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# Collaborations with Other Parties in Science and Related Activities during the 2006/2007

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Conscious of the importance of collaborations among the parties within the spirit of the Antarctic Treaty and in accordance with Article 6 of the Protocol, Korea had cooperated with several parties during the 2006/2007 in scientific and related activities.

## *1. Trace metal analysis in the snow pits in cooperation with China*

As a cooperative work between Korea and China, two snow pit samples were collected in the Lambert Glacier basin, East Antarctica. Trace metals, water soluble ions and Pb isotopes in the snow samples were analyzed to investigate inter- and intra-annual changes in their concentrations. In addition, successive snow samples from a pit at the Dome A were collected during the Chinese expedition to Dome A in 2004/2005 and they are to be analyzed for various elements. (Contact point: Dr. Sungmin Hong, smhong@kopri.re.kr)

## *2. A joint paleoceanographic study between Korea and Israel*

KOPRI and the Department of Environmental Sciences and Energy Research, Weizmann Institute of Science in Israel have been working together to reconstruct paleoenvironment recorded in sediment cores retrieved from Bransfield Strait, South Orkney Plateau and Drake Passage. Sedimentological, geochemical & paleontological analysis are being performed at KOPRI and carbon, nitrogen, and oxygen isotope analyses on diatom at Weizmann's isotope laboratory. Two Korean scientists have stayed in Israel to learn the procedure of cleaning and pre-treatment of diatom and analyze the stable isotope compositions of diatom in a sediment core from South Orkney Plateau and Drake Passage. (Contact point: Dr. Ho Il Yoon, hiyoon@kopri.re.kr)



## *3. A hydroacoustic monitoring in the Bransfield Strait*

In anticipation of the up-coming 2007-2008 International Polar Year, the Korea Oceanographic and Polar Research Institute (KOPRI) and the NOAA Ocean Exploration Program deployed seven acoustic hydrophone moorings (complete with current meter) in the Bransfield Strait and Drake passage from the *R/V Yuzhmorgeologiya* in December 2005. They recovered those seven hydrophones and redeployed five hydrophones in the Bransfield Strait in December 2006. These hydrophones record underwater sounds originated from earthquakes, icebergs and marine mammals. We expect to understand tectonic events, volcanic activities, and ice breakup in the region from those records. (Contact point: Dr. Minkyu Park, minkyu@kopri.re.kr)

## *4. Fire and Ice: Exploring Submarine Hydrothermal Activity at Deception Island, Bransfield Strait, Antarctica*

During November 2006 the Korea Oceanographic and Polar Research Institute (KOPRI) and the NOAA Ocean Exploration Program recovered the hydrophones and preparing them for another year deployment in the Bransfield Strait off the west coast of the Antarctic Peninsula. During this cruise, we took the research vessel into the submerged caldera of Deception Island, a recently active volcano located in the Bransfield Strait. In support of logistic operation from the Spanish Antarctic Base, Gabriel de Castilla, KOPRI and NOAA scientists performed detailed studies, using a small ROV and hydrophone, of the extensive submarine hydrothermal vent systems and fumaroles within the bay of Deception Island. This research was conducted in cooperation with the Spanish Polar Committee. (Contact point: Dr. Minkyu Park, minkyu@kopri.re.kr)

## *5. Gas hydrates survey in the Sea of Okhotsk (CHAOS-III 2006)*

The CHAOS-III (2006) expedition, an international collaborative research program for hydro-*C*arbon Hydrate *A*ccumulations in the Okhotsk *S*ea, was conducted in the northeastern continental slope of Sakhalin Island, Okhotsk Sea from 24 May to 18 June 2006. 30 scientists from Korea (KOPRI), Russia (POI and VNIIOkeangeologia), Japan (KIT), and China (IOCAS) participated in the expedition. The main purpose of the expedition was to study gas hydrate-related geological and oceanological phenomena in the Okhotsk Sea and to define gas hydrate area in the northeastern slope of Okhotsk Sea. **High-resolution geophysical survey, Core sediment study and underway observation in the gas hydrate area on the slope were carried out by KOPRI scientists in the expedition.** (Contact point: Dr. Young Keun Jin, ykjin@kopri.re.kr)

### *6. International collaboration on the study of Antarctic oscillations and their impact on mid-latitude climate*

It is important to understand what caused the Antarctic Oscillation (AAO) variability, particularly the low frequency variability. This heavily depends on the availability of the AAO index reconstruction. To improve the quality of low-frequency changes in the reconstruction, we need to take the advantage of multiproxy data, including tree-ring and ice-core data sets. The usage of ice-core and coral data would greatly improve the low-frequency climate signals and hopefully result in a much better AAO index for the past several centuries. That is essential to answer whether recent trend in AAO is caused by ozone as suggested by recent simulations. In order to investigate pole to the AAO variability and its connection to mid-latitudes, KOPRI and Bejing Normal University of China are currently collaborating. The purpose of this study is to find teleconnections between Antarctica and East Asia by analyzing coral records in the northern mid-latitudes and modern meteorological data. (Contact point: Dr. Seong-Joong Kim, KOPRI, seongjkim@kopri.re.kr)

### *7. Arctic atmospheric aerosol and climate research*

In August 2006, a collaborative research between KOPRI and the Zeppelin aerosol research team (Sweden Stockholm University, Norway polar research institute) has started by additional atmospheric particle number concentration monitoring at the AWIPEV Corbel station in Ny-Alesund. Data from these collaboration will contribute to the understanding not only the physico-chemical processes of new particle formation, but also the formation of clouds through growth into the CCN size and activation. Simultaneous measurements of the DMS(g) and CCN at the Zeppelin Station is now being deployed in 2007, and this new plan will significantly contribute to the better understanding of (i) the air-sea interchange of the trace gas, and (ii) the feedback between climate systems, especially for unpolluted Arctic environments, below and above the cloud level. (Contact point: Dr. Young Jun Yoon, yjyoon@kopri.re.kr)

### *8. The 14th International Symposium on Polar Sciences*

International Symposium on Polar Sciences will be held in KOPRI, Incheon, South Korea in May 15-17, 2007. The symposium is the 14th of its kind, and it has been held in Korea every one or two years since 1988 (every year since 2000). With the theme, ‘Polar Regions in Global Change’, there will be more than 45 presentations spanning from paleoceanography and paleoclimatology, glacialogy, atmospheric sciences, geophysics, geology, and gas hydrates. Seventeen foreign scientists from eight countries will participate in the symposium and give their presentations.

(Contact point: Dr. Jae Il Lee, leeji@kopri.re.kr; Dr. Hyoun Soo Lim, tracker@kopri.re.kr)

### *9. Logistic cooperation with China, Chile, Uruguay and Russia*

KOPRI had two vessel operations in the 2005/2006: one for conducting research and the other for transporting fuel and provisions to King Sejong Station. With the research vessel, we have provided a free service transporting and loading/unloading cargo to Chinese and Russian bases. Second vessel operation was conducted with Uruguayan Antarctic Institute. Uruguayan Navy vessel, “ROU04 Artigas” transported 150CBM of Korean cargo from Montevideo, Uruguay to Maxwell bay, King George Island. Chile and Uruguay which have amicably neighboring bases on King George Island, aided Korea with airlift service to

and from an Antarctic gate way, Punta Arenas, Chile and King George Island again as in the previous seasons. Frequent flight services by Chilean Air Force provided timely services to scientists who had irregular time schedules for their field work, transporting Korean scientists and cargo. It was crucially helpful for us to complete our summer campaign effectively and successfully in time, alleviating a great deal of time loss in the season's operation. We would like to heartily thank these parties for their unsparing efforts exerted. (Contact point: Mr. Hyoung-Geun Lee, hglee@kopri.re.kr)