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SUMMARY OF THE SARES PROJECT AS A PART OF THE JAPAN–CANADA COMPLEMENTARITY STUDY

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Abstract: The Japan–Canada Comprementarity Study was born in 1989 derived from the Japan–Canada Agreement on Cooperation in Science and Technology in 1986. Several workshops were held in Japan and Canada in 1990 and 1992 to develop the joint project to evaluate the role of the Arctic Ocean as a sink of CO_2 involving ice physics, hydrodynamics and biological production. The SARES project, Saroma Ko and Resolute Passage Study, was lounched on the first-year ice of Saroma Ko lagoon (Northern Hokkaido, Japan) and of Resolute Passage (Northwest Territories, Canada) during the winter and spring of 1992. The two sites were chosen due to their contracted characteristics, such as geographical location, sea ice feature, oceanographic conditions. The project involved 25 Japanese and 30 Canadian scientists, graduate students and technicians, from 12 different institutions in Japan and 7 different institutions in Canada. The sixteenth Symposium on Polar Biology was held at National Institute of Polar Research, Tokyo in December 1993, to synthesize the scientific achievement of the SARES project.

The Japan–Canada Complementarity Study was published in 1989 within the framework of the Japan–Canada Agreement on Cooperation in Science and Technology of 1986. Six broad "umbrella" areas of science and technology were identified for enhanced cooperation. One of them was "Sustainable development and environmental management", which included the influence of the North Polar Region on global climatic change and global scale simulation.

A Japan–Canada workshop on "The influence of the North Polar Region on global climatic change and global scale simulation" was held in Tokyo and Tsukuba, Japan, on 27–30 March 1990. The workshop was organized around four subgroups. A subgroup on "Global warming phenomena in the Arctic" discussed the "Impact on biosphere in Polar region". Four Canadian and five Japanese scientists participated in this session. The report of the workshop stressed the role of the Arctic Ocean on global climate change and "several specific examples of possible areas for collaboration on biological impacts were identified, including work on the physics and biological production of first-year ice areas". This led to the SARES project

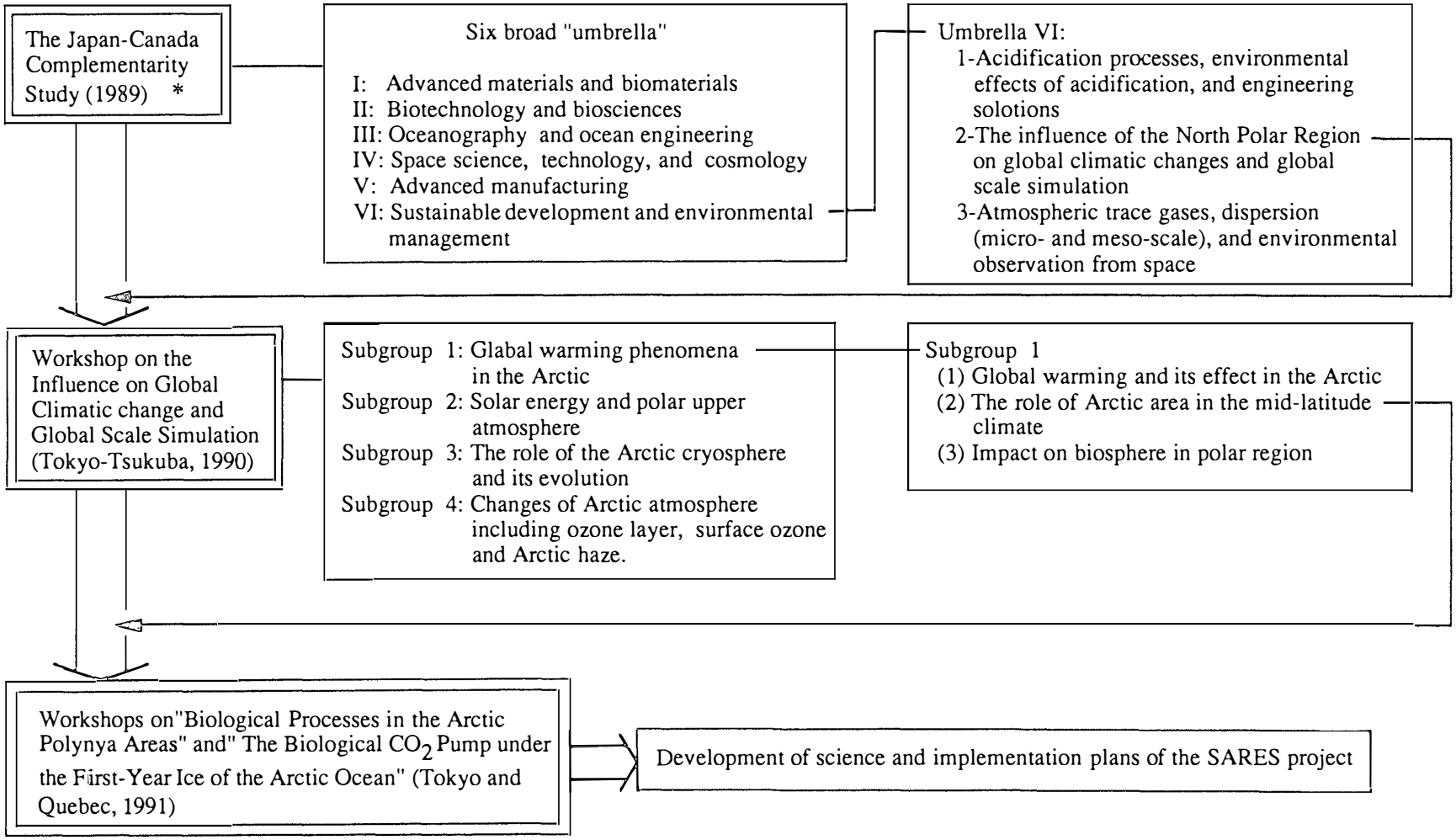

*Fig. 1. Development of the SARES project. *KENNEY-WALLACE, G. (1989): Canada-Japan Complementarity Study. Science Council of Canada, 22 p.*

(Saroma Ko and Resolute Passage Study). The development of this project is summarized in Fig. 1.

In 1990, research programs were proposed in the two countries to implement the SARES project. The Japanese proposal on "Biological Processes in the Arctic Polynya Areas" (Principal investigator: Takao HOSHIAI, National Institute of Polar Research) to the Monbusho International Scientific Research Program (03044146) and the Canadian proposal on "The Biological CO_2 Pump under the First-Year Ice of the Arctic Ocean" (Principal investigator: Louis LEGENDRE, Laval University) to the Japan Science and Technology Fund were granted 3-year funding.

The main objective of the SARES project were to measure the activity of the biological CO_2 pump under the first-year sea ice, and to characterize its main physical controls in two first-year ice areas with very contrasted characteristics. Saroma Ko is a coastal lagoon, located in Northern Hokkaido (44°N). It is the southernmost area in the Northern Hemisphere with seasonal sea ice. Resolute Passage is an open area, located in the Canadian High Arctic (74°N). It is one of the northernmost areas with recurrent first-year sea ice. The two sites were chosen because of their contrasted characteristics, such as geographical location, sea ice features, and oceanographic conditions.

Two workshops were organized in 1991, in order to discuss details of the science plan and of its implementation. The first meeting was held at the National Institute of Polar Research (Tokyo, Japan; 28 January through 1st February 1991), and the second workshop was held at Laval University (Québec City, Canada; 23 to 26 September 1991). Field work in the Saroma Ko lagoon was carried out from 18 February to 28 March 1992, and that in Resolute Passage, from 7 April to 30 June 1992. Following the field studies, two workshops were held to analyze data and prepare publications. The first one was within the Eight International Symposium on Okhotsk Sea and Sea Ice (Mombetsu, Hokkaido, Japan), in February 1993. The second was at the Maurice Lamontagne Institute (Mont-Joli, Québec, Canada), in September–October 1993. The last workshop was devoted to detailed planning of a joint volume and actual writing of publications.

Overall, 25 Japanese and 30 Canadian scientists, graduate students and technicians, belonging to 12 different institutions in Japan and 7 in Canada, participated in the planning and implementation of the SARES project. The project has already produced a number of publications, data reports and presentations at various meetings. The XVI Symposium on Polar Biology at the National Institute of Polar Research, Tokyo, was organized to be the finale of the SARES project. One summary presentation (this paper) and three overview papers were given in plenary session, followed by 7 individual oral presentations and 11 individual posters. The three overview papers covered major components of the SARES projects, *i.e.* (1) physical and meteorological conditions, (2) primary production and microbial food web, and (3) zooplankton and fish. These were given by Kunio SHIRASAWA, Serge DEMERS and Louis FORTIER, respectively. The present volume of proceedings contains the summary paper, the three overview papers, one original paper, and abstracts of individual presentations. Corresponding original papers, except one,

will be submitted for publication in a special issue of the Journal of Marine Systems devoted to the SARES project.

The SARES project would not have been possible without the collaboration of a large number of colleagues and support staff, in both Japan and Canada. We gratefully acknowledge their essential contribution.

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