

**Arctic Ocean Sciences Board
International Arctic Polynya Programme
Scientific Coordinating Group (IAPP-SCG)**

Meeting of 28 January 2000
San Antonio, Texas

In attendance were: Jody Deming (USA), Louis Fortier (Canada), Martin Fortier (Canada), Hans-Jürgen Hirche (Germany), Mark Johnson (USA), Louis Legendre (Chair, Canada), Tsuneo Odate (Japan), Ian Walsh (USA), Andrew Willmott (UK)

I. Polynya sessions at the Ocean Sciences meeting

Jody Deming, co-chair of the polynya sessions, reported there was excellent attendance during both days of the polynya sessions and a good mix of Arctic and Antarctic research. Many scientists expressed enthusiasm for the mix of north and south polar research. The poster sessions had people from outside the discipline walking through, and was a very productive forum.

Action

Jody Deming will compile a count of attendance at the polynya sessions for the SCG.

II. 2000 ASLO meeting in Copenhagen

Louis Legendre reported that there is no information available yet on the number of papers submitted for the polynya session, but in total, over 1200 papers were submitted for the meeting. Each session will be opened by a 30 minute invited talk. Louis Fortier has already accepted the invitation to speak at the polynya session.

Action

Louis Legendre will circulate the information on polynya submissions to the SCG when he has it.

The 2002 Ocean Sciences meeting will be held in either Honolulu, HI or New Orleans, LA. The SCG would like to hold a polynya session there as well, though discussions about this can be put off until the 2001 SCG meeting.

III. IAPP-SCG membership

Current Members

<u>Name</u>	<u>Country</u>	<u>Specialty</u>
Louis Legendre (Chair)	Canada	
John Andrews	USA	geologist
Jody Deming	USA	biological oceanographer (microbial)
Louis Fortier (NOW Chair)	Canada	biological oceanographer
Torkel Gissel Nielsen	Denmark	
Jean-Henri Hecq	Belgium	modeling
Hans-Jürgen Hirche	Germany	biological oceanographer
Mark Johnson	USA	physical oceanographer
Gerhard Kattner	Germany	chemical oceanographer
Tsuneo Odate	Japan	biological oceanographer
Atsumu Ohmura	Switzerland	physical oceanographer
Ian Walsh	USA	physical oceanographer

Andrew Willmott

UK

physical oceanographer

Corresponding Member

R. Møbjerg Kristensen

Denmark

A few of the members have either expressed interest in retiring from the SCG or have not been active for some time:

- Gerard Kattner would like to retire from the SCG.
- Atsumu Ohmura has not attended in many years but is still interested in participating.
- Jean-Henri Hecq has never attended an IAPP-SCG meeting.

Action:

Louis Legendre will tell Jean-Henri Hecq that the IAPP-SCG has revised its membership and he is no longer on the SCG, and will ask Atsumu Ohmura if he would like to continue as an SCG member, a corresponding member or if he would like to retire from the SCG.

Before evaluating the distribution by country and discipline of the remaining IAPP-SCG members, it was decided to wait until a decision is made about the IAPP's future plans.

IV. North Water Polynya Project (NOW)

Louis Fortier made a short presentation on the history and progress of the NOW project. Most recently, observations in the polynya were made from August-October 1999. Approximately 80% of the moorings placed the previous year were recovered, and another set of samples were obtained along the transects.

Public Relations

The 1999 field season brought some concern among the people in Qaanaaq and Grise Fjord with how the ship would interfere with hunting and that the NOW scientists were scouting for oil or fish. NOW held an open house in both ports to allow people to tour the ship and learn about the research. This approach was successful. The presence of a research ship should not pose a problem for future work.

The Canadians would like to declare the area a Marine Protected Area. However, the most productive and diverse part of the polynya is on the Greenland side. At a previous meeting in Virginia, it was privately suggested that UNESCO should declare the NOW polynya a World Heritage Site. This would protect the entire polynya including the Greenland side and prevent potential catastrophe (e.g. if oil reserves are discovered) to the world's most productive region.

Action:

The IAPP-SCG would like the AOSB to explore the possibility of obtaining UNESCO International Heritage Site status for the NOW polynya.

Action:

Martin Fortier will ask the Canadian Authorities about obtaining Marine Protected Area status for the Canadian side.

Data

Presently, NOW participants are compiling the data and hope to have it online soon. There is no timeline yet, but the framework is set up to handle the data whenever it is ready. Participants at the

NOW Workshop (which will be held in the next two days) will discuss what should go on the database.

Summary

- The NOW Project had an extremely successful field component and collected excellent data
- The next step is the synthesis of the data
- Future funding is an issue in Canada. Only four years were anticipated for this project, 2 years in the field and 2 years of synthesis. Instead, 3 years were spent in the field leaving only one year of funding for synthesis.

V. 2001 Polynya Symposium

Jody Deming spoke about the planning efforts underway for the 2001 Polynya Symposium. The Steering Committee has been in contact via email to determine the date and location for the meeting. They will now expand their mandate to plan the scientific aspects of the meeting.

Steering Committee Members:

Jody Deming (Chair)	US	microbiology	NEW, NOW
Walker Smith (Co-Chair)	US	biological oceanographer	NEW, Ross Sea
Knud Falk	Denmark	orinthologist	NEW, NOW
Louis Fortier	Canada	zooplankton and larval fish	NEW, NOW
Hans-Jürgen Hirche	Germany	zooplankton	NEW
Grant Ingram	Canada	physical oceanographer	NEW, NOW
Peter Minnett	US	heat budgets and meteorology	NEW, NOW
Tsuneo Odate	Japan	zooplankton and carbon flux	NOW
Doug Wallace	Germany	inorganic chemistry	NEW, NOW

Action:

Jody Deming will ask Heide Kassens, a member of the Laptev Sea Polynya community, to join the Steering Committee.

Venues

The Steering Committee suggested these five venues:

1. Miami, FL
Local hosts: Sharon Smith, Peter Minnett
2. Williamsburg, VA (VIMS)
Local host: Walker Smith
3. Kiel or Bremerhaven, Germany
Local hosts: G. Kattner, H.-J. Hirche, D. Wallace
4. Quebec City or Montreal, Canada
Local hosts: L. Fortier, M. Fortier
5. Seattle, WA or Victoria, BC
Local hosts: J. Deming, G. Ingram
6. San Diego, CA (Scripps Institution of Oceanography)

After some discussion, the SCG agreed that a Canadian site would be the best location for the symposium, both as a way to recognize the work the Canadians have put into the polynya projects and as a way to keep meeting and participant costs down.

Action:

The SCG decided on Quebec City in September 2001 as the location and date for the Polynya Symposium.

Length of Meeting

The SCG felt that four days would be a sufficient length of time for the Symposium, preferably held near a Saturday so participants could get a cheaper airfare by staying over a Saturday night.

Meeting Format

A variety of meeting formats were discussed. A majority of the SCG favored non-concurrent sessions so that there would be interaction between the disciplines. Two slightly different formats arose around this idea.

9:00-11:00	talks (6)	9:00-11:00	talks (6)
11:00-noon	posters, lunch	11:00-noon	posters, lunch
1:00-1:30	talk (1)	1:00-4:00	talks (6)
1:30-	posters beer, etc.	4:00-	posters, beer, etc.

Themes

The SCG agreed that the symposium should not be divided by project (eg. NEW, NOW, Laptev Sea, Ross Sea, etc.) since one of the goals of the meeting is to encourage interaction between members of the various projects. Suggestions for daily topics (or themes) included polynya formation, productivity rates, cross-polynya comparisons and the carbon cycle.

Publicity

It was suggested that distributing emails on Arctic mailing lists would be the simplest, most efficient and cheapest way to publicize the Symposium. Suggested mailing lists include: NOW (Louis Fortier), NEW, Ross Sea (Walker Smith), Laptev Sea (Heide Kassens), OAI (Lou Codispoti), Arc Info, and AOSB (Lou Brown). The SCG will also try to distribute flyers at the upcoming ASLO meeting in Copenhagen.

VI. Publication of polynya book and/or special journal issue

Both Jody Deming and Walker Smith, chairs of the polynya sessions at the Ocean Sciences meeting, were approached at the meeting by various publishers about books and/or special journal issues on polynyas.

Special Journal Issue on the NOW Polynya

The SCG feels that NOW should definitely have a special issue of an international journal. It was suggested that an outline and/or manuscript be ready by the ASLO meeting in Copenhagen in June 2000. Further discussion on timeframe, editors and journals were planned for the NOW Workshop, held on the Saturday following this SCG meeting.

Polynya Book

Publishers, including Kluwer, AGU Monographs, Academic Press and Elsevier, approached the Ocean Sciences polynya session chairs about putting together a major book on polynyas. This would not be a textbook or a collection of papers, but a synthesis of current knowledge about polynyas. The SCG encouraged this idea. Jody Deming and Walker Smith were already approached to be editors and are considering this opportunity. Other suggestions for editors are welcome.

VII. New projects/future of the IAPP

New Projects

Last year it had been suggested that the Lincoln Sea polynya be the focus for the next IAPP project. After further exploration, it was determined that this area is not really a polynya and would not well-complement the NEW and NOW studies. A second possibility suggested was the St. Lawrence Island Polynya (SLIP), a small polynya, located outside the Arctic Basin (as were

the Northeast Water and North Water Polynyas). A new suggestion made this year is the Cape Bathurst polynya (also known as the Banks Island polynya) near Banks Island in North Western Canada.

The Cape Bathurst polynya is a coastal polynya with a large freshwater input from the Mackenzie River. It would be very different from the NEW and NOW polynyas and probably the only North American analog to the Siberian polynyas. Thus, the Cape Bathurst polynya may be more representative of the Arctic as a whole than either the NEW or NOW polynyas are.

Satellite images of the Cape Bathurst polynya show that, although it was quite large and productive in 1998, it is more often smaller than the NOW polynya. However, it is located within the Arctic Basin and its close link with the Mackenzie River outflow could provide a link with the Mackenzie River program taking place nearby. The intent is to link with the new U.S. Shelf-Basin Interaction (SBI), to be conducted in Beaufort Sea.

Previous work in the area includes the collection of sediment trap data, but it is not yet known what has already been done in the marine biology. Before any decisions are made to go forward on a Cape Bathurst polynya study, past research performed in the area needs to be investigated. It was agreed that the driving questions for studying the Cape Bathurst polynya would be discussed further at the upcoming NOW Workshop.

Logistics

Logistically, it might not be extraordinarily difficult to get a ship into the Cape Bathurst polynya. Although this is an area where the sea-ice is thick, it is also where the SHEBA project observed thinning. One suggestion made was the CCGS *Louis St. Laurent* be brought into the polynya in the fall, overwinter (but not frozen into the ice), and be present for the polynya opening in the spring. It was also suggested that ice camps and drifting buoys could be set up quite easily in the area.

Concerns were expressed about the possible difficulty moorings might face, including 6m-thick sea-ice and the dangerous combination of shallow water on the shelf and ships with 20m-deep keels coming through.

Funding

Canada might have two simultaneous avenues of funding for network renewal (4-5 years of funding), through NSERC and DFO. It is easier for Canadian researchers to get money for ship use if there are other countries putting money in as well. The United States' NSF is putting in a request for 100 days of ship time for the *Healy* when it first goes into operation. However, they have budgeted more money for ship time than is required for these 100 days and may be able to put some of the excess into use of a Canadian ship. After the *Healy* gets fully underway, NSF will be budgeting for 200 days of ship time and will no longer have the extra logistics money.

Other possible options for funding from the U.S.:

- Through ARCSS, though the last project required a 7-year lead time
- The project could be coordinated unofficially as was the NOW project
- Compete through NSF's new Biocomplexity Initiative
- Other agencies besides NSF?

Action:

Louis Legendre will contact the IAPP-SCG with results of the discussions on the Cape Bathurst polynya that will take place at the NOW Workshop this coming weekend.

VIII. Terms of Reference

The IAPP-SCG discussed what would be gained by revising the Terms of Reference document, first written in 1991. Scientists in some countries use this document as a reference for their proposals, and it was agreed that such an old, scientifically outdated document might look strange to reviewers and funding agencies.

The IAPP-SCG divided the document up among the SCG by subject (Missions) for revision. The groups responsible for each section are:

<u>Mission</u>	<u>Revision Team</u>
Water	A. Willmott (lead), M. Johnson, A. Ohmura
Carbon Flux and Fate	I. Walsh (lead), J. Deming, J. Andrews
Community Structure & Productivity	H.-J. Hirche (lead), L. Fortier, T. Nielsen, R.M. Kristensen

Revisions will be done over email. After the Missions are revised, the Core Measurements and General Introduction sections will be updated as well. It is hoped that the revised Terms of Reference will be finished in time for the AOSB meeting (1 April 2000) for the Board's approval.

IX. Next IAPP-SCG Meeting

The next IAPP-SCG meeting will be held in conjunction with the 2001 Gordon Conference on Polar Marine Science. It will be held in Ventura, CA around the beginning of March.

Addendum 1

A follow-up from Louis Legendre (4 February 2000):

1. Membership. Because of numerous conflicting activities, Jean-Henri Hecq would prefer to become corresponding member of the SCG-IAPP, at least for the time being.
2. During the NOW workshop of 29 and 30 January, there were lengthy discussions (some of them over dinner and wine) about a possible project concerning the Cape Bathurst (also called Bank Island) Polynya, in the Canadian High Arctic. We already examined general aspects of that project during the SCG-IAPP meeting. Here is additional information.

The winter system in the proposed study area is characterized by a latitudinal succession of subsystems, from the mouth of the Mackenzie River to the Arctic Ocean Basin. At the mouth of the Mackenzie in late winter, freshwater begins to accumulate behind an ice dam, called "stamukhi", eventually forming a large, under-ice "inverted lake" called Lake Mackenzie. The stamukhi-lake zone is expected to be dominated by a large input of continental dissolved organic matter (DOM), chemical reactions, and heterotrophy. The polynya is located offshore from the stamukhi. There, dense water is formed, and biological activity is expected to dominate the organic matter processes (phytoplankton production and biological transformation of the DOM). Between the polynya and the basin, there is deep export of dense water containing dissolved and particulate organic matter, while the surface underice waters may resemble the usual first-year ice encountered elsewhere in the Arctic. The region supports very abundant marine life, including mammals and birds. These elements will be used to develop an hypothesis concerning the input, transformation and transport of organic matter, from the coast into the deep basin, and its impact on marine life.

Starting in about a year time, the USA will conduct a major Shelf-Basin Interaction study in Beaufort Sea, to the west of the Mackenzie area. There will be a Canadian-led proposal for a

parallel, year-round study, to be conducted from the mouth of the Mackenzie River to the basin. The provisional name for that study is MERLOT (Mackenzie Environmental Research on Land-Ocean Transport). The study is intended to be open to international participants. US and Japanese researchers, in addition to Canadian University and Government scientists, have already expressed interest.

There will be a US proposal to the NSF biocomplexity initiative, led by Jody Deming, focussed on the stamukhi zone. The name will be SHIRAZ (Stamukhi: Heat-Ice-River Arctic Zone).

Finally, it was proposed that the SCG-IAPP recommends to the AOSB to conduct the polynya component of MERLOT under the name of "CAB Polynya Project" (CAB: CApe Bathurst).

Addendum 2

A follow-up from Jody Deming (11 February 2000):

Information on the Special Session on Polynyas at Ocean Sciences 2000, San Antonio:

Total number of presentations (oral and poster) = 46

Number of oral presentations = 32

Number invited = 6

Number of graduate students = 5

Number withdrawn = 3

Number of poster presentations = 14

Number of undergraduate students = 2

Number of graduate students = 2

Withdrawn = 1

Attendance ranged from about 40 to 100 participants per session.