

**DISCUSSION SESSION ON SUSTAINED MONITORING OF ARCTIC FLUXES,
ARCTIC SCIENCE WEEK CAMBRIDGE, 2-7 APRIL 2000**

Dr. Robert Dickson is organising and will chair a small discussion session during the Arctic Science Summit Week (ASSW) to advance planning for sustained monitoring of Arctic fluxes. This session will be held on Thursday, April 6th. Participation in this session is limited by space and time considerations to about thirty scientists and thus will be by invitation only. Nominations (including self-nominations!) may be sent to Bob via email or fax (these communications addresses are provided below).

Dr. Dickson will then consider all such nominations and invite those most likely to be able to contribute to the discussions. Please bear in mind that this is expected to be the first step in a comprehensive scientific planning process that will provide opportunities at a later stage (probably at multiple stages) for all interested scientists to become involved in the planning process.

In order to make the maximum progress at the meeting, Bob is inviting some session participants to prepare for circulation before the meeting a set of condensed 1-page statements (plus figures) on "present understanding" that apply to the several key parts of the programme participants will be discussing. This should avoid the need to go over agreed ground during the session itself. Such strawmen are not expected to emerge unscathed, but experience indicates that kind of preparation would enable participants to get more rapidly to **the point -- defining what the optimal long-term Arctic observing system for climate might/should look like.**

The preparations will focus on four issues:

The Science Driver - why we are interested in the Arctic freshwater flux and thermohaline shutdown in the first place;

Observations - what and where would we measure to keep pace with any change in the thermohaline circulation and determine its causes;

Programs – what programs underway now or planned for the immediate future could contribute to such an effort; and

Applications and Funding

Specific issues that are likely to be addressed in these preparations include the following:

The Science Driver

- (1) paleo evidence that increased freshwater accession has caused rapid shutdown of the MOC in the past;
- (2) what is the range and consensus of the present models of how the thermohaline circulation is expected to be affected by rising CO₂ and what are the control variables;
- (3) how close are we to shutdown at present;
- (4) where their main observational needs presently lie for coupled models; and
- (5) what is the climate of the sector likely to do as we move from the extreme NAO-positive state of the 1990's to the extreme anthropogenic forcing expected around 2100?

Observations

(6) ice and freshwater flux in the western Fram strait;

- (7) the freshwater flux array under the ice of SE Greenland shelf (i.e., how much of the Arctic efflux reaches the open North Atlantic);
- (8) the freshwater flux through the Canadian arctic archipelago;
- (9) poleward heat/salt flux west of Norway;
- (10) the heat/salt flux into the Arctic via E. Fram Strait;
- (11) these same fluxes via the cooler fresher pathway through the Barents Sea;
- (12) heat, freshwater, and nutrients via the Bering Strait;
- (13) ice extent and thickness in the Eurasian Basin; and
- (14) where would the meridional overturning circulation be monitored?

Programs

- (15) SEARCH;
- (16) VEINS-2;
- (17) the proposed UK-Norway initiative;
- (18) ACSYS/CLIC; and
- (19) others

Applications and Funding (no one-pagers are planned for this section)

Topics that are expected to be covered in this section include:

potential applications such as initializing or verifying models; preparation of data products (gridded fields, etc.); and possible contributions to periodic assessments (e.g., the proposed Arctic Climate Impact Assessment), etc.;

options for sustained measurement programs and observatories; and

The key issue: how might we best achieve some sort of long-term stamina in funding (prospects for funding for sustained observations in the Arctic from both national and international sources.

To comment on this paper or to submit nominations, please contact Dr. Dickson at:
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