

Summary Report on the Seventh Assessment Steering Committee (ASC) Meeting, 19 - 20 April 2001, Reykjavik, Iceland

Opening

ASC Chairman Bob Corell opened the meeting at 8:30 a.m. in the Radisson SAS Island Hotel on Thursday, 19 April 2001. Bob reminded the ASC members that the Arctic Council wishes to be kept fully informed on the progress of the Arctic Climate Impact Assessment (ACIA). He noted that there is a high level of expectation among the Arctic nations and their governments, indigenous peoples organizations, and the scientific community. He said his visits to the Arctic nations are almost complete and that he intends to finish these visits in the near future.

Snorri Baldursson welcomed the ASC members to Iceland, offered his government's hospitality, and mentioned that optional excursions would be available on Saturday after completion of the meeting.

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

Participants introduced themselves. They are listed in Appendix 2.

Presentations/Discussions

Erland Källén reported on the modeling and scenarios workshop that was held 29 - 31 January 2001 in Stockholm. He said that the report on the workshop had already been released. He pointed out that global climate models exist, with large model-to-model differences, uncertain ice-ocean processes, and limited time and space resolution. On the other hand, regional coupled climate models suitable for climate scenario development remain to be developed. The Stockholm workshop recommended that ACIA work with a single IPCC-type scenario, i.e. the SRES B2 scenario. B2 is a "moderate" climate change scenario and it contains projections out to the year 2100. (See the section on climate scenarios below.)

Vladimir Kattsov showed plots of average temperatures in the Arctic region over the next century as derived from seven different global circulation models. These models had been driven only by greenhouse gas increases.

Bob Corell said it would be good to begin development of an Arctic regional model, even if it will not be ready in time for use in ACIA. Erland Källén agreed, but urged that the assessment move forward now using currently available global models. He noted that the Stockholm workshop recommended establishment of a dedicated resource to provide tailored scenarios for use by the authors of the other chapters in the assessment.

Betsy Weatherhead reported on ozone scenarios and potential ultraviolet (UV) impacts. She said that surface UV levels depend principally on clouds, surface albedo and ozone levels. The World Meteorological Organization will release an updated ozone assessment in 2002, but it will not include consideration of climate change and it will be too late to be truly useful in ACIA. She said there has been a recent study indicating that ozone recovery may be quicker than heretofore predicted. The chair asked her and Petteri Taalas to make a recommendation on what the ASC should do in this regard, lacking a useful ozone scenario to work from at this time. Several lead chapter authors pointed out that they need these ozone scenarios as soon as possible in order to do their work. (See the section on UV scenarios below.)

Gudmundur Bjarnason requested that the assessment include the likelihood of a major volcanic eruption in Iceland that will release a large amount of particles into the atmosphere sometime in the next 70 years.

Inger Hanssen-Bauer reported on a statistical downscaling technique that might be used in ACIA. It is possible to use the methodology if one has a long time series of data at a single point, supplemented by fewer data at nearby points, in order to characterize a region. She offered to work with colleagues at this meeting and make a proposal on this topic at a later session. (See the section on statistical downscaling below.)

John Walsh reported on data/archives required for ACIA. He said the Stockholm workshop had strongly recommended that ACIA create a dedicated resource to supply those who are assessing potential climate change impacts with model-generated scenarios in suitable form. This resource would guide users on the limitations of models and their outputs. Archives of global model output already exist, e.g. the IPCC Data Distribution Center, but these cannot meet the Arctic-specific needs of ACIA. Issues for ACIA include the location of a data center, funding mechanisms, staffing, dedicated equipment, data holdings, ties to ozone and UV data, etc. He recommended that this resource be established soon. Gunter Weller said the International Arctic Research Center (IARC) in Fairbanks is prepared to provide support for this kind of dedicated resource at IARC, including support for one staff person. (See the section on data distribution center below.)

This led to a lively discussion on a number of related topics, including the location of ongoing climate model work, financing of a data center, the importance of liaison between a data center and its user community, the difficulty of quantifying the impacts of climate change on biological systems, current use of global models to examine impacts on Arctic vegetation changes, the advisability of a virtual data center, the use of a single scenario in all the assessment chapters, the outputs characteristic of SRES scenarios, the importance of two-way interaction in order to arrive at useful scenarios, staff needs for a dedicated data center, and the desirability of employing vulnerability assessment. Finally, Bob

Corell asked Erland Källén to assemble a small group and report back later in the meeting with a concrete recommendation.

Lars-Otto Reiersen report on the planned ACIA workshop, 28-30 May, in St. Petersburg. The purposes of the workshop will be (1) to learn about Arctic climate research being done in Russia and (2) to recruit additional Russians to serve as contributing and consulting authors of the assessment. He noted that organizing and scientific committees are at work, that one-page abstracts had been called for, and that a large number of these abstracts had been received to date. Funds are available to support participation by 30 - 40 Russian scientists. Some will be invited to make presentations; others to show posters summarizing their work. Funds are also available to support attendance of a few lead chapter authors, and he encouraged some of them to attend.

Bob Corell reported on his and Pål Prestrud's recent visit to Russia, citing the high level of interest in ACIA among Russian scientists. He and Pål had met with Arthur Chilingarov, Deputy Chairman of the Duma and former Arctic scientist. Dr. Chilingarov will be invited to give a major presentation at the workshop. Vladimir Kattsov was Bob's host throughout his visit to Russia. Pål Prestrud pointed out that they did not meet many people from the biological or social science communities in Russia. Snorri Baldursson agreed that circulation of notice about the workshop had been quite inadequate, and he said that the AMAP and CAFF Secretariats are trying to remedy the situation. Bob Corell said there was still a short time in which to reach out to communities that were missed in the initial distribution of the notice, and he asked ASC members to help.

Henry Huntington reported on social science issues in ACIA. He thought that, without strong social science input, the assessment will be much weaker, especially in the eyes of Arctic Ministers and residents. As examples, he pointed out the relevance to the assessment of the economics and management of fisheries, reindeer herding in some parts of the Arctic, and the ability of communities to handle emergencies. To date, social scientists had given a disappointing response to his invitation to participate in ACIA. His impression is that social scientists do not yet feel welcome in ACIA. Terry Fenge noted that the social science community was scheduled to meet May 15 - 20 in Quebec City and suggested that some indigenous peoples' representatives bring up the topic of ACIA on that occasion.

In this connection, Bob Corell suggested that the ASC consider establishing a social science consultative group that would provide social science perspectives and insights to the lead and contributing authors of all chapters in the assessment. But, after further discussion, the ASC decided that it would be wise to retain the present structure of the assessment, not establish any new consultative group, and try to recruit more social scientists to work as contributing or consulting authors of the appropriate chapters in the assessment. The chair asked Henry Huntington and Rögnvaldur Hannesson to report

back with suggestions on how to more thoroughly involve the social science community. (See the section on social sciences below.)

Shari Fox spoke about indigenous knowledge and how it might be incorporated more effectively into the assessment. She described the dissertation she is writing on Inuit knowledge of climate change and its impacts, based on her work with four Inuit communities in Canada. She said, for example, that eastern Inuit communities perceive cooling and increased rain in winter, together with more lightning and thunder. Other communities report warmer winters, more storms, thinner caribou, and drier summers than they were accustomed to. She offered to act as resource on indigenous peoples' knowledge of climate change.

Terry Fenge said that there is a Canadian video on Inuit knowledge of climate change. He offered to send a copy to any ASC member who wants a copy. He also urged that the assessment include maps of what hunting, residence, etc. patterns currently look like in the Arctic and what they might look like when subjected to climate change. Maps of this type could have a major impact on Arctic ministers when the policy reports are written by AMAP and CAFF. Jim Berner said the Alaska Native Science Commission maintains a database on indigenous knowledge at the website <http://www.nativeknowledge.org>.

Progress reports

Lead authors briefly described their progress in recruiting teams of contributing and consulting authors, scheduling workshops, refining the ACIA Operative Outline, specifying areas in need of additional attention, setting boundaries for their chapters, and identifying areas of potential overlap. Gunter Weller asked the lead authors to send the names of contributing and consulting authors to the ACIA Secretariat, along with updates of the chapter outlines. Bob Corell stressed the importance of assembling a list of all contributing and consulting authors so the ASC could approve them before the conclusion of this meeting.

Bob Corell put a PC in the meeting room so the lead authors could use it to update the author lists and the chapter outlines. He also asked the lead authors to use a spreadsheet to specify a time line for each chapter.

Vladimir Kattsov asked whether there are any space limits for the individual chapters of the assessment. Gunter Weller thought there should be about 50 pages per chapter. This would lead to a total ACIA report approximately the size of the AMAP assessment report. Betsy Weatherhead thought short papers are read more than long ones and recommended that the ASC aim at about 30 pages per chapter. The ASC agreed to return to this topic later. (See the section on text guidelines below.)

Gunter Weller proposed a report production schedule based on the ACIA Implementation Plan that had been approved by the Arctic Council:
First draft ready for ACIA review -- 3rd quarter of 2002
ACIA review completed -- 2nd quarter of 2003
External review completed -- 4th quarter of 2003
Final report produced -- 1st quarter of 2004
Final report printed -- 3rd quarter of 2004

Bob Corell asked whether ACIA could have a password-protected website for use by authors. He was assured by Gunter Weller that it would be done.

Lars-Otto Reiersen said that preparation of the AMAP and CAFF policy reports would be started when the second ACIA draft is completed, i.e. in the second quarter of 2003.

UV scenarios

As requested earlier by the chair, Petteri Taalas and Betsy Weatherhead addressed the question of what the ASC should do about the lack of ozone and UV scenarios. They recognized that a number of chapters in the assessment need estimates of stratospheric ozone and UV based on concentrations of halogenated compounds and greenhouse gases. They pointed out that there are some existing ozone and UV scenarios, together with future UV estimates for certain time slices. The WMO 2002 ozone assessment is under construction and should be available in late 2002. It is not clear whether there will be UV estimates in that report. **For those writing groups that want UV scenarios for their own uses in the near future, Petteri and Betsy recommended that they use scenarios currently published in Geophysical Research Letters.** Petteri Taalas will send a copy of the scenarios to each member of the ASC. A year from now, Petteri and Betsy may return to the ASC with a new recommendation based on what has been accomplished in the meanwhile.

The ASC approved the recommendation that writing groups use the scenarios that had been published in Geophysical Research Letters.

Climate scenarios

Erland Källén said **the Stockholm workshop on climate modeling and scenarios recommended that ACIA stay as close to the IPCC approach as feasible and that ACIA concentrate on the SRES B2 scenario which has been implemented on several global climate models.** SRES B2 is a moderate climate change scenario, one whose hypothesis is globally averaged warming of 2.5 degrees C over the period 2000 - 2100. This warming is assumed to be due to a gradual increase of carbon dioxide only. **The workshop recommended that ACIA implement the B2 scenario on five climate models that are readily available to scientists in North American and European**

centers: Canadian Climate Center, NCAR, GFDL, Hadley Center, and Max Planck Institute. The workshop further recommended that ACIA use time slices around 2020, 2050 and 2080 which are the ones being used by IPCC.

The ASC approved the report of the Stockholm workshop and accepted the workshop recommendations on use of the B2 scenario, implementation on the indicated five climate models, and three time slices centered on 2020, 2050 and 2080.

Gunter Weller stated that the report from the Stockholm workshop would be printed and distributed to ASC members.

Data distribution center

John Walsh said that data would have to be accessed through modeling centers. These modeling centers would thus constitute a "virtual" data center. The current hub of expertise for using model output is at the Swedish Meteorological and Hydrological Institute (SMHI), but it lacks the financial support needed to respond to ACIA requests. John believed that some formal arrangements would be needed between the International Arctic Research Center (IARC) and the North American modeling centers, and between SMHI and the European modeling centers. Assuming SMHI is funded to perform the data distribution center task, he hoped SMHI could be ready to be a focal point for requests by mid-2002.

Gunter Weller reminded the ASC that some funding will be available at IARC for this kind of data center function. He noted that the Director of IARC has allocated funds for one person to do this work.

Erland Källén mentioned the recommendation of the Stockholm workshop that IARC fulfill the data center function initially, but that the function should move to SMHI once SMHI is funded for the task.

Bob Corell summed up the discussion in the form of a resolution:

- (1) The ASC urges IARC to develop a position for at least one person for the next three years to perform the function of data interface manager on behalf of ACIA. The person should be resident in Fairbanks and work closely with the ACIA Executive Director. Guidelines for this person will be formulated under the Executive Director's guidance.**
- (2) The ASC recommends that IARC explore formal relationships with the five modeling centers on behalf of ACIA so the ASC can find out the implications of obtaining the data needed for ACIA and formulate signed agreements with the modeling centers.**

- (3) The Chair of the ASC should start conversations with the Director of SMHI about ways in which SMHI can eventually become the operational interface for working with data sets. He should estimate costs, explore how they might be met, and agree to a timetable. It is estimated that three people will be needed for the data interface manager's role at SMHI.**
- (4) The data interface manager's role might subsequently move from IARC to SMHI.**
- (5) An ad hoc team of Bob Corell, Pål Prestrud, Gunter Weller, Erland Källén, and John Walsh will work on this topic.**

The ASC approved the resolution as stated.

Statistical downscaling

Terry Callaghan reported on ACIA's use of statistical downscaling techniques to facilitate impact studies. He did this on behalf of Deliang Chen, Inger Hanssen-Bauer and himself in collaboration with Vladimir Kattsov. He described the objectives of statistical downscaling thus:

- (1) To develop statistical downscaling models in order to create local climate change scenarios for a key station at each of the selected locations;
- (2) To develop empirical links between local climate at one key station in each location and other stations in the area in order to describe the spatial variation around the key stations;
- (3) To use the local scenarios in key representative impact studies at the sites selected from impacts of various parameters relating to temperature and precipitation on vegetation change, trace gas emissions and species distributional limits; and
- (4) To explore the applicability of downscaling models to a wide range of other impacts studies such as the impact of temperature increases on infrastructures and also on reindeer husbandry.

Data required for application of statistical downscaling techniques are:

- (1) As long as possible (at least 30 years) data series from the key station within each site;
- (2) Existing data series (covering at least one seasonal cycle) from secondary stations at the test sites;
- (3) Reanalysis data (ERA and/or NCEP);
- (4) Monthly global grided datasets for the last ~100 years; and
- (5) Model data for one or more suitable GCMs, or -- if available -- from RCM simulations including the respective test sites.

Resources needed for a three-year effort include:

- (1) one full-time postdoc for the period of the project at RCG/GU;

- (2) one postdoc for three years with sufficient travel funds to allow site visits at Abisko; and
- (3) one full-time postdoc for the period of the project at DNMI.

This task group recommended the following pilot sites for initial application of statistical downscaling techniques:

- (1) Abisko -- sub-Arctic with great topographical complexity;
- (2) Toolik Lake -- mid-Arctic with mesotopography;
- (3) Lena Delta (?) -- mid-Arctic with flat, low polygonal tundra; and
- (4) Ny Ålesund -- high-Arctic with complex topography.

The ASC decided that the downscaling effort described above should be pursued as soon as the necessary resources become available.

Social sciences

Henry Huntington reported on behalf of a small group that had met during this meeting and discussed social science input to the assessment. He summarized their recommendations by stating that ACIA should address:

- (1) the consequences of socio-cultural change;
- (2) the social implications of climate change;
- (3) the adaptive capacity of human society; and
- (4) mitigative response options.

This task group recognized that chapter 16 of the assessment is to be a synthesis of the implications of climate variability and change and UV increases for the people and institutions of the Arctic. But ideas must be developed in prior chapters in order to set the stage for this synthesis. The task group felt this approach could be used to attract the attention of social scientists to participate in the work of ACIA.

As for practical steps, they suggested:

- (1) invitations by lead authors for specific chapters;
- (2) invitations by the ACIA Secretariat, especially for those who will draft sections of chapter 16; and
- (3) word of mouth and seeking advice from people like Fae Korsmo at the U.S. National Science Foundation.

The task group recommended some social scientists who could contribute to various chapters in the assessment and encouraged similar suggestions from others.

In a general discussion on the role of social science in ACIA, ASC members reached consensus that:

- (1) ACIA should make use of the International Arctic Science Committee to help establish links to social scientists in all the Arctic nations.**
- (2) There should be early social science input to the chapters in the assessment wherever it is appropriate. This should not be left until the first draft is finished.**
- (3) ACIA should somehow be brought up for consideration at the next meeting of the International Arctic Social Sciences Association in Quebec City in May. It would help to have some aboriginal leaders broach the topic, since this might well affect how it is received.**
- (4) The ACIA Secretariat should assemble a list of people who might be interested in helping write the synthesis chapter 16.**
- (5) The next Senior Arctic Officials meeting in Finland in June is an opportunity to talk about ACIA with indigenous peoples' representatives there.**
- (6) There are non-governmental organizations (e.g. the Northern Forum) that have Russian connections, and they might be able to facilitate participation by more Russian social scientists.**
- (7) Indigenous knowledge should appear in the study wherever it is appropriate. It should not be left exclusively to chapter 9.**

Regional climate models

Erland Källén presented a resolution that had been drafted by a small task group concerning the development of regional climate models:

"Present scenarios for future Arctic climate change are based on results from global coupled climate models. These models can be used for impact assessment and are providing a basis for the first Arctic Climate Impact Assessment (ACIA). However, global climate models have a coarse spatial resolution that limits their ability to capture many important aspects of climate change. In particular, they cannot accurately represent severe storms, effects of topography, and fundamental aspects of regional ocean circulation. To improve the modeling of such phenomena in the Arctic, regional coupled ocean/ice/atmosphere climate models need to be developed. The ACIA Steering Committee strongly urges governments and organizations concerned about the Arctic region to enhance, establish and fund research groups to develop such models."

Terry Fenge thought the resolution was good but not sufficient. He asked that a brief memo be written stating how a number of groups regard development of regional climate models as important topics for support. He reminded meeting participants that Arctic ministers are looking for policy recommendations.

The ASC approved the resolution as written, and also approved a reformulated version of the resolution to be written later by Bob Corell and Terry Fenge.

Text guidelines

Participants discussed guidelines for texts to be produced by the writing teams. **It was agreed that each chapter should aim at approximately 65 pages of text, not counting bibliography, references and figures, with 1-1/2 spacing between lines. There will be some room for flexibility in this regard. Authors can cite either review articles or individual articles, as appropriate. As decided at the Seattle ASC meeting, gray literature may be cited.**

Gunter Weller reminded the participants that the ACIA budget includes money for help with graphics. All graphics must be in electronic form.

Glenn Juday recommended that the authors try to consolidate a lot of material in a few good graphics that can appear early in the assessment and be referred to in a number of different chapters. With regard to temperature data, he advised that authors wait and see what consolidations of graphics can be made after the first drafts of the chapters are completed.

David Klein said the assessment will need an excellent series of fairly detailed maps, e.g. vegetation maps and maps of fish and mammal distributions.

Lars-Otto Reiersen, reflecting his experience with AMAP publications, recommended that ASC involve a good publisher early in this process.

The ASC instructed the Secretariat to bring a draft set of text guidelines for consideration at the next ASC meeting. The draft guidelines should deal with the kinds of graphics that are likely to be used in the assessment. Lars-Otto Reiersen was requested to help with this draft.

Other items

Gordon McBean said that the writing group for chapter 3 intends to take the lead in creating an Arctic climate data set that will build on existing global data sets, but with special attention to improving coverage of the Arctic region. It will be based on the last 100 years of scientific observations and the last 10,000 years of paleo-climate records. Tom Karl at the National Climatic Data Center has volunteered to help. The shortage of Russian data is a problem. Lars-Otto Reiersen added that the Arctic countries are collecting a lot of data related to climate, and those data go to the AMAP thematic data centers. The ASC should make certain it gains access to the holdings of those data centers and show that they have been taken into consideration in the assessment. There is some

regionality in the data: some areas show average cooling, while others show heating, and this should not be ignored.

Since Mark Nuttal withdrew, there is no lead author for chapter 11 on hunting, fishing, herding and gathering (formerly subsistence). Gunter Weller said that suggestions on a lead author for that chapter are welcome, and that it might be necessary to have two or more co-lead authors. **He recommended that the executive committee of ASC be tasked to recruit lead author(s) for chapter 11. The ASC accepted this recommendation.**

Lars-Otto Reiersen returned to the topic of the Russian workshop scheduled for St. Petersburg at the end of May. He said many abstracts had been received from Russian scientists who wanted to participate in the workshop, and some of those abstracts had been reviewed by ASC members. He asked some members of the ASC to take part in the workshop. He asked for copies of the passports of those who will be there, especially Americans and Canadians. Invitations to the workshop should go out by the first of May. The workshop will be held at the Arctic and Antarctic Research Institute. There will be simultaneous Russian-English interpretation. The ASC endorsed the idea of seeking abstracts from those Russian scientists who had submitted vitae but not abstracts.

Bob Corell noted that it had been helpful to have liaison to IPCC. He suggested that Jim McCarthy of IPCC Working Group II might be willing to serve as liaison between IPCC and ACIA. Bob intends to contact Jim on this subject.

Bob Corell pointed out that it might be good for ACIA to have better liaison with the WMO ozone assessment. Since Petteri Taalas and Betsy Weatherhead are part of that activity, the ASC asked them to look into this topic and report back at the next ASC meeting. Since Terry Callaghan is on a panel of another WMO group concerned with ozone impacts, the ASC requested that he explore informal liaison with them.

Gunter Weller mentioned that the ACIA Implementation Plan is final as approved by the Arctic Ministers. But ASC remains free to change the annexes to that plan as circumstances change. He said the Implementation Plan will be put on the ACIA website, without reference to any version number.

Bob Corell asked about governmental support of ACIA. Gordon McBean said the Canadian government is supporting Canadian lead authors, along with a reasonable number of their contributing authors. There will be a Canadian authors workshop in the fall, and financial details should become clear at that time. Hanne Petersen said that Denmark's government is supporting the Danish lead authors. Erland Källén reported that the Finnish government is supporting its authors. Snorri Baldursson said Iceland's support of its authors is firm. Pål Prestrud said that the Norwegian government is

supporting its lead and contributing authors. Terry Callaghan reported that the Swedish government is making a lump sum available for both lead and contributing authors. Gunter Weller said that IARC has sufficient funds from the U.S. government to continue support of the ACIA Secretariat and to contribute about \$10,000 to the expenses of each workshop.

Lars-Otto Reiersen reported on the possibility of securing funds from the Global Environment Fund (GEF) for support of Russian participation in ACIA. A preliminary proposal for about \$1,000,000 was submitted to GEF a few weeks ago, and it seems that senior GEF officials are well disposed toward the proposal. Any GEF grant will, of course, require equal matching contributions; but a number of national contributions to ACIA could be counted as match. He will report back on this topic at the next ASC meeting. The ASC endorsed this approach to GEF.

Rögnvaldur Hannesson volunteered a list of economists who might be willing to help write the final synthesis chapter. This list has been transmitted to the ACIA Secretariat.

The ACIA Operative Outline was updated in the course of the meeting on the basis of material submitted by lead authors. This updated outline will be on the ACIA website at <http://www.acia.uaf.edu> as a downloadable pdf file. The list of lead and contributing authors was also updated in the course of the meeting, and it too will be available on the ACIA website.

As requested by the chair, lead authors had created a time line for the assessment in the course of the meeting. It is in Appendix 3 to this report. It will later appear on the ACIA website.

Lars-Otto Reiersen suggested that ACIA may need a cross-fertilization meeting after the first draft of the assessment is completed. AMAP found it necessary to hold this kind of meeting; it involved about 100 people and went on for a week. In the AMAP case, all kinds of links were discovered during the cross-fertilization workshop. ACIA may find it profitable to do something similar. The right time might be February 2003. It was agreed by ASC members that this should be discussed further at the next ASC meeting.

The ASC decided to tentatively schedule its next meeting after completion of the individual chapter workshop, i.e. early December 2001. The Secretariat will look into holding the next meeting in Ottawa.

The ASC expressed its deep appreciation to Snorri Baldursson and Olga Palsdottir and to the government of Iceland for hosting this meeting. The meeting was adjourned at 6:00 p.m. on Friday, 20 April 2001.

Respectfully submitted,
Tom Murray

ACIA ASSESSMENT STEERING COMMITTEE MEETING

AGENDA

THURSDAY, 19 APRIL

08:30 Presentations/Discussions (10-15 min. each)

- (1) Results from the January workshop in Stockholm
 - a. Regional modeling and climate scenarios (E. Källén)
 - b. Ozone scenarios (E. Weatherhead)
 - c. Statistical downscaling (I. Hanssen-Bauer)
 - d. Data/Archives (J. Walsh)
- (2) Social science issues
 - a. Inclusion in each chapter (H. Huntington)
 - b. Consultative groups (R. Corell)
- (3) Indigenous knowledge (S. Fox)

13:30 Progress reports (10-15 min. Each)

Progress reports from each of the writing groups (all lead authors)

FRIDAY, 20 APRIL

- (1) Any remaining problems (gaps, overlap, etc.) with chapter outlines
- (2) Contributing author lists
 - a. Imbalance of national representation
 - b. Need for economists and paleoclimatologists
- (3) Planned workshop in Russia (Lars-Otto Reiersen)
- (4) Other ACIA Business
 - a. Finances
 - b. National liaison
 - c. Outreach
 - d. Others?
- (5) Next steps, including next ASC meeting

APPENDIX 2

Participant List Assessment Steering Committee Meeting Reykjavik, 19-20 April 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

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

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

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

Dr. Guðmundur G. Bjarnason
Environmental and Food Agency of
Iceland
Armula 1a, IS-108 Reykjavik
Iceland
Phone: +354 585 1000
Fax: +354 585 1010
guðmundurb@hollver.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

Niels Einarsson
Stefansson Arctic Institute
Nordurslod, 600 Akureyri
Iceland
Phone: +354 463 0581
Fax: +354 463 0589
ne@unak.is

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

Shari Fox
Coop. Institute for Research in
Environmental Sciences
University of Colorado at Boulder
Boulder, CO 80303
USA
sfox@kryos.colorado.edu

Prof. Rognvaldur Hannesson
NHH, Dept. of Economics
Helleveien 30
N-5035 Bergen
Norway
Phone: +47 5595 9260
Fax: +47 5595 9543
rognvaldur.hannesson@nhh.no

Dr. Inger Hanssen-Bauer
Norwegian Meteorological Institute
Niels Henrik Abels vei 40
N-0313 Oslo
Norway
Phone: +47 2296 3000
Fax: +47 2296 3050
i.hanssen-bauer@dnmi.no

Dr. Henry Huntington
Huntington Consulting
23834 The Clearing Dr.
Eagle River, AK 99577
USA
Phone: +1 907 696 3564
Fax: +1 907 696 3565
hph@alaska.net

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

arne.instanes@ngi.no

Dr. Helgi Jenson
Office of Environmental Protection
Ármúla 1a, P. O. Box 8080
IS-128 Reykjavik
Iceland
Phone: +354 585 1000
Fax: +354 585 1010
helgij@hollver.is

Tómas Johannesson
Icelandic Meteorological Office
Bustadavegur 9
IS-150 Reykjavik
Iceland
Phone: +354 522 6000
Fax: +354 522 6001
tj@vedur.is

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

Professor Erland Källén
Department of Meteorology
Stockholm University
S-10691 Stockholm
Sweden
Phone: +46 8 162396
Fax: +46 8 157185
erland@misu.su.se

Dr. Vladimir M. Kattsov
Voeikov Main Geophysical Observatory
Karbyshev St. 7
194018 St. Petersburg

Russia
Phone: +7 812 247 8668
Fax: +7 812 247 8661
kattsov@main.mgo.rssi.ru

Dr. David R. 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

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

Svend-Aage Malmberg
Marine Research Institute
P. O. Box 1390
121 Reykjavik
Iceland
Phone: +354 552 0240
Fax: +354 562 3790
svam@hafro.is

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

Dr. Hanne Petersen
Dept. of Arctic Environment
National Environmental Research Inst.
Frederiksborgvej 399, PO Box 358
DK-4000 Roskilde
Denmark
Phone: +45 4630 1940
Fax: +45 4630 1914
hkp@dmu.dk

Dr. Lars-Otto Reiersen
AMAP Secretariat
P.B. 8100 Dep
0032 Oslo
Norway
Phone: +47 2324 1632
Fax: +47 2324 1631
lars-otto.reiersen@amap.telemax.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@dfm-mpo.gc.ca

Mr. Jan-Idar Solbakken
Saami College
N-9520 Guovdageaidnu
Norway
Phone: +47 7848 7700
Fax: +47 7848 7702
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

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

Dr. John Walsh
Dept. of Atmospheric Sciences
University of Illinois
105 S. Gregory Ave.
Urbana, IL 61801
USA
Phone: +1 217 333 7521
Fax: +1 217 244 4393
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

ACIA Secretariat

Dr. Gunter Weller, Executive Secretary
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

Dr. Thomas Murray
Arctic Research Office
NOAA
1315 East-West Highway
Silver Spring, MD 20910
USA
Phone: +1 301 713 2518
Fax: +1 301 713 1967
tom.murray@noaa.gov