



EXPRESSION OF INTENT FOR ACTIVITIES IN IPY 2007-2008.

Deadline for Submission - January 14, 2005

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1.0 PROPOSAL INFORMATION

1.1 Title of proposed activity

Integrated ARCTIC OCEAN OBSERVING SYSTEM -2 "Shelf-Basin Exchanges (SBE)"

1.2 Acronym or short form title of proposed activity

iAOOS-2 "Shelf-Basin Exchanges"

1.3 Concise outline of proposed activity

[400 words]

Rapid changes are being observed in the Arctic supporting contentions that polar ecosystems may be bell-weather of a global climatic change. The Arctic Ocean continental margins are the interactive transformation zone between the shelf and deep basin regions. In that context, they act as a dynamic boundary for cross-slope shelf-basin interactions, playing a major role in the ventilation of the deep basins by transporting dense, brine-enriched shelf waters and associated organic and inorganic carbon to the abyssal region. From the pan-Arctic perspective, the margins are main avenues for boundary currents and the overall large scale ocean circulation to transport heat, salt, fresh water, biogeochemical properties and sediments around the Arctic Ocean. Understanding the key processes regulating interactions across margins and gateways are vital for modeling the past, present and future of the Arctic ecosystem. Based on these factors, we are proposing an "Arctic Snapshot" of key shelf-basin exchange (SBE) parameters at the shelf break for the International Polar Year in 2007-2009 through development of a synoptic network of collaborative international studies over a pan-Arctic scale. The SBE project envisions a coordinated research effort through a framework of time-series moorings situated on radial circum-arctic SBE transect lines, with process studies and paleoceanographic coring that can be coordinated internationally. Standard physical and biogeochemical measurements on these transect lines, occupied simultaneously by multiple ship platforms, would be built around a backbone of moorings at the Arctic shelf break to investigate potential oceanographic changes with ice retreat northward over the margins. The use of satellites for remote sensing of ice coverage and thickness, ocean color, and tracking marine mammals and seabirds will provide enhanced coverage of the pan-arctic region as well as validation of measurements during the field program.

Key shelf-basin exchange measurements made around the Arctic coincident with measurements in the key gateways to/from the Arctic (Bering Strait, the Canadian Archipelago, St. Anna Trough, and Fram Strait) and coordinated with high resolution process and large scale modeling studies are needed for a better understanding of the Arctic Ocean and its variability over time. Coordinated circum-arctic projects would also entrain coastal communities by both active participation in international research projects and educational opportunities. The SBE project is one of 5 elements of the ocean program of international Arctic Ocean Observing System (iAOOS).

1.4 Which IPY 2007-2008 theme(s) will be addressed by the project (see Note 1)

Theme 1 – The current state of the polar environment	Y
Theme 2 - Change in the polar regions	Y
Theme 3 - Polar-global linkages and interaction	Y
Theme 4 - Investigating new frontiers & techniques	Y
Theme 5 -The polar regions as vantage points	Y
Theme 6 - Human societies in polar regions	Y

1.5 What is the major target of the proposed activity (specify one – see Note 1)

Natural or social science research	Y
Education/Outreach and Communication	
Data Management	
Legacy	
Other Targets	

1.6 What significant advance(s) in relation to the IPY themes and targets can be anticipated from this project?

100 words max

- A coordinated network of pan-Arctic cross-margin transect lines with standardized measurements to determine the current state of the shelf margins
- A circum-arctic ocean observing network of moored technology on the slope region to enhance understanding of seasonal and interannual variability
- Coincident regional modeling studies to scale-up to a pan-Arctic understanding and ultimately to improve global relevancy for the Arctic system
- Develop new biochemical mooring sensors critical to understanding ecosystem change and its impact on human society
- A pan-Arctic SBE science-measurement network, interfaced with public education and community involvement, will be a lasting legacy of IPY

1.7 What international collaboration is involved in this project? (see Note 2)

50 words max

SBE is an element of the iAOOS Science Plan, which was approved by the international AOSB and CLIC Committees. SBE will coordinate with the German Synoptic Pan-Arctic Climate and Environment Study (SPACE), the Nordic Land-Shelf-Basin Interaction Study, the Canadian Arctic Margin Expedition (CAME), and the US Shelf-Basin Interactions (SBI) project.

2.0 FIELD ACTIVITY DETAILS

2.1 Outline the geographical location(s) for the proposed field work (see Note 3)

50 words max. SBE activities cover the circum-Arctic margins of the Arctic Ocean where Arctic change is hypothesized will be most extreme. These areas include the Barents, Bering, Beaufort, Chukchi, East Siberian, Laptev, and Kara Seas and the Canadian Archipelago.

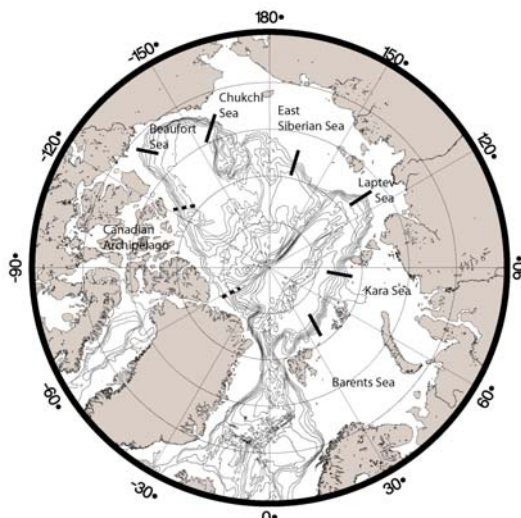


Figure 1. Tentative locations of transect lines for the SBE “Arctic Snapshot” project.

2.2 Define the approximate timeframe(s) for proposed field activities?

Arctic Fieldwork time frame(s)	Antarctic Fieldwork time frame(s)
2007 – 2009	mm/yy – mm/yy

2.3 What significant logistic support/facilities will be required for this project? Can these resources be usefully shared with other projects? (see Note 4)

50 words.
 Surface ships (icebreakers and ice-strengthened), moorings (current meters, ice-profiling sonar, CTD profilers, biochemical sensors, marine mammal acoustic recorders, benthic video cameras), and air support for occupation of heavy ice regions. This project requires international logistical assets, specifically ships. These assets will be shared with other oceanographic projects.

2.4 Will the project leave a legacy of infrastructure? (see Note 1)

50 words:
 Time-series slope data will enable us to evaluate the role of pan-Arctic slope regions in climate change and ecosystem response. Establishment of an international pan-Arctic framework for future studies will be an IPY legacy. These data will advance regional to large-scale, modeling efforts for predictive scenario analysis of future change.

2.5 How is it envisaged that the required logistics will be secured? (one or more options can be identified)

Consortium of national polar operators	Y
Own national polar operator	Y
Another national polar operator	Y
National agency	Y
Military support	N
Commercial operator	Y
Own support	Y
Other sources of support	Y
Further details - 50 words max 1) PI involvement and their existing equipment inventory, with further acquisition support from individual national agencies 2) National ship scheduling for ship assets (e.g., icebreaker support such as Healy, Polarstern, Louis St. Laurent, Admunsen, Oden, Federov), coordinated via international FARO and SBE efforts	

2.6 Has the project been "endorsed" at national or international level (see Note 5)

Y	<p>Further details – 50 words max</p> <p>The SBE element within the iAOOS program is consistent with the ‘Global Change’ research priorities of the international Arctic Ocean Sciences Board and the WCRP Climate and Cryosphere program and is endorsed by both. Also, this expression of interest is being considered by the US IPY National Committee.</p>
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3.0 PROJECT MANAGEMENT AND STRUCTURE

3.1 Is the project a component (established over the IPY 2007-2008 timeframe) of an existing plan, programme or initiative or is it a new autonomous proposal?

New Project ?	Component of an existing or planned activity ?
<p>50 words max:</p> <p>The SBE project is part of iAOOS AOSB-CLIC planning. Developing national programs under the SBE umbrella include the German SPACE project, the Nordic Land-Shelf-Basin Interactions Study, and the Canadian CAME project, and the US Shelf-Basin Interactions (SBI) project. SBE goals occur in SEARCH, ISAC, and IASC Pacific Arctic Group plans.</p>	

3.2 How will the project be organised and managed? (see Note 6)

<p>100 words max: The SBE project will coordinate within an agreed pan-arctic structure of the AOSB-CLIC Science Plan. Implementation will follow the principal funding sources within the AOOS-framework, specifically driven by national funds, but scientifically coordinated via an international SBE science working group within the parent international AOSB and CLIC Committees. An international management scheme will be developed to interface the SBE national groups in order to facilitate efficient field programs, data transfer (via virtual web-based design), and synthesis. Representatives from each of the national SBE program will participate in a revised SBE steering committee and interact with other i-AOOS management bodies.</p>
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3.3 What are the initial plans of the project for addressing the education, outreach and communication issues outlined in the Framework document? (see Note 7)

<p>50 words max</p> <ul style="list-style-type: none"> • Coordinate an educational outreach component through ongoing international organizations, such as the “Nordic Network”, the Canadian ArcNET, and University of the Arctic • Utilize an educational, web-based infrastructure format to bring research results to both the near-field Arctic Native communities and far-field global public communities

3.4 What are the initial plans of the project to address data management issues (as outlined in the Framework document)? (see Note 8)

• 50 words max:

Data management would be approached in a coordinated fashion using an internationally agreed upon, web-linked "virtual electronic" data base for linking the international Arctic margin and gateway-relevant data via one web page to the actual data housed in national data archives

3.5 How is it proposed to fund the project? (see Note 9)

50 words max

There are a variety of national funding sources, including those in the European Union, National Research Councils and Government Departments in Europe, Canada, Japan, China, Korea and Russia, and various interagency funding groups in the United States, specifically NSF, NOAA, and NASA through the SEARCH and IPY forums.

3.6 Is there additional information you wish to provide?

100 words max

The SBE working group plan can be found on the AOSB website (<http://www.aosb.org/SBE.html>). In addition, a science plan is being developed through the International Conference on Arctic Research Planning (ICARP2) efforts (Working Group 5 Arctic margins and gateways; draft outline at <http://www.icarp.dk/>). The complete AOSB-CLIC Science Plan, which includes SBE planning with iAOOS, can be found at the ASOF website (<http://asof.npolar.no/IPY.html>) as a pdf file (AOSB-CLiC Observing Plan, Aug. 2004).

4.0 PROPOSER DETAILS

4.1 Lead Contact for the Expression of Intent

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