

**REPORT ON THE CLIC SCIENTIFIC STEERING GROUP MEETING, COPENHAGEN,
DENMARK, 6-9 NOVEMBER 2005**

The CliC SSG, plus invited experts, met at the Danish Polar Center, Copenhagen just before the Second International Conference on Arctic Research Planning (ICARP) meeting. The meeting was wide-ranging and covered a large number of ongoing and planned activities within the broad field of climate and cryosphere.

This was the second SSG meeting of CliC and the main goal was to develop the recently published CliC Implementation Strategy into a number of well-focussed initiatives that would be the main CliC research effort over the next few years.

CliC research is based around four CliC Project Areas (CPAs):

CPA 1 – The Terrestrial Cryosphere

CPA 2 – Glaciers, ice caps and ice sheets, and their relation to sea level

CPA 3 – The marine cryosphere and its interactions with high-latitude oceans and atmosphere

CPA 4 – Links between the cryosphere and global climate

SCAR is a co-sponsor of the CliC programme and there are strong science links between the two organisations within the scope of the four CPAs.

I lead CliC CPA 4 and presented a plan for its implementation via four main activities:

1. An intercomparison of cryospheric analyses for the last 50 years and predictions for the next century, based on global model output and observational data. These would be concerned with:
 - a. Sea ice
 - b. Snow cover
 - c. Mass balance of ice sheets
 - d. Change in the fresh water balance of the Arctic Ocean and adjacent seas.
 - e. Work with WG on Coupled Models – we will bring cryospheric expertise
 - f. Link with glacier models?
 - g. Goals:
 - i. to consider the uncertainty in the cryospheric change
 - ii. To examine predicted changes under various greenhouse gas scenarios
 - h. Primarily concerned with output from GCMs
 - i. Will contribute to IPCC AR 5
2. Long term past and future interactions between the cryosphere and the rest of the global climate system?
 - a. Concerned with processes and the uncertainties in the cryospheric linkages with the rest of the Earth System
 - b. Paleoclimate changes – e.g. 8.2 Kyr event, deglaciations of the major ice sheets, Heinrich events
 - c. Impact of fresh water injection at high latitudes on the THC e.g. West Antarctic and Greenland ice sheets.
 - d. Biogeochemical interactions

- e. Would involve teleconnections with the tropical climate - ENSO
- 3. The impact on the cryosphere of changes in the main atmospheric/oceanic modes of variability
 - a. SAM/NAM/NAO
 - b. Impact on ocean, snow cover, precipitation and sea ice, Antarctic Peninsula ice shelves
 - c. Decadal timescale variability
 - d. Timescale of past few thousand years to the next century
 - e. Primarily model based, but with some use of proxy data e.g. ice cores

There are obvious possibilities for collaboration here with SCAR's Antarctic and the Global Climate System (AGCS), and it was proposed that a joint AGCS/CPA 4 workshop be held in Cambridge in September 2006. This would involve a limited number of invited expert who would develop a way forward for these two programmes.

There was extensive discussion during the meeting of how the goals of CliC could be advanced during the IPY. We were fortunate that Dr David Carlson, the Director of the IPY Programme Office, was present at the meeting, and there was a lively discussion on the role of CliC. It was agreed that it would be valuable to have a proposal cluster concerned with Antarctic atmospheric variability and links with lower latitudes, and I agreed to coordinate the preparation of this proposal before the January 2006 deadline. A high priority within IPY will be to have good operational, real time atmospheric analyses for the IPY period. The routine and additional observations must get to the major re-analyses in a timely fashion, and there will also be a need to give good re-analyses after the event. It was agreed that it would be desirable to have a meeting on the whole question of polar re-analyses, and it was suggested that this be held in Cambridge, UK around March/April 2006. A one day visit would be arranged to ECMWF to discuss IPY matters.

On the question of re-analyses, it is being suggested that there should be ocean re-analyses prepared at some stage, and a further, perhaps more distant target would be to have cryospheric re-analyses.

A CliC IPY proposal entitled The State and fate of the Cryosphere (CRYOS) has been submitted.

Concern was expressed over the loss on launch of the Cryosat satellite, which would have provided very valuable cryospheric data, especially for the IPY. Many organisations had written supporting letters to funding agencies requesting a build of a replacement satellite. However, it was thought to be unlikely that a replacement could be launched in less than three years. Funding is still being sought to re-build a replacement.

A number of important meetings are planned for the next couple of years:

The SCAR Open Science conference will be held in Hobart, Australia over 12-14 July 2006.

The International Glaciological Society conference on Cryospheric Indicators of Global Climate Change will take place in Cambridge, UK during 21-25 August 2006.

The Earth System Science Partnership conference will be held in Beijing over 9-12 November 2006.

The next meeting of the CliC SSG will probably take place in Boulder, Colorado in October 2006.

John Turner
21 November 2005