

The World Climate Research Programme and IPY

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The major polar research conference that was held in Oslo in June 2010 celebrated the end of the International Polar Year (IPY), a multi-year (2007-2008) and interdisciplinary international programme sponsored by ICSU and WMO. WCRP has been at the forefront of the planning and implementation of IPY since its inception. It was during the decade (1994-2003) of the Arctic Climate System Study (ACSYS), a completed WCRP core project, rapid changes in the Arctic climate were predicted and detected. The WCRP research at the end of the 20th century and beginning of this century was clearly indicating the likelihood of massive changes in the Polar Regions and their high importance for the rest of the globe.

Polar and cryospheric research has been and continues to be a priority for WCRP. In 2000, WCRP initiated the core project "Climate and Cryosphere" (CliC), a global initiative, which would continue beyond the end of ACSYS. In October 2002, the ACSYS/CliC Scientific Steering Group reviewed the idea of an IPY and agreed that cryosphere and climate should be an important element of the its programme. They also recommended that synchronous observations of snow cover, sea-ice, permafrost, mountain glaciers and ice sheets should be made in both hemispheres and that a concept paper should be developed trying to justify the initiation of an International Polar Decade (IPD) in 2007/08 rather than just having "a Polar Year", which was deemed to be short for climate studies.

The 24th Session of the Joint Scientific Committee for the WCRP (JSC, Reading, March 2003) asked CliC to organize preparations for IPY within WCRP, taking into account the interests of all relevant projects and working groups. WCRP- and CliC- affiliated specialists took a very active role in the discussions of the IPY concept and agenda, both at national and international arenas, and within ICSU and WMO circles. The main ideas expressed by WCRP/CliC representatives at the time were focused on creating a dataset of multidisciplinary and multi-scale observations in the polar atmosphere, ocean, cryosphere, and land that would be instrumental for diagnostics of the state of the polar climate system and would enable its comprehensive modeling and prediction. The abilities to scale observations up and down and provide a coherent description of the climate system were deemed important. In the early WCRP statements on IPY, a strong requirement was also expressed on the need to have a comprehensive data management system. The ACSYS Data and Information Service (ADIS), which at the time was being reviewed with an intention to propose a Data and Information Service for CliC (DISC) was offered as a prototype. The input from the WCRP community, in various forms, such as ideas expressed at several Open IPY Forums, was taken into account in "A Framework for the International Polar Year 2007-2008" published in September 2004, including its data management part.

Responding to the IPY Joint Committee (JC) November 2004 call for ideas, WCRP issued an internal call. Approximately one hundred ideas associated with WCRP activities were submitted to IPY JC. In May 2007, the Integrated Global Observing Strategy (IGOS) Partnership endorsed the IGOS Cryosphere Theme Report prepared by WCRP and SCAR, which proposed a community-consensus based approach to the development of cryospheric observations. The

work on this report resulted in the proposal of the Global Interagency IPY Polar Snapshot Year (GIIPSY) project, which subsequently led to the establishment of the IPY Space Task Group.

The WCRP community was very responsive to the JC's calls for preparation of full proposals. WCRP and its projects became a leading international agency of 23 major IPY projects. Twelve other projects were related to WCRP or its core projects. Almost all of the WCRP- and project-related proposals were endorsed by the IPY JC. Climate research strongly shaped the IPY science agenda.

WCRP has used the opportunity of IPY to engage several partners in joint proposals for ideas and projects. Some partners engaged WCRP in their activities. Strong cooperation was developed with WMO, SCAR, IPA, and AOSB. The ESA announcement of opportunity to work with IPY satellite data explicitly indicated that it was issued to meet CliC IPY objectives.

Early in the IPY period WCRP engaged in activities aimed at creating and preserving the IPY legacy. The following achievements were anticipated from WCRP IPY activities:

- improved understanding the state of the cryosphere, and its past, present and future variability and change across a range of time and space scales, which was encompassed in the WCRP "flagship" IPY project "State and Fate of the Polar Cryosphere";
- first "virtual" satellite constellation under the umbrella of the GIIPSY project proposed by CliC and IGOS Theme on Cryosphere. It involved all major space agencies, and had the emphasis on the use of Synthetic Aperture Radar sensors;
- establishment of a basis for an innovative Arctic Ocean Observing System and intensification of observations in the Arctic Ocean (via AOSB);
- unprecedented survey of the Southern Ocean and establishment of elements of its observing system;
- advances in the establishment of an Arctic hydrological cycle observing system and advances in polar hydrology;
- a step forward in permafrost monitoring;
- record-long (~1 million years) ice-core based climate history (Chinese contribution in Antarctica);
- massive collection of data and new developments of SPARC/IPY higher troposphere-stratosphere data assimilation component;
- advances in studies of impact of aerosols on the hydrological cycle in the Arctic; and
- advances in communication and outreach, education and capacity building, more involvement of and support to young scientists.

In addition, WCRP took advantage of the interdisciplinary scope of IPY to broaden its collaboration. One key development area was the formation of climate services in Polar Regions. Together with the World Climate Programme (WCP), WCRP-CliC/IPY laid the groundwork for creating a Polar Regional Climate Outlook Forum (PCOF).

At present WCRP is actively working with partners on securing the IPY legacy. Through a series of workshops, efforts are made to develop a coherent approach towards predicting Arctic and Antarctic climate on a range of time scales.