

REPORT ON IPY DISCUSSION FORUM

REID HALL, PARIS, MARCH 31, 2004

Rapporteur – Cynan Ellis-Evans

The meeting was co-chaired by Chris Rapley and Robin Bell, chair and vice chair of the ICSU IPY Planning Group. The purpose of the meeting was to discuss the principles and characteristics of the IPY, to give interested parties insight into the work of the ICSU Planning Group and to provide an opportunity for them to input ideas into the planning process and influence its outcomes.

Attendees:

Annick Wilmotte (Belgium NC)
Gerard Jugie (France NC)
Karsten Gohl (Germany NC)
Carlo Alberto Ricci (Italy NC)
Massimo Frezzotti (Italy NC)
Hajime Ito (Japan NC)
Alicia Garcia (Spain POC)

Naja Mikkelsen (AOSB)
Bryndis Kjartansdottir (Arctic Council)
Paul Egerton (EPB, ESF)
Jean-Louis Bougeret (IHY)
David Schindel (NSF)
Colin Summerhayes (SCAR, IOC)
Eduard Sarukhanian (WMO)

Representatives from the Planning Group

Robert Bindschadler
Michael Kuhn
Olav Orheim
Hanne Petersen

Chris Rapley introduced himself as having been tasked by the European Polar Board (EPB) and the Scientific Committee for Antarctic Research (SCAR) to take forward development of an International Polar Year under the sponsorship of the International Council for Science (ICSU). The United States Polar Research Board (US-PRB) was similarly interested in seeing an IPY develop. A Planning Group led by Chris and Robin was formed in June 2003 at the instigation of ICSU and this Group invited the science community to contribute ideas in order to help map out the range and scope of the potential IPY content. Some 300+ ideas have been received as of March 2004; a web site (www.ipy.org) is being established in conjunction with ICSU; some funding agencies and science organisations have offered to provide support and some polar operators have already offered logistic facilities. The World Meteorological Organisation (WMO) is also intent on developing a Polar Year and will be co-sponsoring IPY 2007-2008 with ICSU. There is now WMO representation (Eduard Sarukhanian) on the Planning Group.

It was pointed out by the Chair that the increasing workload in organizing the rapidly evolving Polar Year plans requires secretariat support to tackle it effectively; an outline science plan needs to be developed by the Planning Group for discussion within the research community; an implementation concept for IPY is also required by ICSU. The Planning Group winds up in September when it sends its recommendations to ICSU. It will be replaced by an appropriate body created by the leading sponsors (ICSU and WMO).

Robin Bell explained that the Planning Group's initial approach had been to establish 3 broad themes: Change; Explore; Decode; to help the science community in developing IPY ideas. Nations have been encouraged to form committees to promote IPY and encourage the submission of individual ideas. Each committee has its own approach - some have put up suggestions for relevant IPY topics (e.g. Italy,) whilst others (eg. USA) have instead encouraged bottom-up driven ideas from their community and yet others adopted both approaches (e.g. UK). At the

third Planning Group meeting it will be necessary to establish principles for the development of programs; a draft Science Outline; and an Implementation strategy. Following ICSU guidelines, the science must be as far as possible interdisciplinary, and ideally cover activities that would not otherwise occur. Activities should be promoted that would probably not be possible within individual national programs. These might include: e.g., systematic campaigns of coordinated observatories; installing widespread observational networks to capture ongoing change; mapping geophysical parameters to understand the onset of glaciation (such as the evolution of key ocean gateways); or exploring polar ecosystems (e.g. active marine ridges, sub-glacial lakes).

Initial themes put forward by the Planning Group were:

Change in polar regions (documenting, tracking and understanding how change arose);

Exploration of polar regions (investigating previously inaccessible areas or taking a novel approach, eg. a pole-to-pole geodynamic slice);

Decoding polar processes (carbon cycle, linking humans to the environment; the sun-earth connection).

Implementation structures for IPY are numerous, including organisation models such as that of IGBP. This issue will be a major topic for discussion over the coming months.

In structuring the discussion forum participants were invited to first make presentations and then to consider: Principles, the Science Outline, Engaging the Community and Approaches to Implementation.

Presentations

1) **Germany** - Karsten Gohl made the point that this is a unique (once in 50 years) opportunity for IPY to make a giant leap forward in finding responses to key global science questions from polar perspectives. Clearly it must be feasible; must capitalise on existing logistics and infrastructures; and must focus on what is achievable in a limited time frame (2 seasons in both polar regions). Suggests concentrating primarily on activities during the IPY field seasons with some programs taking off at and continuing beyond IPY. Must focus, prioritise, and be selective.

Karsten presented 4 possible goals:

- (i) current changes (synoptic survey of physical and chemical parameters, biological processes, human dimension)
- (ii) learning from the past and predicting the future (e.g. lithosphere-ice sheet interactions, ocean gateways, studied with high temporal resolution);
- (iii) new technology (e.g. using Mars-type rovers);
- (iv) outreach and education (making polar exploration as exciting as outer space exploration, and enabling people to take part).

It was further suggested that stationary and mobile laboratories should be installed to provide a dense spatial network of observations.

2) **SCAR** - Colin Summerhayes outlined the current structure of SCAR science and emphasized that there was natural synergy between what SCAR plans to undertake and the developing plans for IPY. It was pointed out that SCAR has already persuaded the Antarctic Treaty parties (in 2003) to commit to involvement in the IPY. The Polar Year offers an opportunity to enhance SCAR science but Colin emphasised that coordination on science plans would be important as, for example, SCAR will have developed its cryosphere research plans before IPY starts. As an ex-GOOS coordinator he highlighted data management as a major issue for IPY that needs attention at an early stage. Also encouraged IPY to work closely with COMNAP (and clearly with FARO in the Arctic). Colin provided a document outlining a set of objectives that SCAR would want the IPY Planning Group to consider. He stressed the need to take account of

teleconnections between the tropics and polar regions (e.g. El Nino, Circum-polar Wave). Consideration must be given to how IPY could add to existing science activities such as understanding ice sheet stability. Finally it was suggested that IPY should have 3-4 main themes and possibly a set of ancillary themes ("satellites").

3) **The International Heliosphere Year:** A presentation was made by Jean-Louis Bougeret on the IHY, which also takes place in 2007 (see <http://ihy.gsfc.nasa.gov>), and whose goal is to study the sun-earth system (especially solar events that affect life and climate on earth). Potential clearly exists for linking the IPY and the IHY and particularly of IHY constituting a distinct programme within the broad scope of IPY. 2007 is proposed to be an optimal period because it is a solar minimum and thus a less noisy environment in which to study Sun-Earth processes.

The IHY science program has yet to be established but will include

- (i) scientific campaigns (including involving developing countries);
- (ii) meetings and publications; and
- (iii) outreach (media; IGY history and context; production of materials).

2007 is too late to develop anything other than possibly small satellites so emphasis will be existing satellites and planning the necessary coordination is underway.

Outreach is now regarded as an essential part of NASA activities, and consumes 1% of the NASA budget so there will be an expectation for substantial outreach activities within IHY and this could usefully link with IPY activities in this area. An IHY Campaign Database Site will be launched with details of every IHY activity. Already successful for SOHO so the concept could be useful to IPY.

It was also pointed out that NASA demands that all its instruments data are made freely available to project investigators from the international community and the issue of data availability will need to be looked at carefully in IPY. IHY plans to use the Goddard data facility to manage its data. Colin mentions that the IOC has a network of international data centres that could be of assistance to IPY.

Gerard Jugie suggested the concept of polar platforms – the advantages of polar regions for space science. Can then see obvious links to projects such as SuperDARN. There needs to be links between IHY and IPY not just two programmes running in parallel, if both programmes are to gain benefit.

4) **European Polar Board** - Gerard Jugie outlined the intentions of the European Polar Board (EPB), which can(i) play a role at the European Union level; (ii) help emerging countries in the EU to use polar facilities; (iii) call for the investment of EC resources. He called for all to build together and not to create sets of activities that run parallel to one another. He stressed the need to think seriously about bipolar activities.

Paul Egerton presented further detail on the EPB's views. He had some concerns about implementation. Strongly felt that development of implementation plans should involve the major polar organisations contribute so as to maximise potential outputs. Ideally these organisations should be brought together in some kind of Council, to guide developments. We need to be realistic about funding, and focus on what is achievable in IPY. The science plan must be validated with funding organisations if it is to have any relevance. The IPY should feature overarching themes and not go into too much detail on individual proposals; proposals should largely be the province of national funding agencies. Optimal use should be made of logistics and infrastructures. This would require the coordinated deployment and/or use of logistical assets

such as ships, aircraft, and land stations. There is a good geographic spread of polar stations and these could be usefully utilised within the science clusters.

Scenarios for European involvement in IPY included:

- a) Grand traverse
- b) Southern Ocean research deployments
- c) Arctic Armada
- d) Coordination of multiple monitoring stations.

Paul suggested that a consortium model was needed to ensure adequate support for large projects and recommended looking at past models such as EPICA. Aside from a Secretariat and Director, the IPY would need Project Offices for individual large projects.

He noted that the major polar organisations would meet during Arctic Science Week (Reykjavik, mid April) to produce a statement for ICSU on what they expected from the IPY, and how they thought it should work. This could be a useful document for the IPY Planning Group.

From this presentation Karsten stressed the need to focus on the science and that the Planning Group should choose the themes. David suggested it is important to establish who has ownership of IPY and to coordinate international funding. It was also suggested that some scientists involved in large programmes such as SEARCH are concerned that a broad IPY could degrade SEARCH. Arguably a need for these programmes to be involved in the IPY development but Chris stressed the need for IPY to add value if it was to interact with existing programmes which will happen anyway.

David Schindel (NSF) suggested that as science plans are developing there is now a need to start meshing gears with logistics groups such as COMNAP and FARO.

5) **Arctic Ocean Sciences Board** was represented by Naja Mikkelsen (Denmark). Three areas have been already proposed by AOSB.

- a) The scale of IPY could clearly help improve the Arctic Ocean Observing System (especially with regard to pack ice distribution). Many buoys are required both on and under the ice (currently a major shortcoming), and it is important to install systems that will last for the long term.
- b) We need to know more about Arctic continental shelves, and especially about their resources, for the benefit of coastal populations; some of what is required could come from shelf edge transects.
- c) We also need to improve understanding of the global water cycle in the Arctic – noting for example increased runoff from rivers; decreased sea ice cover; disappearing ice sheets; and increased outflows from Hudson’s Bay. Arctic Ocean deep water is freshening already.
- d) Naja suggested a further area – namely Arctic Ocean drilling which would establish the recent geological record at high resolution.

Naja felt that coordination in the Arctic could be much better and that IPY could help with this process. Could certainly learn from the IHY community which shows substantial coordination capability.

6) **Arctic Council** – was represented by Brindjís Kjartansdóttir. The Council recently provided a statement to the Planning Group which emphasises that IPY planning should include the human dimension and recognise the need to provide the information required to encourage sustainable development. Among other things we need improved Arctic Climate Impact Assessments (ACIA), as well as pollution monitoring and abatement schemes.

All interested parties should be involved in IPY planning. The IASC and similar organisations provide useful platforms for IPY development. A transparent IPY decision-making process is considered essential.

7) **WMO** - represented by Ed Sarukhanian. WMO has already endorsed involvements in the IPY, is represented on the Planning Group, and has been invited by ICSU to co-sponsor the IPY. WMO needs considerable upgrades of its observing networks in polar regions, as the basis for improving forecasts of all kinds. Its recent submission to IPY promotes developments in:

- a) upgrade observing components, including space-based subsystems and organise special observing periods with increased frequencies.
- b) Polar stratospheric ozone
- c) Atmospheric pollution effects on climate, including ozone depletion.
- d) Climate Assessment
- e) Climate and the Cryosphere
- f) Polar oceanography. New ice station proposed will be in position by 2007.
- g) Hydrology and water resources - the importance of the freshwater cycle.

This is a great deal of work but much is already underway albeit without as yet an IPY focus. There is a need to improve WMO involvement in the polar regions, particularly in the Southern Hemisphere. WMO will use IPY as a way to address these shortcomings. A big issue will be increasing numbers of buoys (particularly ARGO) in the Southern Ocean; under-ice ARGO's particularly important.

WMO favours having an IPY Council, overseen by a joint ICSU-WMO organising committee, and with thematic groups for implementation. The organizing committee could usefully comprise a Science Advisory Group and a Technical Advisory Group to ensure covers all the bases.

Karsten advises caution to ensure that this short term programme does not have too much administrative overhead and suggests that a light bureaucracy will be more transparent.

Robin asked if ICSU could potentially put equipment inside WMO sites. Ed replied that WMO would need funds to do this but in principle should be possible and already past examples.

8) **IOC**- Colin Summerhayes provided a resume of the IOC and JCOMM position papers. There are clearly benefits in involving IOC who have responsibilities - will need to go through IOC to access waters controlled by navies, notably around South America. The IOC will present a paper in June to encourage member countries to sign up to IPY.

9) **Italy**- represented by Carlo Alberto Ricci – Concordia and Summit Stations offer opportunities for IPY in addition to existing plans for use of these facilities. The Italian National Committee has formed and has decided on a set of projects to put into the IPY planning process.

10) **Belgium**: was represented by Annick Wilmotte, who replaced the Belgium NC chair, Professor Hugo Decler. The National Committee has formed but only met once to date. This meeting produced a substantial document outlining the Belgium proposals for research and includes a plan, developed by the International Polar Foundation (IPF), for a new Belgian Antarctic research station (in collaboration with Japan). The new station will be located near the Sor Rondane Mountains (Queen Maud Land) in a remote area over 500 km from the next station. The IPF is very interested in IPY and particularly in outreach and education relating to climate change. Has experience in outreach and could form a focus point.

11) **Japan** – represented by Hajime Ito from NIPR. There is considerable interest within NIPR and Japan for involvement in IPY. It was inferred that Japan is currently finding it difficult to fully engage in the IPY process (arguably somewhat Euro-North American centric) and appreciated being able to freely contribute to the discussion forum. The Japanese National Committee has only just formed and has, like Italy, put forward a number of ideas for IPY. It intends to implement these proposals in the polar regions whether or not it is part of IPY, but clearly they will benefit through scaling up to IPY through proposed international collaborations.

It was suggested that it could be useful for Planning Group representatives to visit the Far East to promote IPY though clearly this would take up time of individuals. This raised the issue of the geographical distribution of countries currently involved in IPY. There is involvement from North America, Western Europe (though limited East European involvement) and some from Australasia but only South Africa from the African continent, only Chile in South America has formed a national committee, no involvement from the Middle East and only India, Japan and China from the Far East. ICSU is keen to see countries not currently undertaking polar research taking an interest in IPY.

Colin Summerhayes mentioned the problem of communicating IPY when it is currently only disseminated in English – it was agreed this needs to be addressed. IOC/WMO do all their work in multiple languages and it was suggested that IPY will become more multi-lingual with WMO involvement. It was felt that certainly the most important documents and key web pages should be translated into at least four languages.

SUMMARY OF THE GENERAL DISCUSSION

Criteria summarized from ICSU statements and Planning Group discussions:

- High quality research
- Pushes frontiers (accept some risk of failure)
- Multi-disciplinary
- Involves one or both polar regions (overall program balances across both)
- Should ideally be research specific (unique) to polar regions
- Addresses issues beyond the scope of individual nation capability
- International and inclusive
- Open access to collected data
- Open access to territory in the Arctic
- Include collection of a broad-ranging data set that forms a benchmark (snapshot) for future comparison
- Provide a legacy (establish monitoring sites, collection of core material)
- Should engage and involve young scientists
- Should be communicable to the public
- Must not degrade existing programmes and should use existing resources/programmes where possible
- Should add value to existing activities
- Should be achievable in the IPY time frame

A Revised List brainstormed at the Discussion Forum:

- Relevant science
- International
- Be feasible
- Maximize logistics capabilities
- Open access to data
- Interdisciplinary (multidisciplinary)
- Public outreach as component
- Adds value (encourages things that would not happen otherwise)
- “Do no harm” (don’t duplicate or co-opt existing programmes yet take advantage of things already planned)
- Give more weight to input from National Committees
- Observations – IGY stressed synoptic observations in remote areas; IPY stress improved synoptic observations plus focus on facilitating time series as next level goal

It was usefully observed by David Schindel that the “criteria” are actually characteristics of three different things:

1. ... of IPY overall
2. ... of individual research activities (components)
3. ... of the capacity building component of IPY

Criteria Compiled and Sorted into those 3 Groups

Criteria for research activities:

- Research that is of high quality
- Research that is relevant to the IPY themes and goals
- Research that pushes frontiers (accept some risk of failure)
- Open access to collected data
- Add value to existing activities (encourages things that would not happen otherwise)
- Achievable in the IPY time frame
- Give more weight to input from National Committees
- Be feasible
- Maximize logistics capabilities

Criteria of IPY overall:

- Includes research from a wide range of disciplines (multi-disciplinary) and includes multi-disciplinary approaches where appropriate
- Includes research that involves one or both polar regions (and the overall program is relatively balanced across both poles)
- Should ideally be research specific (unique) to polar regions
- Addresses issues beyond the scope of individual nation capability
- International and inclusive
- Open access to territory in the Arctic
- Include collection of a broad-ranging data set that forms a benchmark (snapshot) for future comparison
- Must not degrade existing programmes and should use existing resources/programmes where possible
- “Do no harm” (don’t duplicate or co-opt existing programmes yet take advantage of things already planned)

- Observations – IGY stressed synoptic observations in remote areas; IPY stress improved synoptic observations plus focus on facilitating time series as next level goal

Criteria related to capacity building component of IPY:

- Provide a legacy (establish monitoring sites, collection of core material)
- Should engage and involve young scientists
- Should be communicable to the public
- Public outreach as component

Funding

It was suggested that European agencies could work together and Nordic Countries are already thinking along these lines. Is it feasible to get new money and not divert existing funds from existing commitments? The International Group of Funding Agencies for Global Change Research (IGFA) could possibly help in this context. Interagency/international joint calls with no exchange of funds but possibly joint peer review are a potential approach. EURO-CORES is put up as an example. This does not involve non-European agencies but other European initiatives such as ERA-NET could be attractive to NSF, for example.

Promoting IPY

There is a need to more actively promote IPY and make presentations directly to agencies. However need to plan presentation of IPY very carefully. Governmental mechanisms (WMO, ATCM, UN, G8?) need to be tackled and there may be merit in approaching industry at the appropriate time. Need to be clear however of the cost/benefit of such actions and need to establish an appropriate “hook” to interest these groups. Clearly Antarctic Treaty rules will apply in some cases such as minerals and bioprospecting. Ethics an important issue here. An IPY logo will be a useful promotional tool but need to clearly think through who owns IPY and what rules apply when giving the logo to programmes or, more significantly, to organisations in industry, etc.

Implementation

Karl Erb (NSF) has provided a useful discussion document on IPY implementation issues. Once move into establishing a set of big themes will need to bring in the agencies and logistic groups, lead scientists. Need to get them talking quickly so are involved before September. An example of how little time is available is that the US science community will need to be seeing calls from agencies for IPY activity proposals by early 2005.

TASKS emerging from the discussion:

- Need to get a letter back to all those who contributed items, individuals and national committees, that includes a summary of Planning Group Meeting 3 and how their contributions were used. Including an update on “what next.”
- Soon, need to take Planning Group output and widely disseminate in two directions: (1) to scientists for input on the science priorities and (2) to operators for input on feasibility.
- Soon, need increased public visibility. Some key announcement so that efforts for funding can get serious.

KEY DELIVERABLES requested from Meeting 3 by the discussion forum participants:

- Clustering (organizing) of main themes.
- Identify 3-4 major themes with 10-12 overarching topics or goals (not as detailed as projects).
- A logical summary presentation of all planning to date that can be widely distributed.
- Opportunities for feedback on the clusters, themes, goals.
- Explanation of structure and functions for implementation after September.
- Focus now on the science but recognize that IPY requires a “triangle” that includes science, technology and logistics. All segments must be engaged.
- IPY could help link polar – space – oceanographic institutions.
- Stress importance of observations. People collecting data are often under-valued. Hard to argue for long-term observations when budgets tight - IPY may make it more attractive.
- Describe criteria clearly. The Planning Group needs to be able to evaluate all in a short time. But also, process of deciding what is included will continue and need to leave clear vision of why things are selected (or not selected)
- Identify science themes and criteria so it is all transparent about how decisions are made.
- Have a role in “sorting” so that IPY is feasible.
- Use ASSW to full advantage. Have a draft ready for comment and be truly open to input. Make all of the proposals to date available in some form (summary). Make the input from various national committees available to all.
- Make progress on how implementation might proceed. Get feedback.
- Bring together key non-Planning Group representatives again for another meeting before the next PG meeting as here. Potentially focus particularly on inviting logistics and operations people and funding agencies.
- Trust and representation issue. Need to allow the process to be inclusive.
- Avoid the temptation to be too prescriptive or to write a “call for proposals” (avoid that level of detail). “Perfect is the enemy of the good”. Each nation or agency will take the Planning Group output and rework it to meet their own needs and interpretation of how they plan to participate in IPY. Instead, the Planning Group job is to do higher level descriptions (although still specific enough to implement).