

Proposed Approach and Workplan

ICSU Planning Group for a

International Polar Year 2007/8

Purpose of this Document

This document presents the proposed approach to planning a major ICSU initiative for an International Polar Year in 2007/8. The IPY is aimed to promote intensified investigation of the role of polar regions in the Earth System.

Background

The year 2007 will mark the 125th anniversary of the First International Polar Year (1882/3), the 75th anniversary of the Second Polar Year (1932/3), and the 50th anniversary of the International Geophysical Year (1957/8). The IPYs and IGY were major initiatives, which resulted in significant new insights into global processes, and led ultimately to decades of invaluable polar research. (See Box 1.)

In spite of the investment of substantial effort in polar exploration and research over the years, the relative inaccessibility and harsh environment of the polar regions have left them less well studied than other areas of the planet. As a result, polar processes remain significantly less well understood than those in other, more accessible regions. Hidden beneath thick ice sheets and frozen oceans lie vast unexplored zones that may contain the most isolated ecosystems on the globe. At a time of growing evidence that human activities are driving the planetary machinery into a previously unexplored state, especially in the polar regions, this crucial knowledge gap must be filled.

Why organise an IPY4?

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.

The concept for the International Polar Year recognises that although many well designed programs 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 2007/8 is envisioned as an intense programme of internationally co-ordinated polar observations and analysis which would not otherwise occur.

Box 1 IPY History

The First IPY occurred in 1882-83. It was an ambitious idea, the first time that polar expeditions were driven by scientific research instead of exploration. Eleven countries participated in fifteen different polar expeditions and it heralded a new age of scientific discovery.

The Second IPY occurred in 1932-22, at the 25th anniversary of the First IPY. This time, 40 nations participated. This IPY focused primarily on Arctic research and was tempered by the constraints of the Great Depression. Still, it produced impressive successes in its areas of focus: meteorology, magnetism, aurora, and radio science.

The Third IPY was being planned for 1957-58 when it expanded in scope and was renamed the International Geophysical Year (IGY). It was proposed in 1952 by the International Council of Scientific Unions, following a suggestion by US National Academy of Sciences member Lloyd Berkner. IGY left a legacy of monumental accomplishments: Scientists measured the thickness of the Antarctic Ice Sheet for the first time, discovered the Van Allen Belts, and launched the first U.S. satellite. Some 67 nations participated and 12 nations maintained 65 stations in Antarctica. It can be argued that the IGY led directly to the Antarctic Treaty, with nations setting aside their individual claims for territory and agreeing to share the continent in the name of “peace and science.”

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

- The polar regions are integral components of 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 is 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 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.
- The Arctic is home to people and cultures also uniquely adapted to survival in the challenging environment, and these people face significant challenges caused by social and environmental change.

In summary, an intense focused campaign of polar studies bringing together many nations would be timely for a variety of reasons. Previous IPYs and IGY provide widely used benchmark data for change detection and evaluation, and a new intensive campaign of observations will provide a clear vision of trends and change and lay foundations for the next generation of benchmark data sets. In addition, new satellite assets and diverse advances in technology provide unprecedented opportunities for new understandings.

ICSU EB Decision

Serious discussions about the value of an IPY 2007/8 have been occurring for more than a year in many settings. In February 2003, the European Polar Board and US Polar Research Board decided to act as a catalyst to give structure to these ideas by developing a planning process that would lend international credibility and organization to the effort. At the direction of EPB and US PRB, Chris Rapley (European Polar Board and SCAR) and Robin Bell (US Polar Research Board) prepared a request to the ICSU Executive Board to establish a Planning Group for IPY 2007/8. This was approved in February 2003. The role of the PG is to formulate a concept for an IPY 2007/8 and to design the means of ICSU leading such a programme. The Terms of Reference are given in Appendix I.

The ICSU Board stipulated that, to have its support, an IPY 2007/8 must address exciting science. It also must lead a programme that is 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 2007/8 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 will play a key role in facilitating creating a coherent structure to guide all those nations and scientists wishing to participate in IPY4.

Emerging views on General Principles and Key Characteristics of an IPY 2007/8

Based on the consultations and discussions, the general principles of what an IPY4 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

The key characteristics of the IPY 2007/8 will be:

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

IPY4 should commence in 2007/8 to celebrate the anniversary of the historic IPYs and the IGY. Its initial duration should be approximately 2 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 2007/8 should be maintained over the long-term as necessary to achieve their goals, preferably of order a decade.

Terms of Reference of the ICSU IPY 2007/8 Planning Group

- (i) To gather, summarise and make widely available information on existing ideas for an IPY serving as a clearinghouse for ideas,
- (ii) To stimulate, encourage and organise debate amongst a wide range of interested parties on the objectives and possible content of an IPY,
- (iii) To formulate a set of objectives for an IPY,
- (iv) To develop an initial high level Science Plan for an IPY which engages younger scientists throughout the planning process.
- (v) To develop a specific set of objects targeted at formal and informal education as well as the general public in the next IPY.
- (vi) To develop a proposed mechanism for the design, development, guidance, and oversight of an IPY
- (vii) To present a draft plan to the ICSU EB at their February 2004 meeting; and
- (vii) To report to the ICSU 28th General Assembly in 2005 a plan for an IPY in 2007/8 for final endorsement.

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