

## **Summary Report on the Eighth Assessment Steering Committee (ASC) Meeting, 3 - 5 December 2001, Ottawa, Canada**

### **Opening**

ASC Chairman Bob Corell opened the meeting at 8:30 a.m. in the Minto Place Suite Hotel on Monday, 3 December 2001.

Gordon McBean, host of the meeting, welcomed the ASC members to Ottawa and introduced Assistant Deputy Minister Marc Denis Everell. Dr. Everell, from the Meteorological Service of Environment Canada, spoke of the importance of the North to Canada, political and demographic changes that are taking place in the Canadian North, the recent creation of a foundation to study climate change, and the roles of Environment Canada and Natural Resources Canada in climate change studies. He voiced strong support by the Government of Canada for the Arctic Climate Impact Assessment (ACIA).

The draft agenda was approved without change. It is Appendix 1 to this report.

Participants introduced themselves. They are listed in Appendix 2.

Chairman Bob Corell asked agency representatives to share their impressions of ACIA's progress to date. Tom Pyle, representing the National Science Foundation (NSF), said that NSF's advisory committee had received comments suggesting that ACIA attempt to reach out to a larger community. He promised to send those comments to the Chair. John Calder, representing the National Oceanic and Atmospheric Administration (NOAA), said that he wants to see the Bering Sea and its fisheries receive adequate treatment in the assessment; wondered whether SRES-B2 is the right scenario for ACIA; and suggested that abrupt climate change should be considered in a scenario. Odd Rogne, representing the International Arctic Science Committee (IASC), said he was concerned about what would follow ACIA -- a topic for later discussion. Snorri Baldursson, representing the Conservation of Arctic Flora and Fauna (CAFF), said that CAFF is happy with ACIA's progress to date and urged ACIA authors to pay due attention to the impacts of climate change and ultraviolet radiation (UV) on living creatures. Lars-Otto Reiersen, representing the Arctic Monitoring and Assessment Program (AMAP), noted that the Senior Arctic Officials (SAOs) have huge expectations for ACIA and want to be actively involved in it through their national representatives on the steering committee. Finally, Snorri Baldursson said that Iceland will take over leadership of the Arctic Council next year and will put heavy emphasis on successful completion of ACIA.

## **Report by the Chairman**

Bob Corell told the ASC members that he has completed his initial round of visits with relevant government officials in each of the Arctic nations. He found this series of visits to be a highly constructive process. When the time is right, he is ready to do it again.

Bob spoke about the uniqueness of ACIA. It goes well beyond the technical aspects of climate change and its impacts. In its involvement of the social sciences, ACIA is heading in the same direction as the Intergovernmental Panel on Climate Change (IPCC).

Bob reported on his interactions with Senior Arctic Officials (SAOs) at their recent meeting in Espoo, Finland. He received encouraging feedback from the SAO of every nation represented at Espoo. He noted that the SAOs are focused on the World Summit on Sustainable Development (WSSD) to be held in Johannesburg next year. They want to make certain that Arctic affairs have a prominent place on the WSSD agenda.

Bob described how ACIA leaders had approached all the Arctic governments to ask for financial support of their lead authors. The response was very encouraging. In addition to supporting their lead and contributing authors, some governments have started research programs that are expected to provide significant new data to ACIA. ACIA now has a lead author from the United Kingdom and the British government is supporting his work. Continued U.S. support of the Secretariat is excellent. The Global Environment Facility (GEF) proposal for support of Russian participation is a topic for later discussion.

Lars-Otto Reiersen described the AMAP-CAFF process for developing policy recommendations based on ACIA scientific findings. The policy document will be about 30 pages in length, aimed at a wide audience of non-specialists, following a process similar to the earlier AMAP process, and giving governmental leaders an opportunity to consider some policy decisions before the report is published. He said the SAOs want ACIA to do its work independently, thereby leaving their review until rather late in the process. This means the second draft of the report should be finished by Christmas 2002.

Terry Fenge noted the growing interest in ACIA on the part of the Arctic Council's permanent representatives. The Indigenous Peoples Secretariat wants to coordinate the involvement of aboriginal people in the ACIA process. He reported that a survey of Inuit and Saami living conditions is now underway -- a survey that will provide data useful to the ACIA process. Terry cited AMAP as an excellent example of how science can influence policy.

## Progress reports on the ACIA chapters

**Chapter 2: The Arctic climate system and its global role**

**Chapter 3: The role of Ozone and UV processes in the Arctic**

**Chapter 4: Future changes of climate and UV: modeling and scenarios for the Arctic region.**

Gordon McBean reported that most of the authors of chapters 2 and 3 had met during the previous week in Vancouver. They found that the definition of the Arctic -- currently the AMAP definition -- is critical. They are dealing with processes that take place in the mid-latitudes but whose impacts are felt in the Arctic. The authors present at the workshop developed new chapter outlines -- outlines that treat climate change in both pre-instrumental and instrumental periods. This group plans to meet again next spring, possibly in tandem with some other writing groups.

Glenn Juday remarked that the authors of these chapters may find tree ring records useful, and he wants to talk with them about this. Harald Loeng said that it might be desirable for his marine systems writing team to have an overlapping meeting with the authors of chapters 2, 3 and 4.

Petteri Taalas reported that the UV writing group plans to meet 10 - 12 April 2002 immediately following the Euro-SPICE meeting.

Vladimir Kattsov mentioned that the results of last January's workshop in Stockholm on modeling and scenarios had already been published. In a second workshop in Bracknell, the group that is working on scenarios developed an initial draft of chapter 4 that deals with the Arctic in the context of global climate change, tools for Arctic climate projections, simulations of present Arctic climate by GCMs, simulations of 21<sup>st</sup> century climate by GCMs, ozone and UV scenarios, regional modeling of the Arctic, statistical downscaling, improving projections for the Arctic, and summary and conclusions. Erland KällÎn said that this outline of chapter 4 was developed without knowing what would be included in earlier chapters. The authors of chapter 4 intend to concentrate on the elements of the models that are most important for climate change considerations. They will do their best in this regard and later iron out any differences with other chapters.

Gordon McBean expressed the hope that the chapters on impacts will consider the possible effects of large, unexpected, abrupt changes -- the kinds of changes that are not included in the five models ACIA is employing. Arne Instanes said that the authors of chapter 15 will also be concerned about the effects of extreme events. But Erland KällÎn pointed out that extreme events are too fine scale to be treated by existing models. This is a topic for future research.

Lars-Otto Reiersen reminded the committee that, in addition to scenarios based on numerical models, attention will be paid to scenarios based on historical and paleoclimate records that describe changes in climate over the Arctic region. This was decided by the committee some time ago during development of the ACIA Implementation Plan, and it is reflected in Appendix 1 of that plan.

Mark Nuttall raised the question of socio-economic scenarios. This led to a lively discussion on the extent to which various chapters in the assessment will be expected to deal with impacts on humans. Odd Rogne pointed out that ACIA must reach a common understanding of what scenario will be used in all the chapters of the assessment. Otherwise, readers will be confused. Bob Corell noted that the SRES-B2 scenario has buried within it some assumptions about socio-economic futures.

Bob Corell asked Mark Nuttall to chair a small group that would straighten out how socio-economic considerations would be provided to the authors who are to write the impacts chapters.

Bob Corell asked Gordon McBean, Betsy Weatherhead and Petteri Taalas to meet separately and produce a revised outline of chapters 2, 3 and 4.

### **Chapter 5: The cryosphere and hydrologic variability.**

John Walsh reported that, during the months since the last ASC meeting in Reykjavik, the authors of chapter 5 had outlined the structure of the chapter; prepared a 14-page "Contents Document" with key references, candidate figures, and preliminary conclusions; participated in a workshop on hydrologic issues of concern; and augmented the Contents Document by exchanges of e-mail. Chapter 5 will contain sections on precipitation, sea ice, snow cover, glaciers and ice sheets, permafrost, and river/lake ice. An authors' meeting is scheduled for January 31 - February 1, 2002, in conjunction with the IASC Workshop on Glaciology. The target date for completion of the first chapter draft is July 2002. Igor Shiklomanov has been added to the list of contributing authors to work with Terry Prowse on hydrology, especially on surface flows.

Harald Loeng and Arne Instanes asked when they would receive outputs on sea ice. They were assured that they would receive them very soon.

### **Chapter 6: Terrestrial ecosystems.**

Terry Callaghan reported that an initial authors' meeting was held March 31 - April 1, 2001, in Lund, Sweden. The writing group elaborated an outline of the chapter, agreed on writing assignments, and provided a detailed content list for each section of the chapter. Specific issues that emerged were (a) the need to represent different approaches to climate change impact assessments, recognizing that no single approach is adequate, (b) the need

to capture the variability in responses of biota and ecosystems to climate and UV-B change in space and time, and (c) the need to explicitly address uncertainties. The authors will meet again at the Ecosystems Center, Woods Hole, Massachusetts, in January 2002 to develop a comprehensive working draft, complete with graphics. It is intended that this group will meet together with some of the chapter 7 (freshwater ecosystems) authors.

### **Chapter 7: Arctic freshwater ecosystems**

Jim Reist reported that he has recruited a number of contributing and consulting authors for this chapter. He has been unsuccessful in finding Russian authors. The first chapter workshop was held in Winnipeg in November 2001, and it resulted in a revised outline of the chapter. He introduced Dr. Fred Wrona who has accepted co-lead authorship, responsible for the physical/chemical aspects of freshwater ecosystems, while he concentrates on biotic aspects. He said that the chapter will present case studies, preferably one case study in each Arctic region.

During the following discussion, Lars-Otto Reiersen pointed out the necessity of involving Russian authors. Odd Rogne said he would help identify appropriate Russian contributors. In answer to question concerning impacts on estuaries, Jim Reist said that this chapter will handle that topic.

### **Chapter 8: Marine systems**

Harald Loeng reported that the chapter 8 drafting group had their second meeting in Sydney, BC, 19 - 21 November 2001. The group decided to make only minor changes to its initial outline. They identified several issues that need to be clarified with other lead authors in order to avoid overlaps -- especially for chapters 2, 5, 7 and 12. They are depending heavily on the results of chapter 5 dealing with sea ice. The drafting group also needs to have results from the scenario group as soon as possible in order to begin evaluating the consequences of climate change on marine systems. If a standard scenario is not available soon, they will have to move ahead on the basis of their own "worst guess" scenario. The marine systems drafting group will have its third meeting in May 2002 in order to finalize version 1.0. They have invited other drafting groups to hold parallel meetings so they can sort out common problems and avoid overlaps.

Erland Kallin expressed his worry about using a "worst guess" scenario, since it is important that all chapters use the same basic climate change scenario.

Harald Loeng added that the marine systems chapter will not deal much with the impacts of pollutants. That will be left to AMAP which has an ongoing assessment.

### **Chapter 9: Indigenous perspectives on climate change**

Lead authors Henry Huntington and Shari Fox were unable to attend this committee meeting. A recent report from them said that chapter 9 would describe the ways in which Arctic people observe, are affected by, respond to, and feel about climate change. It will include a summary of documented traditional knowledge about climate change, plus a series of case studies examining particular groups and their experiences. This topic has been studied to some extent in the North American Arctic, giving them material to draw on. In the Eurasian Arctic, less has been done. Henry and Shari will, therefore, participate in a workshop in Tampere, Finland, in February 2002, where they will interact with Saami and Russian indigenous participants.

### **Chapter 10: Wildlife management and conservation**

Dave Klein reported that he is drafting a chapeau to explain how chapter 10 fits within the ACIA context and its relationship to and dependence upon other chapters. An overview of wildlife management systems, stressing user involvement in management decisions, will receive prominence in the chapter. Wildlife management systems and their effectiveness in the Fennoscandian Arctic will be reviewed by a Swedish co-author, and a similar task is being undertaken by a Russian co-author for the Russian Arctic. Chapter 10 authors are heavily dependent on collaboration with the WWF Arctic Program, working through the Circumpolar Protected Areas Network under CAFF, in projecting needs for critical habitat protection in relation to climate change. He enumerated some uncertainty principles under which this chapter must work, together with a "humility principle" that affects assessments as we move up from the physical environment to the biological, then up through the trophic levels to and within the human system.

In the course of the subsequent discussion, Bob Corell asked whether it would be advisable to remove the word "subsistence" from use in ACIA. It is considered a pejorative term in some indigenous communities. But it was pointed out that it is a "must use" word in Alaska. The steering committee did not agree to cease using the word.

Terry Fenge noted that this is a compelling chapter from the point of view of Arctic indigenous people. He said it would be helpful to show maps of how caribou calving grounds would likely change as a result of climate change.

### **Chapter 11: Hunting, fishing, herding, gathering**

Mark Nuttall recognized the need to tie this chapter to several other chapters in the assessment. His writing group will present at least sixteen case studies, four in each of the identified ACIA Arctic regions. Contributing authors have been asked to send extended abstracts on topics such as climate change effects on resource use in the past, adaptability and local responses to climate change, gender and generational aspects, mobility and movement, noticeable loss of hunting and fishing grounds, constraining

institutional factors, etc. There will be a joint workshop with RAIPON in Russia, and he is trying to arrange workshops in tandem with meetings that have already been arranged by other groups for their own purposes.

Mark wondered whether the committee would be willing to hold one of its meetings in combination with an indigenous people's workshop. It would make a powerful statement on the importance of outreach within ACIA. Terry Fenge said that Inuit leaders are scheduled to hold a meeting in August 2002 in Canada -- something that happens only once every four years. The committee agreed to look into the feasibility of participating in the quadrennial Inuit leaders' meeting.

Odd Rogne recommended that the case studies in this chapter look at the effects of both warming and cooling. Dave Klein urged that this chapter address the role of education as part of human adaptation to climate change. Mark Nuttall accepted both of these recommendations.

## **Chapter 12: Fisheries and aquaculture**

Hjalmar Vilhjalmsson reported that a chapter 12 workshop is planned for the second week of February 2002 in Copenhagen. Recognizing that chapter 12 is closely related to chapter 8 on marine systems, Harald Loeng and possibly other authors of chapter 8 will be invited to the February workshop. This writing group plans to use case studies to tell readers what is likely to happen in the future. Tasks will be assigned at the February workshop. Then they will meet again sometime in April to consolidate what has been done, identify weak areas, and make a first draft of the chapter. A third meeting around mid-July 2002 will be necessary in order to finalize the chapter. The team still lacks Russian participation. The team also lacks an aquaculturalist, but that is something he will deal with shortly.

Gunter Weller suggested that Hjalmar look to Japanese and Russian economists to complete his writing team.

## **Chapter 13: Forests, land management and agriculture**

Glenn Juday briefly outlined this chapter and specified that one subject to be dealt with here is the study of land ownership and management. Another is the direct effect of CO<sub>2</sub> and climate change on northern boreal forests. Still another is the indirect effects of climate change, e.g., insects, fire and fire management policies, human land uses, and wildlife. He agreed with Dave Klein that our climate change scenario needs to include specific information that can be used in the impacts chapters. In response to a question from Petteri Taalas, Glenn said that this chapter will pay attention to the effects of increased UV.

## **Chapter 14: Human health**

Jim Berner introduced his new co-lead author Dr. Chris Furgal. He then explained that human health is an outcome of the complex interaction of genetic, nutritional, and environmental factors. Environmental in this context includes socioeconomic, cultural, physical infrastructure and ecosystem factors. All of these, except genetic factors, are either directly or indirectly impacted by climate. When looked at from a health perspective, all these categories of factors can improve or degrade health status by enhancing the resilience of a population or by causing stress. In these instances, stress can be a direct physical change such as temperature; or it can be in the form of increased prevalence of a disease-causing organism, or in the form of a perceived sense of loss, engendering psychological stress. Thus there are potential direct and indirect impacts of climate change on aspects of human health in the circumpolar North.

Jim said this chapter will produce a menu of indicators that a population can use to monitor its health. The writing group plans to hold another meeting in the 3<sup>rd</sup> week of January 2002.

In response to a question raised by Betsy Weatherhead, Jim assured the steering committee that impacts of UV-B will be included in the chapter.

## **Chapter 15: Infrastructure, including business and industry**

Arne Instanes reported that this writing group held workshops in St. Petersburg and Anchorage. He said that it is difficult to detect the engineering impacts of climate change, and he asked cooperation from other writing groups in identifying impacts on structural designs. Arne pointed out that the effects of warming will clearly be largely positive, but that the oil industry will suffer negative impacts when pipelines begin to sink because of the decline of permafrost.

Arne acknowledged that rising sea level, coastal erosion, etc. are serious concerns, especially for small coastal communities. The chapter 15 writing group plans to examine the potential impacts of climate change on communities in Alaska, Canada and Russia. They will need help from social scientists in order to handle the socio-economic aspects of climate change.

Glenn Juday mentioned that he has the temperature record for Fairbanks over the past 200 years, and he offered to share it with Arne.

### **Arctic Vulnerability Study**

Bob Corell suggested that ACIA include a chapter that would attempt a vulnerability approach to study the extent to which Arctic individuals and communities can be affected

by things that influence human health and well-being, indigenous cultures and food security, and human settlements and development. He and other scholars propose to examine the impacts of environmental pollution, UV-B and climate change, and trends in human and societal development that serve as stressors on Arctic peoples and communities. Ultimately, they hope to go from these concepts to creation of quantitative models. Harvard University is acting as facilitator of this effort, with funding from U.S. federal agencies.

After extensive discussion, the committee decided to add to add a chapter on the Arctic Vulnerability Study following chapter 15 on infrastructure and before the final synthesis chapter in the assessment. Bob Corell agreed to ask Jim McCarthy to serve as lead author of this new chapter. Bob also agreed to provide an initial outline of the new chapter's contents before the end of the year.

### **Scenario Resource Center**

John Walsh reported on the current minimally-funded ACIA modeling and scenario work being done at the University of Alaska Fairbanks (UAF). He said the full Scenario Resource Center should, at a minimum, provide an archive of outputs from the five models ACIA has chosen to work with and facilitate use of those outputs by chapter authors. In the absence of funding for the center, the International Arctic Research Center at UAF has tried to jump start this activity, driven by the realization that this activity must begin immediately if it is to be useful. UAF has purchased computer and high-volume storage systems for this purpose, and interviews are being conducted for the person who will serve as the ACIA point of contact.

The International Arctic Research Center at UAF has created a website <http://zubov.atmos.uiuc.edu/acia> to assemble outputs of runs from the five different climate models. One example of what can be found on this website is the number of growing degree days per year at present and at future times. These types of outputs can be derived to suit the needs of chapter authors; but different models, of course, give different outputs. In answer to a request from several committee members, John Walsh agreed to put his viewgraphs on the website.

Gunter Weller asked that the website be linked to the ACIA website, and John readily agreed.

With regard to the ACIA contact person, Gunter Weller asked members of the steering committee to send him names of suitable candidates who have an appropriate background, understand the limitations of climate models, and would be willing to work in Fairbanks and possibly Sweden.

Bob Corell asked participants what kinds of model and scenario information should be provided to the writers of the impacts chapters. Jim Reist recommended that the steering committee develop a preliminary list of the quantities that will be needed and circulate it for subsequent additions and subtractions by lead and contributing authors. Betsy Weatherhead suggested that the committee start immediately with Appendix 1 from the Stockholm meeting report and move on from there. Bob Corell then asked John Walsh to distribute copies of that appendix to committee members and to begin compiling a list of variables that are needed by the authors.

In a subsequent discussion, John Walsh went briefly through the model outputs that seem to be needed by the impacts chapters and asked lead authors to send additional requirements to him by e-mail. In this connection, John reiterated the importance of recruiting the right person to serve as the ACIA point of contact at the Scenario Resource Center.

### **Socio-economic-cultural elements in scenarios**

Mark Nuttall reported on discussions by a side group on the extent to which socio-economic-cultural elements should be included in the scenarios that are used in the assessment. His group stressed that the ACIA assessment will be read by people who do not know much about the Arctic before they read the report. It is essential that the assessment include sufficient background material for the general reader. This is probably best done by presenting it in the introductory chapter on the Arctic system.

This matter was resolved when Bob Corell recruited Henry Huntington to serve as lead author for the first chapter of the assessment, assisted by contributing authors Jan-Idar Solbakken, Terry Fenge, Terry Callaghan, Mark Nuttall, Lars-Otto Reiersen, Snorri Baldursson, Pål Prestrud and himself.

Lars-Otto Reiersen informed the committee that ICC and RAIPON are preparing material on the human background for an AMAP report. He is willing to ask them to contribute to the ACIA assessment. The committee accepted his offer.

### **Lead authors**

Gunter Weller asked the committee to consider approving Shari Fox as a co-lead author of chapter 9, Fred Wrona as co-lead author of chapter 7, and Chris Furgal as co-lead author of chapter 14. The committee approved all of them as co-lead authors and members of the committee.

Bob Corell recommended that lead authors continue to recruit additional Russian authors. He indicated that he and Executive Director Gunter Weller would try to help identify

suitable candidates. Lars-Otto Reiersen pointed out that the report from the St. Petersburg ACIA workshop might contain good leads.

Lars-Otto Reiersen reminded the committee that we must have CVs on all lead, contributing and consulting authors. The CVs should be sent to Patricia Anderson and Tom Murray. Patricia was asked by the Chair to update the list of authors on the ACIA website. Note that the Secretariat needs e-mail addresses for all authors.

### **Sharing chapter drafts**

Patricia Anderson asked how the lead authors want to exchange chapter drafts. The original proposal was to put them in a password-protected section of the ACIA website, but some had expressed a preference for using e-mail.

Lars-Otto Reiersen said that AMAP used a password-protected website and found it a quite satisfactory mechanism for exchanging drafts. If this is done, everyone on the steering committee should be notified whenever the website is updated. Bob Corell said that, based on experience with the U.S. National Assessment, only authors should have the password.

The committee decided that chapter drafts should be placed in a password-protected section of the ACIA website, that all lead authors should have the password, and that lead authors should decide which of their chapters' contributing authors would have the password. The committee also decided that different chapter drafts should be clearly identified by their dates of composition.

### **Assessment timetable**

Gunter Weller remarked that it would be helpful to have first drafts of all the chapters by the time of the spring 2002 committee meeting, and that it would be absolutely necessary to have them by the fall meeting. Hanne Peterson wondered how this schedule would mesh with production of the popular summary report and the AMAP-CAFF policy report. Harald Loeng said it would be helpful to have AMAP-CAFF-IASC comments on the scientific report by the time the first drafts are complete. Gordon McBean pointed out that an international external review is a long process and it might not fit into the kind of timetable being discussed here.

The committee decided that the ASC review of the report will be done first, followed by the international experts review, followed by the AMAP-CAFF-IASC review. The committee instructed Gunter Weller to adjust the production timetable accordingly and to post it on the ACIA website.

Bob Corell agreed to write a brief paper on recommended steps in the review process and distribute it prior to the next committee meeting.

### **Consistency among chapters**

Bob Corell raised a question about ensuring consistency among the chapters of the assessment. Jim Reist pointed out that this could be handled by regular communication among the authors, placement of drafts on the password-protected section of the ACIA website, and the review process. Elizabeth Bush said it would be good to identify any gaps that exist in the revised operative outline that will be produced shortly. Bob Corell thought that only the lead authors could do an effective job of writing the chapeaux that are intended to integrate various parts of the assessment.

The committee decided that drafts of the chapeaux should be written by the lead authors by the time of the spring 2002 committee meeting so they can be examined at that meeting.

### **UV scenarios**

Betsy Weatherhead remarked that the committee had not adequately addressed the use of UV scenarios. She and Petteri Taalas pointed out that such scenarios are already available in the literature and will be further developed.

The committee decided that the UV scenarios should be delivered soon to John Walsh so they can become part of the Scenario Resource Center. Betsy cautioned that these scenarios should be used with care, preferably after consultation with Petteri Taalas and/or herself.

### **Adding past leaders of Arctic climate impact assessments to the ASC**

Gunter Weller asked whether the committee wanted to added leaders of MBIS, BASIS, etc. to its membership in order to profit from their experiences. Mark Nuttal thought this was a good idea from the point of view of the social sciences. Pål Prestrud thought the ASC was big enough already. He suggested that these people be used as resource persons as they are needed. Gordon McBean thought each lead author should try to recruit such persons whenever there was need. Elizabeth Bush expressed the view that these experienced people might be most helpful in writing the final synthesis chapter of the assessment.

The committee decided to put off further consideration of this topic until its spring 2002 meeting.

### **Strategy for producing the ACIA policy document**

Lars-Otto Reiersen asked if the AMAP-CAFF strategy for producing the ACIA policy document was satisfactory. AMAP and CAFF need to deliver the strategy to the SAO meeting in March 2002.

The committee decided that the strategy is satisfactory. If anyone has comments on the strategy, he should send them to Lars-Otto or Snorri Baldursson as soon as possible. Note that the second option in the strategy -- that the SAOs be involved in preparation of the ACIA policy document from the very beginning -- is no longer being considered. The SAOs have agreed that AMAP and CAFF should prepare the policy document and policy recommendations without active involvement of the SAOs. In early 2002 the recommendations will be handed over to the SAOs for their consideration prior to the ministerial meeting.

### **ACIA guidelines**

Lars-Otto Reiersen asked whether the draft guidelines for ACIA were satisfactory. They are based on hard experience in writing the AMAP assessments, starting in 1994.

The committee decided that any reactions/comments/suggestions on those guidelines should be sent directly to Lars-Otto as soon as possible.

### **Publication of the assessment and graphic support**

Bob Corell pointed out that the committee would soon have to choose a publisher for the assessment report and make provision for graphic support. He recommended that these matters be left to Executive Director Gunter Weller, with advice from Lars-Otto Reiersen and Snorri Baldursson. He also recommended that the person(s) be on board by the spring 2002 committee meeting and begin attending these meetings.

The committee accepted Bob's recommendations regarding selection of a publisher and graphic support.

Gunter Weller offered to contact GRID-Arendal about use of their polar projection maps throughout the report. The committee accepted his offer.

### **Cross-fertilization**

Lars-Otto Reiersen suggested that ACIA would profit from a cross-fertilization meeting of authors to iron out differences among the chapters, take care of overlaps, etc., especially for those chapters that must use output from other chapters in order to do their work. Betsy Weatherhead said she had participated in the AMAP cross-fertilization meeting and found it a tremendously helpful experience. The AMAP meeting

lasted an entire week. Lars-Otto Reiersen added that, because each participant paid his own way, it was not very expensive.

The committee decided that cross-fertilization would be a principal item on the agenda of the spring 2002 committee meeting. Any additional cross-fertilization meeting will be considered at that time.

### **Science session and reception**

At a science session, the following individuals made presentations:

Bob Corell  
Chair, ACIA Steering Committee  
Sustainability science and the ACIA

Doug Whelpdale  
Director, Climate Research Branch, Environment Canada  
Arctic climate, present and future

Don Lemmen  
Chief, Hazards & Environmental Geology, Natural Resources Canada  
Climate impacts on Arctic environments

Mark Nuttall  
Lead author, ACIA  
Climate impacts on Arctic peoples

Clifford Lincoln  
Member of Parliament of Canada  
Canada's interest in the Arctic

At a following reception, brief remarks were delivered by:

David Anderson  
Minister of the Environment

Mary Simon  
Canadian Ambassador of Circumpolar Affairs

Sheila Watt-Cloutier  
President of the Inuit Circumpolar Conference Canada

### **Standardization of language**

Bob Corell offered to assemble a table of some important qualifying phrases that will be used throughout the assessment, e.g. "likely," "high confidence," etc.

The committee accepted his offer.

### **The next steering committee meeting**

Pål Prestrud and Lars-Otto Reiersen offered that Norway was willing to host the next committee meeting. The committee accepted the offer. The host country will decide on the location of the meeting.

Subsequent to this meeting, Executive Director Gunter Weller sounded out members concerning acceptable meeting dates. The scheduled dates for the next meeting are 2 - 4 June 2002. Since cross-fertilization will be a principal feature of the next meeting, it may last 3 full days or more. Details will be worked out by the Secretariat.

The committee decided that the next committee meeting could involve a small number of contributing authors in addition to lead authors. This will be left to the discretion of lead authors, in coordination with the Secretariat.

### **Structure of chapters 2, 3 and 4**

Gordon McBean reported on discussions that took place among the authors of chapters 2, 3 and 4 of the assessment. The authors recommended that chapter 2 concentrate on the climate system, chapter 3 on the UV-ozone system, and chapter 4 (as at present) on the combined scenarios for the future. The chapter 2 outline was provided, and the lead authors on UV-ozone agreed to provide a revised outline for chapter 3. There will be a need for a chapeau or introductory section to describe how these chapters relate to one another. The committee accepted these recommendations.

### **Operative outline**

The committee urged lead authors to send any updates to their operative outlines to Patricia Anderson by 20 December 2001. She will then put these modified operative outlines on the ACIA website.

Bob Corell said he would like to move toward longer annotated outlines that would be on the ACIA website but would not be made available to the public. This would be in addition to the operative outline that appears on the public section of the website.

The committee decided that, while the operative outline will remain on the public ACIA website as at present, annotated outlines may be put on the password-protected section of the website. The contents of the annotated outline may be changed as often as lead authors wish. Eventually, these annotated outlines will turn into first drafts.

### **GEF proposal**

Lars-Otto Reiersen reported that the Global Environment Facility (GEF) proposal for funds to assist Russian colleagues participation in the assessment is close to final. Indicators from the GEF staff are favorable. The proposal writing group needs one more meeting in Russia.

Terry Callaghan asked whether ACIA has the capability to do a Russian version of the operative outline and put it on the ACIA website. Snorri Baldursson suggested that provision for future translation costs be made a budget item in the GEF proposal.

### **ACIA budget**

Gunter Weller said that the ACIA budget has sufficient funds to help chapter authors hold a limited number of workshops. He urged lead authors to contact him directly on this subject. He also said the budget will support both U.S. and Russian participation in the workshops.

Terry Callaghan expressed the need for some "up-front" money that can be used when there is a delay in receiving funds from other sources.

Lars-Otto Reiersen said that ACIA should send a clear message to the SAOs on how ACIA is, in fact, being supported.

Bob Corell assured the committee that funding of a Scenario Resource Center at SMHI is under active discussion.

Gunter Weller reminded the committee that he needs to know the designated point of contact for financial matters in each Arctic nation. He asked lead authors to send this information to him by December 20. The current list is:

Canada -- Elizabeth Bush  
Denmark -- Lars Moseholm  
Finland -- Outi Mähönen  
Iceland -- Thorir Ibsen  
Norway -- Christopher Brodersen  
Russia -- Yuri Tsaturov  
Sweden -- Manuela Notter  
U.K. -- Neil Gilbert  
U.S. -- ACIA Secretariat

## **Millenium Assessment**

The Millenium Ecosystem Assessment is seeking nominations of social and natural scientists to participate as experts or reviewers in the Millenium Assessment process. The Millenium Assessment is an international assessment that intends to meet decision makers' needs for scientific information on the consequences of ecosystem change for human well-being and on the response options available to address undesirable changes. Since Bob Corell wants to assure that an Arctic perspective is included in this assessment, he asked committee members to send him suggestions on who might be qualified and willing to serve as authors.

## **Follow-up to ACIA**

Odd Rogne distributed a paper on follow-up to ACIA. It had two sections.

1. Short-term needs. Odd pointed out the difficulty that some ACIA participants have had in securing funds from regular research funding sources, since they had to compete with all sorts of cutting edge science proposals. He wondered whether a procedure could be found for obtaining funding for actions that are important to the ongoing Arctic assessment. He suggested that the ACIA leadership approach funding agencies on this subject, not just research councils.

Bob Corell noted that he has discussed the research funding issue in all his visits to Arctic nations. About half the governments indicated that they intend to support additional climate research connected to ACIA. An example is U.S. SEARCH.

Erland Källén thought the committee should be careful about going to agencies for support of activities that they were not told about earlier.

Bob Corell asked that lead authors send their needs to him so he can discuss them with the ACIA Executive Committee and possibly put the ACIA stamp of approval on them before they are communicated to funding agencies.

2. Longer-term follow-up to ACIA. Odd raised the issue of follow-up research initiatives. For those ACIA chapters where we can expect a significant future research need and for which circum-Arctic cooperation is required, he thought it was reasonable to begin considering some initiatives. Lead authors would be the first persons who would detect any such needs, such as serious gaps, and they could be encouraged to make proposals if and when they feel it is timely. IASC is willing to coordinate such follow-up initiatives.

Bob Corell pointed out that we need regional Arctic climate models, and he has been talking about them with several research groups lately. Gordon McBean remarked that

the Canadian foundation for the sciences of climate and atmosphere has recently funded development of a regional climate model at the University of Quebec in Montreal. He added that ACIA has serious data needs, and any follow-up assessment will demand them even more. He suggested that ACIA might want to involve itself in the Global Climate Observing System. Lars-Otto Reiersen thought that the Arctic Council might want a second assessment, since it needs studies like ACIA to do its work.

In conclusion, Bob Corell asked each lead author to identify a couple of research needs that he can communicate to IASC and the SAOs at their next meeting.

### **ACIA flyer**

Gunter Weller asked whether the current ACIA flyer is useful. The consensus of the committee was that it is indeed useful. Lars-Otto Reiersen and Odd Rogne asked if the next version could be in Russian and English side by side. The committee considered this a good idea. The committee decided that a new version would be prepared for the Ministerial meeting in November 2002, with details to be discussed at the June committee meeting.

### **Recognition of authors**

It was asked how lead, contributing and consulting authors would be recognized in the assessment report. Gunter Weller replied that the committee had earlier decided that all authors should be recognized at the beginning of each chapter. It was also agreed that the IPCC format is acceptable. He pointed out that some consulting authors might turn into contributing authors, and vice versa, depending on their level of contribution.

### **References**

Bob Corell recommended that all references in the assessment report should be in a consistent form. Most authors use bibliographic system software of some kind, and the different systems are generally compatible. He asked lead authors to send information on the bibliographic systems they use to Lars-Otto Reiersen so he can use this information in the ACIA guidelines document.

With sustained rounds of applause, the committee acknowledged the contributions of Gordon McBean and Elizabeth Bush in arranging the meeting.

The meeting was adjourned at 11:30 a.m. on Wednesday, 5 December 2001.

Respectfully submitted,

Tom Murray

**ACIA  
ASSESSMENT STEERING COMMITTEE MEETING  
3-5 December 2001  
Minto Place Suite Hotel, Ottawa, Canada**

**AGENDA**

**SUNDAY, 2 DECEMBER**

5:00 pm: Meet in hotel lobby for informal get-together

**MONDAY, 3 DECEMBER**

8:30 am: Meeting Room Salon Stanley

    Welcoming remarks

    Report by the ACIA chairman

    Reports from the lead authors about progress in each chapter/discussions  
    (15 chapters x 15 minutes each = about 4 hours)

10:00 am: Health break

12:00 Noon: Lunch

1:30 pm:

Reports from the lead authors (continued)

Discussion of broad issues dealing with the ACIA science report

- I. Do the lead authors understand clearly the climate scenarios to work with?  
(SRES-B2, time slices, how and who to ask for help if data are needed, etc.)
- II. How to incorporate new data and results in the assessment?
- III. Do we have the right author expertise in each chapter?
- IV. Do we need to appoint other co-lead authors?
- V. Is there still a lack of social scientists, e.g., economists?
- VI. Is the coverage of hydrology issues adequate?
- VII. How to share/comment on chapter drafts (ACIA web page or e-mail)?
- VIII. What are the milestones/timetable for preparing the report?

3:30 pm: Health break

**TUESDAY, 4 DECEMBER**

8:30 am:

Discussion of other aspects of the ACIA reports

- I. Opening and closing chapters of the ACIA report (who? when? Etc.)
- II. Adding past leaders of Arctic climate impact assessments (MBIS, BASIS etc.)
- III. AMAP/CAFF policy paper (Lars-Otto Reiersen)

- IV. Synthesis meeting of ACIA authors (purpose, when, where?)
- V. Formats, illustrations, graphic support to be provided to authors, etc.
- VI. Choosing editors/graphic artists for the reports

10:00 am: Health break

12:00 Noon: Lunch

1:30 pm: Science session (organized by Gordon McBean)

4:30 - 6:00 pm: Reception

### **WEDNESDAY, 5 DECEMBER**

8:30 am:

Discussion of administrative matters/problems and future activities

- I. Budgets and remaining funding problems
- II. Who are the contact persons in each country for financial support?
- III. Funding/operation of a Scenario Resource Center (Bob Corell)
- IV. ACIA GEF application (Lars-Otto Reiersen)
- V. Millenium Ecosystem Assessment (Bob Corell)
- VI. ACIA follow-up (Odd Rogne)
- VII. Replacement of representatives (AMAP, CAFF, others?) on the ASC
- VIII. ACIA flyer and other outreach activities
- IX. Any other business
- X. Time and place for next ASC meeting  
(Arctic Week: 21-27 April, Groningen, The Netherlands?)

10:00 am: Health break

12:00 Noon: Lunch

1:30 pm: Continued discussions, if needed

Adjourn

**Participant List  
Assessment Steering Committee Meeting  
Ottawa, 3-5 December 2001**

Dr. Robert Corell, Chair  
American Meteorological Society  
1401 Oyster Cove Drive  
Grasonville, MD 21638  
USA  
Phone: +1 202 682 9006  
Fax: +1 410 827 3958  
Pager: 1 888 203 2692  
[global@dmv.com](mailto:global@dmv.com)

Dr. Elizabeth Bush  
Canadian Coordinator for ACIA  
Meteorological Service of Canada  
4905 Dufferin St.  
Downsview, Ontario M3H 5T4  
Canada  
Phone: +1 416 739 4332  
Fax: +1 416 739 4882  
[elizabeth.bush@ac.gc.ca](mailto:elizabeth.bush@ac.gc.ca)

Dr. Pål Prestrud, Vice-Chair  
Norwegian Polar Institute  
Polarmiljøseneteret  
9262 Tromsø  
Norway  
Phone: +47 7775 0530  
Fax: +47 7775 0501  
[pal.prestrud@npolar.no](mailto:pal.prestrud@npolar.no)

Dr. John Calder  
NOAA/Arctic Research Office  
1335 East-West Highway  
Silver Spring, MD 20910  
USA  
Phone: +1 301 713 2518 x288  
Fax: +1 301 713 2519  
[john.calder@noaa.gov](mailto:john.calder@noaa.gov)

Dr. Snorri Baldursson  
CAFF International Secretariat  
Hafnarstraeti 97  
600 Akureyri  
Iceland  
Phone: +354 462 3350  
Fax: +354 462 3390  
[snorri@ni.is](mailto:snorri@ni.is)

Prof. Terry Callaghan  
Abisko Scientific Research Station  
Royal Swedish Academy of Sciences  
Abisko, SE 981-07  
Sweden  
Phone: +46 980 40071  
Fax: +46 980 40171  
[terry.Callaghan@ans.kiruna.se](mailto:terry.Callaghan@ans.kiruna.se)  
[a.doncaster@sheffield.ac.uk](mailto:a.doncaster@sheffield.ac.uk)

Dr. Jim Berner, M.D.  
Office of Community Health  
Alaska Native Tribal Health Consortium  
4201 Tudor Centre Drive  
Anchorage, AK 99508  
USA  
Phone: +1 907 729 3640  
Fax: +1 907 729 3652  
[jberner@anmc.org](mailto:jberner@anmc.org)

Dr. Jim Carscadden  
Department of Fisheries & Oceans  
St. Johns, NF  
Canada  
Phone: +1 709 772 5541  
[carscaddenj@dfo-mpo.gc.ca](mailto:carscaddenj@dfo-mpo.gc.ca)

Dr. John Crump  
Arctic Council Indigenous Peoples  
Secretariat  
Pilestraede 52 Copenhagen  
Denmark  
Phone: +45 3369 3498  
Fax: +45 3369 3499  
[jpc@ghsdk.dk](mailto:jpc@ghsdk.dk)

Dr. Terry Fenge  
Inuit Circumpolar Conference (Canada)  
170 Laurier Avenue West, Suite 504  
Ottawa, Ontario K1P 5V5  
Canada  
Phone: +1 613 563 2642  
Fax: +1 613 565 3089  
[tuktu@magi.com](mailto:tuktu@magi.com)

Dr. Chris Furgal  
CHUL Research Centre  
Public Health Research Unit  
2400 rue d'Estimauville  
Beauport, Quebec G1E 7G9  
Canada  
Phone: +1 418 666 7000 x555  
[christopher.furgal@crchul.ulaval.ca](mailto:christopher.furgal@crchul.ulaval.ca)

Dr. Arne Instanes  
University Courses on Svalbard (UNIS)  
P. B. 156  
N-9171 Longyearbyen  
Norway  
Phone: +47 7902 3344  
Fax: +47 7902 3301  
[arne.instanes@unis.no](mailto:arne.instanes@unis.no)  
[arne.instanes@ngi.no](mailto:arne.instanes@ngi.no)

Dr. Peter Johnson  
Department of Geography  
University of Ottawa  
550 Cumberland St.  
Ottawa, ON K1N 6N5  
Canada  
Phone: +1 613 562 5800 x1061  
Fax: +1 613 562 5145  
[peterj@aix1.uottawa.ca](mailto:peterj@aix1.uottawa.ca)

Dr. Glenn Juday  
Forest Sciences Department  
University of Alaska Fairbanks  
P. O. Box 757200  
Fairbanks, AK 99775-7200  
USA  
Phone: +1 907 474 6717  
Fax: +1 907 474 7439  
[gjuday@lter.uaf.edu](mailto:gjuday@lter.uaf.edu)

Professor Erland Kroll  
Department of Meteorology  
Stockholm University  
S-10691 Stockholm  
Sweden  
Phone: +46 8 162396  
Fax: +46 8 157185  
[erland@misu.su.se](mailto:erland@misu.su.se)

Dr. Vladimir Kattsov  
Voeikov Main Geophysical Observatory  
Karbyshev St. 7  
194018 St. Petersburg  
Russia  
Phone: +7 812 247 0103  
Fax: +7 812 247 8661  
[kattsov@main.mgo.rssi.ru](mailto:kattsov@main.mgo.rssi.ru)

Dr. David Klein  
Institute of Arctic Biology  
University of Alaska Fairbanks  
P. O. Box 7000  
Fairbanks, AK 99775-7000  
USA  
Phone: +1 907 474 6674  
Fax: +1 907 474-6967  
[ffdrk@uaf.edu](mailto:ffdrk@uaf.edu)

Dr. Alexander Klepikov  
Ocean and Atmosphere Department  
Arctic & Antarctic Research Institute  
38 Bering St.  
St. Petersburg 199397  
Russia  
Phone: +7 812 352 0226  
Fax: +7 812 352 2688  
[klep@aari.nw.ru](mailto:klep@aari.nw.ru)

Dr. Don Lemmen  
Natural Resources Canada  
601 Booth St.  
Ottawa, Ontario K1A 0E8  
Canada  
Phone: +1 613 992 5861  
Fax: +1 613 992 0190  
[dlemmen@nrcan.gc.ca](mailto:dlemmen@nrcan.gc.ca)

Dr. Harald Loeng  
Institute of Marine Research  
P. O. Box 1870 Nordnes  
5817 Bergen  
Norway  
Phone: +47 5523 8466  
Fax: +47 5523 8584  
[harald.loeng@imr.no](mailto:harald.loeng@imr.no)

Professor Gordon McBean  
Institute for Catastrophic Loss  
Reduction  
University of Western Ontario  
1389 Western Road  
London, Ontario N6A 5B9  
Canada  
Phone: +1 519 661 4274  
Fax: +1 519 661 4273  
[gmcbean@uwo.ca](mailto:gmcbean@uwo.ca)

Professor Mark Nuttall  
Dept. of Sociology & Anthropology  
University of Aberdeen  
Kings College  
Aberdeen AB24 3QY  
Scotland, UK  
Phone: +44 1224 272771  
Fax: +44 1224 273442  
[m.nuttall@abdn.ac.uk](mailto:m.nuttall@abdn.ac.uk)

Dr. Hanne Petersen  
Danish Polar Center  
Strandgade 100 H  
DK-1401 Copenhagen K  
Denmark  
Phone: +45 3288 0100  
Fax: +45 3288 0101  
[hkp@dpc.dk](mailto:hkp@dpc.dk)

Dr. Thomas Pyle  
Office of Polar Programs  
National Science Foundation  
4201 Wilson Blvd.  
Arlington, VA 22230  
USA  
Phone: +1 703 292 7424  
Fax: +1 703 292 9082  
[tpyle@nsf.gov](mailto:tpyle@nsf.gov)

Dr. Lars-Otto Reiersen  
Executive Secretary, AMAP  
P. B. 8100 Dep.  
0032 Oslo  
Norway  
Phone: +47 2324 1632  
Fax: +47 2324 1631  
[lars-otto.reiersen@amap.no](mailto:lars-otto.reiersen@amap.no)

Dr. Jim Reist  
Fisheries and Oceans Canada  
501 University Crescent  
Winnipeg, Manitoba R3T 2N6  
Canada  
Phone: +1 204 983 5032  
Fax: +1 204 984 2403  
[reistj@dfo-mpo.gc.ca](mailto:reistj@dfo-mpo.gc.ca)

Mr. Odd Rogne  
Executive Secretary  
International Arctic Science Committee  
P. O. Box 8100 Dep  
N-0032 Oslo  
Norway  
Phone: +47 2324 1600  
Fax: +47 2324 1601  
[iasc@iasc.no](mailto:iasc@iasc.no)

Mr. Jan-Idar Solbakken  
Saami College  
N-9520 Guovdageaidnu  
Norway  
Phone: +47 7848 7700  
Fax: +47 7848 7702  
[jan-idar.solbakken@samiskhs.no](mailto:jan-idar.solbakken@samiskhs.no)

Dr. Petteri Taalas  
Finnish Meteorological Institute  
P. O. Box 503  
FIN-00101 Helsinki  
Finland  
Phone: +358 9 1929 4150  
Fax: +358 9 1929 3146

[petteri.taalas@fmi.fi](mailto:petteri.taalas@fmi.fi)

Dr. Hjalmar Vilhjalmsson  
Marine Research Institute  
Skulagata 4, P. O. Box 1390  
121 Reykjavik  
Iceland  
Phone: +354 552 0240  
Fax: +354 562 3790  
[hjalmar@hafro.is](mailto:hjalmar@hafro.is)

Dr. John Walsh  
Dept. of Atmospheric Sciences  
University of Illinois  
105 S. Gregory St.  
Urbana, IL 61801  
USA  
Phone: +1 217 333 7521  
Fax: +1 217 244 4393  
[walsh@atmos.uiuc.edu](mailto:walsh@atmos.uiuc.edu)

Dr. Betsy Weatherhead  
Univ. of Colorado at Boulder  
NOAA/R/ARL  
325 Broadway  
Boulder, CO 80303  
USA  
Phone: +1 303 497 6653  
Fax: +1 303 497 6546  
[betsy.weatherhead@noaa.gov](mailto:betsy.weatherhead@noaa.gov)

Dr. Frederick Wrona  
National Water Research Institute  
11 Innovation Blvd.  
Saskatoon, Saskatchewan S7N 3H5  
Canada  
Phone: +1 306 975 6099  
Fax: +1 306 975 6414  
[fred.wrona@ec.gc.ca](mailto:fred.wrona@ec.gc.ca)

ACIA Secretariat

Dr. Gunter Weller  
Executive Director, ACIA Secretariat  
Cooperative Institute for Arctic  
Research  
University of Alaska Fairbanks  
P. O. Box 747740  
Fairbanks, AK 99775-7740  
USA  
Phone: +1 907 474 7371  
Fax: +1 907 474 6722  
[gunter@gi.alaska.edu](mailto:gunter@gi.alaska.edu)

Dr. Patricia Anderson  
Center for Global Change  
University of Alaska Fairbanks  
P. O. Box 747740  
Fairbanks, AK 99775-7740  
USA  
Phone: +1 907 474 5415  
Fax: +1 907 474 6722  
[patricia@iarc.uaf.edu](mailto:patricia@iarc.uaf.edu)

Dr. Thomas Murray  
NOAA/Arctic Research Office  
1335 East-West Highway  
Silver Spring, MD 209810  
USA  
Phone: +1 301 713 2518 x289  
Fax: +1 302 713 2519  
[tom.murray@noaa.gov](mailto:tom.murray@noaa.gov)