



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

Thirty-seventh Session of the Executive Council
Paris, 23–29 June 2004

Agenda Item: 4.1.6

PREPARATION FOR THE INTERNATIONAL POLAR YEAR 2007–2008

This document contains information on planning and preparation of the International Polar Year 2007/08. It also provides some ideas on IOC involvement in this process, in particular with respect to polar oceanography. The Executive Council is invited to adopt Draft Resolution XXXVII-(4.1.6) that is proposed at the end of this document.

Status of IPY planning

- 1 The year 2007 marks the 125th anniversary of the First International Polar Year (1882/83), the 75th anniversary of the Second Polar Year (1932/33) and the 50th anniversary of the International Geophysical Year (1957/58). These Polar Years and IGY all contributed significantly to new insights into global processes and stimulated intense international collaboration.
- 2 Spurred by the interests of the European Polar Board and US Polar Research Board, the ICSU Executive Board decided in February 2003 to establish an IPY Planning Group for an International Polar Year. The role of the Planning Group is to formulate a concept for an IPY 2007/08 and to develop a mechanism for the design, development, guidance and oversight of an IPY. The Chair of the Planning Group is the Director of the British Antarctic Survey, Dr Chris Rapley. ICSU intends that the IPY 2007/08 must address exciting science, and that the programme must be truly participatory, with strong involvement from nations other than Europe and the United States. The Executive Board charged the Planning Group to provide a draft plan for an IPY 2007/08 for the ICSU Executive Board meeting in February 2004, and then develop a final plan for presentation to the ICSU 28th General Assembly in 2005. Along the way, the Planning Group should play a key role in facilitating creating a coherent structure to guide all those nations and scientists wishing to participate in the IPY.
- 3 The ICSU Executive Board approved in February 2004 an interim report of the Planning Group and decided to establish an International Polar Year 2007/08, subsequent to confirmation by the 28th General Assembly of ICSU. The ICSU Executive Board further tasked the Planning Group that, by October 2004, it should have developed a full Science Plan and have arranged to replace itself with an **International Implementation Group** to take over responsibility for the further development of IPY 2007/08.
- 4 Within UNESCO the concept of the IPY was considered at the end of September 2003 by the Chairpersons of the five scientific programmes (IOC, IGCP, IHP, MAB and MOST¹), who, in their recommendations to the Director-General and the 32nd General Conference, endorsed the participation of the five programmes in the proposed UNESCO-IUGS International Year of Planet Earth (2005/07), and the desirability of joint action in relation to the International Polar Year (2007/08) ([32 C/Resolutions, Section XII.C; Annex](#)).
- 5 The Fourteenth World Meteorological Congress considered the concept of the IPY (2007/08) in May 2003. WMO Resolution 34(Cg-XIV) approved the idea of holding the IPY, and requested the 56th WMO Executive Council (a) to examine the preparation and holding of the IPY, in collaboration with other relevant international organizations, and (b) to establish an ad hoc working body to develop a plan of action for IPY preparation and to coordinate its implementation. As follow-up actions the Secretary-General of WMO established in the WMO Secretariat an internal Steering Committee on the IPY, with a Task Team that developed an outline of programme activities to be implemented as contributions of WMO Programmes to the IPY. It is expected that the 56th session of the WMO Executive Council will agree to establish a Joint Organising Committee (JOC) with ICSU for planning and coordination of the IPY preparation.

¹ IGCP: International Geoscience Programme
 IHP: International Hydrological Programme
 MAB: Programme on Man and the Biosphere
 MOST: Management of Social Transformations Programme

- 6 Close collaboration has been established between WMO and ICSU on this matter. Recognising the interest of the WMO in supporting an IPY, the ICSU Executive Board of February 2004 proposed that **the two organizations should jointly sponsor IPY 2007/08**. The details of this joint activity are being discussed. WMO already have representation on the ICSU Planning Group to provide necessary communication. **There is room for the involvement of other potential partners including IOC.**
- 7 An International Meeting on Cooperation for the IPY was organized in the Arctic and Antarctic Research Institute (AARI), St Petersburg, Russian Federation, from 22 to 23 January 2004 by Roshydromet and the Russian Academy of Science, with the support of the European Commission. About forty participants took part in the meeting, including representatives of WMO, the ICSU Planning Group on the IPY, European and US Polar Boards, Arctic Council, IASC, the EC, and Directors of Polar Centres of Chile, Finland, Japan, Sweden and other countries. There were about 20 presentations on various topics related to scientific and operational activities in polar regions that contained proposals for an IPY programme. The meeting approved a Joint Statement suggesting priority areas for the IPY and considered that for coordination and support of joint actions it would be necessary to develop a coordination plan based on a wide range of inputs. The meeting requested WMO and ICSU, **in close cooperation with other relevant organizations**, to undertake steps in this direction.
- 8 At the time of writing (March 2004), ICSU and WMO were working on a summary of proposals for the IPY programme received from the scientific community (130 proposals) that would form a basis for development of a draft of a Preliminary IPY Outline Science Plan, which will be discussed, with WMO participation, at the third meeting of the ICSU Planning Group on IPY (Paris, 1–3 April 2004). It is planned that the draft would be presented then for comments to participants of Arctic Science Week (Reykjavik, April 2004), to the European Geophysical Union (EGU) meeting (Nice, spring 2004), American GU and Canadian GU meeting (Montreal, May 2004), Arctic Social Science Conference (Alaska, 2004) and SCAR Open Science Conference (Bremen, July 2004) and finalized at a forthcoming meeting of the ICSU PG with WMO representatives (Paris, September 2004). **The timing provides the opportunity for comment by IOC.**
- 9 **A proposal to consider IPY as a joint WMO-ICSU-IOC initiative was presented** informally by the WMO representatives at the meeting of the ICSU Planning Group on the IPY in Paris (December 2003) and at the St Petersburg meeting (January 2004). **This proposal deserves consideration by the Executive Council of IOC.**

Nature of the IPY

- 10 The IPY will be an intense international campaign of coordinated polar observations and analysis, with researchers from many nations working together to gain holistic insights into planetary processes, targeted at exploring and increasing our understanding of the poles and their roles in the global system. The IPY should address compelling science issues; enable science programmes that otherwise might not occur; attract and develop the next generation of polar scientists; and engage the public. The IPY Planning Group envisages focused research activities under three overarching themes: (i) exploration of new frontiers; (ii) understanding change at the poles; and (iii) decoding polar processes. IOC has the opportunity to provide input on the proposed themes, to suggest specific research activities, and to review proposals.
- 11 The general principles of what the IPY should consist of are as follows:
1. Intense programme of internationally co-ordinated polar observations and analysis which would not otherwise occur;

2. Address compelling science issues;
3. Lay foundation for longer-term commitments;
4. Build on and enhance existing programmes & initiatives including enabling technology;
5. Attract and develop next generation of polar scientists;
6. Engage the media and public.

12 The key characteristics of the IPY will be:

- Visionary and inspiring
- Challenging but achievable
- Include cooperative observations by many nations, thus adding value (“greater than the sum of the parts”)
- Cover both the Arctic and Antarctic, and linkages between the regions.
- Multidisciplinary, including human dimensions
- Push frontiers and therefore accept some risk of failure

13 The IPY should begin in 2007/08 to celebrate the anniversary of the historic IPYs and the IGY. Its initial duration should be approximately two years to allow time for the possibility of summer and winter field campaigns in both polar regions. However, observing networks and longer-term activities begun during IPY 2007/08 should be maintained over the long-term as necessary to achieve their goals, preferably for the order of a decade.

14 The scientific importance of the polar regions can be summarised as follows:

- The polar regions are integral components of the Earth System — linked to global climate system, sea level, biogeochemical cycles, marine ecosystems.
- The unique facets of the polar environments such as (sea ice, snow cover and major ice sheets, are variable over wide range of timescales and have exhibited non-linear behaviour.
- The polar regions respond to, amplify and drive changes elsewhere in earth system.
- The interplay of the ocean, atmosphere and the cryosphere in the polar regions makes this region key in producing “rapid” climatic change (change on decadal or human timescales).
- The polar marine benthic environment and the extensive sub-glacial environment has been a relatively isolated and stable environment over long time period and hence is particularly vulnerable to change.
- Polar ice, sediments and rocks represent a unique repository of information on past states of the planet, which provide crucial insights into the past and future.
- Polar regions are home to unique organisms adapted to the demanding environment, offering incredible opportunities to understand evolution and other biological and ecological questions, especially given the tools of modern bioscience.

15 The motivation for an International Polar Year is based firmly on the understanding that the poles are an integral component of the Earth’s complex systems. It will require a multi-disciplinary perspective which is broader scientifically and more integrative than the IGY, which

focused exclusively on the geosciences. The International Polar Year will be designed to make significant strides toward understanding the role the Poles play in the global systems, exploring the unknown, and recovering key climatic records.

16 The concept for the International Polar Year recognises that although many well-designed programmes are underway and planned for the polar regions by individual nations, a coordinated international effort will give special emphasis and facilitate a real leap forward in our understanding of the Poles, past, present, and future. The science community is truly global and international. Previous International efforts, both IGY and earlier IPYs, produced benchmark datasets which have been used time and again as baseline observation to detect change. Technology today provides the potential for the IPY 2007/8 to build the infrastructure to deliver long-term data sets — the infrastructure which will detect future change as it occurs — but doing so would require coordinated, international effort. For this reason The International Polar Year 2007/08 is envisioned as an intense programme of internationally co-ordinated polar observations and analysis which would not otherwise occur.

17 It is thus expected that successful implementation of the IPY and the comprehensive data sets and scientific results obtained as a result of the above activities will ensure further development of monitoring of environment and forecasting systems, in particular for prediction of severe weather phenomena. It should also provide a valuable contribution to the IPCC assessment of climate change and its impact in polar regions, extend our knowledge on specific physical processes in polar oceans and their impact on the global ocean circulation and climate, and serve as a basis for constructive recommendations to governmental agencies and the socio-economical sector.

The Interests of Oceanography

18 The IPY is expected to investigate physical, chemical and biological processes in polar oceans, and has direct implications for several IOC programmes, including GOOS, JCOMM, ICAM, CO2, Climate, and IODE. These programmes should therefore be represented in the planning for the IPY. For example, the IPY is expected to lead to the establishment of observing components that would last for at least a decade, thereby contributing to GOOS and, through JCOMM to observations, data management and services in polar areas. Equally, the IPY is expected to enhance understanding of how processes taking place in the polar ocean influence the circulation of the global ocean, and hence have an influence on climate in far-flung areas.

19 Several IPY projects can be expected to focus on the establishment of observing systems in the Arctic Basin and/or Southern Ocean that could significantly contribute to the development of an Arctic Ocean Observing System and an Observing System for the Southern Ocean under the auspices of JCOMM and GOOS. The present Global Ocean Observing System is especially weak in polar regions, and the IPY provides an unusual opportunity to stimulate the investment required to make GOOS effectively global. The purpose of the Arctic and Southern Ocean observing systems would be twofold: (i) to provide products and services creating socio-economic benefits for the communities on polar coasts and in the hinterland (especially in the Arctic) and relying on polar resources (in the Arctic and Antarctic); and (ii) to provide the measurements considered essential by the UN Framework Convention on Climate Change to make the Global Climate Observing System more effective (in that context it should be noted that the ocean component of GCOS is the climate component of GOOS. Among the expected benefits of improving the ocean observing systems in polar regions would be improved forecasts of weather, climate, sea state (including waves, currents and sea ice cover), and improved information about living marine resources (especially plankton—the base of the food chain). Implementation of GOOS and GCOS requirements is the province of JCOMM. It is therefore

proposed that the JCOMM Management Committee and the GOOS Steering Committee should review the relevant IPY proposals, establish contacts with the leading groups, and assist in promotion of these projects. In this connection, it will be necessary to appoint focal points within JCOMM and GOOS to communicate with IPY mechanisms. Where there are gaps evident in the proposals JCOMM, GOOS and GCOS should identify the gaps in requirements and propose measures for addressing them.

20 It should be borne in mind that GOOS and GCOS need a global supply of information about the temperature, salinity and other properties of the ocean's subsurface, so as to be able to feed both ocean surface and subsurface data into numerical models of the ocean and climate systems. This information presently comes from the growing network of Argo floats collecting information about temperature and salinity from 2,000 m deep to the ocean surface. However, even when Argo is global these floats will not work under the ice, thus leaving significant gaps in coverage in both the Arctic and the Southern Oceans.

21 One of the challenges for the IPY should be to develop and deploy the technology for under-ice Argo floats that would for the first time give a comprehensive year-round picture of circulation (i) in that part of the Southern Ocean where North Atlantic Deep Water wells up, and where Antarctic Intermediate Water and Antarctic Bottom Water form, and (ii) in the high Arctic Basin. The formation of water masses in these areas has a significant effect on ocean circulation globally, and hence on climate. Recent work shows that subsurface waters forming near the Polar Front in the Southern Ocean also influence ocean biology worldwide through their nutrient contents. Other technological solutions — like unmanned submersibles, or gliders, or fixed moorings — could also be part of a programme to make observations under the ice.

22 Surface drifters, which are important elements in GOOS and JCOMM, are deployed on the sea-ice. There has been substantial decline in the number of such deployments, especially in the Southern Ocean. The advent of the IPY offers an opportunity to reverse this undesirable trend.

23 Climate studies call for the reactivation of existing and the establishment of new sea level measurement stations in polar regions as part of GLOSS.

24 There is always the need for improved ocean bathymetry to improve the output from models of ocean circulation. For instance, ocean bathymetry steers the Antarctic Circumpolar Current, so to improve models of the current we need improved swath bathymetry maps, which may well prove important inputs for GODAE.

25 There are some things we need from the Southern Ocean that we probably will not get in time — for example ocean salinity from satellites (since the launches are not until 2008), and the ocean eddy field from the proposed Wide-Swath Ocean Altimeter (again with a launch after 2007). But there may well be some things that IOC can propose from satellites that will be available in this time period.

Draft Resolution EC-XXXVII.(4.1.6)

THE INTERNATIONAL POLAR YEAR 2007–2008

The Executive Council,

Noting:

- (i) the call by the ICSU Executive Council for an International Polar Year in 2007/2008, and the endorsement of this concept by the Fourteenth World Meteorological Congress through WMO Resolution 34(Cg-XIV),
- (ii) the recommendation by the Chairpersons of the five scientific programmes (IOC, IGCP, IHP, MAB and MOST), to the Director-General and the 32nd session of the General Conference, that UNESCO be involved in the proposed International Polar Year,
- (iii) the intention for ICSU and WMO to form an International Implementation Group to take over responsibility for the further development of IPY 2007-08,

Recalling the usefulness of the International Year of the Ocean as a means of promoting the development of oceanography nationally and internationally,

Recognizing:

- (i) the significant role of the oceans in the polar regions, not least as engines driving the circulation of global deep waters and hence influencing climate across the world,
- (ii) the potentially vital role to be played by the IOC in facilitating access to ocean data from polar regions, as well as the direct involvement played by relevant national navies in the IPY,

Decides that the IOC should be actively involved as a co-sponsor of the IPY 2007–2008;

Requests the IOC Executive Secretary to:

- (i) formally approach ICSU and WMO to propose that IOC co-sponsor and co-organize the IPY 2007-2008;
- (ii) appoint appropriate focal point responsible for communication with IPY mechanisms from within relevant IOC programmes;
- (iii) arrange for the focal points and other appropriate IOC-appointed scientists to conduct a review of proposals contained in oceanographic projects submitted for the IPY Outline Plan, to establish contacts with the project leading groups, and to assist in promotion of these projects.

Financial Implications (Regular programme)(2006–2007):

\$10,000 from the Regular Programme budget to facilitate the development of proposals for developing observing systems in polar regions, and to support the attendance of IOC focal points at relevant IPY planning meetings, supplemented by extra-budgetary funds as appropriate.