



ICCSU

International Council for Science

strengthening international science for the benefit of society

ICCSU and Polar Research: 1957 - 2007 and beyond

From IGY to IPY

Celebrating 75 years: 1931-2006

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Catalysing international research

A key part of ICSU's mission is to plan and coordinate research, especially on topics that need collaboration between scientists in different disciplines and in different parts of the world. To understand how ICSU accomplishes this is to understand how a small organisation with extensive networks can have a big impact on the progress of science.

Typically, the first step in the development of a new ICSU programme is to bring the key international scientific experts together and secure the support of appropriate institutional partners. Depending on the topic of interest, an initial scoping activity may be required as a prelude to a more focused programme planning exercise. In this way ICSU, in consultation with the international scientific community, is able to define the framework for an international research programme, set the scientific priorities and establish quality benchmarks, whilst taking on board the relevant policy issues. Once a scientific framework is approved – normally involving formal endorsement by the General Assembly of ICSU, a scientific steering committee is established with appropriate representation to oversee implementation of the programme. At this stage a separate secretariat or programme office is normally set up, to support the long-term coordination and planning. In effect, ICSU develops and incubates a programme until it is mature enough to stand on its own.

While ICSU will often fund some or all of the programme incubation costs from its own resources, the cost of the actual research will be met by other sources, national as well as international. ICSU may help scientists raise funding from such sources, for example by ensuring that funding agencies are fully briefed on the objectives of the overall programme. Most importantly, ICSU maintains a long-term responsibility for ensuring the quality and strategic direction of the programme.

In the context of research collaboration, ICSU is effectively a bridge between the international scientific community, global governmental organisations and national funding agencies. Such a role is particularly valuable where a long-term scientific perspective has to be negotiated. The link with intergovernmental organizations, which is frequently manifest is co-sponsorship of programmes, can be crucial in ensuring cross-border collaboration.

The following outline of some of ICSU's contributions to the development of polar research illustrates how this approach to facilitating collaboration can work in practice.

International Geophysical Year (*the IGY*)

One of ICSU's most distinctive roles is helping to get scientific research done in situations that demand a high level of multinational and multidisciplinary collaboration. Its first major attempt to do this was the 1957-58 International Geophysical Year. The IGY was the most complex and ambitious exercise in international research collaboration undertaken in peacetime up to that point. It was initially proposed by three ICSU Unions (astronomy, geodesy and geophysics, and radio-sciences); it was endorsed by ICSU, which then worked with these and other Unions, and with the World Meteorological Organisation, to define scientific priorities for the Year and to secure the necessary resources. The resources came from ICSU Members, from national governments (via approaches by ICSU National Members) and from international bodies such as UNESCO. ICSU's central role throughout the planning and implementation phases was crucial to the scientific coherence of the Year and to building credibility with government bodies controlling access to major resources.

IGY brought together 67 nations and over 60,000 individual scientists in a concerted effort to understand the earth as a planet. This included a major focus on the polar regions. The scientific accomplishments of IGY were numerous and included the discovery of the Van Allen Radiation Belts encircling the Earth, the first estimates of the size of Antarctica's ice mass and confirmation of the theory of continental drift. It also directly stimulated at least one major geopolitical advance, the Antarctic Treaty System. Many of the structures and bodies that were developed by ICSU and its partners as a result of the IGY continue to play a major role in serving the scientific community to this day.

International Polar Year (*the IPY, 2007-2008*)

Given that international polar years, or related initiatives such as IGY, have been organised at 25 or 50 year intervals since 1882-83, the idea of another Year in 2007-08 was in itself fairly obvious and was being widely mooted in the polar community as the next major anniversary approached. But it needed to be pulled together. In February 2003, the Chairs of the European and USA Polar Boards jointly asked ICSU to establish a planning group. They noted that, 'with powerful players such as national environmental research funding agencies, space agencies, major institutes and even government departments taking an active interest worldwide', only ICSU had both the scientific authority and the global range needed for the key interests across the world to accept it in a coordinating role. As the two Polar Boards put it, 'The justification [for ICSU taking on such a function] lies in ICSU's established role as the world's leading arbiter and coordinator of international scientific research, as well as its historic role in the development and coordination of the IGY.'

The ICSU Executive Board accepted the challenge, and appointed and funded a Planning Group to develop a science plan and implementation strategy for the IPY. The International Unions for Geodesy and Geophysics and for Geological Sciences were officially represented on the group to ensure coordination with their own related plans (IGY+50 and Year of Planet Earth, respectively). The Planning Group consulted with over 40 governmental and non-governmental organisations and the international polar research community, with national IPY scientific committees being rapidly established in over 30 countries. The resultant report - A Framework for the International Polar Year 2007-2008 - was published in November 2004 and endorsed by the ICSU General Assembly in 2005.

The basic concept behind the IPY is that it will comprise an intensive burst of internationally coordinated, interdisciplinary, scientific research and observation focused on the Polar Regions, and should run from March 2007 to March 2009 in order to allow for two complete seasons of fieldwork at each Pole. The programme of research is built around six broad themes¹. These include one on the human dimension of life in the Polar Regions, and this also features where appropriate in the other five themes. That the programme should give an integral role to the biological and social sciences alongside the geophysical sciences is characteristic of ICSU's broad approach to planning research, and a contrast to the narrower vision of the 1950s.

The IPY programme features a strong commitment to education, outreach and communication activities, and is likely therefore to have wide-ranging impact on a non-traditional audience. This provides a further example of ICSU seeking to bring together the insights and methods of natural and social science in a specific context.² The IPY also has a strong commitment to training the next generation of polar researchers through involvement in IPY projects and aims to attract scientists from nations that have not traditionally been involved in polar research.

Implementation and Funding for IPY

Because of the extensive consultative process that underpinned preparation of the IPY strategy, there was an overwhelming response to the call for expressions of interest that followed publication of the scientific framework. Self-organised research groups from over 60 countries are now developing proposals within the overall IPY framework. Supported by the relevant National Committees, and branded as part of the IPY, they will then seek the requisite funding from national and international research funding agencies. In addition to their normal funding allocation for polar research, several countries have allocated significant additional resources for the IPY period.

Implementation of the Year is being overseen by an ICSU-WMO Joint Coordinating Committee appointed and funded jointly by the two sponsors. *[The May 2003 WMO Congress had independently supported a proposal for an IPY, but WMO quickly agreed to throw in its lot with the ICSU-led initiative already under way].* All IPY proposals have to be formally endorsed by this scientific committee. An International Programme Office has been established at the British Antarctic Survey headquarters in Cambridge. This was selected by ICSU and WMO after a process of competitive tender and is supported nationally.

ICSU spent 60 000 euros in 2003-04 to get the IPY going, and has allocated 25 000 euros p.a. through to 2009 to support the Joint Committee. The International Programme Office has secured 225 000 euros p.a. from the UK Natural Environment Research Council. How big IPY will be has yet to be seen, but estimates range up to 3 billion euros for the total cost of experiments to be carried out under the IPY banner.

¹ The six themes are: Status, Change, Global Linkages, New Frontiers, Vantage Point and Human Dimension. In addition to collaborative research, projects on outreach and education will also be included in IPY. See www.ipy.org for more information.

² Other examples include programmes of coordinated research on the human dimensions of global change and on natural hazards and disasters.

The future (*IPY and beyond*)

At this stage (early 2006) it is, of course, too early to say confidently what research will be carried out under IPY, let alone what results it will produce. However, the following examples give a flavour of possible themes and outcomes.

- Changes in permafrost systems and their impacts on terrestrial and coastal ecosystems and on global carbon and water cycles
- Polar marine ecosystems and their roles as biodiversity reserves, fishery resources and important agents in global biogeochemical processes
- Changes in global snow and ice reservoirs, and the impact of these changes on sea level, ocean circulation and global weather
- Environmental and economic changes that will impact the health, vitality and cultural resiliency of northern peoples
- Impacts on the practice of research arising from the experience of combining natural and social science perspectives and involving non-scientists in some aspects of the programme

The implementation of IPY will act also as a catalyst for the reshaping of existing structures and establishment of new mechanisms for conducting and managing polar research well into the future. For example, fifty years ago ICSU established networks of data management and analysis centres in response to the needs of IGY. These structures continue to serve a valuable function but an ICSU assessment in 2004³ recognized the urgent need to update parts of these systems. This will need to happen if they are to meet the challenge of providing ready access for the next 50 years to the enormous amount of data and information that will be generated by IPY.

Conclusion

Fifty years ago ICSU launched the International Geophysical Year which marked a new approach to collaborative scientific exploration and had a very major impact on our understanding of earth processes. In 2007-2008, a new International Polar Year will be launched with the expectancy that it will have an equally, if not more, significant impact. The legacy of IPY is likely to inspire scientists across the world for many years to come.

³ Scientific Data and Information: A report of the CSPR Assessment Panel (ICSU,2004) 42pp



ICSU

International Council for Science

ICSU Mission Statement

In order to strengthen international science for the benefit of society, ICSU mobilizes the knowledge and resources of the international science community to:

- Identify and address major issues of importance to science and society.
- Facilitate interaction amongst scientists across all disciplines and from all countries.
- Promote the participation of all scientists—regardless of race, citizenship, language, political stance, or gender—in the international scientific endeavour.
- Provide independent, authoritative advice to stimulate constructive dialogue between the scientific community and governments, civil society, and the private sector.

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