to disseminate information widely through hard copy and electronic distribution.

B. Federal and state agencies, colleges, universities, businesses, and grantmaking institutions should use the environmental education resource library, discussed under Recommendation 7.A above, and other resources to identify gaps in environmental education materials and programs and to fund the development of new materials and programs where needed.

C. Federal and state agencies and colleges and universities should identify relevant instruments for evaluating materials and promote their use by environmental educators.

D. Federal and state agencies, colleges and universities, and nonprofit organizations, should stress the importance of including investigation and action skills development for environmental education materials.

E. EPA, the U.S. Department of Education, states, and professional societies should promote the adoption of high quality environmental science and environmental social studies courses and teaching materials for middle and high schools.

F. Federal and state agencies, colleges, universities, businesses, and grantmaking institutions should support national studies on the status of environmental literacy and the determinants of responsible environmental behavior following instruction in environmental education among K-12 students, post-secondary students, and adult populations.

Recommendation

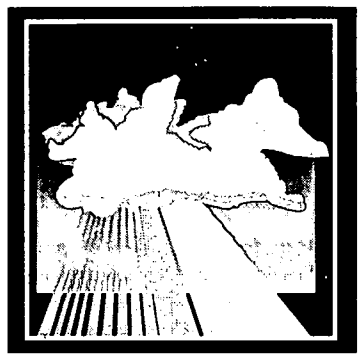
8 Encourage and Support Environmental Careers

A. Federal and state agencies, nongovernmental organizations, universities, schools, and businesses should: 1) support career awareness opportunities for young people; 2) fund environmental internship opportunities within and outside the government; 3) establish community and regional mentor programs for high school students, particularly minority students, interested in environmental careers; and 4) send speakers and workshop leaders to provide urban and minority students with opportunities to interact with environmental professionals.

B. The organizations mentioned in recommendation 8.A, especially universities and state and federal Departments of Labor, should help to provide an evaluation of long-term environmental career opportunities. This evaluation will require a better understanding of the breadth of careers in the environmental field, a status report on current environmental careers, and a forecast of future needs for environmentally-trained professionals. Identification of these needs will help educators prepare students for jobs of the future.

VI. CONCLUSION

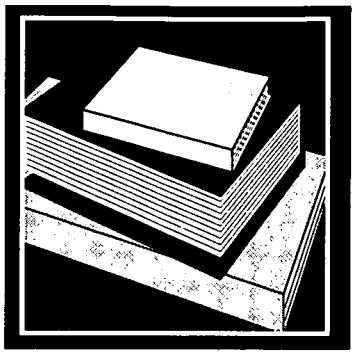
What is environmental education and why is it so critical? Environmental education is a lifelong learning process aimed at developing an environmentally literate citizenry that has the knowledge, skills, and commitment to make responsible decisions that impact environmental quality. Environmental education:



- Teaches people of all ages how the quality of life is inherently linked to the quality of the environment
- Helps ensure a workforce that has the critical and creative thinking skills and knowledge to work across disciplines to find innovative solutions to complex environmental issues
- Provides all citizens with the informaton and tools they need to make sound decisions about the environment and participate in local, state, national, and international policymaking
- Improves the way we educate new generations so that they understand the links among science, geography, civics, math, history, and language arts— and how the world as we know it depends on ecological integrity
- Ensures that all Americans have opportunities to appreciate and experience the incredible diversity of life on Earth and learn that humans are a part of nature—not separate from it

The U.S. Environmental Protection Agency has done a commendable job of implementing a national environmental education effort with limited resources. However, there is much more to be done and they cannot do it alone. Environmental education must become a priority at the local, state, national, and international level so that—as a nation and as leaders in an increasingly interdependent world—we can make balanced decisions that address the complex social, political, economic, and environmental issues of our time. The members of this Council believe that to ensure a sustainable future we must all work together to make environmental education a priority now.

REFERENCES



Champeau, Randy. 1990. "Perspectives on Pre-service Education Students on Environmental Education Coursework." In: *Preparing Classroom Teachers to Be Environmental Educators*, editors D.C. Engleson and J.F. Disinger. Troy, OH. NAAEE. Pages 25-36.

Disinger, J.F. 1993. "Environment in the K-12 Curriculum: An Overview." In: *Environmental Education Teacher Resource Handbook*, editor R. Wilke. Kraus International Publications. Milwood, NY.

Environmental Education Associates, Inc. 1993. "State-by-State Overview of EE Standards." Washington, DC.

Federal Coordinating Council for Science, Engineering, and Technology (FCCSET) Committee on Education and Training (CET). September 17, 1993. Report of the Ad Hoc Working Group on Environmental Education and Training.

Federal Register. December 10, 1996. Fiscal Year 1997 Environmental Education Grants Program; Solicitation Notice. Pages 65106-65117.

Harris, L., V.L. Tarrance, and C.C. Lake. 1989. *The Rising Tide: Public Opinion, Policy, and Politics*. Americans for the Environment, Sierra Club, National Wildlife Federation. Washington, DC.

Hart, Peter D. Research Associates, Inc. December 1994. Key Findings from a Post-Election Voter Survey Conducted for the National Wildlife Federation.

Hungerford, Harold, R., R. Ben Peyton, and Richard J. Wilke. 1980. "Goals for Curriculum Development in Environmental Education." *Journal of Environmental Education*. Volume 11 Number 3. Pages 42-47.

Hungerford, Harold and Trudi L. Volk. 1990. "Changing Learner Behavior Through Environmental Education." *Journal of Environmental Education*. Volume 21 Number 3. Pages 8-21.

Iozzie, Louis A. , editor. 1984. "A Summary of Research in Environmental Education, 1971-1982." The Second Report of the National Commission on Environmental Education Research. NAAEE Monograph #2. Columbus, OH. ERIC/SMEAC.

Iozzie, Louis A. 1989. "What Research Says to the Educator: Part One, Environmental Education and the Affective Domain." *Journal of Environmental Education*. Volume 20, Number 3. Pages 3-9.

Kennedy, M.M. 1991. "Policy Issues in Teacher Education." *Phi Delta Kappa*. Volume 72, Number 9. Pages 658-665.

Marcinkowski, Thomas, J. 1990. "The New National Environmental Education Act: A Renewal of Commitment." *Journal of Environmental Education*. Volume 22, Number 2. Pages 7-10.

Marshall, Karen. 1987. Unpublished draft. "State Legislation for Environmental Education: Survey and Report." National Wildlife Federation. Washington, DC.

Minnesota Department of Education. 1994. Parent and Non-Parent Survey on Graduation Requirements and Other Educational Issues. Minneapolis, MN.

National Commission on Excellence in Education. 1983. A Nation at Risk: The Imperative for Educational Reform. U.S. Government Printing Office. Washington, DC.

National Consortium for Environmental Education and Training. February 1994. National Survey of Environmental Education Teacher Inservice Education.

National Environmental Education Act of 1990 (Public Law 101-619).

National Forum on Partnerships Supporting Education About the Environment. November 1996. *Education for Sustainability: An Agenda for Action*. A demonstration project of the President's Council on Sustainable Development. U.S. Government Printing Office. Washington, DC. ISBN0-16-048783-8.

North American Association for Environmental Education (NAAEE). October 1996. Environmental Education Materials: Guidelines for Excellence.

NAAEE. September 1996. Environmental Education and Training Partnership Third Quarter Report (April - June 1996). Submitted to U.S. Environmental Protection Agency.

Orr, David W. 1992. *Ecological Literacy: Education and the Transition to a Postmodern World*. SUNY Press. Albany, NY.

President's Council on Sustainable Development. February 1996. Sustainable America: A New Consensus for Prosperity, Opportunity, and a Healthy Environment for the Future. U.S. Government Printing Office. Washington, DC.

Ramsey, John M. and Harold R. Hungerford. 1989. "The Effects of Issue Investigation and Action Training on Environmental Behavior in Seventh Grade Students." Journal of Environmental Education. Volume 20, Number 4. Pages 29-34.

Roper Starch Worldwide Inc. December 1994. Survey on Environmental Attitudes and Behaviors of American Youth with an Emphasis on Youth from Disadvantaged Areas. Conducted for the National Environmental Education and Training Foundation.

Roth, Charles E. 1992. *Environmental Literacy: Its Roots and Directions in the 1990s*. Columbus, OH. ERIC/CSMEE.

Ruskey, Abby and Richard Wilke. 1994. Promoting Environmental Education: An Action Handbook for Strengthening EE in Your State and Community. University of Wisconsin-Stevens Point Foundation Press, Inc. Amherst, Wisconsin.

Ruskey, Abby and Richard Wilke. 1996. "50 State Survey Shows "Results": States are Making Progress Toward Comprehensive Environmental Education Programs." *The Environmental Education Advocate*. Winter. Pages 1, 3-5.

Simmons, Deborah A. 1989. "More Infusion Confusion: A Look at Environmental Education Curriculum Materials." *Journal of Environmental Education*. Volume 20, Number 4. Pages 15-18.

Simmons, Deborah A. 1994. *The NAAEE Standards Project: Papers on the Development of Environmental Education Standards*. Washington, DC. NAAEE.

Simmons, Deborah A. 1995. "Environmental Education's Role in Education Reform," A Discussion Paper Submitted to the U.S. Department of Education. Department of Curriculum and Instruction, Northern Illinois University.

UNESCO. 1978. *Final Report, Intergovernmental Conference on Environmental Education*. Organized by UNESCO in cooperation with UNEP. Tbilisi, USSR. 14-26 October 1977. UNESCO ED/MD/49.

U.S. Department of Education. 1991. *America 2000: An Education Strategy Sourcebook*. Washington, DC.

Wall Street Journal. 1991.

Weis, Judith S. 1990. "The Status of Undergraduate Programs in Environmental Science." *Environmental Science and Technology*. Volume 24, Number 8. Pages 116-121.

Weis, Judith S. et al. 1992. "Report on the Workshop on Undergraduate Environmental Science Education." *The Environmental Professional*. Volume 14, Number 4. Pages 33-37.

World Wildlife Fund. 1993. A Biodiversity Education Survey. Published in conjunction with the University of Wisconsin, Stevens Point. Washington, DC.

APPENDICES

APPENDIX A

SUMMARY OF NATIONAL ENVIRONMENTAL EDUCATION ACT OF 1990 (P.L. 101-619)

On November 16, 1990, the National Environmental Education Act (P.L. 101-619) was signed into law. The goal of the Act is to increase public understanding of the environment and to advance and develop environmental education and training. It provides for the U.S. Environmental Protection Agency to play a leadership role among federal agencies in implementing the new law and encourages partnerships among federal government agencies, local educational institutions, state agencies, nonprofit educational and environmental organizations, and the private sector.

The mandates and authorizations under the Act are as follows:

Section 1 -- Title -- National Environmental Education Act

Section 2 -- Findings

Includes Congressional finding that environmental challenges present a significant threat to human health and environmental quality . . . and that current federal efforts to educate the public and train a professional work force about environmental challenges and effective responses are not adequate. States it is the policy of the United States to establish and support a program of education on the environment.

Section 3 -- Definitions

Includes various definitions for terms used in the Act.

Section 4 -- Office of Environmental Education

Requires the establishment of an office of environmental education at EPA. The staff shall be headed by a Director who is a member of the Senior Executive Service and shall include a headquarters staff of not less than six and not more than ten full-time equivalent employees. The regional support shall include one full-time equivalent employee per region.

Section 5 -- Environmental Education and Training Program

Requires the establishment and operation of an Environmental Education and Training Program. On an annual basis, the EPA Administrator shall award a grant or cooperative agreement to an institution of higher education or a nonprofit institution or a consortia of such institutions to establish and operate an environmental education and training program. Purpose of the program is to train education professionals to develop and deliver environmental education programs. Requires the program to include teacher and education professional exchanges between the United States, Mexico, and Canada.

Section 6 -- Environmental Education Grants

Authorizes EPA to award grants to educational institutions, state and local agencies, and nonprofit organizations to support environmental education projects. Requires publication of regulations addressing solicitation, selection, and supervision of projects as well as evaluation and dissemination of results of projects. Grants may not exceed $250,000. Twenty five percent of grant dollars shall be awarded as grants of $5,000 or less. Authorizes grants that foster international cooperation between the United States, Mexico, and Canada.

Section 7 -- Internships and Fellowships

Requires EPA to facilitate internships for college students and fellowships for in-service teachers with agencies of the federal government. To the extent practicable, there shall be 250 internships and 50 fellowships per year.

Section 8 -- Awards Programs

Requires EPA to provide for national awards recognizing outstanding contributions to environmental education. Awards shall be given to commemorate Theodore Roosevelt, Henry David Thoreau, Rachel Carson, and Gifford Pinchot. Also authorizes "President's Environmental Youth Awards" recognizing young people (K-12) for outstanding local environmental awareness projects.

Section 9 -- Federal Task Force and National Advisory Council

Requires the establishment of a Federal Task Force and a National Environmental Education Advisory Council to advise, consult with, and make recommendations to the Administrator on EPA's implementation of the Act. The Federal Task Force shall include members from various federal agencies under the leadership of EPA. The National Advisory Council shall be comprised of 11 members who represent primary and secondary education, colleges and universities, nonprofit organizations, state agencies, business and industry, and senior Americans.

Section 10 -- National Environmental Education and Training Foundation

Requires the establishment of a National Environmental Education and Training Foundation that will encourage private gifts for the benefit of the environmental education activities of EPA; participate with foreign governments furthering environmental education and training worldwide; and further the development of environmental awareness.

Section 11 -- Authorization of Funds

Authorizes funds to implement the Act as follows: $12 million in FY 1992; $12 million in FY 1993; $13 million in FY 1994; $14 million in FY 1995; and $14 million in FY 1996. **NOTE:** Congress actually appropriated less than was originally authorized under the Act as follows: $6.5 million in FY 1992; $7.2 million in FY 1993; $7.8 million in FY 1994; $7.8 million in FY 1995; $5.6 million in FY 1996; and $7.8 million in FY 1997.

APPENDIX B

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APPENDIX D

ENVIRONMENTAL EDUCATION CONTACTS IN STATE AGENCIES

The following is a listing of one key state agency contact in each of the 50 states, listed alphabetically by state. The person listed is either the key environmental education agency contact or is an individual in another state agency with significant environmental education responsibilities and is networked with the environmental education community statewide. These individuals were reported by state leaders in a survey conducted by the National Environmental Education Advancement Project (NEEAP) in the fall of 1995 and updated through individual calls to states by NEEAP staff in the fall of 1996.

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APPENDIX E

MODEL STATE ENVIRONMENTAL EDUCATION LEGISLATION

The proposal presented below would enable a state to establish an environmental education program both through the traditional education system and through community and state agency activities to ensure that citizens are well-informed on environmental issues. It would establish an environmental education board to guide the state environmental education program, an office of environmental education to implement it, and an interagency coordinating committee to facilitate cooperation among state agencies. The draft act calls for the development of a state plan for environmental education, a grants program, and regional environmental education centers. It requires the development of an environmental education curriculum framework for grades K through 12 and environmental education studies for teacher pre-service and in-service education programs, as well as undergraduate education. The act also sets forth state agency duties for non-formal environmental education initiatives. Drafted by a subcommittee of The Council of State Governments' National Environmental Task Force, the proposal was subsequently accepted by the Task Force at its September 1992 meeting in Austin, Texas. The subcommittee members and additional reviewers of the proposal represented state and federal education, environmental protection and natural resource agencies; state legislators; academic institutions; environmental public interest organizations; and the private sector. Although the enactments of several states were consulted in the drafting of the proposal, it is based largely on existing environmental education legislation from the states of Arizona (Ch. 266, HB 2675, 1990), Florida (Ch. 92-128, 1990 and 1992 amendments), and Wisconsin (1989 Assembly Bill 660). More information on this proposal or the activities of the CSG Environmental Task Force may be obtained by contacting The Council of State Governments, Center for the Environment, 3560 Iron Works Pike, P.O. Box 11910, Lexington, Kentucky 40578, (606) 231-1939.

Environmental Education Act—A Proposal of the CSG National Environmental Task Force

Section 1. [Short Title.] This act may be cited as the [state] Environmental Education Act.

Section 2. [Mission Statement.]

(a) It is in the public interest that a comprehensive environmental education initiative be undertaken that will result in environmentally literate citizens who will effectively and constructively solve existing environmental problems, prevent new ones, and maintain a sustainable environment for future generations. The appropriate audiences for environmental education include formal education, business, government, non- profits, and citizens.

(b) Characteristics of an environmentally literate citizenry must include:
(1) Ecological literacy - a basic understanding of:
(i) ecological principles and concepts and their application;
(ii) the cause and effect relationship between human behavior and the environment; and
(iii) the economics of that relationship.
(2) Civics literacy - a basic understanding of the decision- making processes of governments, business and other social, political and economic institutions impinging upon environmental issues.
(3) Mathematical, technological and scientific literacy - an understanding of the basic concepts of math and science to evaluate environmental problems and make sound decisions regarding their resolution.
(4) Personal and social action skills - develop and use skills such as problem-solving, risk analysis and integrating diverse perspectives to understand and contribute to decision-making processes.
(5) Attitudes - expression of care for other humans, present and future, and for other components of the environment. These attitudes also affect understanding of ecology and civic responsibility.
(6) Motivation for action - the commitment to act for a healthy environment based on one's attitudes, knowledge and skills.

(c) There is hereby created a statewide environmental education program to implement the purpose of this act. The program shall consist of an [environmental education board], an [office of environmental education], an [interagency coordinating committee], a state plan, environmental education centers, a curriculum framework, teacher and undergraduate environmental education programs, non-formal programs, and a finance and grants program.

Section 3. [Environmental Education Board.]

(a) There is created an [environmental education board] attached for administrative purposes to the [state department of education or natural resources]. The [board] shall identify needs and set priorities for environmental education within the state. It shall be responsible for reviewing, approving and transmitting a plan for environmental education to the governor and the legislature every [two (2)] years. An annual appropriation should be provided to finance the operation of the [board]. The appropriation level would range from [50,000] dollars to [100,000] dollars depending upon the size, needs and resources of the state. Staffing of the [board] shall be provided by the [office of environmental education].

(b) The [board] shall provide advice and assistance to the governor, the legislature, the [office of environmental education], and other state agencies, including university extensions, conservation and environmental organizations, community action services, and nature and environmental centers on policies and practices needed to provide environmental education. The [board] shall serve as a forum for the discussion and study of problems that affect the environment and environmental education. It shall provide assistance to and obtain information from the [interagency committee] to coordinate the environmental education programs of state agencies.

(c) The [board] shall be responsible for the administration of the state's environmental education grants program. The [board] shall promulgate rules establishing the procedure for the awarding of grants. Grants under this section may not be used to replace funding available from other sources. No more than [one- third (1/3)] of the total amount awarded in grants in any fiscal year may be awarded to state agencies.

(d) The [board] shall be appointed by the governor for staggered [three- (3-)]year terms and include a balance of government and non-governmental entities that consists of the following members or their designees with experience in environmental education:

(1) [state superintendent of public instruction];
(2) [secretary of environmental protection];
(3) [tribal government (if applicable)];
(4) [secretary of natural resources];
(5) [[one (1)] majority and [one (1)] minority party member of each house of the legislature];
(6) [board of regents (specify number)];
(7) [environmental advocacy organizations (specify number)];
(8) [industrial community (specify number)];
(9) [small business (specify number)];
(10) [municipal corporations (specify number)];
(11) [elementary and secondary school teachers (specify number)];
(12) [ethnic minorities (specify number)]; and
(13) [a professional environmental scientist].

Section 4. [Office of Environmental Education.]

(a) A state [office of environmental education] shall be established by the legislature. It shall be headed by an environmental educator who is appointed by the [environmental education board]. The [office] should have supra-agency authority and dependable funding. It may be administratively attached to an existing agency such as the [state education or natural resources department].

(b) The responsibilities of the [office] shall include:

(1) Assess the status of environmental literacy in the state's students, teachers and citizens every [two (2)] years.
(2) Prepare a plan for environmental education every [two (2)] years at the direction of the [environmental education board] and with the assistance of the [interagency coordinating committee].
(3) Provide assistance to the [environmental education board] in the administration and evaluation of the state environmental education grants program.
(4) Promote and aid in the establishment and evaluation of learner outcomes for pre K-12 school environmental education programs through cooperation with the [state department of education].
(5) Promote and aid in the development of pre-service and in- service environmental education programs for teachers through cooperation with the [council on higher education] or its equivalent and the state's colleges and universities.
(6) Cooperate with federal government and state agencies and the private sector in developing, promoting and evaluating programs of environmental education.
(7) Function as an environmental education clearinghouse by:
(i) reviewing and recommending environmental education materials;
(ii) cooperating with state agencies and organizations in the development and distribution of an environmental education newsletter;
(iii) establishing an electronic capacity to disseminate databases of environmental education information and to network with interstate and federal programs.
(8) Promote the development of cooperative environmental education initiatives with the private sector.
(9) Initiate, develop, implement, evaluate and market non- formal environmental education programs; facilitate, encourage and support multi-school district cooperative efforts to assess the need for, develop and evaluate environmental education curriculums; promote state government and private sector policy that is consistent with the environmental education strategic plan established in paragraph (2) of this section, and coordinate non-formal environmental education with the K-12 and postsecondary environmental education programs.
(10) Initiate research on environmental education as called for in the strategic plan by issuing contracts to colleges, universities and other research based institutions.
(11) Coordinate an environmental education conference on a periodic basis to assist in the dissemination, development and achievement of the state's environmental education strategic plan.

(c) Staffing. The [office of environmental education] should be administered by a professional environmental educator and staffed with personnel having appropriate expertise and education.

Section 5. [Interagency Environmental Education Committee.]

(a) An [interagency environmental education committee] shall be established to promote networking, coordination and cooperation among state agencies and federal, tribal and local agencies to promote the efficient distribution of information and to facilitate the planning and development of educational programs and materials. One agency shall be given responsibility for convening and facilitating the functions of the [committee].

(b) The [committee] shall be composed of [specify number] persons with experience in environmental education and the members shall consist of employees of the following agencies that have been appointed by the agency head: [state departments of education, economic development, environmental protection, resource management, land, parks, water resources, tourism, environment commission, geological survey, energy, fish and wildlife, agriculture, mining, attorney general, health, transportation, local government/community affairs, general services, local conservation districts, county extension, community services, youth groups and minority affairs]. The chairperson shall be elected by the members.

(c) Members of the [committee] shall also serve as environmental education coordinators for their respective agencies, and shall direct an assessment of their own agency's target audiences and appropriate programs. The [committee] shall establish subcommittees as needed and assist with the development and implementation of the state's environmental education strategic plan.

(d) The [committee] shall develop and maintain a memorandum of understanding to specify methods by which the agencies can share their resources to benefit environmental education in the state.

(e) Members of the [committee] are not eligible to receive compensation and are not eligible for reimbursement of expenses from the [committee].

Section 6. [State Plan.]

The [office of environmental education], with assistance from the [interagency committee] should coordinate, write and publish a plan for environmental education. It should be reviewed and approved by the [environmental education board] and transmitted to the governor and the legislature every [two (2)] years. A report on the status of environmental literacy in the state should be conducted every [two (2)] years to serve as a basis for the plan. The plan shall be officially called the ["Governor's Plan for Environmental Education"].

Section 7. [Grants Program.]

The [environmental education board] shall award grants [annually] to non-profit organizations and public agencies for the development, dissemination and evaluation of environmental education programs. Proposals addressing needs and priorities identified by the [board] or included in the strategic plan should receive priority. The [office of environmental education] staff shall administer the grants program and develop an evaluation plan. Grant recipients must provide a match of at least [25] percent of the amount of the grant. No more than [33] percent of the grant funds shall be awarded to state agencies in [one (1)] year. The [environmental education board] shall promulgate rules establishing the specific criteria and guidelines for the program. An annual state appropriation ranging from [200,000] dollars to [2,500,000] dollars shall be provided to fund the grants program. Funding mechanisms are described in the Section 14 of this act.

Section 8. [Environmental Education Centers.]

(a) Regional environmental education centers should be established at state universities. They should perform the following functions:
   (1) provide graduate level and continuing education courses for educators;
   (2) develop and maintain a resource library for teachers and other educators that includes curriculum materials, software and audio visual materials;
   (3) provide assistance to schools in the development of their environmental education curricula;
   (4) coordinate an annual conference for resource providers and educators to share, plan and implement environmental education;
   (5) support teachers to conduct action research or classroom- based research on environmental education strategies and student outcomes;
   (6) network with interstate, federal, regional and tribal environmental education and training centers;
   (7) provide for residential environmental education experiences for all students.

(b) Regional environmental education centers shall receive an annual appropriation to finance the staff, travel and supplies necessary to carry out these functions.

Section 9. [Curriculum Framework.]

(a) The [office of environmental education] and the [environmental education board] shall work with the [state department of education] to develop a curriculum framework for establishing environmental education programs in

all public and private elementary and secondary schools. The programs shall integrate environmental concepts, skills and attitudes into the regular curriculum, where appropriate, including but not limited to:

(1) basic ecological relationships including firsthand real life experiences in varied natural and built environments with organisms as they interact with their environment;
(2) issue investigation, analysis, evaluation, problem-solving, prediction, and action skills that enable the student to understand concepts such as the interrelationships and interdependence of natural and human systems;
(3) the values and behaviors of individuals, institutions and nations regarding environmental problems;
(4) alternative responses to environmental issues and their consequences; and
(5) the potential controversies arising from multiple use patterns of public and private lands.

(b) Model measurable learner outcomes. The program shall be implemented through the [state department of education]. The program should be comprehensive and include learner outcomes, assessments, feedback mechanisms and instructional processes. The [state department of education] shall develop curriculum integration models for a measurable learner outcome-based environmental education program. The models must include:

(1) the specific environmental education and curriculum integration goals;
(2) the various options to achieve the goals;
(3) a hierarchy of learner outcomes composed of state learner goals; integrated learner outcomes; program learner outcomes; and course, unit and lesson learner outcomes;
(4) mechanisms to communicate the models;
(5) an objective process to evaluate the progress to establish and implement a model integrated environmental education curriculum;
(6) methods to assess pupils' environmental

Section 10. [Pre-service Teacher Education.]

(a) Pre-service education in environmental education is essential in order to foster an environmentally literate citizenry. Future teachers must acquire the content and teaching skills to effectively instruct students in preschool through grade 12.

(b) Teacher education pre-service programs are required to provide instruction in environmental education, including ecological concepts, environmental issues and problems, developmentally appropriate practices, and use of a variety of instructional curricula and materials. Teacher education should come from a variety of sectors, including academia, environmentalists and the regulated communities.

(c) The [environmental education board] and the [office of environmental education] shall work with members of teacher education institutions, natural resources departments in colleges and universities, the state higher education council, the state board of regents, and representatives from private colleges and universities to develop guidelines for incorporating environmental education into teacher education requirements.

(d) In states where teacher exams are required, environmental education knowledge and teaching skills should be assessed by the exams.

(e) Pre-service teacher education should consist of the following components:

(1) Definition of the environmental education competencies that teacher candidates are expected to acquire;
(2) Definition of the acceptable approaches that can be used to develop the competencies;
(3) A plan for evaluating the achievement of the competencies;
(4) A plan for evaluating pre-service teacher environmental education programs and;
(5) A timeline for implementing the required pre-service education programs at colleges and universities.

Section 11. [Staff Development: K-12 Teachers (In-service Education).]

In-service teachers should develop the same environmental education competencies specified for pre-service teachers. To accomplish this:

(1) In-service education in environmental education should be added to the courses recommended or required for recertification or licensing;
(2) Every teacher education institution shall be required to offer both pre-service and in-service courses in environmental education;
(3) State natural resources, environmental protection, parks, health and human services and education agencies shall develop and publicize environmental education teacher in-services and/or professional internships related to their mission;
(4) School districts shall be encouraged to develop environmental education staff development plans and seek matching funding for implementation of these plans from the state grants program.

Section 12. [Undergraduate Environmental Education.]

(a) Universities, colleges and vocational institutions are required to implement programs that encourage environmental literacy and provide opportunities for environmental stewardship among the student population.

(b) Such programs shall include at a minimum:

(1) Course Requirement. Implementation of an environmental studies course requirement for all graduates, or the development of an integrated general education program that accomplishes environmental literacy through its integration in a variety of required courses.

(2) Comprehensive Program Planning. The state higher education coordinating council or board of regents shall plan and implement the following programs:

(i) Environmental audit. Institutions shall conduct an [annual] environmental audit to review the environmental and economic impact of the institution's operations. This evaluation should include a review of purchasing, waste disposal, energy usage and transportation practices. Institutions should implement methods and processes to reduce the negative impacts of these activities on the environment.

(ii) Assessment. Each institution shall review their activities (curriculum, internships, work study program, scholarships) to evaluate how they can promote environmental literacy among their student population.

(iii) Faculty development. Each institution shall provide opportunities and incentives for faculty of all disciplines to learn how they can contribute to developing environmental literacy in the student body.

(iv) Consortium. A consortium shall be developed to facilitate communication about existing environmental education programs.

(v) Environmental centers. Institutions shall be selected on a regional basis to serve as environmental centers to accomplish the functions in Section of this act.

(vi) Competency identification and assessment. Environmental literacy competencies required for all graduates should be identified and a plan for assessing the achievement of these competencies shall be developed and implemented.

(vii) Environmental careers. Institutions should be encouraged to offer environmental career awareness workshops for high school students and especially for under-represented populations.

Section 13. [Non-formal Education.]

(a) "Non-formal" refers to education conducted outside of traditional formal education systems. The audiences for non-formal environmental education are numerous and quite diverse. They include: general public, youth and adult groups, local government, business and industry, environmental and conservation organizations, the media, elderly, and ethnic and cultural groups.

(b) Non-formal programs should focus on communities, the media, and other state agencies not traditionally considered part of the environmental protection/natural resources agenda.

(c) All state agency mission statements and particularly environmental protection or resource management agencies shall contain an environmental education component.

(d) Agency Duties. An agency shall be charged with the following duties:

(1) Establish a committee within the agency of representatives of all programs conducting education activities to facilitate coordination and communications;

(2) Conduct a periodic assessment of non-formal environmental education offered by the agency throughout the state;

(3) Maintain an inventory of its environmental education materials, programs and resources;

(4) Prepare a periodic report to the [interagency coordinating committee] and the state [environmental education board] outlining environmental education programs, activities and needs;

(5) Identify target audiences and programs;

(6) Environmental protection leadership. State agency internal operations should serve as a model for waste and pollution reduction, energy efficiency, and protection, preservation, and management of natural resources. The state [interagency committee] shall outline ways in which state agencies can implement model environmental policies such as office waste reduction and recycling, employee incentives for using mass transit, workplace energy conservation, native landscape planting and native plant and wildlife habitat restoration around state office buildings, printing on recycled paper, procuring paper with recycled content, and recycling of used oil and tires from state auto fleets;

(7) Educate the regulated community (operators, builders, developers, private landowners, agriculture, water and air dischargers, water and sewer authorities, and local to promote:

(I) conservation and environmental protection;

(ii) economic benefits of protecting the environment;

(iii) the intrinsic valuing of natural resources;

(iv) development/enhancement of a corporate environmental ethic and responsibility for environmental protection;

(8) Promote programs for the regulated community that:

(i) provide examples of economically viable business/industry activities which have also benefitted the environment;

(ii) provide education programs and field experiences;

(iii) establish awards programs (waste reduction award, environmental protection award, community action award, best management practices award, habitat restoration award, etc.);

(iv) establish or promote the development of an industry council on environmental education to promote industry partnerships;

(v) facilitate innovative industry environmental problem solving;

(vi) provide workplace environmental education materials;

(vii) promote public/private partnerships for environmental education programs and initiatives.

Section 14. [Finance.]

(a) Funds will be necessary to implement the environmental education program and create the [environmental education board], [office of environmental education], and the grants program.

(b) There is hereby created a [special non-lapsing environmental education trust fund] in the state treasury. Monies for the fund shall be authorized by the state legislature. All monies placed in the fund and the interest it accrues are hereby appropriated, upon authorization by the governor and with advice from the [board], to accomplish the purposes of this act. All monies in the fund shall only be used for environmental education. This fund is exempt from provisions relating to lapsing of appropriations. On notice from the [board], the [state treasurer] shall invest and divest monies in the fund. The [state treasurer] shall credit all monies earned from these investments to the fund. The [board] shall develop a plan for the expenditure of monies in the fund.

Section 15. [Effective Date.] [Insert effective date.]

APPENDIX F

*RESULTS OF STATUS SURVEY ON COMPREHENSIVE ENVIRONMENTAL EDUCATION PROGRAMS AT THE STATE LEVEL**

State	Structure Components								Program Components						Funding Components		Totals
	Master Plan	K-12 Instruction Requirement	Coordinated Teacher Inservice	Preservice	Curriculum Guide	Objectives	Grants Program	Assessment	Board	Office	Centers/Regional Offices	Interagency Committee	State Association	Computerized Network	Funding Sources	Trust Fund	
Alabama			●			●	●					●	●		●		6
Alaska													●				1
Arizona	●			●		●	●		●		●		●	●	●		9
Arkansas	●	●	●		●	●	●		●	●	●	●	●		●		12
California		●			●		●		●	●		●			●		7
Colorado	●					●				●			●		●		5
Connecticut			●				●			●	●	●	●		●		7
Delaware			●	●		●			●	●	●						6
Florida							●		●	●	●	●	●	●	●	●	9
Georgia		●	●				●		●				●				5
Hawaii			●		●	●						●	●	●	●		7
Idaho													●				1
Illinois		●										●	●				3
Indiana			●									●	●		●		4
Iowa		●	●				●			●			●		●		6
Kansas					●			●	●				●				4
Kentucky	●						●		●	●	●	●	●	●	●	●	10
Louisiana		●			●							●	●				4
Maine												●	●				2
Maryland		●	●			●	●	●	●		●		●		●	●	10
Massachusetts	●				●	●			●	●	●	●	●	●	●	●	11
Michigan													●				1
Minnesota	●		●		●	●	●		●			●	●		●		9
Mississippi											●						1

*Conducted by the National Environmental Education Advancement Project, led by the University of Wisconsin-Stevens Point (1995).

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State	Structure Components								Program Components						Funding Components		Totals
	Master Plan	K-12 Instruction Requirement	Coordinated Teacher Inservice	Preservice	Curriculum Guide	Objectives	Grants Program	Assessment	Board	Office	Centers/Regional Offices	Interagency Committee	State Association	Computerized Network	Funding Sources	Trust Fund	
Missouri						●									●		2
Montana													●		●		2
Nebraska			●				●						●				3
Nevada		●			●								●				3
New Hampshire								●			●		●				3
New Jersey	●					●			●	●	●		●				6
New Mexico									●				●				2
New York					●					●	●		●				4
North Carolina	●		●				●		●	●	●	●	●	●	●		10
North Dakota																	0
Ohio		●			●	●	●						●	●	●		7
Oklahoma			●				●		●	●		●	●				6
Oregon									●		●		●		●		4
Pennsylvania	●	●					●		●	●	●	●	●		●		9
Rhode Island							●				●		●				3
South Carolina					●		●		●			●	●		●		6
South Dakota													●				1
Tennessee						●				●		●	●				4
Texas			●						●		●	●	●	●		●	7
Utah											●		●	●			3
Vermont												●	●				2
Virginia			●		●	●	●					●	●	●	●		8
Washington	●	●			●	●			●	●	●	●	●	●	●		11
West Virginia	●				●	●			●				●				5
Wisconsin		●		●	●		●		●		●	●	●		●		9
Wyoming					●	●							●				3
TOTALS	**11**	**12**	**15**	**3**	**15**	**17**	**21**	**3**	**22**	**16**	**20**	**23**	**45**	**11**	**24**	**5**	

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