

Agenda Item: ATCM 10,
 CEP 5
Presented by: SCAR for IPY
 IPO
Original: English

**International Polar Year 2007-2008 Planning Document:
2008 and Beyond**

International Polar Year 2007-2008 Planning Document - 2008 and Beyond

“The IPY aims to exploit the intellectual resources and science assets of nations worldwide to make major advances in polar knowledge and understanding, while leaving a legacy of new or enhanced observational systems, facilities and infrastructure. Arguably the most important legacies will be a new generation of polar scientists and engineers, as well as an exceptional level of interest and participation from polar residents, schoolchildren, the general public, and decision-makers, worldwide.” (International Council for Science. 2004. A Framework for the International Polar Year 2007-2008 produced by the ICSU IPY 2007-2008 Planning Group.)

IPY seems poised to achieve and perhaps exceed the ambitious goals expressed in the Executive Summary of its founding document (above). The intellectual resources of thousands of scientists, many more than expected, often from ‘non-polar’ nations, and representing an unprecedented breadth of scientific specialties, supported by substantial new funding and the international array of polar research assets, will undoubtedly “make major advances in polar knowledge and understanding”. National and international polar organizations already undertake efforts to sustain new and improved observational systems.

The “most important legacies” however, take longer to develop. International outreach networks gradually build breadth and strength, largely through IPY Polar Science Days and other internationally-coordinated IPY events. In a short time, IPY participants, scientists and educators together, have stimulated:

- Extensive media coverage, networks and products (film, print, web)
- International educator networks, materials and resources
- A new Association of Polar Early Career Scientists (APECS)
- New field schools and stronger polar higher education programs and consortia
- Stronger connections among polar and non-polar regions
- Enthusiastic and energetic individual and community advocates
- A polar focus in educational and awareness-raising activities

These outcomes and networks will, with time and with continued international coordination, achieve an “exceptional level of interest and participation”.

In this document we:

- a) Provide a mid-IPY assessment, from the view of the IPO, of IPY legacies and legacy partners ([Section 1](#));
- b) Describe the networks and infrastructure developed during IPY, and possibilities for their continuation ([Section 2](#));
- c) Present initial plans for events in the time period February to April 2009 ([Section 3](#));
- d) Propose that success of IPY science and IPY communication requires continued international coordination ([Section 4](#)); and
- e) Assess and align the tasks and resources of the IPO ([Section 5](#)).

Section 1: Assessment of IPY Legacies

This Section draws on an existing assessment (Allison, Carlson, Béland, 2008, The Mid-Term Status and Progress of the International Polar Year 2007-2008, submitted). It also responds to a January 2008 proposal by Norway entitled ‘Maximizing the IPY Legacy’, but expands the definitions of the IPY legacy to include a broad array of facets and issues.

The IPO, in partnership with leading polar science organizations (IASC, SCAR) looks forward to contributing to legacy discussions with many scientific and political partners.

We consider, in order:

- 1.1 [The Overall IPY Legacy](#), and the next IPY;
- 1.2 [Science and Science Funding](#);
- 1.3 [Scientific Data](#);
- 1.4 [Observations](#);
- 1.5 [The Environmental Impact of Polar Research](#);
- 1.6 [Future Researchers](#);
- 1.7 [Political Systems](#);
- 1.8 [International Science Organizations](#);
- 1.9 [An Informed Public](#); and
- 1.10 [Supporting Activities](#).

After a description of each facet of the IPY legacy, we include a table indicating potential partners and their possible impact, and the need for additional partners.

1.1 - The Overall IPY Legacy

In addition to tangible and practical aspects of IPY legacy listed below, IPY has encouraged an integrating focus, a sense of urgency, and substantial cooperation. In addition to its investigations, IPY has served as the occasion and stimulus for novel ideas and fresh enthusiasm, leading to a hope and a goal that we achieve the possible and exceed the probable. With very rapid changes underway in the polar regions, one wonders whether the 25-year interval to the next IPY, as suggested by young polar researchers and others, might prove too long? The suggestion by Icelandic President Ólafur Ragnar Grímsson that the next IPY occur in 10 years represents a fresh idea from this IPY and a possible means to sustain focus, cooperation and enthusiasm.

1.2 - Science and Science Funding

The IPY scientific legacy, measured by quantity, will follow funding - the pulse in IPY funding will produce a pulse in polar research publications. The IPY scientific legacy measured by quality depends on the quality of the investigators involved and on the extent to which they use international collaboration to extend and enhance the quality of their research. IPY has excellent investigators engaged in international collaborations on crucial scientific issues. The need for excellent polar science will continue for many decades.

IPY will demonstrate the value of bi-polar studies and the necessity of multinational scientific cooperation. The experiences gained from the IPY Project development and funding processes may have value as examples for improved long-term research coordination and funding. New trans-national funding opportunities will arise after IPY but additional discussion and action may prove necessary to achieve durable international research funding cooperation.

Partner	Impact	Issues
Potential Science and Science Funding Partners		
Project Coordinators	Leading polar science advocates	Volunteers, not funded for their coordination responsibilities
IPY National Committees	Advocates for polar science	Most will not continue after IPY?
APECS	Impact on future science	Need support, resources
IPY Participants	Individual advocates	
Joint Committee	IPY Leadership Group	'State of Polar Research' report?
EOC Subcommittee	Valuable advocacy partners	
Polar Organizations	IASC, SCAR	International science planning
Other Partners ...		
IPO	Information source	For IPO duration, see Section 5

1.3 - Scientific Data

IPY has an enlightened and advanced data policy, clearly stated and agreed to by IPY participants. IPY has component information systems, within nations, disciplines or existing programs, that provide access capabilities and that push across disciplinary boundaries. IPY occurs in a time of unprecedented real-time data communications and of rapid advances in geobrowser technologies.

Nevertheless, IPY faces substantial data challenges: inconsistent understanding of its policy, minimal support from national funding agencies, weak compliance, no means of enforcement, and little prospect for a modern friendly integrated IPY data and information system that would enhance access and encourage compliance. IPY tries to advance the frontiers of international data management at a time when national bodies work to define their own data visions and while legacy international data centers struggle to modernize. The SAON and PANTOS processes will assign a very high priority to data access and exchange, but will face the same challenge to obtain the resources necessary for international data coordination.

Partner	Impact	Issues
Existing and Potential Scientific Data Partners		
IPY Data and Information Service (IPYDIS)	Center of IPY data management	Needs resources
Project Coordinators	Project points of contact	Many projects will not continue
National Committees	Influence national data policies and data resources?	Most will not continue after IPY?

Partner	Impact	Issues
IPY Participants	Cooperation essential to inventory and sharing	
Joint Committee	Advocates for compliance and resources	
Data Subcommittee	International coordination group	Connections to international data services?
Observations Subcommittee	Network of satellite agencies	Compliance with IPY policies
Other Partners ...		
IPO	Information source	For IPO duration, see Section 5

1.4 - Observations

This IPY requires and implements a uniquely broad and advanced array of tools and techniques. These include airborne remote sensing systems, underwater and under-ice fixed and mobile systems, genomic and proteomic probes and assays, and a host of analytical improvements. This unprecedented array of new and expanded observational capabilities provokes two questions. Which elements of this evolving suite of existing and new observational tools represent the most effective and most efficient post-IPY observing systems? Second, how can the polar research community sustain the necessary observational capabilities? Substantial community efforts, organized under the label SAON (Sustained Arctic Observing Networks) in the Arctic and PAnTOS (Pan-Antarctic Observing Systems) in the Antarctic, begin to define the needs and explore the solutions for sustained polar observational capabilities. Other major infrastructure developments, such as for ice breakers and for polar research stations, occur independent of the SAON and PAnTOS processes.

Observational capabilities must evolve in order to monitor rapidly changing physical and ecological systems in polar regions. All systems need careful evaluation from an integrated and bi-polar perspective. Satellite platforms and sensors that today provide essential observations have very long lead times and an uncertain future. Predictive capability for the polar regions will require enhanced interaction between observational systems and research and operational modeling communities.

Partner	Impact	Issues
<i>Existing and Potential Observation Partners</i>		
ICSU, WMO	Influence through panels and working groups	Global Cryosphere Watch?
National Committees	Influence national funding priorities?	Most will not continue after IPY?

Partner	Impact	Issues
Observations Subcommittee	Influence on satellite observations?	
Polar Organizations (IASC, SCAR)	Home organizations for SAON (?), PAntOS	
Other Partners ...		

1.5 - Environmental Impact of Polar Research

A rigorous and encompassing environmental impact assessment of the ensemble of IPY research would document the activities of all funded IPY projects ‘as delivered’, the equipment used, the duration and location of all deployments and operations, the transport (in and out) of people, equipment and supplies, and so on, to quantify the physical infrastructure (buildings, runways), emissions and disposals into air and water, and the energy expenditures that contribute to the cumulative environmental footprint of polar research. Although an assessment at this point would not change IPY’s environmental footprint, a thorough and honest assessment of the environmental impacts of polar research during IPY could establish an important baseline for long-term observations in polar regions and offer positive examples for other large-scale international research efforts.

Partner	Impact	Issues
Potential Environmental Impact Partners		
National Committees	Connections to national environmental regulations?	Most will not continue after IPY?
IPY Secretariats	Represent polar operators?	
APECS	Advocates for reduced impact	
Polar Organizations (COMNAP, FARO)	Operations managers	
Other Partners ...		

1.6 - Future Researchers

IPY has attracted a bright talented energetic group of early career researchers who have crossed national and disciplinary boundaries to form a network, APECS - Association of Polar Early Career Scientists. They have quickly grasped the essence of IPY, they recognize the need to extend their community across more disciplines and to more countries, and they value and balance research and outreach. They have growing national and international networks, and very likely represent the views and needs of many future researchers. They seek to play a very positive role in the future of polar research.

Partner	Impact	Issues
Existing and Potential Future Researchers Partners		
APECS	Influence the future	Need support, resources
National Committees	Support national youth activities	Most will not continue after IPY?
Polar Organizations (IASC, SCAR)	Provide institutional home for APECS?	
Other Partners ...		
IPO	Short-term support	

1.7 - Political Systems

IPY has gained attention in international settings and at governmental and non-governmental levels. That attention and exposure might result in sustained increases in funding for polar research, in improved abilities to observe the polar regions, and in continued or extended protection of polar environments for peaceful and scientific purposes. In the Arctic, IPY receives strong support and attention from the Arctic Council and from Council members, observers, and permanent participants. Member states of the Antarctic Treaty system provide similar support and attention to IPY. International discussion, originating in the Arctic Council, has led, at least momentarily, to improved international research access to Arctic Ocean regions. Efforts toward sustained observing networks (SAON, PANTOS) also benefit from political involvement and support. Through its partnerships with northern communities and institutions, IPY should enable greater knowledge and stronger voices for the cultural and political well-being of northern residents.

IPY data, shared widely and freely, will have a 'second life' as the basis for discussion, management and possible exploitation of polar ecological and geochemical resources. IPY terrestrial and marine biodiversity studies might indicate the need and desired location for protected areas. Or, prediction of future ice-free regions or routes and identification of surface and subsurface features might accelerate resource exploitation. The timing and attention of IPY will provoke renewed discussion of existing and future treaties and conventions for environmental protection of polar regions.

Activity	Description	Partners/Issues
Potential Political System Partners		
National Committees	Influence on national policies	Most will not continue after IPY?
APECS	Includes political activists	
Partner Organizations (ATS, AC)	Political influence	
Other Partners ...		

1.8 - International Science Organizations

The breadth of IPY science exceeds the breadth of existing international science organizations. This breadth represents a potential success for IPY. It portends a truly comprehensive approach to the polar regions, and perhaps sets a fine example for future international science. However, the IPY breadth exposes fissures and weaknesses in current science infrastructure. IPY participants from various disciplines have different traditions of data sharing, different funding sources and strategies, different career options, different vernaculars, even different geographic coordinate systems. No existing international organization encompasses all the geophysical, sociological and ecological sciences of IPY.

IPY has established new connections, new mechanisms, new networks, and new impacts of communication within this uniquely broad IPY scientific community. In many ways, these connections represent science learning about itself. These ideas and practices within IPY (including consultative forums, email and website news and blogs, geobrowser layers, self-subscribing information groups, and Polar Science Days), developed largely without resources and outside of institutional control, may represent useful models from the polar research community to the broader science community. The leading polar science organizations, IASC and SCAR, have shown innovation and flexibility and will play key roles as IPY plans and conducts its own conferences and in planning and implementing post-IPY research programs.

Partner	Impact	Issues
<i>Potential International Science Organization Partners</i>		
ICSU, WMO		
National Committees	Influence through Councils and Academies?	Most will not continue after IPY?
APECS	Highly interdisciplinary	Need support, resources
Joint Committee	Interdisciplinary Leadership Group	
Polar Organizations (IASC, SCAR)	International science planning	
Other Partners ...		
IPO	Information Source	For IPO duration, see Section 5

1.9 - An Informed Public

IPY occurs during a time of increasing public attention to climate and environment issues in many countries. Often, IPY information about sea ice, sea level, or polar ecosystems receives immediate broad international mainstream press coverage and reverberating comment in the blogosphere. The fact that IPY gets quoted broadly in many locations and

formats emphasizes its substantial and still-growing potential to represent science to the public as an accessible, non-magic, non-elite activity. The IPY networks of young researchers, teachers, artists and journalists and the polar information systems developed centrally, nationally and institutionally (described in [Section 2](#)) can provide an enduring public resource for polar science and information. This public impact, combined with the quantity and quality of IPY research, will influence future perceptions of science and future decisions about funding.

Many IPY research projects include active education and outreach programs, focused on change in polar regions. Given the breadth of IPY science, this pulse of fresh attractive information could improve interest and understanding of science in a public already fascinated by polar images. IPY educational materials could persist in national and international education networks and lead to improved public awareness of how policies and lifestyle choices in non-polar regions impact polar environments. A small fraction of IPY projects take a more explicit environmental focus, addressing contaminant impacts on ecosystems and humans, impacts of visitor activities, and ways to increase use of renewable energy and improve processing of wastes in polar research and in polar communities. These particular messages have relevance within polar regions and within the polar research community, but also address globally-important themes. Many IPY participants share the view and hope that IPY might lead to a greater environmental awareness inside and outside the polar regions, and to individual and collective change of views and behaviors.

1.10 - Supporting Activities

IPY supporting activities include many informal networks and practical activities, including the IPY web site and other activities coordinated by the IPO, by Coordinators of various IPY Projects, or by IPY National Committees. Many of these networks and supporting activities may prove useful or essential to the on-going success of the legacies listed above. Unlike most of the legacy aspects listed above, these supporting networks and activities depend almost entirely on the IPO and on volunteer efforts from people not pursuing polar careers and without connection to polar institutions. For these networks and activities to continue, IPO must identify partners to accept responsibility. Some supporting or coordinating activities should end as the IPO and IPY Projects end, but may need recording or archiving. IPO advocates a timely, deliberate and active identification and decision process to develop optimal partnerships and to prevent unintended loss of any parts or records. Section 2 (next) describes these activities and proposed partnership processes.

Section 2: IPY Networks and Infrastructure

IPY will, we hope, have many legacies, large and small. On the large side we anticipate improved observational networks, on-going data exchange practices and systems, and continued international polar science collaboration as listed in [Section 1](#). On the smaller side we find many informal networks and practical activities, including the IPY web site and other activities coordinated by the IPO, by Project Coordinators of various IPY Projects, or by IPY National Committees.

Many supporting activities may prove useful to the on-going success of the larger legacies. For these, IPO should identify willing partners to accept responsibility for their continuation. Other supporting or coordinating activities should end as the IPO and IPY Projects end, but may need recording or archiving. In either case, and for large and small legacies, IPO advocates a timely, deliberate and active identification and decision process to develop optimal partnerships and to prevent unintended loss of any parts or records.

We advocate the following steps (identical to the catalogue, share, and preserve steps in IPY data management):

- Identify those activities with legacy value and impact within IPO and in IPY Projects;
- Develop a process to encourage broad participation in legacy activities, including finding and confirming partners and long-term homes for these activities; and
- Develop plans for preservation of continuing and discontinued elements.

We anticipate many partnerships rather than a single 'home' for these activities, and recognise the need for different strategies for websites than for people networks or databases. We anticipate an on-going need for a central information function, some system or process by which the various partner organisations continue to inform and interact ([Section 4](#)). We join the planning groups within several organisations who already consider some of the larger legacy aspects (observational systems, for example) in urging prompt attention to these issues.

The following tables represent catalogues of IPY networks and infrastructure.

Partner	Impact	Issues
<i>Existing and Potential Informal Networks</i>		
Polar scientists	Essential source of information	Cooperation extends beyond IPY?
Educators	Working teachers and specialists; largely focused on students 5-18 years old	Volunteers; very international; potentially effective partners for polar organizations.
Tertiary Educators	University and post-graduate; includes summer schools	Coordination through U Arctic, IAI?
Media Officers	Media and press professionals at polar institutions	International network; have worked effectively together; very busy
Journalists	Self-selected network of science and environment journalists	Interested; potential strong influence.
Tourists	Informal network of tourists and tour operators	

Partner	Impact	Issues
Artists	Informal network	
Geobrowsers group	Informal international network of geobrowsers users	Support Google Earth layers for science and outreach.
Other Partners ...		
IPO	Support (minor), coordination and integration of all above	Coordination will end before networks become sustainable.

Activity	Description	Partners/Issues
Existing Infrastructure and Potential Partners		
Publications Directory	IPY Project 51	http://www.nisc.com/ipy
Polar Issues Books	Polar books for the general public; IPY Project 440	http://www.grida.no/polarbooks/
www.ipy.org	Central source of IPY information	Continue operation and updates through 2012? Serving?; Operation?; Archive - SPRI / British Library
Project websites	Information about science and participants; linked to ipy.org	Most projects lack long-term funding? Archive a snapshot of these?
Project and Eol databases	Original collection of IPY ideas and proposals	Stop Eol on 28 Feb 2009? Archive at BAS/SPRI? Elsewhere?
IPY Artifacts	Correspondence, fliers, brochures, stickers, clothing, stamps, coins, etc.	Archive at SPRI, as agreed (JC6).
IPY Digital Media	Digital files, emails, presentations, video interviews, podcasts,	Curate at a digital library? DiTRL & SPRI?
Other Partners ...		
IPO	Coordinators, producers, or holders of most of these	

Functional transfer of those networks and activities deemed worthy of continuation should happen soon, during this second year of IPY. Partner organisations will have time to integrate the new activities into existing activities, to seek support necessary for success, and to establish themselves as an identified hub for future polar activities. IPO and the partner organisations will find it easier to keep momentum going, rather than to re-start it after IPY ends.

Many IPY informal networks continue to expand, accumulating enthusiastic members with each Science Day and each IPY event. These networks and partners make plans for sustained post-IPY activities. New partners will and must also join, in order to sustain these networks and

activities. All these partners seek to identify themselves as contributors to the IPY legacy. We propose a revised IPY circular logo, with the years '2007-2008' replaced by the work 'Legacy' for the use of partners around the world. We also propose a simple sign-up process, to allow partners to identify themselves. For example:

Partner	Impact	Issues
<i>Potential Partners - EXAMPLES ONLY</i>		
University of the Arctic	Training courses for many students working in polar tourism	
Cape Farewell Project (IPY 460)	Continue to promote creative aspects of science-art partnerships	Need additional partners, venues
UNEP	Continue the Polar Books series	Advertise through polar organizations
SPRI	Operate physical and digital archives; serve the website?	Need partners and resources
Other Partners ...		

Section 3: A Plan for IPY Events in 2009

Motivation

- IPY research in many nations will continue beyond March 2009.
- Many nations, developing plans for the continuation and celebration of their IPY programs, need information about international schedules and activities.
- The IPY community has opportunities for exposition and celebration in Oslo in 2010 and again in Canada in 2012, but also needs to meet public expectations for information and celebration in early 2009.
- Two prominent events, namely a meeting of the ATCM that celebrates the 50th anniversary of the Antarctic Treaty and a Ministerial meeting of the AC, will occur in April 2009.
- The IPY Joint Committee (JC) should formally announce the era of polar science that follows IPY.
- The IPY JC and the IPY sponsors should recognize the contributions and accomplishments of the IPY community.

Recommendations

- IPY partners should plan events and develop activities for February 2009 to celebrate achievements and to announce future plans and activities.
- These February 2009 events should interact in a mutually beneficial manner with the ATCM and AC meetings.
- The JC should issue a statement 'State of Polar Research' for wide public attention.
- A media event related to the release of this State of Polar Research report should occur in Geneva in February in concert with a JC meeting.
- The IPY global outreach community should organize local and inter-connected celebrations in February.

In addition

- International Polar Days should continue at least through the time period of the IPY Early Science Conference in June 2010.
- An end of IPY celebration should occur at the Early Science Conference.

Actions

- The IPY JC and sponsors should provide prompt endorsement of this plan and these schedules.
- Many groups should begin planning coordinated events for February to April 09.
- These and other activities require a continued coordination and integration function (Section 4).

Section 4: Continuing Polar Integration and Coordination

This section presents recommendations of the IPY Education, Outreach, and Communication Subcommittee and its working groups, compiled at a European Science Foundation supported meeting in Strasbourg, France. That group identified an urgent need for a clear plan for events around the end of the formal IPY period ([Section 3](#)). This Section contends: a) that major advances in polar science will and must continue after the formal IPY period (2007-2008); b) that achieving the resource levels need to sustain polar observations and science depends principally on public support generated through education and communication; and c) that future success of the science and the communication networks require continued international coordination.

The IPY endeavour, with its unique bottom up, science-driven initiative to identify projects, and with encouragement, integration and coordination from the international Joint Committee and the International Programme Office, has stimulated some unique international qualities. These include:

- **Multidisciplinary approaches**
- **Bipolar cooperation**
- **Enhanced international cooperation**
- **Integration of science and outreach**

Throughout IPY, embedded in all aspects of science, data management, observations, and outreach, these qualities make IPY greater than the sum of its parts. Anticipating the rapidly-approaching end of the formal IPY period, safeguarding and nurturing these essential qualities of this IPY becomes increasingly important, as a legacy of IPY and as the basis for future, post-IPY, polar research.

The IPY International Programme Office, whose term will end during 2009 ([Section 5](#)), currently oversees facilitation of these “value-added” components. In order to maintain these qualities at least through the IPY conferences of 2010 and 2012, the IPY community and the IPY sponsors should devise a “next step” plan and ensure a transfer and handover of knowledge and networks.

The IPY scientific and outreach networks, the unusual integration across specialities and among nations, and the growing public attention to polar issues require continued promotion and co-ordination. IPY has achieved much in a relatively short period, particularly in the creation and nurturing of networks and cooperation. To ensure longevity of these growing efforts, and to ensure effective and widespread communication and impact as IPY results emerge, international integration and co-ordination must continue.

IPY sponsors should establish a follow-on body to ensure coordination, foster integration and maintain momentum. The follow-on entity, perhaps an “International Polar Office,” should overlap with the current IPO and continue at least through 2012. Activities that require continuing support include:

- Maintaining focus on the status of the polar regions
- Communicating future science results
- Supporting the IPY scientific communities
- Embedding polar Education, Outreach and Communication in science
- Maintaining, updating and, eventually, archiving a centralized website
- International Polar Days
- Supporting major international conferences
- Continuing and developing the involvement of non-polar communities

- Finding partners to maintain various activities for the long-term
- Supporting on-going evaluation
- Supporting polar communities

IPY has stimulated a multidisciplinary approach, a bi-polar view, a shared sense of urgency, and global understanding of polar issues. Maintaining these positive aspects of IPY will ensure maximum benefit from the energy and enthusiasm already invested, but will require continued connection and coordination.

Section 5: IPO Tasks and Resources

In general, the IPY IPO evolves from organizing and promoting IPY to broadening its impact and ensuring its legacy. In practical day-to-day terms, we only consider incorporating new Expressions of Interest or new Project proposals that involve activities that will start before 28 February 2009. We support the Joint Committee and the IPY subcommittees as they conduct assessment and evaluations and focus on concluding activities. We work with the IPY networks of teachers and journalists, particularly on remaining IPY Polar Science Days and events for February 2009, and begin substantive discussions with groups and organizations who will take a long-term role in sustaining IPY activities.

The figure below shows IPY IPO income from all sources and total expenditures for the period 2005 to 2009 (the 'years' refer to UK fiscal years that end in March of the following year - 2009 ends in March 2010). IPO has deliberately, and in full consultation with BAS, spent more in 2006 and 2007, for web sites, subcommittee meetings, youth meetings, and so on - all the activities necessary to initiate the IPY networks and infrastructure - than projected. In the absence of additional contributions and to fit within overall five-year allocations, IPO will restrict expenditures during 2008 and 2009. As the figure shows, IPO activities will need to end approximately half way through 2009, that is at the end of September 2009.

