

1998 Presentation of Foundation-Assisted Research Findings Bettering the Future of the Global Environment-Comprehensive Research Assistance



Professor Shigeru Ito introduces the Foundation's research assistance program for comprehensive research.

On July 14, 1998, the results of Foundation-supported comprehensive research were announced at the United Nations University. The public lecture was opened by Jiro Furumoto, chairman of the Foundation. Professor Shigeru Ito of Keio University, representing the Foundation's research assistance committee, explained the Foundation's category of comprehensive research and announced the grant recipients.



Evaluating the Global Environment from Air Contained in Antarctic Ice

Professor Shinji Mae, Graduate School of Engineering, Hokkaido University

Professor Mae analyzed gas components within Antarctic ice to research historic climatic changes. Ice from 300,000 years ago was obtained through deep-layer drilling conducted at the Russian Base Vostok and the Japanese Base Dome Fuji. In cooperation with France Laboratoire de Glaciologie et Geophysique de l'Environnement C.N.R.S., Professor Mae studied types of gas molecules found in ice from Base Vostok to prove that water molecules surround gas molecules to create monocrystals (air hydrates) in ice found deeper than 500 meters. It was also discovered that the size of air hydrates and the concentration of gas components within monocrystals are related to historic climatic changes.



Carbon Circulation Systems in Beech Forests in Japan and Canada

Professor Kaneyuki Nakane, Faculty of Integrated Arts and Sciences, Hiroshima University
Yasuyuki Oshima, President, Natural Environment Research Center

In order to determine the parameters of climate change, the quantity of carbon dioxide that can be absorbed by forests must be determined. Professor Nakane measured the quantity of carbon in the soil relative to changes in climate and soil temperature of beech forests of Canada, which have little undergrowth, and beech forests of

Tochigi Prefecture, which are covered with a short, leafy variety of bamboo.

The project was conducted in cooperation with the University of Toronto.

Professor Nakane developed a model for the carbon circulation system based on this data to analyze carbon dioxide absorption power.

Although there are differences in Japanese and Canadian beech forests' circulation systems, the soil's annual carbon absorption ability in Canada was 6.55 tC/ha and, in Japan, 6.97 tC/ha.

This makes it clear that forests in both cold and warm climates are directly related to carbon dioxide absorption.



Photochemical Air Pollution in the Czech Republic and Policies for Improvement

Professor Hiromasa Ueda,
Disaster Prevention Research
Institute, Kyoto University

Researchers from five nations, including Japan and the Czech Republic, cooperated in determining the levels of and reasons for the generation of high levels of air pollution in Prague and surrounding areas, as well as proposing efficient policies based on scientific data.

Observation over four years determined that although SO_x pollution has decreased in Prague, NO_x levels remain high in the center of the city. Photochemical air pollution levels are low in the city center while high in the surrounding areas, indicating the large effects of cross-border transportation from neighboring countries.

The Prague municipal government is promoting education for citizens, improving observation networks as well as reviewing policies to improve this issue based on Professor Ueda's proposal.



U.S. - Japan Comparison of Recycling Attitudes and Action

Professor Takematsu Abe, Faculty of
Law, Nihon University

To promote effective recycling of waste, people generating the waste must have a high understanding of their actions. Researchers in Japan and the United States cooperated in conducting surveys on residents' understanding and actions regarding waste recycling in Tokyo and Seattle, as well as the surrounding regions of both cities.

Regarding the sorting and separate collection of recyclable waste, U.S.

citizens are economically committed in comparison to Tokyo residents, who are morally committed.
Economically committed people tend to recycle waste for a continuous period of time.
On the other hand, morally committed people might stop recycling because they tend to disregard the economic aspects.
Professor Abe proposes efficient and accurate methods of offering information through the media in order to establish environmentally friendly waste disposal methods.
Local governments' information inserted in newspapers were found to be most effective.



Sustainability and Catastrophe: Simulations for the 21st Century

Professor Shunsuke Mori,
Faculty of Science and Technology,
Science University of Tokyo

Professor Mori developed a comprehensive model (MARIA) which quantitatively evaluates sustainable progress through research in the multidisciplinary areas of energy, resources, economics, population, food and development.
The program divides the world into four blocks.
The gross domestic product of these four blocks is estimated based on data on the above areas.
Professor Mori forecasts that a global crisis may be avoided if manufacturing activities are continued while absorbing the costs of global warming and if energy consumption levels for transportation and private citizens are kept at appropriate levels using nuclear and biomass as energy resources while recovering and efficiently disposing of CO₂.
However, some regions may see negative effects should the population of developing nations continue to increase and the ability of new food producing techniques to generate higher output be exhausted.