

Minutes
AGM for CNC/SCOR
May 30, 2004
at the CMOS Congress, Edmonton
Fantasyland Hotel, Bordeaux Room

The meeting was called to order at 9:05 a.m.

1. Welcome and Introductions

Attending: Bjorn Sundby, Dick Stoddart, Christine Michel, Rob Macdonald, Susan Allen, Neil Campbell (part time), Paul Myers, Allyn Clarke, Gordon McBean (part time), Greg Flato, Jinyu Sheng, Mike Stacey (part time), Bob Jones (part time)

Regrets: Dave Barber, Ken Denman, Ian Perry, Ali Aksu, Rich Pawlowicz, Maurice Levasseur, Brad de Young, Suzanne Roy

2. Approval of May 30, 2004 Agenda

It was **moved** by Susan Allen, **seconded** by Jinyu Sheng, that the draft agenda sent to members on April 26, 2004 be **approved** as circulated. **Carried**

A detailed annotated agenda was provided to participants in advance of the meeting on May 18, 2004. It contained detailed information meant to initiate discussion on each agenda item.

3. Approval of February 19, 2004 Draft Minutes

The minutes of the last CNC/SCOR meeting held on February 19, 2004 were distributed to members on February 24, 2004. Editorial changes to those draft minutes were provided by Ian Perry on (i) his affiliation, and (ii) possible sponsorship of a new SCOR Working Group proposal. No additional changes were suggested. Accordingly, the draft minutes as amended, were approved on a **motion** by Rob Macdonald, **seconded** by Susan Allen. **Carried.**

4. Review of 2003/2004 Actions

A status report on the February 19th action items was previously provided by email to members on April 1, 2004, and again on May 18, 2004. Decisions and further actions resulting from the review of the May 18th status report, which are not included elsewhere in the agenda, included:

- (i) **Ocean Science MSc and PhD Theses.** There was general agreement that the initiative to gather and list recent ocean science theses on the CNC/SCOR web site was a useful and productive activity, and should be strengthened if at all possible. Suggestions for improvement were (i) provide potential contributors with a template so the site could be standardized with common information, and (ii) provide hot links to the university that originated the theses. **Action: Dick Stoddart.** The web site has been updated to include ocean science theses from UVic, UBC, Québec-Océan, and UofA, and an update from

Dalhousie is promised. A few other universities were contacted to provide similar information, namely Memorial (Brad de Young), York (Peter Taylor) and Manitoba (David Barber) – there needs to be follow up to ascertain if contributions are likely. **Action: Dick Stoddart.** It was also suggested that additional universities be contacted, namely Acadia (Richard Karsten), St. Francis of Xavier (**Allyn Clark** to provide a contact once a prospective new arrival is known) and UofT (Bill Gough). **Action: Dick Stoddart.**

- (ii) **Hits on CNC/SCOR web site.** Members were interested to find out if it was possible to determine the level of activity (number of hits) on the CNC/SCOR web site in general, and on individual pages such as the “theses” page in particular. Bob Jones, CMOS and CNC/SCOR web master, was invited to participate in this discussion. Bob reported that he had just compiled a series of “hit” statistics for all of the CMOS site, including the SCOR site, but had not yet had a chance to analyze them in any sort of standard fashion. He indicated that SCOR was the third highest site visited, with between 30,000 and 38,000 hits annually depending how one counted. The statistics indicated that SCOR was the third highest site being accessed on the overall CMOS site, behind only Atmosphere/Ocean and the Private Sector pages. Bob Jones noted that he would be able to drill down to individual pages on the SCOR site, such as the theses page, to determine the number of hits/page – but he did not have these statistics presently at hand. Dick Stoddart will work with Bob Jones over the coming few weeks to develop a report on SCOR page hit statistics, and this report will be then circulated to CNC/SCOR members for information. **Action: Dick Stoddart.**

5. CNC SCOR Finances

- (i) **CNC/SCOR revenues and expenses.** The audit for 2003 indicates a CNC/SCOR balance of \$33K. Expected revenue in 2004/5 from DFO is \$12K while expected expenses are: secretariat services (est. \$1K), travel support of some members to the Edmonton AGM (est. \$5K), travel for two people to the SCOR meeting in Venice (est. \$5K, additionally it is expected that NRC will support the travel of Bjorn Sundby to Venice), lecture tour (est. \$3K), and support to the science program of Edmonton Congress (est. \$3K). The estimated expenses for 2004 (est. \$17K) exceed revenues (12K), with an according depletion of the \$33K balance by \$5K. It was suggested that CNC/SCOR should earmark where the balance of the funds were meant to be expended in the coming years, or else they may be reallocated by DFO given their tight budget situation. Bjorn Sundby indicated this had already been done verbally in a recent meeting with Wendy Watson-Wright, and she had been very supportive that CNC/SCOR should retain these funds for planned support to such ventures as IPY.
- (ii) **Agreement with DFO.** The agreement between DFO and CMOS for continuing funding support through 2003/4 was implemented this year through a contract, rather than the usual “grants and contribution” agreement. This was an oversight in planning and it is expected that the G&C arrangement will be reinstated this year.
- (iii) **Agreement with NRC.** The agreement between NRC and DFO, for NRC to pay the international SCOR fees (currently at \$US 18.5K) is in effect through the end 2004. NRC normally undertakes a formal evaluation every 4 years to determine if they will

extend such support into the future. The NRC evaluation of CNC/SCOR and the benefits of continued Canadian participation in international SCOR should have started by now, but NRC has yet to indicate the actual start date for such an evaluation.

6. CNC/SCOR Issues and Activities

- (i) **Web site.** The CNC/SCOR web site (www.cncscor.ca) has been kept up to date and checked periodically for dead links. Major items added since last year include: all CNC/SCOR Canadian Ocean Science Newsletters, international news, results from the Moscow international SCOR meeting, summaries of all SCOR related programs, summaries from Canadians on SCOR Working Groups, and ocean science theses titles/authors from various Canadian universities. Members were very appreciative of the work done by Bob Jones in keeping the web site current, and for his proactive involvement in gathering “hit” statistics on the SCOR site as noted under agenda item #4(ii) above.
- (ii) **Newsletter.** The electronic Canadian Ocean Science Newsletter was implemented just after the last CNC/SCOR AGM in Ottawa, with the first issue being distributed on July 20, 2003. Seven issues have been distributed and an 8th issue is planned for June 17, 2004. Currently there are 405 subscribers. Various statistics on the Newsletter frequency, types of articles, contributors and reader feedback were compiled in the Appendix 2 of the annotated agenda.

Members were very supportive of continuing the Newsletter as it was seen as a very useful outreach mechanism for the Canadian ocean science community. It was noted that the Newsletter does not happen by itself – it needs contributors, and members should be proactive in seeking articles from colleagues. It was agreed that a notice should be sent to Members three (3) weeks in advance of the each future Newsletter, reminding them of the publication date and asking them to scout around for possible contributions. **Action: Dick Stoddart.** It was observed that there has been a lack of articles in the Newsletter on marine geology. Rob Macdonald and Allyn Clarke will contact managers at NRCan/PGC and NRCan/AGC to see if they could supply a list of possible subscribers (email addresses) and a few preliminary articles in an attempt to fill the noted marine geology gap. **Action: Rob Macdonald, Allyn Clarke.** Bjorn Sundby will attempt the same with the academic community, starting by seeking advice from Ali Aksu. **Action: Bjorn Sundby.** Rob Macdonald will draft an article on IPY for the Newsletter. **Action: Rob Macdonald.** Possible future articles might also include a one-page summary of theses, as they are completed, suitable for a general audience; e.g. what it found and why it is of interest – publishing just the theses abstract would not accomplish this goal. **Action: Academic Members.**

- (iii) **Lecture Tour.** The February 19, 2004 conference call gave favourable consideration to initiating a CNC/SCOR sponsored lecture tour. A discussion paper was prepared, and distributed as Appendix 3 to the annotated agenda, outlining a range of issues for consideration in the implementation of such a lecture tour. Members were in favour of proceeding at a modest pace initially by implementing a once/year lecture tour, for a

Canadian ocean scientist from one coast to provide lectures at Canadian centres on the other coast over a one week period, at an estimated cost of \$3K. It was suggested that CNC/SCOR could bear all travel costs (air fare and taxis) while the host centre could endeavour to pick up the meal and accommodation costs at each stop. It was recognized that the meal/accommodation cost issue would be fairly easy to accomplish in most centres if sufficient lead-time is given, but for some centres this might be difficult if not impossible. In this latter case CNC/SCOR would pick up the costs. In instances where local centres were picking up local expenses they would do so directly so as to avoid any administrative burden on the lecturer of having to invoice a multitude of hosts. In other words the lecturer would invoice CNC/SCOR for travel costs (and meals and accommodations in centres unable to do so) and local hosts would pay for meals and accommodations directly without the lecturer having to pay and invoice locally. Flexibility in timing and venues should be maintained so as to ensure maximum benefits and participation

To initiate the lecture tour this year, names of prospective lecturers will have to be gathered and placed in some sort of priority. It was decided that this should be done rather quickly, by the end of June, concluding with a conference call to decide on how to proceed with next steps. Susan Allen agreed to come up with a short list of names (4-5) of potential West Coast lecturers who might be persuaded to undertake a one-week lecture tour on the East Coast in the October/November 2004 timeframe. **Action: Susan Allen.** Jinyu Sheng will do the reverse, generating a list of 4-5 potential East Coast speakers who might be willing to undertake a one-week West Coast lecture tour. **Action: Jinyu Sheng.** At the same time an article will be written for the June 17th Newsletter, announcing the lecture tour concept and affording readers the opportunity to suggest names for consideration. **Action: Dick Stoddart.** A conference call will be held in late June or early July with Susan Allan, Jinyu Sheng and Bjorn Sundby, along with any other CNC/SCOR members wishing to participate in the final selection process. **Action: Dick Stoddart.** Emphasis in the selection process selection should be: (i) interesting and topical issues, (ii) dynamic speakers able to provide clear messages understandable to a multidisciplinary audience, and (iii) topics sufficiently different from the national CMOS tour in the present year. The conference call will decide which speaker to approach first along with a listing of fall back speakers if it turns out that the initial contacts are unwilling or unable to take up the challenge of a one week lecture tour under the sponsorship of CNC/SCOR.

- (iv) **Poster.** It was decided that a poster, for use as a backdrop in the advertising of the lecture tour by either hard copy or electronic means, was not required. It was noted that local centres, in the main, already have sufficient methods to advertise such events locally. If any centre wishes to obtain, electronically, the CNC/SCOR masthead for use in advertising such events they should contact the Secretary directly.
- (v) **Membership.** CNC/SCOR membership is currently as follows:

Bjorn Sundby, Chair, UQAR 2003, 2004, 2005
Ken Lee, Past Chair, DFO/BIO, 2003, 2004, 2005

Susan Allen, UBC, 2002, 2003, 2004
Rob Macdonald, DFO/IOS, 2002, 2003, 2004
Jinyu Sheng, Dalhousie, 2003, 2004, 2005
Maurice Levasseur, Laval, 2004,2005, 2006
Ali Aksu, Memorial, 2004, 2005, 2006
Christine Michel, DFO/FWI, 2004,2005,2006
Brad de Young, Memorial, 2004, 2005, 2006
David Barber, Manitoba, 2004,2005, 2006
Dick Stoddart, Secretary, 2002, 2003, 2004
Neil Campbell, *ex-officio*, (CMOS)
Suzanne Roy, *ex-officio*, UQAR (GEOHAB)
Ian Perry, *ex-officio*, DFO/PBS, (GLOBEC)
Mike Stacey, *ex-officio*, RMC (IAPSO)
Ken Denman, *ex-officio*, EC/CCCma + DFO (CMOS Scientific Committee)

“Nominated Members” from Canada are Bjorn Sundby, Ken Lee and Rob Macdonald. It was previously agreed that CNC/SCOR should consider replacing Ken Lee as a nominated member in either 2004 or 2005 so as to ensure some overlap and continuity in Canadian contact with international SCOR. It was **agreed** that Allyn Clarke should replace Ken Lee as a nominated member, and Allyn Clarke should become a full member of CNC/SCOR for the period of 2004, 2005, 2006. **Action: Dick Stoddart.**

The CNC/SCOR Executive Committee is Bjorn Sundby, Ken Lee, and Dick Stoddart.

It was **agreed** that current members due to be replaced at the end of 2004, Susan Allen (UBC), Rob Macdonald (DFO/IOS) and Dick Stoddart (Secretary), should all be extended for an additional three years. **Action: Dick Stoddart.**

The list of *ex-officio members* was examined. It was noted that both Ken Denman, Chair of the CMOS Scientific Committee, and Neil Campbell, CMOS Executive Director, would be stepping down effective the end of Congress. The CNC/SCOR Secretary will investigate needed replacements. **Action: Dick Stoddart.**

7. SCOR International

- (i) **Existing SCOR Working Groups.** A full list of current active international SCOR Working Groups, their Chairs and indication of any Canadian memberships, was listed in the annotated agenda. There were no additional updates during the meeting.
- (ii) **SCOR Scientific Committees; e.g. IMBER, SOLAS, JGOFS, GLOBEC, GEOHAB, etc.** A full list of current Scientific Committees co-sponsored by SCOR, and indication of Canadian involvements, was listed in the annotated agenda. An update by Ian Perry on GLOBEC was provided to members, summarized by Susan Allen, and is attached to these minutes as Appendix 1.

Mike Stacey joined the meeting briefly and gave an update on the current makeup of the IAPSO executive; Canadian national representation to IAPSO (he is the senior national delegate); upcoming meetings with SCOR, IAPSO and other interactions; future IAPSO meetings; and, the timing of the next IUGG meeting in 2007 in Italy when the next IAPSO Conference will be held. Mike Stacey agreed to draft a brief summary of his presentation to CNC/SCOR for use in a future Newsletter. **Action: Mike Stacey.**

- (iii) **SCOR Affiliated Programs; e.g., IMAGES, IOCCG, etc.** Reference to the current SCOR affiliated programs (CoML, iAnZone, IMAGES, IOCCG, InterRidge) was provided as: <http://www.jhu.edu/~scor/coop.htm>.
- (iv) **2003 Moscow Executive Meeting.** The SCOR Executive Committee Meeting was held on September 15 – 19, 2003 in Moscow, Russia. Bjorn Sundby's report was previously provided to members and to NRC, and it is posted on the CNC/SCOR web site as entry #B3. The report was reviewed by CNC/SCOR at its February 19, 2004 conference call.
- (v) **2004 Venice Annual Meeting.** The delegation to the next international SCOR meeting in Venice in September 2004 will be Bjorn Sundby (Canadian principal delegate, way paid by NRC), Dick Stoddart (way paid by CNC/SCOR) and Dave Mackas (way paid by CNC/SCOR to present the new WG proposal submitted by Canada).
- (vi) **New SCOR Working Groups.** Three new WG proposals will be considered at the Venice meeting, namely:
- SCOR Working Group on Global Comparisons of Zooplankton Time Series (proposal from Canada)
 - SCOR Working Group to Investigate the Role of Viruses in Marine Ecosystems
 - SCOR Working Group on the Presence and Abundance of Benthosema pterotum Myctophid Fish in the Northern Arabian Sea

Recognizing that the Canadian proposal had already received considerable review in Canada, Canadian reviewers are only required for the other two proposals, the full text of which may be found at <http://www.jhu.edu/~scor/2004GeneralMeeting.htm> Some suggested names of possible reviewers for the virus proposal included: Michel Starr (DFO/MLI), Curtis Suttle (UBC, but he is already a proposal proponent), Suzanne Roy (UQAR) and Ken Lee (DFO/BIO). Members were requested to pass along any additional names of possible reviewers to Bjorn Sundby, and he will subsequently contact some of these to undertake reviews on behalf of CNC/SCOR. **Action: All Members, Bjorn Sundby.** Comments are due to international SCOR, via CNC/SCOR, by July 31, 2004.

- (vii) **ICSU and SCOR.** As part of the ICSU strategy development the ICSU Committee on Scientific Planning and Review (CSPR) commissioned three Priority Area Assessments. The first of these reports, environment in relation to sustainable development, is available and may be found on the ICSU web site at: <http://www.icsu.org/>. The portion of the ICSU report that refers to SCOR is very complimentary to SCOR. Gordon McBean was a member of the ICSU review panel - his personal notes on the SCOR review were

provided to members as Appendix 5 to the annotated agenda. Gordon joined the meeting for this agenda item and reviewed some of his suggestions and observations contained in his report to ICSU. CNC/SCOR members were very appreciative of the positive feedback on the perceived value of SCOR by ICSU, and appreciated the constructive comments by Gordon McBean on where SCOR may wish to place future emphasis or alter some of its initiatives.

8. International Polar Year

Previous discussions on possible IPY roles for CNC/SCOR were well documented in the annotated agenda. Rob Macdonald provided some of the latest insights on IPY planning, in particular noting that the USA was leading a strong push for an international field based effort. Rob will continue efforts to encourage Canadian IPY ocean science participation, both through a promised article (see 6(ii) above) for the Newsletter and promoting an IPY-related session at the 2005 Vancouver CMOS Congress. **Action: Rob Macdonald.**

There have been many recent positive discussions and initiatives on IPY; e.g. the efforts of the Canadian Polar Commission, focused responsibility within departments such as Barry Goodison for EC/MS and Tony O'Connor for DFO/Science, the ADM's Committee on Northern Science and Technology, membership on the planning group for IPY by Dr. Gerhard Duhaim (U. Laval), and presentations by Peter Harrison on the state of IPY planning within Canada. However CNC/SCOR members were very skeptical that these initiatives were resulting in IPY priorities within Canada, particularly in the area of ocean science. Accordingly it was agreed that CNC/SCOR should voice their concern to the highest levels of government, including the government's Chief Scientist, Arthur Carty. Rob Macdonald and Allyn Clarke agreed to collaborate to prepare a first draft of such a letter, and recommend its recipients. **Action: Rob Macdonald, Allyn Clarke.** The letter should be drafted in such a way as to anticipate its public release and possible use by science writers such as Peter Calamai of the Toronto Star. The letter should seize on the opportunity to start a new program that could be sustained for a decade or more, with needed infusion of significant new resources. That is it should not be seen as just a one-year lip service commitment to IPY.

9. Inter-Relationships Between SCOR and CMOS

- (i) **Accounting, Secretariat, Web Site, Annual Report.** The Secretary reviewed the many positive interactions between CNC/SCOR and CMOS, including the fact that the CMOS office looks after revenues and expenses for CNC/SCOR, arranges conference calls, provides liaison with DFO and NRC on existing formal agreements, hosts of the CNC/SCOR web site, publishes the annual CNC/SCOR report, provides support to the co-location of meetings such as through CMOS Congress, CNC/SCOR publication of CMOS activities and events through its electronic Newsletter, and CNC/SCOR promotion of ocean science nationally and internationally through channels not normally available within the CMOS mainstream.
- (ii) **CMOS Awards.** CNC/SCOR members have continued to encourage that one or more names be put forward in CMOS categories for eligible oceanographers. In some previous years awards have not been made due to the lack of nominations. This year awards will be made in the eligible categories – it was agreed to continue the practice of CNC/SCOR

members ensuring that nominations are put forward to encourage recognition of deserving oceanographers.

- (iii) **Congresses.** CNC/SCOR participated on the Scientific Planning Committee for the 2003 Ottawa Congress and the 2004 Congress in Edmonton, primarily in an effort to ensure an enhanced oceanographic presence in these land-locked locations.
- 2004 Edmonton Congress. Paul Myers reported, and was congratulated by CNC/SCOR, on a fairly full oceanographic program at the Edmonton Congress.
 - 2005 Vancouver Congress. The CNC/Secretary has already provided information to the Vancouver program organizers on ocean science session convenors who were invited to orchestrate sessions in Edmonton but who deferred to Vancouver. On behalf of Rich Pawlowicz, Chair of the Scientific Program, Susan Allen noted that the Vancouver Congress theme would be Sea to Sky; e.g. efforts would be made to be as inclusive as possible. Susan promised an early Newsletter article that would encourage potential organizers of theme sessions to self identify themselves at an early stage so as to ensure a grass routes approach to various themes throughout the Congress agenda. In due course the Scientific Program Committee will evaluate the sessions which will have been identified via this mechanism, and they in turn will identify program gaps with a view to approaching session convenors in these deficient areas.
 - 2006 Congress. Confirmation has been received that Toronto is prepared to host the 2006 Congress.

10. Timing and Location of Future Meetings of CNC/SCOR

The next CMOS Congress in June 2005 will be in Vancouver. A major consideration for CNC/SCOR annual meetings has been to try and co-locate with like-minded meetings, such as CMOS Congress to reduce travel expenses; e.g. several members would likely be attending Congress in any case. It was agreed that the next face-to-face CNC/SCOR meeting should take place in conjunction with the CMOS Congress in Vancouver in 2005. A mid-term conference call will be arranged in Jan./Feb. 2005, with any necessary items of urgency being discussed by conference call or email at the call of the Chair, such as the one noted under item #6(iii) on the implementation of the CNC/SCOR lecture tour.

11. Other Business

There was no other business.

12. Adjournment

The meeting adjourned at 1:45.

Report to the Canadian National Committee for SCOR

Global Ocean Ecosystem Dynamics (GLOBEC) Project – an update

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25 May 2004

The Global Ocean Ecosystem Dynamics (GLOBEC) Program is a collaborative project between SCOR, the International Geosphere – Biosphere Program (IGBP) and the Intergovernmental Oceanographic Commission (IOC). GLOBEC programs began in the United States in the early 1990's, and the program as a whole was adopted by IGBP, SCOR and IOC as a Core Project in 1996. Its goal is *“To advance our understanding of the **structure and functioning of the global ocean ecosystem**, its major subsystems, and its response to **physical forcing** so that a capability can be developed to forecast the responses of the marine ecosystem to global change”*. The specific objectives of GLOBEC are:

- 1- To better understand how multiscale physical-environmental processes force large-scale changes in marine ecosystems;
- 2- To determine the relationship between structure and dynamics in a variety of oceanic systems which typify significant components of the global ocean ecosystem;
- 3- To determine the impacts of global change on stock dynamics using coupled physical, chemical and biological models linked to appropriate observation systems;
- 4- To determine how changing marine ecosystems will affect the global earth system by identifying and quantifying feedback mechanisms.

To date, there have been over 30 National GLOBEC programs, 4 Regional GLOBEC programs (with two more expected to be approved shortly), plus other affiliated projects. In addition, there are 4 Working Groups under the direct supervision of the International Scientific Steering Committee, on: Retrospective and Time Series Studies; Process Studies; Modelling; and the Human Dimensions of Marine Ecosystem Changes – see the Figure for the organisational structure. The general web site is www.globec.org. The anticipated conclusion of this international coordination by IGBP/SCOR/IOC is expected to be in 2009. An excellent 30 page brochure has been published on the international GLOBEC program, and is available as a pdf file from http://www.igbp.kva.se/uploads/IGBP_5_GLOBEC.pdf.

Canada had a national GLOBEC program from 1996 to 1999, co-chaired by Dr. Brad deYoung (Memorial University, St. John's) and Dr. Dave Mackas (DFO, Institute of Ocean Sciences, Sidney) [web site <http://www.globec-canada.mun.ca/globec/>] and funded by NSERC and DFO. The Canadian program sought to understand how living marine resources are affected by variability of the physical environment, and included over 50 scientists on both East and West coasts of Canada in seven university and five government laboratories. Project results have been published in a number of journal articles, including several special collections (e.g. see *Canadian Journal of Fisheries and Aquatic Sciences* 56(12), 1999, and 58(4), 2001). A second proposal was submitted to NSERC and DFO in 1999, but was unsuccessful. Since then, Canadian GLOBEC projects have largely been completed, although some synthesis work continues. On-going field studies are being carried out under other project titles.

While Canada no longer has an active formal GLOBEC program, Canadians continue to play major roles in the IGBP/SCOR/IOC GLOBEC activities. Two Canadians are members of the Scientific Steering Committee for this international program: Dr. Ian Perry (DFO, Pacific Biological Station, Nanaimo, BC) and Dr. Rosemary Ommer (a social scientist at the University of Victoria). They also co-chair the Focus 4 Working Group of GLOBEC on the Human Dimensions of Marine Ecosystem Changes. Dr. Brad deYoung co-Chairs the Modelling Working Group. Canadian members of GLOBEC working groups include Dr. Dave Mackas (Process Studies) and Dr. Barb Neis (Memorial University, who is a member of GLOBEC's Focus 4 on the human dimensions). Canadians have been instrumental in developing this novel Working Group in GLOBEC on the human aspects of marine ecosystem changes, which includes the active participation of social scientists.

In addition to the GLOBEC Regional programs in the North Pacific (the Climate Change and Carrying Capacity program of PICES), in the North Atlantic (the Cod and Climate Change program of ICES), the Small Pelagics and Climate Change program in upwelling areas, and the Southern Ocean GLOBEC Program, two new Regional Programs are in development. These are a program on large pelagic fishes in tropical and sub-tropical waters called CLIOTOP (Climate Impacts on Oceanic Top Predators), and a program on sub-Arctic seas called ESSAS (Ecosystem Studies of Sub-Arctic Seas). GLOBEC is also beginning to plan for the synthesis of its activities, in expectation of the program concluding in 2009. Such a global synthesis will be the opportunity to compare the results of GLOBEC National and Regional programs, and the activities of the various Working Groups, to provide the "global-added value" that any single National or Regional program cannot accomplish on its own. This Synthesis Phase will summarise the responses of marine ecosystems to global changes, identify new and outstanding research questions, and will leave a legacy of data and capacity building in global collaborative marine ecosystem research. A busy schedule of symposia and workshops is being planned for the next 5 years to involve the international community in this synthesis and to contrast and compare the impacts of global changes on different ocean systems. These include:

- ICES/GLOBEC symposium on The influence of Climate change on North Atlantic fish stocks, Bergen, Norway. May 2004;

- GLOBEC/PICES/ICES symposium on Climate variability and sub-arctic marine ecosystems, Victoria, Canada, May 2005;
- PICES/GLOBEC symposium on Climate Change and Ecosystem impacts in the North Pacific, Honolulu, USA, April 2006;
- PICES/ICES/GLOBEC 4th Zooplankton Production Symposium. Hiroshima, Japan June 2007.

Information on all of these symposia and others that are being developed is available on the GLOBEC website.

Despite not having an active GLOBEC program at present, Canada can and does play an important role in the international activities of GLOBEC. Canadians can continue to play important roles by participating in these symposia and other synthesis activities of GLOBEC.

GLOBEC INTERNATIONAL STRUCTURE

