

IAPP Report to the AOSB
Iqaluit, Nunavit, April 23, 2001

on

IAPP-SCG Meeting Deliberations
Ventura, CA, March 13, 2001

(summarized by Jody Deming, with post-meeting
email input from members included)

MEETING ATTENDANTS (open meeting):

Jody Deming, chair

Louis Fortier, member

Paul Wassmann, new member

Ursula Schauer, new corresponding member

Louis Legendre, former chair, new corresponding member

Martin Fortier, ad hoc member, IPS'01 Secretariat

Mitsuo Fukuchi, substituting for Tsuneo Odate, member

CJ Mundy, substituting for Dave Barber, new member

Erica Key, USA, substituting for Peter Minnett, new member

Ian Allison, Australia, guest

Michel Gosselin, Canada, guest

AGENDA:

I. Introductions (Chair)

A. Existing members

B. New members

II. Review of IAPP history (Chair)

A. Trio of case studies

B. Current charge from AOSB

III. Status of ongoing and planned projects (Louis Fortier)

A. NOW polynya project

B. CASES project, including studies of CAB Polynya

IV. Priorities for the future (SCG)

A. Interface with non-polynya research plans?

B. Identify new (unstudied) polynyas?

- C. Revisit studied polynyas? (time-series, longterm?)
- D. Incorporate new approaches? (more modelling, cross-polynya comparisons, stronger links to climate change and non-polynya areas/issues?)

V. International Polynya Symposium 2001, Quebec City, Sept 9-13 (Chair)

- A. Themes
- B. Invited guest speakers
- C. Publication options

VI. Adjourn

DISCUSSION:

After addressing items I-III on the agenda, we spent most of our meeting time discussing future priorities (IV) and the IPS'01 (V). As a result of the last AOSB meeting a year ago, we had a list of action items to consider (II.B. Current charge from AOSB). The Chair will be reporting on steps taken in response to this list at the upcoming AOSB meeting in Iqaluit, Nunavit, April 22-27. Each item and planned response are summarized below.

- 1) Continue efforts to make NOW polynya results widely available.

Two special issues in highly regarded journals (Atmosphere-Oceans and Deep-Sea Research) on NOW results are underway. Publications in regular issues of various journals are included on the NOW website and updated periodically. Opportunities for further exchanges and joint manuscript development will be provided at the upcoming IPS'01 meeting in Sept. The possibility of a textbook-quality publication on polynyas in general (as originally proposed by the Chair and Walker Smith), following IPS'01, is still on the table. New players may step forward to help make it happen; e.g., Dave Barber and Andrew Willmott have expressed strong interest in the book concept. Plans to expand and make widely available existing databases are also under consideration, depending on resource availability and the cooperation of PIs and national database facilities.

- 2) Put NOW results into historical context.

Dave Barber and colleagues have a manuscript addressing this goal in press in the special issue in Atmosphere-Oceans, as well as related work in progress. The manuscript is entitled "Sea ice and meteorological conditions in the Northern Baffin Bay and North Water Polynya between 1979 and 1996." Another manuscript addressing past productivity in the NOW based on sedimentary records (showing high regional productivity on a centurial time scale), is expected to appear in the special issue in Deep-Sea Research.

- 3) Check options with UNESCO and discuss implications of making NOW a protected marine area.

We reached consensus that our role as scientists is to provide information to relevant political bodies (e.g, Martin Fortier provided a report to the Head of Canada's Oceans Office), but not to advocate for this step to be taken.

4) Continue plans for IPS'01 in Quebec City and efforts to make a synthesis of all polynyas for possible publication.

The IPS'01 local host (Louis Fortier), secretariat (Martin Fortier) and chair of the organizing committee (Jody Deming) are planning to release the Second IPS'01 Announcement to multiple email lists by the end of March (the Second Announcement was in fact released as planned). We discussed the four main themes to advertise in that announcement and, after much discussion, returned to the themes already approved by the AOSB last year, with a slight expansion to the first theme:

- a) physical mechanisms responsible for the opening, maintenance and closure of polynyas;
- b) effects of these mechanisms and the environmental characteristics of polynyas on ecosystems and carbon cycling;
- c) intercomparisons of the physics, chemistry, biology and carbon cycling in polynyas; and
- d) interannual variability in the time of opening, extent, biological productivity and carbon sequestration in sediments of polynyas, based on remote sensing archives (sea ice, ocean color, etc.) and sediment records.

Although the Chair had received other compelling suggestions for more specific themes from various members of the SCG, we reached consensus that maximal participation would result from advertisement of themes sufficiently broad that any polynya researcher could identify a spot for him/herself in the program. The organizing committee will, in fact, refine the session themes, both oral and poster, after receiving pre-registration forms (due May 1) and then finalize the program after receiving abstracts (due June 15). The registration fee is expected to be modest (CAN\$100) and significantly reduced (CAN\$50), if not relieved, for students, depending on funding available. Several of us are actively working on acquiring adequate funding, with some success to date. Special events will include an icebreaker reception and a closing banquet in the old town district of Quebec City, overlooking the harbor that docks much of the Canadian icebreaking fleet.

We also developed a provisional list of guest speakers to invite, which was later distributed to the organizing committee for their input, and on which the Chair would act immediately thereafter. At the present time, no "unsung hero" has stepped forward to lead an effort to develop a proceedings publication specific to the IPS'01 (only an abstract volume will be printed and distributed), but interest remains strong in pursuing a textbook-quality publication on polynyas in general (see above). The IPS'01 provides a unique opportunity to identify chapter authors for such an effort. Following post-meeting email input from the IPS'01

organizing committee, the following keynote speakers have been invited to make presentations at the symposium (in addition to others who have been or will also be invited to present talks rather than posters):

Peter Wadhams, UK, sea-ice dynamics, Arctuc-Antarctic (accepted)
Stan Jacobs, USA, physical oceanography, Antarctic (invited)
Jean-Eric Tremblay, CAN, primary production, Arctic (accepted)
Kevin Arrigo, USA, primary production, Antarctic (invited)
Robie MacDonald, CAN, biogeochemical cycles, Arctic (accepted)
Dave Karl, USA, microbial processes, Antarctic (invited)
Alessandra Accornero, ITALY, biogenic fluxes, Antarctic (accepted)
Nina Karnosvky, USA, higher trophic levels, Arctuc-Antarctic (accepted)

5) Determine SCG priorities for the future and provide AOSB with options for future research on polynyas.

The Chair considered that polynya researchers may not have paid sufficient attention to defining links between polynya research and other scientific endeavors or trends in the Arctic or to defining reasons to study polynyas as entities distinct from marginal or receding ice zones. Clearer articulation of such issues may help not only with fuller understanding of the significance of polynyas but also with future research funding prospects. Better articulations may emerge from IPS'01 or a follow-on textbook-quality book. More immediately, this goal has underlain selections of new members for the IAPP-SCG, who may bring different, if not broader, perspectives to the planning of future polynya research.

A brainstorming session on future research options then yielded resounding interest in establishing longterm time-series locations in polynyas. After considering scientific and geopolitical issues, we proposed that the IAPP promote as a priority the establishment of a multi-disciplinary time-series location in the NOW polynya. Such an effort and location would complement other time-series efforts ongoing (albeit providing only physical oceanographic data at this time) in the European sector of the Arctic (Fram Strait and Barents Sea). From the physical perspective, time-series data from the North Water in the coming decade, coupled with data from the European locations, might well lead to detection of climate-driven circulation shifts in Arctic outflows. Coupled biological and geochemical data in the Arctic's most productive polynya during a period of climate change could also yield important discoveries and trends regarding ecosystems and carbon cycling. The North Water is visited annually by Canadian icebreakers for non-scientific purposes, so the logistical possibilities for (add-on?) science seem promising. Interest in wintertime sampling was expressed by some of us.

We also discussed that a second time-series effort in the region of the Cape Bathurst (CAB) Polynya on the Mackenzie Shelf would be an obvious undertaking, not only for questions of on- and off-shelf circulation and transport (water, ice, heat) but also for ecosystem and geochemical cycling. Work planned in that region under the auspices of CASES (and

perhaps the US SBI program) could constitute the start of such long-term work in that area, just as the NOW project provides an extraordinary baseline of information for a time-series location there. Although both sites would likely be “serviced” by Canadian vessels, the intent for the scientific endeavor would be international and multi-disciplinary in scope, as usual for IAPP-promoted projects. This polynya region ranked lower in priority to the North Water in the minds of some SCG members due to the potentially anomalous effects of riverine discharge onto the Mackenzie Shelf; others see the riverine influence as a major reason to undertake time-series work in the region, especially if analogs can be drawn to the river-impacted Russian shelves that are not readily available for international research efforts.

Ursula Schauer kindly provided a global Arctic map with the European time-series locations marked on it. Eddie Carmack provided post-meeting input on time-series sites for the NOW and CAB polynya regions that have since been superimposed on the same map. Mark Johnson is reviewing the map and proposed locations, which will be presented to the AOSB at the April meeting in Iqaluit.