



Blue  
Planet  
Prize

**MEDIA RELEASE**

**1996 BLUE PLANET PRIZE:  
ANNOUNCEMENT OF AWARD WINNERS**

**Dr. Wallace S. Broecker**, Newberry Professor of Geology at Columbia University  
“Global Ocean Current Lends Clues to Climate Change”

**M.S. Swaminathan Research Foundation, Chairman: Dr. M.S. Swaminathan**  
“Research Promotes Sustainable Agriculture and Rural Development”

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Tokyo, June 5, 1996—The Asahi Glass Foundation, chaired by Jiro Furumoto, has chosen the recipients of the Fifth Blue Planet Prize, an international award first given in 1992 at the United Nations Conference on Environment and Development in Rio de Janeiro. Presented annually to two recipients, the prize commends individuals, groups, and organizations whose achievements have contributed to the resolution of global environmental problems.

**Dr. Wallace S. Broecker** of the United States, Newberry Professor of Geology at Columbia University, has made major contributions to our understanding of climate change and global warming through his research into global ocean currents and ocean chemical cycles, particularly the carbon cycle.

The **M.S. Swaminathan Research Foundation** of India is a nonprofit organization that supports the promotion of sustainable agriculture and rural development with methods that include the preservation and sustainable utilization of biodiversity, the improvement of soil and plant health using environmentally friendly methods, and the creation of ecojobs for rural families. The research foundation, chaired by Dr. M.S. Swaminathan, is the first Blue Planet Prize winner from Asia.

In addition to public recognition, each Blue Planet Prize winner will receive ¥50 million. An awards ceremony will be held at the Imperial Hotel in Tokyo on October 31, 1996, and the prize recipients will deliver commemorative lectures at the United Nations University in Tokyo on November 1, 1996.

**Selection Rationale**

*Dr. Wallace S. Broecker*

Through his systematic measurements of carbon and other chemical elements and isotopes, Dr. Broecker has contributed to the understanding of chemical cycles in the oceans. In the 1980s, he elucidated the presence of the “great conveyor belt,” a global ocean current that envelops the Earth, extending from the North Atlantic and circulating through the Indian and Pacific oceans. Often

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called "Broecker's Conveyor Belt," the importance of this phenomenon to the Earth's climate was first recognized by Dr. Broecker.

Dr. Broecker clarified how the surface waters and the deep waters of the ocean circulate in a cycle that takes one to two thousand years, and he pioneered the use of chemical and isotopic methods to determine the rate of gas exchange between the atmosphere and the ocean. His analysis of these data has shed light on the influence of such processes on climate change.

In addition, he early recognized the significance of the global carbon cycle and devised a method of using radiocarbon measurements on samples of ocean water, thereby amassing a vital body of research results. Dr. Broecker has offered his ideas and guidance to hundreds of scientists around the world. Describing humankind's emission of greenhouse gases as playing Russian roulette with the climate, he was among the first to sound the alarm about global warming.

### *The M.S. Swaminathan Research Foundation*

The M.S. Swaminathan Research Foundation (Madras, India) was founded in 1988 with the goal of promoting research and activism to further rural and agricultural development by environmentally sustainable and socially equitable means. The founder and chairman of this organization is Dr. M.S. Swaminathan, the recipient of the first World Food Prize, in 1987, and of the 1986 Albert Einstein World Science Award.

One of the research foundation's major achievements has been the study and conservation of coastal ecosystems, particularly mangrove wetlands. Based on its research into vegetation, soil salinity, and other aspects of mangrove habitats, the research foundation has taken steps to restore degraded wetlands. By promoting sustainable agroforestry and aquaculture, together with the use of organic fertilizers, the M.S. Swaminathan Research Foundation helps establish integrated coastal management systems that can provide an ecologically sustainable livelihood for coastal families.

The research foundation also conducts a community biodiversity program to rescue endangered plant species from extinction, identifies microorganisms to serve as bioindicators of ecosystem health, and conserves genetic diversity of plant species used as food or in medicinal and other applications. This program includes the creation of a community gene bank to store collected seeds as well as the establishment of guidelines for conducting ecological observations. These are only a few examples of the many activities undertaken by the research foundation to help restore and maintain natural habitats and biological diversity through the application of technology.

In addition, the research foundation promotes the biovillage model of sustainable rural development in India, the People's Republic of China, and Southeast Asia. Further positive results from these efforts are expected in the future. By helping to conserve the natural environment of developing countries while supporting the economic viability of rural communities, the M.S. Swaminathan Research Foundation is playing an important role in the search for solutions to global environmental problems.

### **Remarks from the Award Recipients upon Being Notified of Their Selection**

*Dr. Wallace S. Broecker*

"I am extremely honored to have been chosen as the 1996 recipient of the Blue Planet Prize. While during my career I have pondered many, many aspects of Earth chemistry

and climate, I consider two aspects to be the most important. The first has to do with contributions I have made to the understanding of the operation of the Earth's carbon cycle now and during the most recent glacial period. The second is the ocean's role in triggering changes in the mode of operation of the global climate system. These studies have generated within me a great respect for the operation of the Earth system. I find that it is far more complicated and interesting than I ever dreamed when I started these studies 40 years ago. I also have come to realize that by adding carbon dioxide and other trace gases to our atmosphere, we play what Americans call 'Russian Roulette,' for we lack the wherewithal to reliably predict the outcome of this activity. There is one chance in six that we will look back on the greenhouse era as a very dark page in the environmental history of our planet. We must prepare to deal with the changes associated with the coming warming."

*The M.S. Swaminathan Research Foundation, Chairman: Dr. M.S. Swaminathan*

"I wish to express our deep gratitude to the Asahi Glass Foundation for choosing us for the 1996 Blue Planet Prize. It is increasingly clear that the developmental pathways followed by humankind during this century, particularly after World War II, are leading to serious and often irreparable damage to the basic life support systems of our planet, namely land, water, forests, biodiversity, oceans, and the atmosphere. In addition, contemporary development activities are resulting in a widening rich-poor divide, social disintegration, the feminization of poverty, and jobless economic growth.

"At the same time, there are now uncommon opportunities for sustainable and equitable development. The onset of the information age has made the concept of the 'global village' real. Frontier technologies like biotechnology, space technology, renewable energy technology, and pollution-free industrial material and processes are opening up opportunities for integrating the principles of ecology, social and gender equity, and economics in the form of a new development paradigm.

"In the eight years since the M.S. Swaminathan Research Foundation was established, more than 160 young scientists and scholars have been working on a number of important projects, including the conservation of coastal ecosystems, particularly mangrove wetlands, the protection of endangered species and habitats, and research to meet potential threats to food and livelihood security as a result of global climate change. We accept the Blue Planet Prize with humility and pledge to work with dedication and determination to keep our planet ever blue."



For your information, this press release may also be viewed on the Asahi Glass Foundation's home page on the World Wide Web of the Internet.

The Foundation's home page address is <http://www.af-info.or.jp>



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## **Dr. Wallace S. Broecker**

(Born on November 29, 1931, in Chicago, Illinois, U.S.A.)

Newberry Professor of Geology at Columbia University, Lamont-Doherty Earth Observatory

Dr. Wallace S. Broecker is perhaps the world's foremost interpreter of the Earth's operation as a biological, chemical, and physical system. He began his research in the 1950s with the development of techniques for measuring the radiocarbon content of ocean water and the ages and accumulation rates of deep sea and lake sediments, using this data to trace ocean circulation patterns over time. One of a group of scientists researching climate change with radiocarbon dating of marine shells found in sediment deposits on the sea bottom, Dr. Broecker helped discover that the abrupt end of the most recent ice age occurred approximately 11,000 years ago.

In the 1970s, Dr. Broecker was one of the leaders of the Geochemical Ocean Sections (GEOSECS) program, which used radiocarbon dating to gather a wealth of information from the world's oceans. In the 1980s, he used radioactive fallout from nuclear bomb tests conducted in the 1960s as chemical tracers to study the rate of uptake of fossil fuel carbon dioxide by the ocean. In addition, in the mid-1980s Dr. Broecker devised his theory of global ocean circulation, today often termed "Broecker's Conveyor Belt." He pioneered the study of the circulation of chemical elements in the sea, the thorough mixing of surface water and deep water of the ocean that takes place every one to two thousand years, and the rate of gas exchange between the atmosphere and the ocean.

Dr. Broecker used radiocarbon dating of samples of ocean water to study the world's oceans. He was a leader in recognizing the importance of the carbon cycle and at the forefront of quantifying its chemical processes, as well as studying the ocean's influence on atmospheric carbon dioxide levels. Many of Dr. Broecker's numerous publications deal with the carbon cycle, and his book *Tracers in the Sea*, published in 1982 and co-authored with T.-H. Peng, has become an indispensable guide for the world's geochemists.

While researching changes in the Earth's climate that occurred in the past 200,000 years, Dr. Broecker discovered that major climate shifts may have occurred much more rapidly than previously had been believed possible. For example, about 11,000 years ago in an event known as the Younger Dryas, temperatures in Northern Europe suddenly plummeted and remained low for about 1,000 years before snapping back to the warm conditions that exist today. The actual transition periods from warm to cold and back again may have taken as little as 20 years. Dr. Broecker believes that this cold spell may have been caused by a temporary disturbance in the global circulation of the world's oceans. Because this global current is linked in complex ways to the atmosphere, the emission of greenhouse gases through fossil fuel combustion could trigger a major interference in the Earth's climate as we know it today.

Through his investigation of oceanic cycles and the relationship of the oceans and the atmosphere, as well as his enthusiastic promotion of research into chemical cycles such as the carbon cycle, Dr. Broecker has advanced our understanding of climate change and provided invaluable information on which to base strategies for dealing with the problem of global warming.

## **Education and Academic and Professional Activities**

- 1953 Received bachelor of arts degree from Columbia College of  
Columbia University
- 1958 Earned doctorate degree from Columbia University
- 1959 Became assistant professor at Columbia University
- 1961 Became associate professor at Columbia University
- 1964 Became full professor at Columbia University
- 1977 Named the Newberry Professor of Geology, Columbia University
- 1979 Elected to the National Academy of Sciences (U.S.A.)  
Elected chairman of the Geochemical Society (U.S.A.)

Research interests include paleoclimatology, ocean chemistry, isotope dating, and environmental science.

## **Major Awards Received**

- 1979 Maurice W. Ewing Medal of the American Geophysical Union
- 1986 Alexander Agassiz Medal of the National Academy of Sciences  
Urey Medal of the European Geophysical Union  
U.M. Goldschmidt Award, Geochemical Society
- 1987 Vetlesen Prize, G. Unger Vetlesen Foundation
- 1990 Wollaston Medal of the Geological Society of London
- 1995 Roger Revelle Medal of the American Geophysical Union

## **Major Honors**

Fellow, American Geophysical Union  
Fellow, European Geophysical Union, 1992  
National Academy of Sciences, 1979  
American Academy of Arts & Sciences, 1976

## **APPENDIX 1-2**

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### **The M.S. Swaminathan Research Foundation (MSSRF)**

(Madras, India; Established in 1988)

Chairman: Dr. M.S. Swaminathan

The M.S. Swaminathan Research Foundation was established by Dr. Swaminathan in July 1988 as a nonprofit organization with the goals of preserving regional ecosystems, developing innovative technology to help realize sustainable agriculture, and promoting the application of ecotechnology in agricultural communities. To help realize these goals, the MSSRF has instituted a number of programs to help alleviate extreme poverty and deprivation through the technological and skill empowerment of the rural poor, particularly women. In 1990, the research foundation established as its core organization the Centre for Research on Sustainable Agricultural and Rural Development.

MSSRF has also set up the Technical Resource Centre for the Implementation of the Equity Provisions of the Convention on Biological Diversity to gather information that will help rural families obtain the recognition and reward due to them for their past and present contributions to genetic conservation and enhancement. The programs of the research foundation are organized under the following five areas.

The first area consists of aligning environmental protection and agricultural productivity in coastal wetlands. In particular, the foundation conducts research into how to tie the ecological security of mangrove forests to the livelihood of coastal communities. With the support of the International Tropical Timber Foundation, MSSRF conducted a survey of mangrove genetic resources throughout Asia and West Africa. The research foundation then developed a multimedia database and an international information service on mangrove ecosystems.

The second area involves research on the conservation of biodiversity, a fundamental requirement for sustainable agriculture. Specific activities include saving endangered plant species and habitats, promoting the revitalization of genetic conservation traditions of local peoples, and maintaining soil fertility by monitoring microorganisms in soil. The research foundation has also created a gene bank to provide modern techniques for the preservation and use of plant genetic material. Based on its research efforts, MSSRF helps set up sustainable agricultural systems.

The third area consists of the application of ecotechnology to sustainable agriculture. Ecotechnology is a term used to describe the blending of vanguard technologies, including biotechnology, with the ecological wisdom and practices of local communities so as to integrate the ecological and economic strengths of both approaches. Ecotechnology is put into action by the voluntary participation of whole communities, known as biovillages. Similarly, programs have been instituted to create ecojobs, which generate additional food and income from available natural resources in a sustainable manner. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has designated MSSRF as the coordinator for the Asian Ecotechnology Network.

The fourth area is a program entitled Reaching the Unreached, which aims to bring the benefits of new technologies to the economically and socially disadvantaged, especially women and children, and promote gender equity in development.

The fifth area involves training programs and communications tools, including publications. Among its many other activities, the research foundation maintains databases, conducts educational programs, and holds workshops for policy makers and farming families.

## History

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| 1988 | The M.S. Swaminathan Research Foundation is registered in Delhi, India, with the goals of preserving regional ecosystems, developing innovative technology to help realize sustainable agriculture, and promoting the application of ecotechnology in agricultural communities. |
| 1990 | To help achieve its goals, the research foundation establishes the Centre for Research on Sustainable Agricultural and Rural Development at Madras, India, as its core organization.  |
| 1996 | The research foundation hosts the Science Academies Summit on the theme "Uncommon Opportunities for a Food-Secure World."   |

## APPENDIX 2

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### The Blue Planet Prize

The Blue Planet Prize was established in 1991 by the Asahi Glass Foundation to express sincere appreciation for the achievements of individuals, groups, and organizations conducting noteworthy research and activities leading to the solution of environmental problems. As well, the Foundation hopes to raise interest in and awareness of environmental issues, which affect all of us equally. The Blue Planet Prize is an international award recognizing environmental research and related activities. Two winners are chosen annually, and each receives a certificate of merit, a commemorative trophy, and a supplementary prize of ¥50 million.

Between August and October of each year, candidates for the Blue Planet Prize are nominated from around the world. Following several meetings of the selection committee, the shortlist of candidates is sent to experts in various countries who are asked for their advice. Finally, the prizewinners are determined by the Board of Directors and Councillors in consultation with the presentation committee.

### Past Prizewinners

**1992 Dr. Syukuro Manabe**, Member of the Senior Executive Service of the Geophysical Fluid Dynamics Laboratory at the National Oceanic and Atmospheric Administration (U.S.A.)  
*Selection Rationale: Pioneering research for predicting climate change by numerical models*

**International Institute for Environment and Development (IIED)** (U.K.)

*Selection Rationale: Sustainable development research work and pioneering implementation activities*

**1993 Dr. Charles D. Keeling**, Scripps Institution of Oceanography at the University of California, San Diego (U.S.A.)  
*Selection Rationale: Pioneering research into atmospheric and oceanic carbon dioxide levels and the global carbon cycle*

**IUCN—The World Conservation Union** (Headquartered in Switzerland)

*Selection Rationale: Over forty years of outstanding results applying scientific strategies to the conservation of natural resources and the promotion of biological diversity*

**1994 Professor Dr. Eugen Seibold**, Professor Emeritus at the University of Kiel (Germany)  
*Selection Rationale: Interdisciplinary approach to research in the field of marine geology and major contributions to the understanding of global environmental problems*

**Lester R. Brown**, Founder and President of the Worldwatch Institute (U.S.A.)

*Selection Rationale: Contributions to international awareness of global environmental problems and formulation of solutions based on scientific analysis*

**1995 Dr. Bert Bolin**, Professor Emeritus at the University of Stockholm (Sweden)  
*Selection Rationale: Pioneering research into the carbon cycle and major contributions to worldwide climate policy formation*

**Maurice F. Strong**, Chairman of the Earth Council (Canada)

*Selection Rationale: International leadership in conceptualizing sustainable development and forming implementation strategies based on findings of scientific research into environmental problems*