DOCUMENT RESUME

ED 047 953 SE 010 791

TITLE	Science for Society Education Review, Volume 1 Number 1.
INSTITUTION	American Association for the Advancement of Science, Washington, D.C. Commission on Science Education.
SPONS AGENCY	National Science Foundation, Washington, D.C.
REPORT NO	AAAS-Misc-Pub-71-1
PUB DATE	Jan 71
NOTE	8p.; Papers presented at the AAAS Conference on Environmental Education Councils (Washington, D.C., October 30, 1970)
AVAILABLE FROM	American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington, D.C. 20005
EDRS PRICE	EDRS Price MF-$0.65 HC Not Available from EDRS.
DESCRIPTORS	Conference Reports, *Environment, *Environmental Education, Outdoor Education, *Program Descriptions, *Programs

ABSTRACT

Included are six papers describing environmental education programs at the AAAS Conference on Environmental Education Councils: Cooperative Science Education Center, Inc. (Tennessee); Fernbank Science Center (Georgia); The Tilton Experience (New Hampshire); Evaluation of Proposals for Environmental Education Councils (New York); Florida Environmental Education Program; and The New Jersey State Council for Environmental Education. The programs encourage interdisciplinary cooperation and involvement in community resources. (PR)

SCIENCE FOR SOCIETY
Education Review
Commission on Science Education

Vol. 1, No. 1 January 1971

ENVIRONMENTAL COUNCILS

Distinctive Contributors to Thought and Action

In this fast-moving decade of the Seventies when virtually every organization, political, social, educational, or commercial, has been climbing on the bandwagon of environmental improvement, a critical need has arisen. The importance of stimulating action no longer seems to be paramount; instead, the task is to analyze who is doing what on the broad front and to attempt to find stimulating examples of performance which all interested people can share and study in order to avoid duplication and at the same time advance the common cause.

In no area is the need greater than in education where national, state, county and local groups, official and unofficial, are taking up the cudgels to attack environmental evils. Among the leading organizations in the movement—and among the most effective—are Environmental Education Councils and other groups dedicated to similar purposes which are found in increasing numbers throughout the nation.

Recognizing that these organizations, though in operation only a brief time, have much to offer by virtue of their experience, the AAAS Commission on Science Education concluded that measures should be taken to bring some of their key leaders together. Out of the discussion it was hoped to assemble information that would be instructive and inspiring to others whose plans were uncertain or not fully developed.

This was part of the Commission's overall action program of which the other two interrelated activities are: (1) establishment of an Environmental Education Information Center through which the bibliography *Science for Society* has already been published, and (2) execution of a Study Guides Project involving preparation and issuance of a series on a wide range of problems, including air pollution, water pollution, and population for use in high schools and adult education programs.

On October 30, 1970 twenty-one representatives gathered on the invitation of AAAS at the Association's headquarters in Washington. The roster of attendees appears on page 8. Following a welcome from John R. Mayor, Director of Education, Howard F. Foncannon, Staff Associate, offered the following remarks:

"In keeping with the long-range objectives of the Commission on Science Education, our purpose is more to stimulate the evolution of the educational process to meet the emerging demands of the future than to teach the specifics of environmental education, *per se*. We believe these demands require a major adjustment of the traditional pattern of textbook, laboratory, and library learning.

"We feel strongly that the community should be the school, and that all of its resources for learning should be available to the students and their teachers. We are proceeding on the assumption that, when the characteristics of human society are studied in the microcosm of the community, there will be generated in most students a desire to know more about humanity and the world in general, thus leading to the development of an attitude of inquiry—the basic element in the natural and social sciences and in the educational process.

"We employ the term "environment" in its broadest sense, and from the point of view of the individual student. It encompasses the physical universe and all of life, including Man, his cultures and their interrelationships, and the many kinds of factors that will influence evolution and survival of a successful civilization.

"We view the environmental education councils as organizations of several types which have as their basic objective the establishment of a place where the needs of students and their teachers can be identified, where study programs of many kinds can be formulated and developed, and where the facilities and resources of the community can be marshaled for the implementation of these programs.

"Our purpose today is to learn about a number of programs that are directed toward this general objective and to seek your advice and guidance on how we may best proceed."

The six papers included in this publication were among those which were then presented by spokesmen for their respective councils. Readers will note that common themes of planning, procedure, and operation characterize virtually all of them—recognition of the drastic fashion in which the introduction of environmental education is certain to alter the framework of science instruction, acceptance of the thought that interdisciplinary cooperation is being encouraged on all fronts, and appreciation of the need for incorporation of numerous non-school civic and other community groups into the comprehensive programs adopted. These are only examples of ways through which a minor revolution in the academic world is being brought about by the widespread concern for improvement in our environment. Repetition of the themes helps to emphasize their pertinence and justifies, we believe, reproduction of their essentials in this report. Full texts, and charts accompanying some of the papers, may be obtained from the originators.

Cooperative Science Education Center, Inc. (Tennessee)

The major role of the Cooperative Science Education Center, Incorporated, in its subcontract with the Oak Ridge National Laboratory, is to develop communication and educational programs that could serve as models for regional or national environmental awareness activities.

The key to effective long-range changes in understanding the environment is an informed public. Schemes, theories, and regional or national plans for abating pollution cannot be successful unless the general public has a basic understanding of *its role* in solution of a number of the most critical environmental threats. Need and support for technological assessments will involve public concern and sympathy for such endeavors.

The target population to be served is the instructional, supervisory, and administrative personnel of the school systems of Tennessee, as well as selected boards of education, county courts, and city council members of designated cities and counties in the state.

The target population has three characteristics: (1) They are directly or indirectly involved in the education of youth, (2) they represent a cross-section of this region's middle class, and (3) they have both direct and indirect ties to the economic and political systems in which they live and work. They also represent a cross-section of urban, suburban, and rural dwellers.

The Center has designed and developed two specific action programs which incorporate a number of components directed at informing a large target population about technological assessment and its role in solving environmental problems. Simultaneously they provide insight on the part of scientists and technologists at ORNL concerning the degree of awareness of technological impact on environmental problems as expressed by the target population.

Initially, data were gathered concerning the characteristics of the target population. These data were supplemented by new information acquired concerning that population. Existing techniques for communication with the target population were reviewed and new or adapted techniques for communication were combined with existing techniques and tested in development of both of the programs.

Setting the Stage

A careful study of content information available was undertaken by the CSEC staff. This collection was then reviewed in light of the best techniques for communicating the specific nature and interrelatedness of each environmental problem. Attention was given to refinement of the monitoring or feedback activities carried on by the CSEC. Documentation of questions and comments from the target population concerning various aspects of the environmental problem are grouped and analyzed, and then directed at appropriate ORNL staff.

The two major program areas are known as (1) Environmental Information Services, and (2) Environmental Awareness Workshops and Conferences. Major emphasis Services is placed on translation of technical information generated at ORNL and elsewhere into the ular. Coupled with this program is an information service for any of the target population who may seek information by contacting the CSEC. An information consultant reviews the requests and provides, to the best of the Center's ability, the information requested.

A monthly publication is also provided to a large sample of the target population known as "Environmental Capsules." It provides simple, nontechnical coverage of local, state, and national activities related to the environment and technological assessment. It also provides special information to educators for conduct of investigations in the general area of environmental insult. Special inserts are developed to serve subpopulations within the target group such as school board members and/or county court squires.

In addition, a variety of specific information packages are under development. These packages are directed at instructional personnel, Grades 1-12. Additional aspects of Information Services provide seminar programs for service clubs and related organizations with the specific intent of presenting an array of environmental problems, and documenting the questions, responses, and commentary of the participants in these seminar programs.

Regional and state awareness conferences are being organized to provide a series of statewide conferences directed at teachers and their supervisors. ORNL staff will assist in conduct of these conferences. The sessions will provide for a two-way exposure--OENL staff and educational personnel.

In the Workshop and Conference programs, emphasis is on a combination of problem awareness with knowledge of the group process by which decisions are made concerning many environmental issues. Simulation problems will be the major emphasis in the in-house workshops.

Enviro County

The simulation problem developed by the Center is known as "Enviro County." It involves simulation of a regional planning commission, attempting to resolve a variety of problems concerning the economic, social, and environmental status of this imaginary county. The county depicts, in a three-dimensional way, a rural, suburban, urban interface, with all its attendant problems.

It is a generalized region resembling a combination of regions throughout the state. Its principal area, Changeburg, is a composite of a number of cities in the region. The Planning Commission is concerned with five basic problem areas, with a number of alternatives. The first of these problems concerns industrial zones; the second deals with urban development; the third with highway congestion and mass transportation; the fourth with water quality and supply; and the fifth with the increasing demand for energy of Enviro County and nearby regions.

A kit is being developed which will provide an opportunity for interested teachers and secondary school pupils to develop their own regional simulation problem reflecting the locale in which they live and study.

Specific teacher and pupil investigations will be presented to provide an opportunity for participants to carry on meaningful studies at their own school following the workshop activities. Follow-up activities will be carried on by the CSEC in the field.

The Regional Awareness Conferences are designed to provide a series of informational programs for various

members of the target population. Both the Center staff and staff from ORNL participate as contributors and monitors in these regional conferences, the first of which was held in November, 1970.

One of the major environmental awareness programs for teachers and pupils is now in the advanced planning stage. This program, known as the Statewide Air Quality Monitoring Program, will involve a number of secondary teachers and their pupils from every county in Tennessee.

The effort will be carried out next March. It involves placement of air monitoring devices designed to measure insoluble particulate matter. The device is used extensively throughout Europe, and to some extent, in the U.S. The Center is cooperating with, and is being provided assistance by, the Atmospheric Sciences Research Center at Albany, New York. Area industry will be involved in fabrication of the devices and it is expected that another major industry in Tennessee will likewise be involved in analysis of the aluminum foils, following the month-long monitoring period.

Numerous organizations, such as service clubs, Jaycees, and selected student groups have already indicated great interest in the development and implementation of the Air Quality Monitoring Program, thus providing an additional dimension of public awareness and involvement in the identification of various environmental parameters. —Peter H. Cochran.

Fernbank Science Center (Georgia)

With scientific knowledge advancing at an exponential rate, the DeKalb County (Ga.) School System concluded that the traditional structure of public education would not suffice in fulfilling its obligation to keep students abreast of developments. It recognized this as essential to ensure constructive contribution by our young citizenry soon to assume their roles in our nation's technological society. The first problem involved the science teachers. Regardless of competence or dedication, none could stay abreast of the rapidly advancing tide of new knowledge. A second major difficulty lay in providing for student access to the costly instrumentation necessary to motivate the student in the new or normally neglected fields of science and to illustrate relevant scientific laws and principles. Our solution is represented by development of a centralized educational complex designed to supplement and extend instructional opportunities in the sciences.

Satellite centers have been established at forest areas adjacent to schools. Three areas have been set aside for use by educational and lay groups, and teachers are being trained to utilize these areas with their classes.

A lease agreement was developed with the Stone Mountain Park Authority to set aside over 100 acres of land for Fernbank use with scheduled classes. Panola Mountain, a granite outcrop consisting of a tract of 500 acres protected in its natural state, will be utilized for teaching the outdoor sciences. Although the tract is owned by the State, Fernbank will contract to operate, staff, and maintain it. An application was submitted to the Office of Surplus Property of the U.S. Office of Education for a tract of the Old U.S. Honor Farm property, declared surplus in DeKalb County. If the 115-acre tract is awarded, land will be devoted to teaching in ecology, water air pollution; development of greenhouses for horticulture and other plant sciences.

Our plans call for expanding the physical facilities at Fernbank to include botanical gardens and greenhouses, a major museum of science, and a marine aquarium for instruction in the marine sciences and oceanography. We want to establish centers throughout the state to encompass all the different types of ecological habitats found there. We anticipate acquiring acreage in the swamp, the mountains, on the coastline and a reservoir or lake to add to the granite outcrop and climax forest that we now have. If interest and support of the community continue, our only obstacle is financing and we believe this will be solved if enough effort is put forth to obtain it.

For five years Fernbank Science Center has provided programs and courses in environmental sciences for children of all age levels from kindergarten through high school, undergraduate and graduate students, teachers and adults. These programs have provided science education to an average of 400,000 people each year from the metropolitan Atlanta area, the State of Georgia and to some degree the Southeast. While the Center is owned and operated by the DeKalb County Board of Education, it provides these services to all interested persons on the same basis. Fernbank offers enrichment courses for the elementary and high school student, programs that supplement the curriculum scheduled by schools during the school day; teacher inservice courses, many of which receive graduate and undergraduate credit from universities in the area; also adult courses in science education.

Programs and courses have been offered in the fields of botany, zoology, ecology, ornithology, and numerous other areas of the biological sciences, horticulture, forestry, meteorology, electron microscopy, and astronomy. Current interest topics in the sciences have been developed and offered at the Center. Because of stress placed on environment by the government and the demand of people for steps to clean and protect it, several programs have been initiated and conducted there. Seminars have been held on pollution with outside speakers; a workshops series was staged last year for teachers in DeKalb County; and during the summer a full week was devoted to a workshop for principals, supervisors, and other administrators in environmental science. These workshops were held at natural areas for the purpose of providing teachers and administrators with an understanding of nature and of the interrelationships of organisms.—Lewis S. Shelton.

The Tilton Experience (New Hampshire)

In order to give background to the establishment of our councils which we call "clusters," I would like to sketch briefly the philosophy of the Tilton program in environmental education. We feel that environmental education is a welcome opportunity to engage students in research projects that go far beyond the normal one-laboratory-period-a-week kind of exercise. To study the state of the environment, and to determine possible causes of and corrections for its deteriorating state, it is necessary for students to come in contact with, and learn in a real way, the properties of that environment, and the effects of man's heavy-handed intrusion into it. What we try to do is to establish situations in which the student and teacher become partners in the learning experience—something we all talk about, but which we find is extremely difficult to achieve in practice.

This situation often is not in harmony with the established organization of schools and school systems; at times, for example, it is necessary for students to be out of school all day, or at least to miss a few periods in the day. Schools are notoriously loathe to accept such practices, sometimes for valid reasons and sometimes, unfortunately, for reasons that have only to do with the difficulties of changing established procedures, even though those procedures be outmoded. Teachers involved in such programs also find that their attitudes towards student involvement in (and actual design of) research projects are often not shared by their colleagues. This, in addition to the extra preparation that such an approach entails, makes it difficult for a teacher to stick to his or her original resolve to change the relationship of teacher to student in his classes, and to carry through on the activity approach we consider essential to environmental education. We found that the summer workshops (one of the two workshops in the summer of 1970 was with "returnees"—people who had gone through the summer, 1969, workshop and had therefore established programs in their schools in 1969-70) served a valuable function in reinforcing teachers and students in their attempts to introduce an innovative program of environmental education. It became clear that some kind of reinforcing activity during the school year would be very helpful to the teachers involved. We developed the idea of the clusters essentially to meet this need, and also to serve as resource centers from which the program could develop.

Schools were grouped according to geographic location. In most cases, no school was more than an hour's drive away from any other school in the cluster. In the summer of 1970 plans were made for an early gathering, at which a regular schedule of monthly meetings would be established and ideas generated for the forthcoming year.

Each cluster developed its own program, although general guidelines were established in the summer. Both students and teachers would be involved in the meetings; some, for example, would be devoted to reports from the participating schools on their activities. Some of the clusters have decided on a coordinated research plan, with each school taking one part of the overall plan. Others have decided to take on some new aspect of the environmental, such as air pollution or the urban rat problem.

Many Groups Allied

Outside organizations—museums, university environmental groups, and others—have begun involvement in the operation of the clusters and have proved to be valuable assets both for stimulation of activity and for the knowledgeable back-up they can provide.

In their operations the clusters have engaged not only in the training of additional teachers and students in activities and techniques already developed but in development of new ideas and techniques in environmental education. For example, students and teachers from the New Hampshire cluster have recently conducted a workshop for 200 teachers and their students in the Meredith school system. Following the one-day workshop, an inservice program for these teachers, involving their students as well, will be conducted. A similar work- will be held soon for the Laconia public school m.

The Pennsylvania cluster (nicknamed the "Keystone Kluster") in addition to planning a follow-up study of the watershed studied last year, has been developing programs in urban areas. This has led to involvement in activities not ordinarily thought of as those of a science class. Such activities as neighborhood recreational activities on Saturdays, tutoring programs and the like are considered necessary prerequisites to studying environmental problems in an urban neighborhood. Some of the most important preliminary work lies in establishing contact with neighborhood groups, gaining their confidence and convincing the residents that this is a serious, long-term effort, and not a fly-by-night operation. Once the groundwork has been established, a scientific and sociopolitical study of the environmental problems can be started, involving urban residents (students, teachers, and parents), with those outside the city eager to study the problems of the cities.

The role of organizations outside the schools and school systems has been gradually evolving and generally can be described as (a) support and (b) stimulation. Where there is already a strong program with much enthusiasm, an institution with scientific and particularly environmental competence can be invaluable in providing intellectual backup to the activities and can serve as a scientific resource to which teachers and students can turn when necessary. The Center for the Biology of Natural Systems, in Washington University in St. Louis, for example, has played this role, particularly in a program involving ghetto students and teachers in a study of the urban rat and lead poisoning problems in the summer of 1970. Although not specifically part of the Tilton effort, the program has served as a guide to, and a prototype of, cluster activities in this area.

On the other hand, where there is latent interest in environmental education, an institution outside the school system can serve as the stimulating agent by becoming the focal point around which environmental studies, with students and teachers acting as partners in the learning situation, can be started. The Center has performed this function in the St. Louis area by starting a program in air pollution studies in the spring of 1970 and again in the school year 1970-71.

Since such institutions are less bound to standard curricula, and because the idea of a predetermined course of studies is less a part of their operation, they are capable of serving as exemplary models of environmental education. Because of the institutions' prestige in the community, their techniques and practices often will be adopted in the school systems, particularly if there is an attempt to include school administration, teachers, and students.

We are dealing with a program of innovative education. The beauty of environmental education is that it provides us with the excitement, the student involvement, and the research tools necessary to change the role of the classroom teacher from that of a lecturer, and imparter of information, often tarnished with the aura of "the truth and nothing but," to that of a partner in the learning process, able to share the joys and the frustrations of that process with his students, and therefore able to lead out into the real world of intellectual excitement and challenge which all of us find such a rewarding way of life. The role

that environmental education councils of the type described will play in this development is a vital one indeed —one that will have a powerful impact on all education in the future.—Alan McGowan.

Evaluation of Proposals for Environmental Education Councils (New York)

Environmental education is a chariot that may be in danger of having more spokes than wheels.

Based on review of existing programs and pending proposals, particularly for Environmental Education Advisory Councils to guide program development and integration, an urgent need for reconsideration by concerned organizations is revealed.

This conclusion is reached after many consultations, and participation in the following conferences relating to environmental education: AAAS-Education Commission, American Association of Colleges for Teacher Education, Conservation Education Association, Congress on Optimum Population and Environment, and New York State Outdoor Education Association.

While enthusiasm is high, and funding not quite so tight, it is imperative to coalesce, coordinate and compound efforts rather than allow continued fragmentation.

The New York State Commission on Youth Education in Conservation is currently studying this problem for a report to the Governor and the Legislature next March. At the present time I have already modified my own original position that environmental education should be mandated, or that it would be achieved through the monitoring of an independent, coordinating agency or council. In New York, achieving environmental education goals will certainly have to be divided among several state agencies.

Effective Procedures

In my opinion, the most effective way to insure the accomplishment of environmental education will be through the following methods:

1. Legislative appropriation of funds limited to environmental education only (probably on the order of magnitude of $4-5 million in New York State in fiscal 1971 as proposed in the budgets for the Departments of Environmental Conservation and Education, Office of Parks and Recreation, the State University and Educational Television).

2. Delineation of responsibility generally along the following lines:

State Education Department—formal study, teacher training, curriculum development and instructional administration.

Department of Environmental Conservation—informal community education, environmental information clearinghouse, local environmental services and assistance.

Office of Parks and Recreation—multiple-and reserve-use of facilities for educational purposes, site maintenance and management.

State University of New York—educational communications, research, development and evaluation.

3. Adaptation of the concept of State or Regional Environmental Education Advisory Councils in whatever way they can be most feasibly accomplished.

Ideally, they would provide the stimulus, where needed, to—

a) prompt the states to utilize the provisions of the new Environmental Education Act as well as previous Federal sources of support,

b) provide channels for motivating, supporting and publicizing environmental education, and

c) receive and administer Federal, State and private funds to promote community education, public information and civic responsibility in environmental protection.

In the few states where such councils have been attempted, the approaches have been different and the results mixed. The fact that they have accomplished very little so far in most cases is largely attributable to lack of sufficient public demand and adequate funding. *Leadership is also frequently weak and/or highly specialized.* Organizations contemplating sponsoring environmental education councils should take a very critical look at themselves—because the evidence indicates that anything less than a multi-disciplinary, inter-organizational approach is a waste of precious time.

Present State Set-up

New York State now has:

1. A Council of Environmental Advisors composed of seven private citizens appointed by the Governor, with Senate approval, to provide counsel on environmental policy, but the enabling legislation does not specify educational responsibility.

2. An Environmental Education Task Force appointed by the Commissioner of Education, consisting exclusively of staff administrators and educators. An advisory committee is proposed to include representatives of the Task Force, the Governor's Office, Department of Enironmental Conservation, Office of Local Government, NYS School District Administrators, and industry.

3. A proposal for an Environmental Information Clearinghouse and a Citizens Advisory Committee related to the establishment of municipal and county conservation councils by the Commissioner of Environmental Conservation.

4. An emerging public service plan for WSKG-ETV (Binghamton) as a prototype for a regional communications center to house-

a) a permanent production staff for modular programs for community environmental education,

b) regular programming with audience participation to discuss current local issues, consider alternatives and plan solutions, plus public hearings and "town meetings,"

c) a Regional Citizens Coalition for Environmental Protection to encourage public action, with an advisory committee for program planning via telecasting and the communications center,

d) consortium of agencies and institutions at local, state and Federal levels which could derive mutual benefit from cooperative planning and funding.

The proposal outlined under #4 seems the most promising method to reach the community to develop awareness and involvement in essential environmental management problems. Everyone seems to agree that this is the most important level to reach, and on that assumption it is obvious that utilizing the mass media is the most practical approach. Public broadcasting minus the commercialism of other media is more likely to have the public's trust—and by definition must be neutral since FCC

licensing requires equal time for opposing viewpoints.

Considering all experimental efforts and proposals for Environmental Education Councils, I conclude that the most serious problem is the definition of terms. There certainly need to be curriculum committees, research projects, professional advisory groups, environmental protection agencies, etc., but there is an equal and compelling necessity for multi-interest regional community coalitions for environmental education and public action.

There is probably also a comparable need for a similar State Council but I favor finding the most responsive local or regional channel of communication first. Through developing it, a model for state development would be demonstrated that would be more persuasive with state officials, and in the process will tend to identify the state agency through which the local groups can best operate.

I would predict that in New York State there will be several agencies principally involved, particularly the Department of Environmental Conservation and the State University, but including the cooperation of the State Education Department, Office of Parks and Recreation, Office of Local Government, Office of Planning Coordination, State Museum, State Library and State Legislature.

One of the few working examples of the media-approach to environmental education is the Puget Sound Coalition in the State of Washington. Additional information can be obtained from the Environmental Center of the Corporation for Public Broadcasting.—Nancy Ayers.

Florida Environmental Education Program

The initial part of this paper dealt with the establishment of Florida's program through passage of the Florida Environmental Education Act by the State legislature, effective July 1, 1970. It reviewed the special points of emphasis in its execution and described the organizational pattern within the State Department of Education responsible for carrying on the work. The program will be developed and administered by the Commissioner of Education according to policies formulated in conjunction with an Advisory Council for Environmental Education. A full-time, experienced environmental consultant will actively guide and prosecute the entire operation, while the Advisory Council, composed of people from both the public and private sectors will have vital responsibilities.

Since inception of Title III, 16 projects have been funded in Florida under the Elementary and Secondary Education Act. Some of the outstanding projects now in operation are:

Environmental Sensitivity Project. The program seeks to make ecology a vital and effective part of the curriculum through provision for training and experiences in environmental education for second and fifth graders. It includes an inservice workshop for teachers, year-round assistance to teachers in planning field trips for study of ecological conditions, prepared field-trip areas, a natural history museum, and an environmental education resources center.

Marine Science Station. Purpose of this center is to add to and enrich the educational and cultural opportunities of the area through emphasis on natural environments, the marine environment in particular.

Throughout the year groups from kindergarten through the university as well as adult groups visit the Marine Science Station for one-day field trips. These visits serve as introductions to the marine environment and stimulate interest in the environmental sciences. Students also collect organisms for use in their home school.

The basic program during the academic year consists of conservation camp visits by intermediate pupils. A class, with the home teacher, spends a full week at the station, studying aquatic, estuarine and marine environments, astronomy, geology, and meteorology. Art and social activities are included, too.

During the summer students from the seven countries participate in a unique type of summer camp. During week-long visits to the center, students are involved in a program of intensive study of aquatic, estuarine and marine biology through daily field activities, laboratory analysis and independent study.

Nature Classroom. This project was designed to utilize the outdoor environment as a tool for enriching, vitalizing, and complementing the content areas of the regular school curriculum through first-hand observation and participation in real life situations and through exposure to both the natural and man-made environment.

During the school year approximately 10,000 sixth graders are provided a week of day-time exposure to a schedule of outdoor experiences with practical educational value. Overnight stays are arranged for fourth and fifth graders from model cities. The project also serves Head Start, Follow Through, migrant school children, and particular project classes on field trip or special assignment basis.

The program consists of individual and group participation in mathematics, social studies, language arts, general science, creative arts, water safety, camping and survival, and life-time sports. Emphasis is placed on water, air, ground, and noise pollution. The program anticipates the implementation of elementary astronomy in conjunction with overnight stays, and marine biology upon securing suitable sites for erection of laboratory facilities. Students perform and demonstrate in actual practice many academic facts and principles abstractly presented in regular classrooms; also the program provides inservice training for classroom teachers.

Environmental Field Studies Program. The primary objective is to develop appropriate curricula for elementary and secondary school students which will create an environmentally aware citizenry able to assess and act upon real issues and problems. Students, particularly on the secondary level, are engaged in field studies programs which provide for investigation into fields of pollutant chemistry, waste recycling, solid waste disposal and other environmental improvement projects. Students are engaged in independent research projects and have organized a Political Action Council to study the political aspects of environmental problems and to suggest appropriate action.

The program includes field trips using marine science mobile lab, development of off-campus environmental centers, a teacher training program, development of an environmental curriculum, a student ecological council and community sponsorship program.

Environmental Education Program (Dade County). The

objectives are implementation of an interdisciplinary approach in schools to environmental education, implementation of a training program for teachers to improve their knowledge and skills in this area, and establishing communication and cooperation between school and community on environmental issues. Elements of the program include a Marine Science Day camp, outdoor education centers, "South Florida Environmental Science Media Productions"; 52 videotapes, films, strips, audiotapes, and accompanying learning activities packages, Ecology Guides, interdisciplinary, K-6, four themes: (a) survival and adaptation, (b) interaction and interdependence, (c) variety and pattern, (d) continuity and change; staff development courses (Marine and Land Ecology), bibliography of people and places important to environmental studies, film and videotape of public relations releases, and a course on ecology currently being taught in two high schools.

In summary, our findings indicate that valuable activities are being carried on at the local level. Varied approaches to studying the environment are being pursued, outdoor education facilities are available in some areas, courses in environmental problems are being added to the high school curriculum, projects involving the school and the community have developed, field studies are being conducted utilizing a local problems approach, and departments are restructuring their curriculum so that it is environmentally oriented. Yet, activities in the field have been fragmentary and there is no school program, K-12, fully executing the comprehensive philosophy of environmental education. It is to that end we shall devote our energies so that in the future Florida can boast of a uniform program of excellence in environmental education.—Karen Underwood.

SCIENCE FOR SOCIETY
Education Review

AAAS Commission on Science Education

The activities of the AAAS Commission on Science Education are supported by a grant from The National Science Foundation.

Published by the:

American Association for the Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington, D.C. 20005

John R. Mayor, Director of Education

Arthur H. Livermore, Deputy Director of Education

Howard F. Foncannon, Associate Director of Education

William E. Chace, Editor

AAAS Misc. Pub. 71-1

The New Jersey State Council for Environmental Education

"Concern for the environment of man has become a dominant social issue of our time. The problem is no longer definable in the traditional terms of conservation or natural resources. It is now the quality of man's life. . . . the livability of the environment, particularly the urban environment. The challenge is as vast as an atmosphere free of cancer-producing chemicals, and as small as a child joyously playing in a stream of water free of disease bacteria and poisons. It is a basic reaffirmation of man's value and dignity, and promise that the future need not be more and more of worse and worse."

This lead-off paragraph from the proposed Master Plan for Environmental Education for the State of New Jersey points up the urgency for a coordinated statewide effort to affect solutions to the environmental crisis, through education. This Master Plan is, we believe, the first such document to be developed in the Nation and came about as a result of the following activities in New Jersey.

1. The long-term interest and series of educational activities related to Environmental/Conservation/Outdoor Education carried on in the State during the past 30 or 35 years, such as the establishment in 1946 of the National Outdoor Education Leadership Training Center in Sussex County, by Life Camps, Inc.; the creation of outdoor education programs in at least 25 school districts during 1950-1960; cooperative efforts of several government agencies in sponsoring environmental-outdoor education sites and programs; college and university sponsored teacher education workshops and institutes; establishment of graduate programs at several state colleges leading to the M.A. degree in environmental and outdoor education; and numerous "grass roots" efforts by private and public agencies.

2. Passage of the Elementary and Secondary Education Act in 1965 which made funds available for eight major environmental education projects. Their locations ranged from the pine barrens of southern New Jersey to the hardwood forests of the north to the barrier beaches of the east coast to the urban situation of Camden in the west.

These projects were funded at the level of almost two million dollars under Title III of the act which provided "risk money," essentially for the development of creative educational programs. The funding schedule established by the act allowed for a one-year planning phase followed by a period of operation not to exceed three years. As a result, federal funding of the eight projects ended or will end in the period from 1969 through 1971, necessitating generation of local funding sources for these programs.

3. A parallel activity was the growth of the New Jersey Association for Environmental Education which encouraged incorporation of a new environmental focus in school curricula across the state. This was accomplished through a series of workshops, conferences, and a newsletter. Members of the organization and participants in these functions initiated environmental education programs in their own school districts which resulted in establishment of more than 225 environmental education programs in the 596 school districts.

Against this background, meetings were held, at the urging of State Education Commissioner Dr. Carl L.

Marburger, among several branches of state government. It was decided that environmental education in the State would be the responsibility of the Education Department. Subsequent meetings established the need for an organization to assess the State's needs in the area of environmental education and to make recommendations for future development. The result was formation of the New Jersey State Council for Environmental Education in 1967 using ESEA Title III funds.

A board of directors was formed of representatives from state agencies and other organizations concerned with environmental education and a staff was employed to carry out the recommendations of the Council. In addition to the development of the Master Plan, the Council was formed to achieve the following objectives:

1. Develop an evaluation instrument for Environmental Education programs.
2. Inventory all Outdoor and Environmental Education programs and sites in New Jersey.
3. Assess existing Title III projects in Environmental and Outdoor Education.
4. Determine whether inner city youth are being served.
5. Increase public awareness of the value of environmental education.

Progress to date on these objectives includes:

1. Development and production of an evaluation instrument with the aid of a national conference held in New Jersey in 1968. This instrument has been accepted by USOE.
2. Publication of an inventory of environmental and outdoor education programs in New Jersey. The 1969 version of this publication is currently being revised and updated.
3. Numerous visits to the Title III projects. Suggestions have been made particularly regarding continuation beyond Title III funding.
4. Programs for inner city students jointly sponsored with other Title III projects.
5. Presentations by staff members before many community and school groups. A 16mm film, entitled *Later . . . perhaps*, was produced, documenting the environmental crisis and suggesting a role for the public school teacher in its solution.

Finally, and most importantly, the Council has developed the aforementioned Master Plan. In a reflection of its own organization the Council has recommended formation of a state-level Technical Advisory Committee on Environmental Education. Reporting to the Commissioner of Education, this Committee would assess the personnel, facilities, and financial resources available and make recommendations for their efficient use.

Furthermore, in recognition of the broad scope of environmental problems in our society, the Council recommends participation by citizens in their solution. Specifically, it recommends formation of local Concerned Citizens Committees to serve as liaison agents between local schools and the community.

In its first three years the Council has utilized its resources to design a plan for the future of environmental education in New Jersey in light of the efforts already made and the resources available. As of the current academic year (1969-70) it has been instructed to implement this plan. As a logical extension of the Council's findings we would suggest that the national effort in environmental education be based on a National Master Plan and effected through cooperation of all concerned. We find the AAAS concept of Environmental Education Councils to be a step in this direction and we are pleased to participate in their formation.

We support the idea of AAAS serving as a national clearinghouse for the Citizens Councils and recommend that the talents and energies of AAAS be directed toward the publication of a series of documented scientific studies or fact sheets, produced in lay language, which could be used by Citizens Councils when they are called upon for opinions and action regarding environmental crises in their respective communities.—Edward J. Ambry

Participants—AAAS Conference on Environmental Education Councils—October 30, 1970

***Edward J. Ambry**, Director, New Jersey State Council for Environmental Education, Mountain Lakes, N.J. 07046; **Nancy Ayers**, Executive Director, Susquehanna Environmental Education Center, 616 Pheasant Lane, Endwell, N.Y. 13760; **Laurence O. Binder**, Program Director, Pre-College Course Content Improvement Program, Natural Science Foundation, Washington, D.C. 20550; **William E. Chace**, Staff Associate, AAAS; **Peter H. Cohan**, Executive Director, Cooperative Science Education Center, Inc., 156 Adams Lane, Oak Ridge, Tenn. 37830.*

***Charles R. Davis**, Science Supervisor, Fairfax County Schools, Fairfax, Va. 22030; **Bowen C. Dees**, President, The Franklin Institute, 20th and the Parkway, Philadelphia, Pa. 19103; **Donald C. Edinger**, Director of Education, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, Ill. 60605; **Howard F. Fonnannon**, Staff Associate, AAAS; **Ray Foresti, Jr.**, Chairman, Joint Board on Science Education, Department of Chemical Engineering, Catholic University of America, 620 Michigan Avenue, N.E., Washington, D.C. 20017.*

***William Harding**, New Jersey State Council for Environmental Education, Mountain Lakes, N.J. 07046; **Jean B. Intermaggio**, Pre-College Course Content Improvement Program, Natural Science Foundation, Washington, D.C. 20550; **Arthur H. Livermore**, Deputy Director of Education, AAAS; **George Lowe**, Director, Environmental Task Force, U.S. Office of Education, Room 3600, ROB-3, Washington, D.C. 20202; **John R. Mayor**, Director of Education, AAAS; **Alan McGowan**, Scientific Administrator, Center for the Biology of Natural Systems, Washington University, St. Louis, Mo. 63130.*

***William E. Scheele**, Director, Natural Science Museum, 10600 East Boulevard, Cleveland, Ohio 44106; **Winslow H. Shaughnessy**, Museum Administrator, The Academy of Natural Sciences, 19th and the Parkway, Philadelphia, Pa. 19103; **Lewis S. Shelton**, Director, Fernbank Science Center, 156 Heaton Park Drive, N.E., Atlanta, Ga. 30307; **Walter Steidle**, Legislative Planning Bureau of Elementary and Secondary Education, U.S. Office of Education, Washington, D.C. 20202; **Karen Underwood**, Research Associate in Environmental Education, State Department of Education, Tallahassee, Fla. 32304; **Vernon J. Walker**, Director, The Nature Center, 1606 Washington Plaza, Reston, Va. 22070.*

American Association for the Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington, D.C. 20005

NONPROFIT ORG.
U. S. POSTAGE
PAID
Washington, D.C.
Permit No. 7304