

## **Global Environmental Change: Understanding the Human Dimensions**

*Paul C. Stern, Oran R. Young, and Daniel Druckman,  
Editors*

At a December 12 meeting in Washington, DC of the U.S. MAB Executive Committee, together with the members of the U.S. MAB directorates, Dr. Oran R. Young spoke about the just-released report produced by the Committee on the Human Dimensions of Global Change, Commission on the Behavioral and Social Sciences and Education of the National Research Council.

According to Dr. Young, the report introduces the complexity of the problem as follows:

People have always sought to transform their surroundings. However, we only now realize that producing food, providing shelter or employment, and increasing our comfort have grave side effects. We are actually changing the global environmental conditions that originally permitted our emergence as a species.

Some authorities single out specific underlying causes for these changes, e.g., human population growth in Third World countries, but the truth is not that simple. An additional person in the United States with a high standard of living and access to technology uses 35 times as much emission-producing energy as an additional person in India.

In order to design effective responses to the global environmental changes that human activity is producing, we must understand how human and environmental systems interact.

Increasingly, stories appear in the media about the destruction of the world's tropical forests, the resulting effects on global climate and the extinction of species.

Headlines attribute this destruction in some part to clearance of forests for agriculture or for grazing. Partly in response to these environmental changes, nations with tropical forest lands are beginning to modify their development policies. But we cannot yet tell whether these efforts will be successful in preserving the remaining forests and their beneficial effects on global climate and biological diversity. Understanding what makes policies effective is of critical importance to researchers, policy makers, and environmental advocates around the world.

The National Academy of Science's Committee on the Human Dimensions of Global Change has issued a report recommending that a study be made:

1. To lay the intellectual groundwork for the development of the human dimensions of global environmental change as a well-defined and widely recognized field of study within the social sciences;
2. To identify the elements of a comprehensive national research program to foster the growth of this field of study; and

*continued on page 3*

## **In This Issue**

- **EuroMAB Update**
- **U.S. MAB Peace Corps/USAID Urban Initiative RFP**
- **Human Dimensions of Global Environmental Change**



## Definition: Sustainable Development

Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

*World Commission on the Environment and Development*

## Notes From the Executive Director

### *EuroMAB Update*

Following on to the activities initiated at the meeting of the 26 MAB National Committees of Europe and North America in September, U.S. MAB has invited EuroMAB member states to update a 1986/87 UNESCO survey of 168 biosphere reserves. The survey contained the 1986/87 results concerning 24 basic resource information categories on the biosphere reserves (indicating records ranging from aerial photographs, acidic deposition and air quality through inventories on invertebrates, mammals, non-vascular plants, etc. to vegetation maps and water quality). The updated survey also calls for bringing up-to-date information on 15 categories of research facilities and staff (e.g., air pollution stations, hydrological stations, permanent plots, vegetation, watershed research sites, and weather stations, etc.). The survey also requests information on seven categories of current research in the environmental and physical sciences (e.g., acidic deposition, biogeochemical cycles to water pollutants, etc.) and nine categories of research in the ecological and biological sciences. Two final categories include reporting on research on human systems and research on management practices.

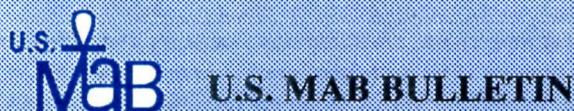
Those reporting MAB Program biosphere reserves have also been asked to indicate five of their basic information categories that are the most robust, with the strongest scientific programs, so that future linkages can potentially be established among the most promising programs.

So far, U.S. MAB has received responses and updated information from the biosphere reserves in nine of the EuroMAB programs. Representatives of seven of these national MAB programs have also indicated that they will attend a workshop to be held in Washington, DC in February to analyze the results of the expanded survey and to chart appropriate courses of future collaborative action.

One immediate result is likely to be the publication of a directory of information about these biosphere reserves, indicating on which of the research categories they have data, what time period their data base covers, and how scientists can make contact with these sources of information/biosphere reserves.

The scientific community has long sought long-term data bases concerning biological information, which may be indicators of global change, ecosystem health, etc. It may well occur that the current peace in our time will allow significantly increased international collaboration and access to data bases across wide biogeographical provinces, or biomes, so that the health of our planetary ecosystem can indeed be empirically measured. We will keep you informed of the progress achieved toward these goals.

**Roger E. Soles**



The U.S. MAB Bulletin is published quarterly by the U.S. MAB Secretariat, OES/EGC/MAB, Department of State, Washington, DC 20522-3706. Tel. 703-235-2946, 2947. FAX # 703-235-3002.

*"The mission of the United States Man and the Biosphere Program (U.S. MAB) is to foster harmonious relationships between humans and the biosphere through an international program of policy-relevant research which integrates the social, physical and biological sciences to address actual problems. These activities—broadly interpreted—include catalytic conferences and meetings, education and training, and the establishment and use of biosphere reserves as research and monitoring sites."*

Adopted by the U.S. National Committee for the Man and the Biosphere Program, January 6, 1989.

U.S. MAB is supported by the Department of Agriculture-Forest Service, the Department of Energy, the Department of the Interior-National Park Service, the Department of State, the Agency for International Development, the Environmental Protection Agency, the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the National Science Foundation, the Peace Corps, and The Smithsonian Institution.

The program is organized into five directorates: High Latitude Ecosystems; Human Dominated Systems; Marine and Coastal Ecosystems; Temperate Ecosystems; and Tropical Ecosystems.



*continued from page 1*

3. To initiate a mutually rewarding dialog and basis for collaboration between social scientists and natural scientists working on global environmental change.

The committee tried not to render judgments about the capacity of existing policies and institutions to mitigate or adapt to the effects of global environmental change. It did, however, draw up criteria for investigator-initiated research and identify several high-priority topics for focused or targeted research on the human dimensions of global environmental change.

Dr. Young noted that the global environmental changes of primary interest today are largely of anthropogenic origin, and include ozone depletion, loss of biological diversity, and climate change. The future of these changes cannot be adequately predicted by simple extrapolative techniques because the course of human behavior changes with new knowledge and technology, the possibility of social chaos or rapid change, and, as a result, of collective action. We need an effort to produce new knowledge for explaining and predicting the course of human actions that alter the environment.

The committee's report notes that the proximate human causes of global change, such as fossil fuel use and biomass burning, are in turn caused by several driving or social forces, including population growth, economic growth, technological change, political and economic institutions, and human values. We need a better understanding of how these forces work together. For example, countries vary widely in the amount of energy they use to produce one unit of Gross National Product (GNP). The differences cannot be explained by traditional/non-traditional or capitalist/socialist, but they do depend on availability of energy resources, public policy, technology, spatial distribution, capital stocks, and corporate incentives. Similarly, the different rates of rainforest deforestation in different countries are a function of a combination of security concerns, public policies, foreign indebtedness, land tenure rules, and the presence of a "frontier mentality."

To respond to the challenges of global change, we need to know more about general processes of response in human groups. Dr. Young suggested the possibility of collective action in a field of research that is obviously relevant to international environmental cooperation. The problem has been analyzed in terms of bargaining for position, two-level games (national and international politics), the costs of transactions, and the role of fears of cheating.

Dr. Young noted that despite the clear need for better knowledge on these and other points of human behavior, the social science community is unlikely to provide the knowledge on its own. There are significant barriers to effective research on the human dimensions of social change. They include the effect of disciplinary specialization, which makes interdisciplinary training difficult; the fact that scientists' professional incentives favor work in the main-streams of disciplines rather than at the margins; the lack of a critical mass of human dimensions researchers in existing centers; and the mismatch of government agencies and missions with the needs. U.S. agencies responsible for the environment have not historically had social science responsibilities or capabilities.

In its report summary the Committee recommends federal funding of the following elements of a National Research Program:

1. Increase resources available for investigator-initiated research.
2. Initiate public and private programs of targeted research on the human dimensions of global environmental change.
3. Ensure that appropriate data sets for research on the human dimensions are routinely acquired, properly prepared for use, and made available to scientists on simple and affordable terms.
4. Develop a national program of fellowships to allow both social scientists and natural scientists interested in the human dimensions of global environmental change to interact intensively with each other for periods of up to 2 years.
5. Establish at least five national centers for research on the human dimensions of global environmental change and make a commitment to fund these centers on a long-term basis.
6. The program should be phased in over a period of several years, with eventual federal funding of \$45–50 million annually.

This report is available from the National Academy Press, 2101 Constitution Avenue N.W., Washington, DC 20418 and from commercial bookstores.



## **New Members Appointed to U.S. MAB Directorates**

The U.S. MAB National Committee welcomes the appointment of 16 new members to its directorates.

To the High Latitude Directorate we welcome Jerry Brown, recently retired from the National Science Foundation where he was Head of the Arctic Research and Policy Staff; and Thomas A. Hanley, Principal Research Wildlife Biologist with the USDA Forest Service in Juneau, Alaska.

New members of the Human Dominated Systems Directorate are Joseph C. (Jay) Zieman, Jr., Professor of Environmental Sciences with an emphasis on marine coastal ecology from the University of Virginia; Joan G. Ehrenfeld, Professor at the Division of Water Resources at Rutgers University; and Ezra B. W. Zubrow, Professor of Anthropology at the State University of New York at Buffalo with an emphasis on applications of Geographic Information Systems to human-biosphere interactions.

New members of the Marine and Coastal Ecosystems Directorate are Charles N. Ehler, Director of the Office of Oceanic and Marine Assessment for NOAA; R. Scott Farrow, Senior Economist and Acting Associate Director for Pollution Control and Prevention of the Council on Environmental Quality; Edward O. Murdy, marine biologist, with the Division of International Programs of the National Science Foundation; and John C. Ogden, Director of the Florida Institute of Oceanography, a consortium of nine state universities, the University of Miami, the Florida Sea Grant Program, and the Florida Department of Natural Resources.

The Temperate Ecosystems Directorate welcomes as its new Vice-Chairperson Hanna J. Cortner, Professor at the School of Renewable Natural Resources at the University of Arizona. She is joined by Terence P. Boyle of the Water Resources Division of the National Park Service; James E. Ellis, Professor of Range Science of the Natural Resource Ecology Laboratory of Colorado State University; David R. Foster of the Harvard Forest Long Term Ecological Research Program, who is investigating the impacts of humans on temperate forest ecosystems and how ecosystem changes affect social activities; Jack A. Stanford, Director of the Flathead Lake Biological Station of the University of Montana; and David N. Wear, Research Forest Economist with the USDA Forest Service in Durham, North Carolina.

The new members of the Tropical Ecosystems Directorate are Anthony W. Stocks, Professor of Anthropology at Idaho State University; and James D. Nations, Vice President of the Latin America Program, Conservation International.

We welcome all of you and look forward to working with you on our ever-expanding interdisciplinary program.

---

### ***U.S. MAB National Committee for Man and the Biosphere***

## **U.S. MAB Request for Proposals for Urban Environmental Projects**

The United States Man and the Biosphere (U.S. MAB) Program hereby announces its request for proposals to continue its assistance to the U.S. Peace Corps in the development of a worldwide urban environmental projects initiative as described below.

U.S. MAB will accept proposals of a maximum length of six (6) pages that outline how the objectives described below could be accomplished.

A curriculum vitae (c.v.) of a maximum length of four (4) pages for each principal(s), that clearly demonstrates a history of competency in the implementation of such tasks, must accompany the proposal.

Proposals may not request more than the sum of forty four thousand, eight hundred and eighty four (\$44,884) dollars to implement this initiative.

All proposals must specify that all tasks will be completed within 12 months at the headquarters of the U.S. Peace Corps or at other appropriate sites, as directed, beginning, approximately, the last week of February 1992.

Payments will be made on a quarterly basis in equal installments.

All proposals and accompanying documents must be received by the U.S. MAB Secretariat no later than the close of business (COB) on February 14, 1992. Proposals and c.v.'s will be evaluated on the criteria noted in the following section.

Selection will be made during the week of February 17, 1992. Selected candidate principals must be prepared to implement their proposals on or about February 24, 1992.

Proposals should be sent to:

U.S. MAB Secretariat  
Room 608 SA-37  
OES/EGC/MAB  
U.S. Department of State  
Washington, DC 20522-3706



## Objectives:

To provide technical assistance to the U.S. Peace Corps, including but not limited to:

— Coordinate Peace Corps/U.S. Agency for International Development (USAID) support for the Peace Corps urban development initiative, including the identification of project opportunities, developing scopes of work, and arranging of contracts and travel for consultancies;

— Review and summarize the Peace Corps' urban development initiative as developed in the Peace Corps annual Integrated Planning and Budget System (IPBS) submission received from Peace Corps field operations and organize the Peace Corps' Office of Training and Program Support (OTAPS) annual support program. The resulting work plan(s) will include the integration of non-Peace Corps resources (e.g., USAID/ Regional Housing and Urban Development Offices and the Water and Sanitation and Health (WASH) project) and are reviewed and approved by the appropriate officials in each of the Peace Corps' regional offices.

— Periodically prepare articles and guidelines to be used by the Peace Corps in promoting its urban environmental development initiative.

— Visit U.S. universities to promote the urban environmental program as well as recruit professionally qualified volunteers to participate in Peace Corps' expanding urban program. The urban projects envisioned include such environmental issues as solid waste management, potable water/appropriate sanitation systems, and the development of overall growth guidelines for rapidly urbanizing cities of the Third World.

— Based on the Cote d'Ivoire urban environmental management project, design and conduct other pilot country specific environmental projects.

— Organize the development of In-Service Training (IST) model(s) for Peace Corps Volunteers (PCVs) working in urban environmentally oriented projects and for local-level host country counterparts, as well as implement country-specific IST's based on these models.

## Selection Criteria:

— Performance record of the proposed principal.

— Demonstrated ability of the proposer to design and deliver assistance in the development of Peace Corps urban development projects and related pre-service and in-service training activities.

— Demonstrated ability of the proposer to manage budgets and personnel.

— Demonstrated ability of the proposer to conduct needs assessments and development project designs.

— Fluency in one or more of Peace Corps' official languages, Spanish or French preferred.

For further information concerning technical or grant performance-related inquiries, please contact:

George Mahaffy  
Director, Office of Training and Program Support  
U.S. Peace Corps  
Room 800  
1990 K Street N.W.  
Washington, DC 20526  
Telephone: (202) 606-3100

For further information concerning administrative and grant management inquiries, please contact:

Roger E. Soles  
Executive Director U.S. MAB  
Room 608 SA-37  
OES/EGC/MAB  
U.S. Department of State  
Washington, DC 20522-3706  
Telephone: (703) 235-2946

Dated: December 30, 1991



## Obituary—Ralph E. Good

The world of ecology lost one of its foremost scientists and advocates on December 10, 1991, when Dr. Ralph E. Good died. Dr. Good was the Vice-Chair of the United States Man and the Biosphere Directorate on Marine and Coastal Ecosystems and was the Director of the Division of Pinelands Research, Institute of Marine and Coastal Services, Rutgers University.

In 1967, Dr. Good, at Rutgers-Camden, established his long-standing interest to understand the flows and exchanges within the ecological communities of tidal marshes and in the New Jersey Pinelands. He was responsible for the creation of the Rutgers Pinelands Research Station near New Lisbon, New Jersey. Dr. Good was instrumental in producing the scientific information leading to the creation of the Pinelands National Reserve (established by the U.S. Congress in 1978, the first of its kind). It was through his efforts that the Pinelands was designated as a Coastal Plain Biosphere Reserve by the UNESCO Man and the Biosphere Program.

In 1983, the university promoted Dr. Good to its equivalent of Distinguished Professor. In 1985, he received the Rutgers Presidential Award for Distinguished Public Service. In 1989, the Ecological Society of America bestowed on him its Distinguished Service Citation for his leadership in the Society. He was elected and served as President of the New Jersey Academy of Sciences from 1978–1980 and served on many of its committees until 1989. In 1989, the Academy awarded him its Outstanding Service Award. In 1990, the American Association for the Advancement of Science elected him to the position of Fellow in recognition of his many contributions to the science of ecology. In 1991, he was honored by the New Jersey Pinelands Commission with a citation that praised his leadership in Pinelands research and for the high quality of his scientific product.

His colleagues remember Dr. Good as a spirited, conscientious, dedicated coworker who did not shrink from responsibility. His contributions to the university and to the science of ecology are notable and will endure.

## PUBLICATIONS

REMEMBER, ENCLOSE YOUR SELF-ADDRESSED MAILING LABEL (OR LABELS, IF YOU ARE REQUESTING SEVERAL ITEMS).

### New Publications—Available from U.S. MAB

**People and the Temperate Region. A Summary of Research from the United States Man and the Biosphere Program.** Edited by Peter F. Ffolliott and Wayne T. Swank. Published by the U.S. MAB Program in August 1991.

**FROM GENES TO ECOSYSTEMS: A Research Agenda for Biodiversity.** Edited by Otto T. Solbrig. Published by the International Union of Biological Sciences with the financial support of the National Science Foundation and the U.S. MAB Program.

### Still Available from U.S. MAB:

May 1991 issue of *BioScience*, the magazine of the American Institute of Biological Sciences, in collaboration with the U.S. Man and the Biosphere Program. Articles on **Coastal Barrier Ecosystems** prepared for a U.S. MAB supported symposium on coastal barriers held at the AIBS meeting at the University of Toronto in August 1989.

Proceedings of a **Workshop on Forest Hydrological Resources in China, An Analytical Assessment.** The workshop was held in Harbin, China, August 18–23, 1987. The Proceedings were edited by Peter F. Ffolliott and D. Phillip Guertin.

**Bibliography on the International Network of Biosphere Reserves.** Published by the United States Man and the Biosphere Program in July 1990.

**Directory of Biosphere Reserves in the United States.** Published by the United States Man and the Biosphere Program in June 1991.

Pamphlet on **The United States Man and the Biosphere Program.** Department of State Publication 9798. Released July 1990.

### Available from Others:

**NATURE RESERVES, Island Theory and Conservation Practice.** Craig Shafer, an ecologist with the National Park Service, reviews the literature on island biogeography and related subjects, synthesizes some guidelines from controversial theories, and assesses the current status of nature



reserves, information available from field surveys, and results of conservation trials. Available from the Smithsonian Institution Press, Blue Ridge Summit, PA 17294-0900, tel. 800-782-4612, 717-794-2148.

**Ecology Chronicle: Twenty-four Windows on the Man and the Biosphere Programme 1989-1990.** Published by the UNESCO-MAB. Available from the UNESCO-MAB Secretariat, 7, place de Fontenoy, 75700 Paris, France.

**Geographic Information Systems and their Application in MAB Projects, Ecosystem Research and Environmental Monitoring.** Edited by Michael Ashdown and Dr. Jorg Shaller. Report #34. Available from: MinR Wilfried Goerke, Dipl.-Biologe. Federal Ministry for Environment, Nature Protection and Nuclear Safety, P.O. Box 120629, D-5300 Bonn 2, Germany. Please include your self-addressed mailing label.

**Available from MAB-UNESCO, 7, place de Fontenoy, 75700 Paris, France:**

UNESCO Publication, **MAB Digest 1, on Eutrophication Management Framework for the Policy-Maker** by Marjorie Holland, Walter Rast and Sven-Olof Ryding. Eutrophication of lakes and reservoirs is one of the most pervasive water quality problems worldwide. This digest aims to provide: quantitative tools for assessing the state of eutrophication of lakes and reservoirs; a framework for developing cost-effective management strategies; specific technical guidance and case studies for effective management of eutrophication.

UNESCO Publication, **MAB Digest 3, on Contributing to Sustained Resource Use in the Humid and Sub-Humid Tropics, Some Research Approaches and Insights**, by Malcolm Hadley and Kathrin Schreckenber. An overview of recent, ongoing and planned activities within the MAB framework pertaining to the ecology of humid and sub-humid tropical ecosystems, principally forests and savannas.

UNESCO Publication, **MAB Digest 4, on The Role of Land/Inland Water Ecotones in Landscape Management and Restoration, Proposals for Collaborative Research**, edited by Robert J. Naiman, Henry Decamps, and Frederic

Fournier. To determine the management options for the conservation and restoration of land/inland water ecotones through increased understanding of ecological processes.

UNESCO Publication, **MAB Digest 6, on Debt for Nature Exchanges and Biosphere Reserves, Experiences and Potential**, by Peter Dogse and Bernd von Droste.

UNESCO Publication, **MAB Digest 7, on Carbon, Nutrient and Water Balances of Tropical Rain Forest Ecosystems Subject to Disturbance, Management Implications and Research Proposals**, by Jonathan M. Anderson and Thomas Spencer.

UNESCO Publication, **MAB Digest 8, on Economic and Ecological Sustainability of Tropical Rain Forest Management**. Edited by Kathrin Schreckenber and Malcolm Hadley.

**Available from the Island Resources Foundation, 1718 P Street N.W., Suite T 4, Washington, DC 20036, tel. 202-265-9712:**

**Country Environmental Profiles.** Six new books providing a national overview of the state of the environment in each of six neighboring island states in the Lesser Antilles-Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines.

Designed primarily for those engaged in setting a national environmental action agenda in motion, Island Resources Foundation and the Caribbean Conservation Foundation have prepared a smaller executive summary of the volumes described above, **Environmental Agenda for the 1990's: A Synthesis of the Eastern Caribbean Country Environmental Profile Series.**

---

DEPARTMENT OF STATE PUBLICATION 9731  
Bureau of Oceans and International Environmental  
and Scientific Affairs

*Released December 1991*



---

U.S. Man and the Biosphere Program, OES/EGC/MAB

**DEPARTMENT OF STATE, U.S.A.**

Washington, DC 20522-3706

---

**OFFICIAL BUSINESS  
PENALTY FOR PRIVATE USE, \$300**



Printed on Recycled Paper