



**The  
United  
States  
Program**  

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**Man and  
the Biosphere**

MAB



# The Man and the Biosphere Program

## AN OVERVIEW

The blue-marble picture of Earth from 23,000 miles in space was the first full-length portrait of his home that man had ever seen. Its effect was profound—from that distance, it is apparent that the Earth is One, and the only fragmentation it knows is that created by and existing within the human mind.

Ever since that picture postcard arrived from outer space, man has been trying to patch his fragmented perception of the environment into something that matches the wholeness he now perceives his world to be. The Man and the

Biosphere Program (MAB) is one of the most promising efforts in this direction. It attempts to bind fragmented disciplines into a tool for understanding man and his environment, as well as to coordinate the efforts of the many nations of the world.

The objective of the MAB Program is to develop the basis within the natural and social sciences for the rational use and conservation of the biosphere—that portion of the earth's crust and lower atmosphere which contains life—and for the improvement of the relationship between man and the environment.

## THE BEGINNING

MAB got its formal start at the 1970 General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) when initial plans were approved and the governing body (the International Coordinating Council) was established.

MAB in many ways builds on the former International Biological Program (IBP), but differs from IBP in that it is intergovernmental in structure and oriented towards actual management of problems arising from the interactions between human activities and natural systems.

## A NEW APPROACH

MAB is an integrated, interdisciplinary, problem focused rather than discipline-focused, research approach to the management problems arising from the interactions between human activities and natural systems. It is aimed at providing a bridge between fundamental science and technological applications.





The MAB approach focuses on:

- the general study of the structure and function of the biosphere and its ecological regions to provide an improved environmental information base for decision making.
- systematic observation of changes brought about by man in the biosphere in order to provide new tools for environmental planning and resource management.
- the study of the effects of these changes upon human populations to improve our ability to predict these effects and to develop new strategies to lessen their disruption to human lives.
- the educational and information needs relating to these subjects.

MAB provides the first formal mechanism for bringing together and coordinating diffuse national and international research, conservation and training activities. The United States, for example, has designated 36 sites as part of an international network of biosphere reserves—protected samples of the world's major ecosystem types. These sites will be standards against which we can measure with greater accuracy man's impact on his environment and predict its probable future effects.

#### **THE WAY MAB WORKS**

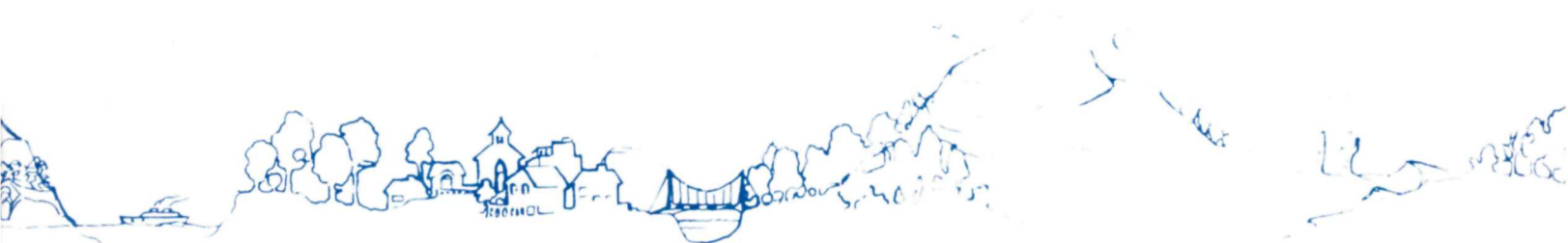
The MAB International Coordinating Council (ICC) consisting of scientific representatives from

30 nations, guides and supervises the program. UNESCO provides the international secretariat.

Over 100 nations presently participate in the MAB program. In each country, a national committee defines and organizes activities concerning particular national problems within guidelines from the ICC. Special working groups and expert panels are set up by the ICC to coordinate national contributions, to define international core programs, and to facilitate use of comparable methodology in the various projects.

A major focus of MAB is man's interaction with particular ecosystems or geographic units. Therefore, projects are often focused on regional and sub-regional levels—countries working together on a series of problems of common concern.

The subject of man and the biosphere encompasses the entirety of relationships humans have with their surroundings. Therefore, in order to embark on real, concrete tasks, the International Coordinating Council selected 14 project areas. Projects 1 through 7 focus on particular kinds of geographic areas (forests, grazing lands, arid lands, fresh and marine water, islands, mountains, and tundra). Project 8 concerns the development of an international network of "biosphere reserves," protected areas for research, monitoring and conservation. Projects 9 through 14 focus on what might be termed systems and processes (major engineering works, demographic changes, urban systems, pesticide use, environmental perception, pollution). Projects are not considered mutually exclusive, and actual research and training activities may include several projects.





## THE UNITED STATES PROGRAM FOR MAB

In 1972, at the invitation of the Director General of UNESCO, the United States Department of State established a National Committee for MAB in the United States National Commission for UNESCO, and the United States began an active role in the MAB program.

The U.S. National Commission for UNESCO is a hundred-member body of individuals and representatives of non-governmental organizations created by joint resolution of the Congress in 1946. The Commission advises the U.S. Government on UNESCO's programs and serves as an information and community action link between the people of the U.S. and UNESCO.

The U.S. National Committee for MAB, with representatives from federal agencies, state, and private institutions, guides the development of national research implementation, and training activities which relate to the international program.

The chairman of the U.S. MAB Committee serves on the International Coordinating Council of MAB.

Under the direction of the MAB National Committee, MAB projects are administered by groups (directorates) of selected experts, whose chairmen serve on the National Committee.

Each directorate formulates the basic framework and goals for research, training, and research implementation activities within its project. It also initiates proposals for such activities or requests other interested parties to do so, and plays a role of coordination and review.

Membership on the 14 directorates includes experts from the natural sciences (e.g., ecologists) as well as experts in fields dealing with the human relationships and activities pertinent to the project topic (anthropologists, psychologists, engineers, etc.).

Concerned government agencies are also represented on the directorates. These persons link the products of directorate activities back to the arena of application. At present, some 25 such agencies and twice that number of universities are represented by the close to 200 scientists and administrators who are participating in the program.

The U.S. National Committee and the directorates are supported by a central administrative staff, the national secretariat. The national secretariat assists in coordinating activities of the directorates, providing a link with the international secretariat of MAB at UNESCO—Paris and the national committees of other nations participating in the MAB program.



## MAB PROJECT AREAS AND CURRENT EMPHASIS IN THE UNITED STATES

**1. Tropical Forests:** ecological effects of increasing human activities on tropical and subtropical forest ecosystems. A conceptual model for tropical forest management will be developed, using available information and defining specific inputs and outputs in ecological and economic terms.

**2. Temperate Forests:** ecological effects of different land uses and management practices on temperate and mediterranean forest landscapes. Baseline environmental monitoring programs and analyses of the effects of changing environmental conditions will be used to develop alternative management strategies for multiple use of temperate and mediterranean forest ecosystems.

**3. Grazing Lands:** impact of human activities and land use practices on grazing lands—savanna and grassland (from temperate to arid areas). The existing condition and potential of grazing lands will be determined, and physical, biological, environmental, and socio-economic effects of conflicting uses will be determined.

**4. Arid Zones:** impact of human activities on the dynamics of arid and semi-arid ecosystems. Causal relationships in arid land degradation will be analyzed with the view toward development of long-range strategies for arid land development consistent with carrying capacities, weather conditions, and research utilization.

**5. Fresh water:** ecological effects of human activities on the value and resources of lakes, marshes, rivers, deltas, estuaries, and coastal zones. Research, education, and training activities will be used to develop management strategies that will provide a predictive capability for establishing the quality and quantity of water available, and identify conflicts that will arise because of limited local or regional supplies.

**6. Mountains:** impact of human activities on mountains and tundra ecosystems. Emphasis will be given to development of techniques for prediction of carrying capacity of mountain ecosystems for multiple use, including tourism. Analysis of the ecological and socio-economic impacts of tourism, industrial development, and resource exploitation will be examined in high latitude areas.

**7. Islands:** ecology and rational use of island ecosystems. Environmental and socio-economic changes associated with tourism and industrial development will be examined in order to develop improved strategies to preserve some of the features of these fragile ecosystems consistent with human needs.

**8. Biosphere Reserves:** conservation of natural areas and of the genetic material they contain. The 36 Biosphere Reserves established thus far in the United States are part of an international system of reserves with the primary objective of conservation of genetic diversity, baseline environmental research and monitoring.

**9. Pesticides/fertilizer:** ecological assessment of pest management and fertilizer use on terrestrial and aquatic ecosystems. Included are studies of methods of transport; behavior and reactions of specific compounds in water and terrestrial environments as related to their physical properties; protective clothing; specific formulation of pesticides to reduce environmental contamination; and disposal of contaminants.

**10. Engineering works:** effects on man and his environment of major engineering works. Attention will be given to concerns which arise in a wide variety of engineering applications including: siting for environmental protection; displacement and relocation of populations including the question of equity; evaluation of effects; and improved predictive techniques to assist in decision strategies.

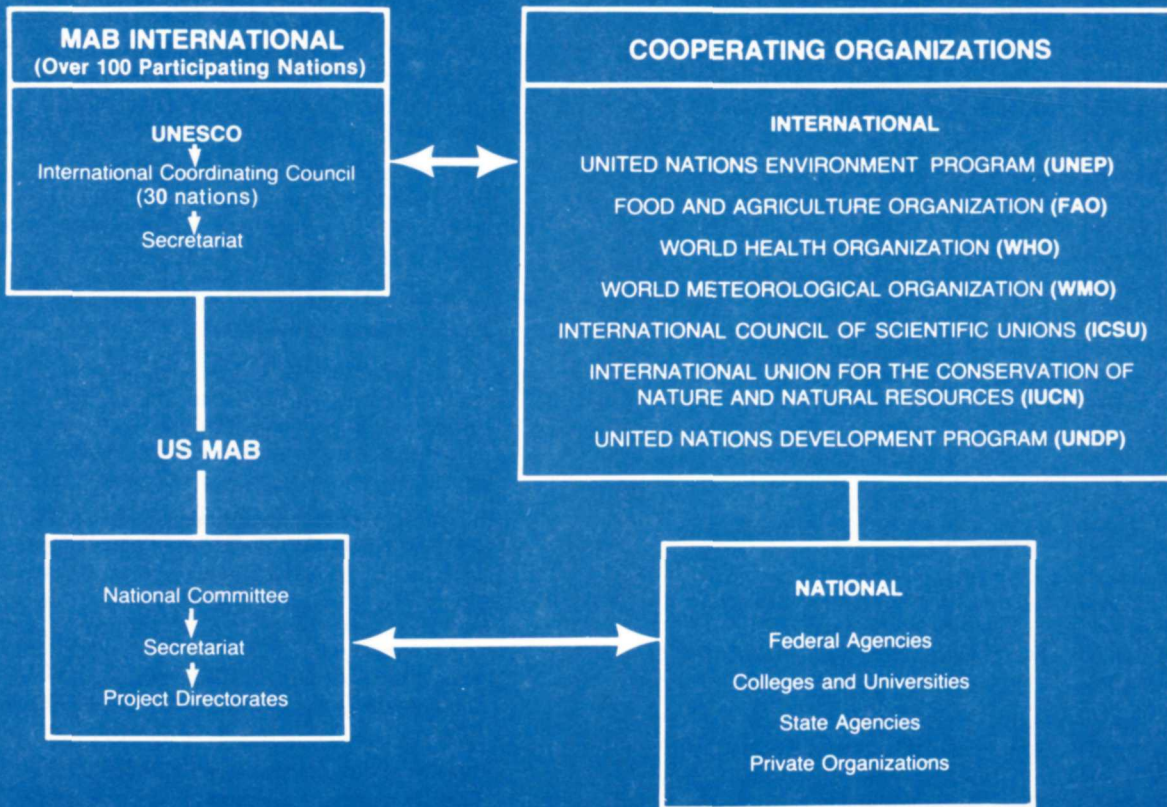
**11. Urban ecosystems:** ecological aspects of urban systems with particular emphasis on energy utilization. The initial thrust will be concerned with water management in urban systems, emphasizing human well being, land use, and energy considerations.

**12. Demographic change:** interactions between environmental transformations and the adaptive, demographic, and genetic structure of human populations. Two dimensions of human population change will be examined including: rural/urban migration and changes in human populations in the new and old environments; changes in health and welfare of human population in existing communities impacted by environmental change (e.g., tourism and industrial development in Samoa).

**13. Perception of environmental quality:** analysis of subjectively perceived environments to understand human well-being within any given environment. This project will be concerned with human perception of environmental hazards, environmental change, and environmental quality.

**14. Pollution:** develop a clearer understanding of the relation of pollution to the structure and functioning of terrestrial and associated aquatic ecosystems. Baseline information will be gathered through state-of-the-art measurements and observations and used to assess current environmental problems and predict future trends.

# Man and the Biosphere Program





Further information on U.S. MAB activities can be obtained through the secretariat:

**U.S. MAB Secretariat**

Department of State (IO/UCS) — SA-5  
Washington, D.C. 20520  
(202-632-2786)

For specific information on the international MAB program please write:

**International MAB Secretariat**

Division of Ecological Sciences  
UNESCO  
7, place de Fontenoy  
75700 Paris, France

The United States Committee for Man and the Biosphere is a Committee of the United States National Commission for UNESCO.



A stylized *ankh*, the ancient Egyptian sign for life, has been incorporated into the symbol of UNESCO's Program on Man and the Biosphere (MAB).

November 1981

