Minutes of

17th Meeting of the BALTEX Science Steering Group

held at

Institute of Meteorology and Water Management (IMGW)
Poznan, Poland
24 -26 November 2004

edited by
Hans-Jörg Isemer

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Participants at the 17th BALTEX Science Steering Group Meeting

From left to right and bottom to top:
D. Jacob, H. Graßl, V. Vuglinsky, A. van Ulden,
M. Kepinska-Kasprzak, O. Bøssing Christensen, V. Ryabinin, A. Omstedt, S. Meyer, S.-E. Gryning,
J. Piechura , J. Nilsson, G. Flöser, A. Lehmann, T. Vihma, M. Endejan
D. Rosbjerg, Z. W. Kundzewicz, S. Keevallik, H.-J. Isemer, C. Simmer, F. Berger

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Summary of Action Items

Action #1: Jörgen Nilsson to establish draft terms of reference for the new BALTEX Working Group on Data Management (BWGD) and a revised draft data exchange policy for BALTEX. Both, the draft terms of reference and the draft data policy shall be reported to BSSG at its forthcoming meeting for final approval.

Action #2: Jörgen Nilsson to suggest members of the new BALTEX Working Group on Data Management (BWGD) and present the BWGD membership at the forthcoming BSSG meeting for approval.

Action #3: Hartmut Graßl and Jörgen Nilsson to organize a BALTEX presentation at the forthcoming *Baltic Directors Meeting* to be held at SMHI, Norrköping, Sweden in March 2005.

Action #4: Andreas Lehmann and the Implementation Plan Writing Team to revise the draft implementation plan according to Appendix 13 to these minutes and establish a final draft version preferably by March 2005.

Action #5: Andreas Lehmann to arrange for an external review of the final draft implementation plan during April to June 2005, and thereafter establish the final implementation plan taking into account the comments and suggestions of the external reviewers. The following external reviewers were suggested: Fred Wulff, Sylvain Joffre and Richard Lawford.

Action #6: **Hartmut Graßl** to organise a workshop – or undertake other suitable steps – with the aim to introduce the initiative "*Assessment of impacts of climate change on the Baltic Sea*", initiated and chaired by Hans von Storch, and the HELCOM proposal "*Assessment of impacts of climate change on the Baltic Sea*" to eachother and find out about the possible level of cooperation between both initiatives.

Action #7: Hartmut Graßl to discuss with Hans von Storch, whether he would accept i) the initiative *Assessment of impacts of climate change on the Baltic Sea* be approved as a BALTEX initiative, and ii) – connected to i) - a review of the compiled assessment material prior to publication be organised by the BALTEX SSG.

Introduction

The 17th meeting of the BALTEX Science Steering Group (BSSG) was hosted by the Institute of Meteorology and Water Management (IMGW) in Poznan, Poland. Prior to the BSSG meeting a science workshop on "Programmes and projects of relevance for BALTEX Phase II" was held on Wednesday, 24 November 2005, 14:00 to 18:30 hours. The agenda of the science workshop is given in Appendix 1.

Hartmut Graßl, the Chairman of the BSSG, opened the BSSG meeting on Thursday, 25 November at 9:00 hours. The meeting was closed on Friday, 26 November at 12:00 hours. The agenda of the BSSG meeting and the list of BSSG meeting participants are given in Appendix 2 and Appendix 3, respectively.

The structure of the minutes follows chronologically the items numbered as given in the meeting agenda (see Appendix 2).

Item 1: Welcome by the Host and the Chairman

In his opening address, Hartmut Graßl, the BSSG chairman, welcomed the participants and emphasized the importance of this meeting in the light of the Implementation Plan for BALTEX Phase II to be finally discussed.

Malgorzata Kepinski-Kasprzak welcomed all participants on behalf of Pjotr Kowalczak, BSSG member and host of this meeting, who could unfortunately not attend this meeting at the time of its opening. M. Kepinski-Kasprzak gave a presentation on the activities of the Poznan branch of the IMGW, which is the national Hydro-meteorological Service in Poland.

Item 2: Amendment and Approval of the Agenda

Three further items to be discussed were suggested:

1. D. Jacob suggested to discuss the future role of the COSMOS (Community Earth System Models, http://cosmos.enes.org) project for BALTEX Phase II. This topic was added to item 9.
2. J. Nilsson suggested to discuss the upcoming *Baltic Directors Meeting* and its role for BALTEX. This topic was added to item 5.3 of the meeting agenda.
3. T. Vihma suggested to discuss a proposed collaboration project between HELCOM and BALTEX. This topic was added to item 7.3 of the meeting agenda.

With these amendments, the agenda of the meeting (see Appendix 2) was approved.

Item 3: Approval of the Previous BALTEX SSG Meeting Minutes

The minutes of the 16th BSSG meeting were unanimously approved.

Item 4: BALTEX SSG Membership Changes

The BSSG unanimously approved the following changes to the BSSG membership:

Ole Bøssing Christensen, senior scientist at the Climate Research Division of the Danish Meteorological Institute (DMI), was appointed new member of the BSSG. He will replace Leif Laursen, who has represented DMI at the BSSG ever since its foundation.

Franz Berger, head of the Observatory Lindenberg of the German Weather Service (DWD) was appointed new member of the BSSG. He will replace Gerhard Adrian, who has been the DWD representative in the BSSG for several years.

Pertti Seuna, of the Finnish Environment Institute (SYKE), has indicated his wish to resign from the BSSG because of his retirement. Pending further notice, Markku Puupponen will act as the point of contact for BALTEX at SYKE.

The Chairman, on behalf of the BSSG, thanked the resigned members and expressed the group's appreciation for their contribution to the steering process of BALTEX, and welcomed the new BSSG members.

Item 5: Review of Important Action Items of the Previous BALTEX SSG Meetings

5.1 Special BALTEX Study Conference Issue in *Nordic Hydrology*

12 papers (see Appendix 4) were submitted to *Nordic Hydrology* and are at the journal's normal review process at present.

5.2 Brief reports on the status of the BALTEX Data Centres

BALTEX Meteorological Data Centre (BMDC):
D. Jacob briefed the BSSG as follows:
1. The BMDC archive is now entirely included in the World Data Centre for Climate (WDCC) maintained at Max-Plank-Institute for Meteorology (MPIfM) , Hamburg, Germany.
2. Technical aspects in the context of data deliveries can be handled by WDCC staff. At present, no scientific support for e.g. data quality measures can be provided by WDCC.
3. Data deliveries to the BMDC were obtained from Estonia, Latvia and Sweden in 2003, and from Sweden in 2004.

Oceanographic Data Centre for BALTEX (ODCB):
See the summary report in Appendix 5.

BALTEX Hydrological Data Centre (BHDC):
See the summary report in Appendix 6.

BALTEX Radar Data Centre (BRDC):
See the summary report in Appendix 7.

J. Nilsson gave the reports on ODCB, BHDC and BRDC. He pointed out that the Swedish Meteorological and Hydrological Institute (SMHI) solely maintains the three data centres.

The financial implications of this support amounts to 100.000 Euro per year, including staff expenses.

It was suggested that the new BALTEX Working Group on Data Management (BWGD, see section 5.3) shall undertake to organise a review of all BALTEX Data Centres. This shall include also the consideration of possible revisions of the individual data centres' objectives in the light of the extended objectives of BALTEX Phase II. It was particularly suggested, to investigate

i) to what extent the individual data centres interact,
ii) how the objectives and data base of ODCB relates to other marine data centres focussed on the Baltic Sea,
iii) whether water quality data needs to be archived specifically in a BALTEX Data Centre;
iv) to what extent the BALTEX Data Centres provide for data products (such as gridded model output or satellite data), in particular in light of the GEWEX (Global Energy and Water Cycle Experiment) and GHP (GEWEX Hydrmeteorology Panel) data policy requirements and suggestions.

5.3 European data exchange policy and its relevance for BALTEX Phase II

As a follow-up of the previous BSSG meeting, Jörgen Nilsson gave a comprehensive overview on international data policies relevant for BALTEX, see his presentation in Appendix 8. He addressed the relevant World Meteorological Organisation (WMO) resolutions on data exchange issues, the Economic Interest Group of the National Meteorological Services (NMS) of the European Economic Area (ECOMET) policies as well as different European Union's directives on data and environmental information exchange policies. The BSSG concluded after lively and extended discussion that the present BALTEX data exchange policy may need revision in the light of the presented policies and directives.

It was therefore suggested to establish **a BALTEX Working Group on Data Management (BWGD)** and **Jörgen Nilsson** was appointed as the chairman of the new BWGD.

Jörgen Nilsson accepted **Action #1** to establish draft terms of reference for the new BALTEX Working Group on Data Management (BWGD) and a revised draft data exchange policy for BALTEX. Both, the draft terms of reference and the draft data policy shall be reported to BSSG at its forthcoming meeting for final approval.

Action #2 was again given to **Jörgen Nilsson** to suggest members of the new BWGD and present the BWGD membership at the forthcoming BSSG meeting for approval.

The tasks of the new BWGD will include to organize the reviews of the existing BALTEX Data Centres including the suggested particular investigations related to BALTEX data and BALTEX Data Centres, as mentioned under item 5.2, points i) to iv).

J. Nilsson informed the BSSG on the next *Baltic Directors Meeting* (BDM) to be held 14 and 15 March 2005 at SMHI, Norrköping, Sweden. The directors of several national weather services, including those of Sweden, Iceland, Finland, Estonia, Latvia and Lithuania, meet regularly to discuss issues relevant for these services. J. Nilsson suggested to present the objectives of BALTEX Phase II at the forthcoming BDM meeting in Norrköping, and to stress the

importance of a continued data delivery of the national weather services in support of the BALTEX Data Centres.

Hartmut Graßl and Jörgen Nilsson accepted **Action #3** to organize a BALTEX presentation at the forthcoming *Baltic Directors Meeting* in March 2005.

Item 6: WCRP and GEWEX developments relevant for BALTEX

6.1 WCRP issues relevant for BALTEX

Vladimir Ryabinin in particular re-inforced the contents of his workshop presentation (Annex 1), where he highlighted COPES. Approaching its 25th anniversary, WCRP (World Climate Research Programme) has recently both reviewed its progress and at the same time suggested a revised research strategy for the time period 2005 to 2015 entitled "Coordinated Observation and Prediction of the Earth System (COPES)". COPES is planned to be built on existing (and future) WCRP projects, and provides a context in which scientists will be able to perform their research. Wherever possible, new experiments, studies, and observational activities will be carried out through the existing WCRP core project structure, with the option of an evolving structure, if necessary. The term 'Earth System' expresses the increasing breadth of climate system research, and it requires application of more holistic approaches to understand, model and predict the components of the climate system and their interactions.

The COPES discussion document (available *e.g.* at http://www.wmo.ch/web/wcrp/), which is currently still debated in the scientific community prior to final approval by the Joint Scientific Committee (JSC), describes several objectives and priorities which are of relevance for BALTEX. Through COPES, WCRP projects will determine the feasibility and expected skill of seasonal climate prediction in all regions of the globe with currently available models and data. This important exercise should be repeated periodically as observational systems and models evolve. Secondly, the techniques for ensemble prediction of climate variability and change will be further developed and tested. A third objective of COPES is to determine the scientific basis for, the best approaches to, and current skill of projections of regional climate change at several time scales. The WCRP Conference held in Geneva, 1997, had approved the following priorities for this decade:

- Assessing the nature and predictability of seasonal to interdecadal climate variations at global and regional scales;
- Providing the scientific basis for operational predictions;
- Detecting climate change and attributing causes;
- Projecting the magnitude and rate of human-induced change, *e.g.* as input for IPCC or UNFCCC.

COPES tries to implement these research priorities. COPES will use the 1979-2004-2009 period to develop reference climate data sets and advanced forecasting techniques. This period will be used for retrospective forecasts of variations on time scales up to decadal.

V. Ryabinin noted finally, that all presently ongoing WCRP projects (such as GEWEX) require now contributions to COPES, to the extent possible, and he concluded by suggesting that BALTEX Phase II should carefully identify possible contributions to COPES.

The BSSG concluded that through both the proposed BALTIC-GRID initiative, which is part of the presently established BALTEX Phase II implementation plan, as well as the cooperation envisaged with COSMOS (see item 9), BALTEX will contribute to meeting COPES objectives.

6.2 The 10th GEWEX Hydrometeorology Panel (GHP) meeting summary

H.-J. Isemer summarized the outome of the the recent 10th GEWEX Hydrometeorology Panel (GHP) meeting (13 to 16 September 2004, see http://ecpc.ucsd.edu/projects/ghp/). One focus at this meeting was on the adjustment of Continental-scale Experiment (CSE) criteria according to the revised objectives of GEWEX phase 2 (see Appendix 9). The present GHP CSE contribution matrix lists the progress of each CSE, including BALTEX, against the present CSE criteria (Appendix 9). Revised criteria for GEWEX phase 2 were suggested (Appendix 9) and will be presented for approval at the forthcoming GEWEX SSG meeting. The majority of the new suggested scientific criteria make reference to GHP working groups, and an important future CSE criteria will be the CSEs' commitment to actively contribute to GHP working groups. The present GHP working groups and the present respective BALTEX representation is given again in Appendix 9.

The BALTEX SSG encouraged interested scientists to actively contribute to GHP working groups. The BSSG also concluded that BALTEX should be represented in most but not necessarily all GHP working groups. The suggested future representation is as follows:

GEWEX Hydrometeorology Project (GHP)
BALTEX panel member: Hartmut Graßl, representation also through Hans-Jörg Isemer.

Water and Energy Budget Studies (WEBS)
BALTEX representative: Daniela Jacob

Water Resources Application Project (WRAP)
No BALTEX representative at present

Extremes (WISE)
BALTEX representative: Ole Bøssing Christensen

Transferability Working Group (TWG)
BALTEX representative: Burkhardt Rockel

Data Management
BALTEX representative (and co-chair): Hans-Jörg Isemer

Stable Water Isotope Intercomparison Group (SWING)
No BALTEX representative at present. The SWING chair Martin Werner shall be contacted to represent BALTEX in this group.

Prediction and Predictability
The implementation of this working group is so far not approved, therefore no BALTEX representative at present.

Item 7: Implementation Plan for BALTEX Phase II

7.1 Summary presentation of the draft plan

Andreas Lehmann, in his capacity as chairman of the Implementation Plan Writing Team (IPWT), summarized the actions taken so far to establish a draft Implementation Plan for BALTEX Phase II and gave an overview on the draft. See Appendix 10 for his presentation. Responsible chapter authors added presentations on details of the individual chapters of the plan, as follows:

General introduction and Chapter 1 (A. Lehmann)
Chapter 2: Better understanding of the energy and water cycles (A.Omstedt)
Chapter 3: Analysis of climate variability and change (J. Nilsson)
Chapter 4: Improved tools for water management (D. Rosbjerg)
Chapter 5: Gradual extension to air and water quality studies (S.-E. Gryning)
Chapter 6: Knowledge management (A. Lehmann)
Chapter 7: BALTEX data management (C. Simmer)
Chapter 8: Strengthened interaction with decision makers (J. Nilsson)
Chapter 9: Education and outreach (S. Meyer)

Details on chapters 4 and 5 are included as Appendix 11 and 12, respectively.

7.2 Discussion of the draft plan

The entire draft plan was discussed in detail and numerous suggestions, both of general and structural nature, as well as detailed text suggestions were brought forward by the meeting participants. Appendix 13 summarizes the major suggestions and related action items.

Andreas Lehmann and the Implementation Plan Writing Team were given **Action #4** to revise the draft implementation plan according to Appendix 13 and establish a final draft version preferably by March 2005.

Action #5 is for Andreas Lehmann to arrange for an external review of the final draft implementation plan during April to June 2005 and thereafter establish the final implementation plan taking into account the comments and suggestions of the external reviewers. The following external reviewers were suggested: Fred Wulff, Sylvain Joffre and Richard Lawford.

7.3 Information on IPCC and BACC

Intergovernmental Panel on Climate Change (IPCC)
Zbigniew Kundzewicz gave a comprehensive overview on the status of the preparation towards the 4th IPCC Assessment Report (AR), see Appendix 14 for his presentation. The roadmap for IPCC AR #4 foresees major deadlines for different versions of the draft AR#4 to be ready in the course of 2005 and 2006, with the overall goal to have AR#4 ready by 2007. Any input, e.g. from BALTEX projects would therefore be required rather rapidly. New BALTEX Phase II projects, which may start just now or in the nearest future, will have little chances to provide evidence to be considered still for AR#4. Z. Kundzewicz particularly explained chapter 3 “Freshwater resources and their management” of the planned AR#4, and the IPCC AR#4 cross-cutting theme “water” as potential areas, where BALTEX results could be considered.

Assessment of Climate Change for the Baltic Sea basin (BACC)
and
Proposal for a BALTEX-HELCOM collaboration "Assessments of impacts of climate change on the Baltic Sea"

Anders Omstedt introduced the BACC initiative. In September 2004, being a member of the BALTEX Implementation Plan Writing Team, Hans von Storch, director at the Institute for Coastal Research at GKSS Research Centre Geesthacht, initiated to conduct an *Assessment of Climate Change for the Baltic Basin* with the ultimate goal to review existent literature on the subject and publish an assessment book by 2006. See Appendix 17 for details. The purpose of this presentation was to i) introduce the initiative to the BSSG, and ii) to investigate whether the mentioned initiative may be conducted as a contribution to or project of BALTEX Phase II, which was suggested by A. Omstedt. He continued to suggest that the BSSG may approve this initiative being renamed to *BALTEX Assessment of Climate Change for the Baltic Basin(BACC).*

In parallel, Timo Vihma and Mikko Alestalo, both in their capacities as BSSG members, had contacted HELCOM (the Helsinki Commission), to discuss the revised objectives of BALTEX Phase II including possible future linkages to HELCOM, and the idea for a HELCOM *Assessment of impacts of climate change on the Baltic Sea* was developed, at that time independently from the above initiative by Hans von Storch. Timo Vihma introduced the proposed collaboration between HELCOM and BALTEX (see Appendix 15 for details).

The BSSG identified quite some apparent overlap between both initiatives and concluded that steps shall be undertaken to discuss options for a possible coordination, or even merging, of the two initiatives. The BSSG also concluded that the initiative chaired by Hans von Storch would be an important contribution to BALTEX. The BSSG further offered to conduct an external review of the compiled climate assessment material, which shall be conducted under guidance and supervision of the BSSG.

Hartmut Graßl accepted **Action #6** to organise a workshop – or undertake other suitable steps – with the aim to introduce both assessment initiatives to eachother and find out about the possible level of cooperation between both initiatives.

The BSSG further asked **Hartmut Graßl (Action #7)** to discuss with Hans von Storch, whether he would accept i) the initiative *Assessment of impacts of climate change on the Baltic Sea* be approved as a BALTEX initiative, and ii) – connected to i) - a review of the compiled material prior to publication be organised by the BALTEX SSG.

7.4 Funding Options for BALTEX Phase II

A brief summary of the contents of the currently open EU-FP6 call "Global Change and Ecosystems" was given by H.-J. Isemer.

The BSSG concluded that there is no major BALTEX proposal at present being prepared as a response to the above call. The experience with recent BALTEX proposals indicate, that a proposal focussed only on the Baltic Sea basin, might be in danger to be rejected because of a too limited regional focus. Therefore, BALTEX scientists and groups were encouraged to contribute, whenever possible, to other ongoing proposals. It was suggested in this context, to review ongoing projects funded at the EU level in order to identify potential contributions relevant for the BALTEX project.

Item 8: Date and Place of the Next Meeting

Upon invitation by Franz Berger, the next BALTEX SSG meeting will take place at the Lindenberg Observatory of the German Weather Service (DWD) in Lindenberg, Germany. The meeting will be organised in conjunction with the 100th anniversary of the Lindenberg Observatory and will take place during 18 to 20 October 2005.

Item 9: Any Other Business

The COSMOS project

D. Jacob summarized the COSMOS (Community Earth System Models[1]) project. COSMOS undertakes to develop a complex Earth System Model (ESM). Such models integrate our knowledge regarding the atmosphere, the ocean, the cryosphere and the biosphere, and account for the coupling between physical and biogeochemical processes in these components of the Earth System. ESMs are needed to understand large climate variations of the past and to predict future climate changes. International programs, including the World Climate Research Program (WCRP) and the International Geosphere-Biosphere Program (IGBP), coordinate Earth System Modeling initiatives through their WFCM and GAIM projects, respectively. The Max Planck Institute for Meteorology in Hamburg has developed global and regional climate models (atmosphere, ocean, cryosphere). Models describing biophysical and biogeochemical processes are being developed at the Max Planck Institute in Jena. Models focusing on tropospheric and stratospheric photochemistry and aerosols and transport are developed and used at the Max Planck Institute for Chemistry in Mainz and at the Max Planck Institute for Meteorology in Hamburg. The Potsdam Institute for Climate Impact has developed a spectrum of Earth System models at various levels of complexity, and accounts for the socioeconomic aspects of importance for the fate of the Earth System. These different institutes have decided to join efforts and work together with the community towards new scientific goals including modeling of the Earth system. For these reasons they initiated COSMOS, a new project for community Earth system models.

The COSMOS community is currently identifying pilot regions for regional modelling, and the Baltic Sea basin has been suggested as the first COSMOS pilot region. Therefore, D. Jacob suggested that BSSG may endorse a closer cooperation between BALTEX and COSMOS and BALTEX activities, in particular the BALTIC-GRID initiative, be accepted as contributions to the COSMOS pilot study on the Baltic Sea basin.

BSSG followed the suggestion by D. Jacob. The COSMOS interest on BALTEX and the Baltic Sea basin was highly appreciated, and all activities towards establishing the Baltic Sea basin as the first pilot study region within COSMOS were definitely endorsed.

Closing of the BALTEX SSG Meeting

The Chairman thanked the participants for a lively and constructive discussions and the host institution and the BALTEX Secretariat for all arrangements made for this meeting.

[1] See http://cosmos.enes.org

Appendix 1: Workshop Agenda

Programmes and Projects of Relevance for BALTEX Phase II

A workshop prior to the 17th BALTEX SSG Meeting
Institute of Meteorology and Water Management (IMGW)
Poznan, Poland

Wednesday, 24 November 2004

The workshop venue is at the IMGW facilities at ul. Dabrowskiego 174/176 in Poznan.

Chair: Piotr Kowalczak, Institute of Meteorology and Water Management, Poznan, Poland

14:00 ***The Institute of Meteorology and Water Management (IMGW) in Poland: National tasks and profile with relevance for BALTEX***
Malgorzata Kepinska-Kasprzak, *Institute of Meteorology and Water Management*, Poznan, Poland

14:25 ***The World Climate Research Programme in 2005-2015: Coordinated Observation and Prediction of the Earth System (COPES)***
Vladimir Ryabinin, *Joint Planning Staff for WCRP*, Geneva, Switzerland

14:50 ***The Global Water System Project (GWSP)***
Marcel B. Endejan, *GWSP International Project O*ffice, Bonn, Germany

15:15 ***The LOICZ (Land-Ocean Interactions in the Coastal Zone) Programme of IGBP***
Götz Flöser, *LOICZ Regional Coordination Office, GKSS Research Centre*, Geesthacht, Germany

15:40 *Break*

16:00 ***Research priorities for HELCOM monitoring and assessment purposes***
Timo Vihma, *Finnish Institute for Marine Research*, Helsinki, Finland

16:25 ***The Swedish MARE project***
Fredrik Wulff, *Stockholm University*, Sweden

16:50 ***European regional climate change and the PRUDENCE project***
Ole Bøssing Christensen, *Danish Meteorological Institute*, Copenhagen, Denmark

17:15 ***The Community System Model COSMOS and its regional pilot study BALTEX***
Daniela Jacob, *Max-Planck-Institute for Meteorology*, Hamburg, Germany

17:40 ***The German priority research programme on quantitative precipitation forecast***
Clemens Simmer, *Rheinische Friedrich-Wilhems-University*, Bonn, Germany

18:05 ***COASTWATCH: A contribution to the Global Monitoring for Environment and Security (GMES) initiative***
Carsten Brockmann, *Brockmann Consult*, Geesthacht, Germany

18:30 Concluding discussion and closing of the workshop

Appendix 2: 17th BSSG Meeting Agenda

17th BALTEX SSG Meeting

at

Institute of Meteorology and Water Management

Poznan, Poland

24 – 26 November 2004

The workshop and the BSSG meeting will take place at the IMGW facilities at ul. Dabrowskiego 174/176 in Poznan, Poland

PROVISIONAL AGENDA AND EXPLANATORY MEMORANDUM

The major objective of the 17th BALTEX SSG meeting is to finally discuss the draft Implementation Plan for BALTEX Phase II. The latter document was established by a dedicated Implementation Plan Writing Team and was distributed to all BSSG members prior to this meeting for review. It is of utmost importance for a successful discussion that participants at this meeting have reviewed the draft plan carefully and are thoroughly prepared for a constructive discussion.

Wednesday, 24 November 2004

14.00 **„Programmes and Projects of Relevance for BALTEX Phase II“**
The workshop prior to the official BSSG meeting aims at identifying important links to and potential future mutual cooperation with relevant international and major national programmes or projects. See the separate workshop agenda for details.

18.30 Closing of the workshop

Thursday, 25 November 2004

9.00

Item 1: Welcome by the host and the Chairman (P. Kowalczak, H. Graßl)

Item 2: Amendment and approval of the agenda

Item 3: Approval of the previous BALTEX SSG meeting minutes

Item 4: BALTEX SSG membership changes
Since the 16th BSSG meeting, three suggestions for BSSG membership changes were brought to the attention of the BSSG Chair. Changes in BSSG membership need to be approved by the BSSG. The suggested changes include:

1. **Ole Bøssing Christensen,** senior scientist at the Climate Research Division of the Danish Meteorological Institute (DMI), to replace **Leif Laursen,** who has represented DMI at the BSSG ever since its foundation.
2. **Franz Berger**, head of the Observatory Lindenberg of the German Weather Service (DWD) to replace **Gerhard Adrian**, who has been the DWD representative in the BSSG for several years.
3. **Pertti Seuna**, of the Finnish Environment Institute (SYKE), has indicated his wish to resign from the BSSG because of his retirement. Pending further notice Markku Puupponen will act as the point of contact for BALTEX at SYKE.

Item 5: Review of important action items of the previous BSSG meetings
The following topics will in particular be reported on:
5.1 Special Conference Issue in *Nordic Hydrology* (D. Rosbjerg, H.-J. Isemer)
5.2 Brief reports on the status of the BALTEX Data Centres (M. Lautenschlager, B. Carlsson, D. Michelson, P. Axe)
5.3 European (ECOMET) data exchange policy and its relevance for BALTEX Phase II (J. Nilsson, to be discussed under item 7.3, see below)

Item 6: WCRP[2] and GEWEX[3] developments relevant for BALTEX
6.1 WCRP and GEWEX issues relevant for BALTEX (V. Ryabinin)
6.2 The 10th GEWEX Hydrometeorology Panel (GHP) meeting summary (H.-J. Isemer)

Break

10.30 **Item 7: Implementation Plan for BALTEX Phase II**
A draft Implementation Plan for BALTEX Phase II, established by a dedicated Implementation Plan Writing Team (IPWT) chaired by Dr Andreas Lehmann, was brought to the attention of the BALTEX SSG (BSSG) members prior to the meeting. The draft will briefly be reviewed by members of the IPWT.

[2] World Climate Research Programme
[3] Global Energy and Water Cycle Experiment

Thursday, 25 November 2004 *(continued)*

BSSG members and guests are expected to comment on the draft and discuss and suggest improvements, if required. This discussion is expected to conclude a final BALTEX Phase II Implementation Plan including a list of suggested improvements and related action items prior to the Plan's publication.

7.1 Summary presentations of the draft plan

Brief summaries of the individual chapters of the draft plan will be given by the indicated speakers, as follows (10 minutes each at maximum, except for the introduction):

a) General introduction and Chapter 1 (A. Lehmann)
b) Chapter 2: Better understanding of the energy and water cycles (A.Omstedt)
c) Chapter 3: Analysis of climate variability and change (J. Nilsson)
d) Chapter 4: Improved tools for water management (D. Rosbjerg)
e) Chapter 5: Gradual extension to air and water quality studies (S.-E. Gryning)
f) Chapter 6: Knowledge management (A. Lehmann)
g) Chapter 7: BALTEX data management (C. Simmer)
h) Chapter 8: Strengthened interaction with decision makers (J. Nilsson)
i) Chapter 9: Education and outreach (S. Meyer)

The total time allocated to item 7.1 is two hours.

12.30 *Lunch break*

14.00 **7.2 Discussion of the draft plan**

The draft plan shall be discussed in detail. General and specific comments, suggestions and criticism related to the draft plan are expected to be discussed following these issues:

- Contents of and links between Chapters 1 to 9

Two additional presentations (see details under item 7.3) are planned to be held in the context of chapters 3, 6.2 and 9.

- Data management and data policy (contribution to chapter 7)
- Scientific exchange with other organisations (GEWEX/GHP, HELCOM, IPCC, GWSP, LOICZ, …) (contribution to chapter 9)
- Time Plan - Table of projects with time schedule (chapter 10)
- BALTEX organisational structure (SSG, working groups, secretariat) (chapter 11)
- Future actions: Figures, Foreword, Executive Summary; additional reviews ?

15.30 *Break*

Thursday, 25 November 2004 *(continued)*

16.00 **7.2 Discussion of the draft plan** *(continued)*

7.3 Information on IPCC and BACC
Issues related to the Intergovernmental Panel on Climate Change (IPCC) and in particular the future 4th Assessment Report are expected to be of relevance for BALTEX Phase II, in particular for issues referred to in chapter 6.2 of the plan. The following presentations will inform the BSSG on relevant IPCC issues and on a new suggested initiative for assessing climate change in the Baltic Sea basin (BACC). Both presentations will be given in the course of the discussion on the draft plan, as suitable:

Towards the Fourth IPCC Assessment: Freshwater.
Z. Kundzewicz (20 minutes)

BALTEX Assessment of Climate Change for the Baltic Sea basin (BACC).
A.Omstedt for H.v.Storch (10 minutes)

18.30 **Closing of day 1 of the meeting**

Friday, 26 November 2004

9.00 **7.2 Discussion of the draft plan** *(continued)*

7.4 National and international funding options to support the implementation of BALTEX Phase II
BSSG members and meeting participants will summarize existent or planned both national and international funding programmes, where funding proposals in support of research activities planned for BALTEX Phase II may be submitted. At the European level, the 4th call of the FP6 thematic priority "*Global change and ecosystems*" as well as FP7 may be relevant options.

7.5 Wrap-up and conclusions

10.30 *Break*

7.5 Wrap-up and conclusions *(continued)*

12.30 **Item 8: Date and Place of the Next Meeting**

Item 9: Any Other Business

13.00 **Closing of the BSSG meeting**

Appendix 3: Participant List

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Stockholm, Sweden

Appendix 4: Submitted BALTEX papers for Nordic Hydrology

No.	Author	Title
1	Arpe, Klaus; Stefan Hagemann, Daniela Jacob and Erich Roeckner	The realism of the ECHAM5 models to simulate the hydrological cycle in the Arctic and North European area
2	Dubicki, Alfred	Drought of 2003 in the Odra Basin
3	Jakobson, Erko; Hanno Ohvril, Oleg Okulov and Nels Laulainen	Variability of radiosonde precipitable water in the Baltic region
4	Kitaev, Lev; Eirik Førland, Vjacheslav Rasuvaev, Ole Einar Tveito, and Olaf Krüger	Distribution of snow cover over Northern Hemisphere
5	Kjellström, Erik; Ralf Döscher, H.E.Markus Meier and Helene Banks	Atmospherice response to different sea surface temperatures in the Baltic Sea
6	Kowalewska-Kalkowska, Halina and Marek Kowalewski	Operational Hydrodynamic model for Forecasting of extreme hydrological events in the Oder Estuary
7	Krysanova, Valentina; Fred Hattermann and Anja Habeck	Expected changes in water resources availability and water quality with respect to climate change in the Elbe River basin (Germany)
8	Lindau, Ralf and Clemens Simmer	Derivation of a root zone soil moisture algorithm and its application to validate model data
9	Omstedt, Anders; Youmin Chen and Karin Wesslander	A comparison between the ERA40 and the SMHI gridded meteorological databases as applied to Baltic Sea modelling
10	Rutgersson, Anna; Anders Omstedt and Youmin Chen	Evaluation of the heat balance components over the Baltic Sea using four gridded meteorological databases and direct observations
11	Saramak, Agnieszka	The influence of synoptic situations on extreme precipitation in the Raba Valley
12	Sepp, Mait; Piia Post and Jaak Jaagus	Long-term changes in the frequency of cyclones and their trajectories in Central and Northern Europe

Appendix 5: Oceanographic Data Centre for BALTEX:

Report to the 17th BSSG
Philip Axe, 22 Nov 2004

Summary:

The data centre continues to support BALTEX activities. During 2004 the centre has banked primarily sea level data, though also CTD (Conductivity, Temperature & Depth) profiles from Swedish cruises. One data request was received, from the Rossby Centre, for CTD profiles to help with the calibration/validation of the Rossby Centre Oceanographic Model.

SMHI Oceanographic Data Group are upgrading to new database servers, and are taking the opportunity to modernise the database structures, and the parameters handled. As a result of this, those data currently held in file structures will be moved into relational databases.

Data Acquisitions:

The data centre has received:

2003 sea level data from:

- Estonia (Stations Narva; Paldiski; Pärnu; Ristna & Virtsu)
- Lithuania (Daugavgriva; Lielupes griva; Liepaja; Pavilosta; Roja; Salacgriva; Skulte & Ventspils)
- Sweden (Kalix; Furuögrund; Ratan; Skags udde; Spikarna; Forsmark; Stockholm; Landsort Norra; Landsort;Marviken; Visby; Ölands Norra udde; Oskarshamn; Kungsholmsfort; Simrishamn; Skanör Klagshamn; Barsebäck; Viken; Ringhals; Göteborg-Torshamnen; Smögen; Kungsvik)

CTD, nutrient & oxygen data from Sweden.

Data requests:

Marcus Meier (Rossby Centre, SMHI Norrköping) requested (& received) 1600 CTD profiles from 2000 - 2003 in January 2004.
Received BALTEX Data User Identification forms for: Anders Engqvist; Sven Halldin; Adolf Stips; Dieter Peters & Niko Schmitz.

Plans for the next 12 months:

- Maintain the current data bank.
- Move CTD data to a relational database
- Fill in gaps in the current sea level data holdings, in particular with data from the Baltic southern coast (Poland, Germany) during the BALTEX-BRIDGE period.
- Extend the high frequency sea level data holdings back in time, to cover the BALTEX Phase II period (1800 – present).
- Look into banking sea ice parameters – in particular, what are the data requirements, and what data (and data sources) are currently available.

Appendix 6: BALTEX Hydrological Data Centre
Report to the 17th BSSG
Bengt Carlsson, Jan 2005

Summary:

The hydrological data centre continues to support BALTEX activities as previous years. During 2004 the centre has banked runoff data from Sweden, Finland , Estonia, Latvia, Lithuania, Russia, Germany and Denmark.

Data Acquisitions:

During 2004 the data centre has received:

Monthly runoff data from 2003:

- Sweden as 40 coast sections based on best choice of runoff stations.
- Finland: 31 stations
- Russia: 2 stations (Neva and Luga).
- Estonia : 4 stations (Narva, Keila, Pärnu and Kasari, calculations from daily data).
- Latvia: 2 stations (Daugava, Venta ,calculations from daily data).
- Lituania: 1 station (Neman, calculations from daily data).
- Belarus: 0 stations
- Poland: 0 stations
- Germany: Calculations will be done based on new choice of stations..
- Denmark as 9 coast sections based on best choice of runoff stations.

Daily runoff data from 2003:

- Sweden: 55 stations.
- Finland: 64 stations
- Russia: 0 stations
- Estonia : 8 stations.
- Latvia: 8 stations
- Lituania: 8 station.
- Belarus: 0 stations
- Poland: 0 stations
- Germany: 7 stations.
- Denmark 19 stations.

The daily meteorological data base over the BALTEX area.
Updated 2003 and for 2004 on request..

Data deliveries:

Adolf Stips, Inland and Marine Waters unit.CEC Joint Research Centre, Italy
Nico Smitz, Univ. of Reading, GB.
Torsten Seifert, Warnemünde, Germany.

Appendix 7: BALTEX Radar Data Centre: Report to the 17th BSSG Daniel Michelson, January 5, 2005

Summary:

The data centre continues to support BALTEX activities. Production of datasets continues, but the overall quality of operations is slowly degrading due to the lack of necessary IT infrastructure. New infrastructure might be phased in during 2005.

Datasets have now been generated continuously for over five years! This is an extraordinary length of time for weather radar based datasets.

The BRDC has gratefully received recognition at the Third European Conference on Radar in Meteorology and Hydrology (ERAD), which was held in Visby, Gotland, between 6-10 September.

Data Acquisitions:

The BRDC continues to receive data from NORDRAD (Sweden, Norway, Finland), Denmark, Germany, and the Netherlands. Data delivery from Poland was discontinued long ago, during the introduction of the new Polish radar network POLRAD, but there is now a mutually strong interest in re-introducing these data to BRDC production.

Data requests:

There is continued interest in using BRDC datasets in meteorology (NWP data assimilation and validation), hydrology (HBV), and satellite remote sensing (AQUA and GPM preparations). Datasets are being made available when possible. Unfortunately however, due to the infrastructural problems mentioned above, it is not yet possible to meet all requests for data.

Plans for the next 12 months:

- Phase in a second generation BRDC IT infrastructure.
- Migrate the current datasets to the new platform.
- Migrate BRDC production to the new platform.
- (Re-)Introduce Polish, Estonian, and Russian data to BRDC production
- Make available all datasets through a common web-based interface.
- Continue to actively support and participate in BALTRAD/NORDRAD development initiatives.
- Hopefully introduce improvements to the quality of existing products.

Appendix 8: European Data Policies, Presentation by J. Nilsson

WMO's Data Policy

WMO Resolution No. 40

- **Essential Data and Products**
  - **..necessary for the provision of services in support of the protection of life and property…**
  - **..required to describe and forecast accurately weather and climate and support WMO Programmes;**
- **Additional Data and Products**
  - **..required to sustain WMO Programmes..**
  - **..to assist other Members in the provision of meteorological services in their countries.**
  - **..conditions on their re-export for commercial purposes outside of the receiving country or group of countries forming a single economic group**
- **Data and products for research and education**
  - **..free and unrestricted access to all data and products exchanged under the auspices of the WMO.**
  - **Conditions for commercial application**

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ECOMET

Objectives

- **To preserve the free exchange of data sets and products between Members of the grouping in accordance with WMO Res. 40;**
- **To assist the Members to maintain and improve their infrastructure;**
- **To expand the availability of meteorological information within the ECOMET Territory;**
- **To increase the use and improve the distribution of data, products and services of the Members while maintaining and improving their quality;**
- **To create the conditions for Members to develop their economic activities.**

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ECOMET's Data Policy

- Negative Clearance type Comfort Letter
  - Approved by the EU Commission in 1999
    - No appreciable restrictions of competition within the meaning of Art. 81.1 or 82 of the EC Treaty
  - Creates a "Level Playing Field"
    - Access for ISP to data and products through ECOMET Catalogue
    - Same conditions and prices for ISP as for NMS' Commercial arm
    - Individual pricing maintained by the Grouping
    - Non-discrimination between ISP and NMS' Commercial arm
    - Different prices for different categories of buyers
    - No exclusive licenses
    - Transparent accounting

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Directive 2003/4/EC on public access to environmental information

Purposes/objectives

- Replaces Council Directive 90/313/EEC of 7 June 1990 on the freedom of access to information of the environment
- Expands the existing access granted under Directive 90/313/EEC
- Makes rules consistent with the UN/ECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (the Aarhus-Convention), signed 25 June 1998.
- Remove disparities between the Member states that may create inequality within the Community

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Directive 2003/4/EC on public access to environmental information

- **Ensures access to environmental information held by or for public authorities**
- **Authorities are required to make available information to any natural or legal person at his request without him having to state an interest**
- **Request can be refused if disclosure adversely affect:**
  - **confidentiality provides for by law**
  - **international relations, public security**
  - **the course of justice etc.**
  - **confidentiality of industrial information, personal data**
  - **intellectual property rights**
  - **statistics secrecy provides by law**
  - **protection of the environment, rare species etc.**
- **The Directive does not imply any right to access for commercial activities**

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Directive 2003/4/EC on public access to environmental information

In 1998 IDEWG adopted the following recommendations addressed to ICWED regarding the data-policy within ICWED NMSs. The recommendations were based on an analysis of the EC Directive 90/313 and the Aarhus Convention by a legal group put together for this purpose.

ICWED is recommended to adopt the following common conclusions and guiding principles for their data policy, regarding access to environmental data :

All meteorological, hydrological and oceanographic data and products are comprised by the definition of ”environmental information” in the EC Directive 90/313 and the Aarhus Convention.

The EC Directive 90/313 and the Aarhus Convention do only make reference to ”access” to environmental information and do not imply any rights for use.

Each NMS claims that all meteorological, hydrological and oceanographic information are comprised by the EC Database Directive (EC Directive 96/9)

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Directive 2003/98/EC on the re-use of public sector information

Background:

- Differences in application between different Member countries of the EU
- Differences in distribution of information between EU and the US
  - Clear framework, Freedom of Information Act etc.
  - Wide range of information available digitally
  - Unrestricted use commercially
  - No copyright on Public Sector Information
  - Available only at distribution cost
- Disadvantages in competition for European companies in selling services
- Obstacles in responding times, pricing, exclusive licenses, lack of transparency etc.

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Directive 2003/98/EC on the re-use of public sector information

- Included in the Lisbon Strategy 2000 and the Action plan eEurope 2002

Purposes/objectives:

- To develop an information society in the Community
- Enabling citizens of the Community to gain new ways of accessing and acquiring knowledge
- The creation of a market for Community-wide services based on the important primary material that lies in public sector information
- Minimum harmonisation of national rules to ensure fair, proportionate and non-discriminatory conditions on re-use

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Directive 2003/98/EC on the re-use of public sector information

The Directive

- **does not yet contain an explicit obligation to allow re-use of documents but shall encourage public sector bodies to make available for re-use any documents held by them. The decision to allow re-use lies with the Member state or public sector body concerned**
- **only applies to information from the authorities public tasks as defined by law or binding rules**
- **builds on existing regimes and does not change national rules for access to documents**
- **stipulates, to avoid cross-subsidies, that re-use should include further use of documents outside the public task within the organisation itself**

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Directive 2003/98/EC on the re-use of public sector information

Charges shall, as well as supply, be non-discriminatory and

- **may be taken out and shall be cost-oriented and may include a reasonable return on investment**
- **does not prevent the exchange free of charge between public bodies for their public tasks**
- **may include a differentiated charging policy for commercial and non-commercial re-use**
- **for information used by the public body for commercial activities the same charges and conditions shall apply to the supply as apply to other users**

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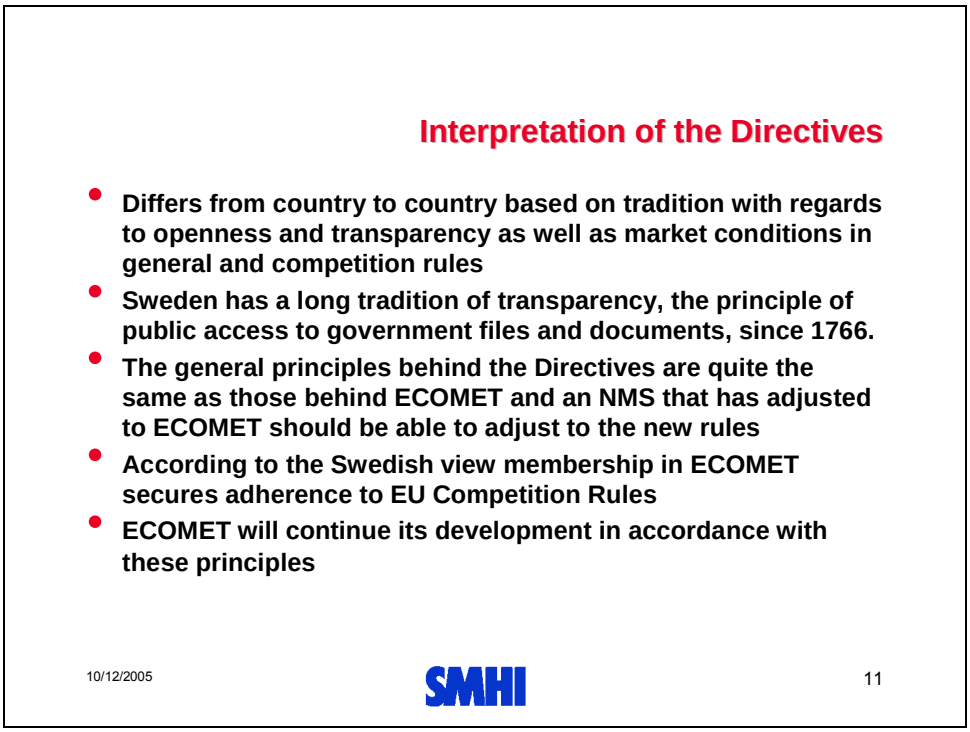
Interpretation of the Directives
Differs from country to country based on tradition with regards to openness and transparency as well as market conditions in general and competition rules
Sweden has a long tradition of transparency, the principle of public access to government files and documents, since 1766.
The general principles behind the Directives are quite the same as those behind ECOMET and an NMS that has adjusted to ECOMET should be able to adjust to the new rules
According to the Swedish view membership in ECOMET secures adherence to EU Competition Rules
ECOMET will continue its development in accordance with these principles
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Appendix 9: GHP issues for BALTEX SSG, Item 6.2

17th BALTEX SSG Meeting, 24 – 26 November 2004, Poznan, Poland

Handout for
Item 6.2 The 10th GEWEX Hydrometeorology Panel (GHP) meeting summary

Hans-Jörg Isemer, International BALTEX Secretariat
17 November 2004

The enclosed material includes:

Page 2: The GHP Continental-scale Experiments (CSE) contribution matrix, as of August 2004

Page 3: Suggested new contribution criteria for CSEs

Page 4: GHP working groups and BALTEX representatives

Page 5: GEWEX Phase 1 and GEWEX Phase 2 objectives

One focus at the recent 10th GEWEX Hydrometeorology Panel (GHP) meeting (13 to 16 September 2004, see http://ecpc.ucsd.edu/projects/ghp/) was on the adjustment of CSE criteria according to the revised objectives of GEWEX phase 2 (see page 5). The present GHP CSE contribution matrix lists the progress of each CSE, including BALTEX, against the present CSE criteria (page 2). Revised criteria for GEWEX phase 2 were suggested (page 3) and will be presented for approval at the forthcoming GEWEX SSG meeting. The majority of the new suggested scientific criteria make reference to GHP working groups, and an important future CSE criteria will be the CSEs' commitment to actively contribute to GHP working groups. The present GHP working groups and the respective BALTEX representation is given on page 4.

The future BALTEX representation in GHP working groups will be discussed.

GEWEX / GHP STATUS OF CONTINENTAL-SCALE EXPERIMENTS (August 2004)

TECHNICAL/LOGISTICAL CRITERIA	GAPP	MAGS	LBA	GAME	BALTEX	MDB
1.) NWP centre atmospheric and surface data assimilation and estimates of hydro-meteorological properties.	F	F	F	F	F	F
2.) Suitable atmospheric-hydrological models and numerical experimentation and climate change studies.	F	F	F	I-F	F	F
3.) Mechanism for collecting and managing adequate hydrometeorological data sets.	F	F	F	F	F	I
4.) Participate in the open international exchange of scientific information and data.	F	F	F	F	F	F
5.) Interactions with water resource agencies and related groups to address the assessment of impacts on regional water resources.	F	I-F	I-F	I-F	I	I-F
6.) Evaluation of GEWEX global data products.	I-F	I-F	F	I-F	F	I-F
7.)Contributions to CEOP and transferability databases.	F	I-F	F	I-F	I-F	I-F
SCIENTIFIC CRITERIA						
1.) Simulate the diurnal, seasonal, annual and interannual cycles.	Pr	Pr	Pr	Pr	Pr	B
2.) Close water and energy budgets.	C	Pr	Pr	Pr	Pr	B
3.) Determine and understand climate system variability and critical feedbacks.	Pr	Pr	Pr	Pr	Pr	Pr
4.) Demonstrate improvements in predictions of water-related climate parameters.	Pr	Pr	Pr	B	Pr	Pr
5.) Demonstrate the applicability of techniques and models to other regions.	Pr	Pr	Pr	B	Pr	B

P Planning	Activity is underway with definite movement toward implementation
I Implemented	Plans or projects are in the implementation phase, but may take several years to be fully functioning (e.g., due to funding restrictions or other complications)
F Functioning	An activity has been implemented and is fully functioning. Schedules are set and delivery of products is assured.
I-F Transitioning	Implemented studies are producing experimental results
B Beginning	Plans have been implemented and preliminary data have been collected
Pr Progressing	Data exist to accomplish the task and work is underway to organize it for analysis
B-Pr and	Most of the work required to collect the appropriate data has been accomplished
	structuring of the databases has begun.
C Concluding	Databases have been organized and analyses are being finalized

New draft CSE requirements, suggested at GHP #10, September 2004

Technical Requirements, P, I, F (Planned, Initiating, Functioning)
(i) Co-operation of an NWP centre… (global as well as regional?)
(ii) Development of improved earth system modeling capability
(iii) Collection and management of hydrometeorological data sets…
iv) Interactions with water resource agencies or related groups…
(v) Contributions to CEOP and transferability data bases…
(vi) Contributions to the evaluation of GEWEX global data products…
(vii) Contributions to GHP working groups

Scientific Requirements B, Pr, C (Beginning, Progressing, Completed)
Active contribution to
(i) Closure of water and energy budgets (WEBS)
(ii) Stable Water Isotope Intercomparison (SWING)
(iii) Research on Extremes
(iv) Application of GEWEX products and models to water resource applications (WRAP)
(v) Model transferability, low level jets, orographic precipitation, land surface feedbacks (TWG)
(vi) Predictability

Present GHP Working Groups and BALTEX representatives
H.-J. Isemer, November 2004

GEWEX Hydrometeorology Project (GHP)
Chair: John Roads, University of California, Scripps Institution of Oceanography, USA
http://ecpc.ucsd.edu/projects/ghp/
BALTEX panel member: Hartmut Graßl.
Since 2001, GHP annual meetings representation was mostly by Hans-Jörg Isemer.

Water and Energy Budget Studies (WEBS)
Chair: John Roads, University of California, Scripps Institution of Oceanography, USA
http://ecpc.ucsd.edu/projects/ghp/
BALTEX representative: Daniela Jacob (tbc)

Water Resources Application Project (WRAP)
Chair: Lawrence Martz, University of Saskatchewan, Dept. of Geography, Canada
http://ecpc.ucsd.edu/projects/ghp/Wrap_web/
BALTEX representative: Phil Graham (resigned, new person to be identified)

Extremes
Chair: Ronald Stewart, McGill University, Dept. of Atmospheric and Oceanic Sciences, Canada, Ronald.Stewart@mcgill.ca
http://www.joss.ucar.edu/ghp/extremes/
BALTEX representative: Daniela Jacob (tbc)

Transferability Working Group (TWG)
Chair: Eugene Takle, Iowa State University, Dept of Geological and Atmosph. Science, USA
http://rcmlab.agron.iastate.edu/twg
BALTEX representative: Burkhardt Rockel

Data Management
Chair: Steve Williams, UCAR/Joint Office for Science Support, USA
http://www.joss.ucar.edu/ghp/
BALTEX representative: Hans-Jörg Isemer

Stable Water Isotope Intercomparison Group (SWING)
Chair: Martin Werner, Max-Planck-Institute for Biochemistry, Germany
http://www.bgc-jena.mpg.de/bgc-synthesis/projects/SWING/index.shtml
BALTEX representative: None

Prediction and Predictability
Chair: Jose Marengo, Centro des Previsao de Tempo e Estudos Climaticos, Brasil
At present, this WG is under discussion to be merged with the *Extremes* WG.
BALTEX representative: None

GEWEX Phase 1 Objectives

- Determine the hydrological cycle and energy fluxes by means of global measurements of observable atmospheric and surface properties.
- Model the global hydrological cycle and its impact on the atmosphere, oceans, and on the land surface.
- Develop the ability to predict the variations of global and regional hydrological processes and water resources, and their response to environmental change.
- Foster the development of observing techniques, data management, and assimiliation systems suitable for operational application to long-range weather forecasts, hydrology, and climate predictions.

Roads, 2003: GHP

Phase II Objectives

- **Produce consistent descriptions of the Earth's energy budget and water cycle and their variability and trends, and data sets for the validation of models.**
- **Enhance the understanding of how the energy and water cycle processes contribute to climate feedbacks.**
- **Develop improved parameterizations encapsulating these processes and feedbacks for atmospheric circulation models.**
- **Interact with the wider WCRP community in determining the predictability of energy and water cycles.**
- **Interact with the water resource and applications communities to ensure the usefulness of GEWEX results.**

Appendix 10: Overview on the Draft BALTEX Phase II Implementation Plan

by Andreas Lehmann

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BALTEX Phase II Implementation Plan Writing Team

Actions so far:

-continued-

- **filling up missing chapters (Jörgen Nilsson, Clemens Simmer, Sigrid Meyer, Andreas Lehmann) in the mean time**
- **Internal review (Hans-Jörg Isemer) end of October**
- **Revised version of IP send to BSSG at the beginning of November**
- **Conclusion of a final BALTEX Phase II Implementation Plan at BSSG Meeting in Poznan, Poland**
- **Finalizing of BALTEX Phase II Implementation Plan to the end of the year**
- **International BALTEX Secretariat Publication January/February 2005**

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BALTEX Phase II Implementation Plan Writing Team

Acknowledgments and thanks to all who have actively contributed to the

Draft BALTEX Phase II Implementation Plan

Special thanks to

Sigrid Meyer

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BALTEX Phase II Implementation Plan

Chapter 1 (Andreas Lehmann, Anders Omstedt)

1.1 Introduction

- **What have we learnt from BALTEX Phase I?**
- **What are the benefits from BALTEX Phase I?**
- **Why should there be a BALTEX Phase II?**

1.2 Achievements from Phase I and Outlook into the Future
- **Achievements should be extended from review report (e.g. sea ice, atmospere-ocean interaction)**

1.3 The BALTEX Phase II Scientific Objectives

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BALTEX Phase II Implementation Plan

Chapter 6 (Andreas Lehmann)

6 Knowledge Management (Integration and synthesis)

6.1 Earth System Model

- **regional component of COSMOS**

6.2 IPCC Assessment Report
(Anders Omstedt will report on this)

6.3 Pilot Grid Project (Daniela Jacob, Andreas Lehmann)

.Should there be a pilot grid project?

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Overview of project ideas for the Implementation Plan including Baltic Grid

Project Ideas for BALTEX Phase II (33)

Acronym	Titel	Objective	Duration	Author
SIR	Security Infrastructure Re-Assessment	2 - 6	6-10 years	Hartmut Grassl
BALTIC GRID	E-Science and Grid - a Potential for BALTEX Phase II	1 - 4	5-10	Andreas Lehmann, Daniela Jacob
GEODYN	The Geosphere Dynamics of the Baltic Sea	1 - 4, 6	2002-2008	Anders Omstedt
	BALTEX Phase II Activities at Göteborg University	1 - 4, 6	2002-2008	Anders Omstedt
RABOF	Radiative Fluxes and Forcings over the Boreal Forest	1	2 years	Thomas Carlund (SMHI)
-	Preparation of a Regional Long-Wave Radiation Data Set for Climate Change Analyses	1	1 year	Tomas Landelius (SMHI)
BMWCOUP	BALTEX Modelling With Coupled Elements	1, 2	5 years	Ralf Döscher (SMHI)
PILOT GRID	A Pilot Grid Project for BALTEX Phase II	2	2 years	Andreas Lehmann, Daniela Jacob
BALTSCEN	Baltex Region 21st Century Climate Scenarios	2	10 years	Markku Rummu-kainen, Hans von Storch
BRRA40	Baltex Regional ReAnalysis for the past 40 Years	2	2 years	Markku Rummu-kainen, Hans von Storch
BOSS	Baltic Sea overflow field experiments and model simulation studies	2	5 years	H.E. Markus Meier (SMHI)

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Overview of project ideas for the Implementation Plan including Baltic Grid

Project Ideas for BALTEX Phase II
-continued-

BOSS	Baltic Sea overflow field experiments and model simulation studies	2	5 years	H.E. Markus Meier (SMHI)
DETECTIVE	Detection of climate change and climate variability in the Baltic Sea Region	2	5 years	H.E. Markus Meier (SMHI)
-	Re-Analysis of Oceanographic Variables for the Baltic Sea Covering 1800-2000	2	-	Lars Axell (SMHI)
-	Detection and Attribution of Climate Change in the BALTEX Area	2, 4	-	Erik Kjellström (SMHI)
HiRHyM-4	High Resolution Hydrological Model, part 4 - Investigation of Climate Change Impacts on the Nutrient Load to the whole Baltic Sea	2, 4	3 years	Johan Andréasson, Berit Arheimer
-	Meteorological Variability and Climate Change in Relation to Air Pollution Abatement Strategies	2, 4	3 years	Joakim Langner (SMHI)
PREINPUT	Precipitation Input to Hydrological Applications	3	3 years	Jonas Olsson (SMHI)

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Overview of project ideas for the Implementation Plan including Baltic Grid

Project Ideas for BALTEX Phase II
-continued-

-	Extended Extreme Value Analysis for a Further Reduction of Uncertainty and new Parameters	3	6 months	Tomas Landelius (SMHI)
HiRHyM-0	High Resolution Hydrological Model, part 0 - Reconstruction of a 20year, 4x2km precipitation data set	3	3 years	Berit Arheimer (not expert in this field)
HiRHyM-1	High Resolution Hydrological Modelling – part 1 - Enlargement of the Hydrological Model Scale for the whole BALTEX Region	3, (4)	3 – 5 years	Phil Graham
HiRHyM-2	High Resolution Hydrological Modelling – part 2 - Improved Estimation of Runoff and Model Parameters with higher resolution input data for all BALTEX countries	3	3 years	Göran Lindström (SMHI)
-	Restrospective Analysis of the Occurrence of Algae Blooms from Satellite Data	4	-	Sven-Erik Gryning, Lise Lotte Sørensen (Risø), Roland Doerffer (GKSS)
-	GIS based model on Nutrient Sources, Sinks and Fluxes in the BALTEX Catchment area	4	-	Sven-Erik Gryning, Lise Lotte Sørensen (Risø), Roland Doerffer (GKSS)
-	Sea Surface Interface Measurements by Satellite	4	-	Sven-Erik Gryning, Lise Lotte Sørensen (Risø), Roland Doerffer (GKSS)
-	Primary Production Estimation from Satellite Data	4	-	Sven-Erik Gryning, Lise Lotte Sørensen (Risø), Roland Doerffer (GKSS)
-	Experimental determination of the air-sea exchange of nutrients and carbon	4	-	Sven-Erik Gryning, Lise Lotte Sørensen (Risø), Roland Doerffer (GKSS)

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Overview of project ideas for the Implementation Plan including Baltic Grid

Project Ideas for BALTEX Phase II
-continued-

EUROBIO	Eutrophication in Lakes by BIOLA	4	3 years	Charlotta Pers (SMHI)
HiRHyM-3	High Resolution Hydrological Modelling – part 2 - Construction of a Reference Model to Quantify the Nutrient Load to the Baltic Sea in each country	4	3 years	Berit Arheimer
	Extension of the BODC for environmental studies, including chemical, biilogical in-situ and satellite data	4		Bertil Håkansson (SMHI)
BALTSAT	Baltic Satellite Produccts	4		Bertil Håkansson (SMHI)
CONNEX	Coupling of Nitrogen and Carbon in Air-Sea Exchange	4	3 years	Lise Lotte Sørensen (Risø)
	BALTEX – Stakeholders Role in Phase II	5		Jörgen Nilsson, Mikko Alestalo
-	Model investigations of nutrient dynamics in the Baltic Sea	4	-	KariEilol (SMHI)

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BALTEX Phase II Research Projects (BALTIC GRID)

BALTIC GRID

Grid technology will allow scientific communities to develope new ways to share and analyse very large data sets, to benefit of both quality and quantify of scientific output. Taking advantage of the BALTEX Network:

- **System approach of North and Baltic Sea area**
- **Development of a Regional Earth System Model of North and Baltic Sea area**
- **Development of an international data exchange grid (network)**
- **Setup of international networks:**
  - **Modelling group**
  - **Observer group**
  - **Data Management group**
  - **Satellite user group**
- **Integrated synthesis and interaction with decision makers and management**

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BALTEX Phase II Science Plan (Objectives)

BALTEX Phase II Science Plan

-Goals (projects) with high potential for application-

- Infrastructure adaption
- Sea level variability and change estimates for coastal zone management
- Regional climate change
- Forecasting of floods, snow pack and hydropower potential
- Reduction of eutrophication of the Baltic Sea
- Ground water changes caused by changed water cycle

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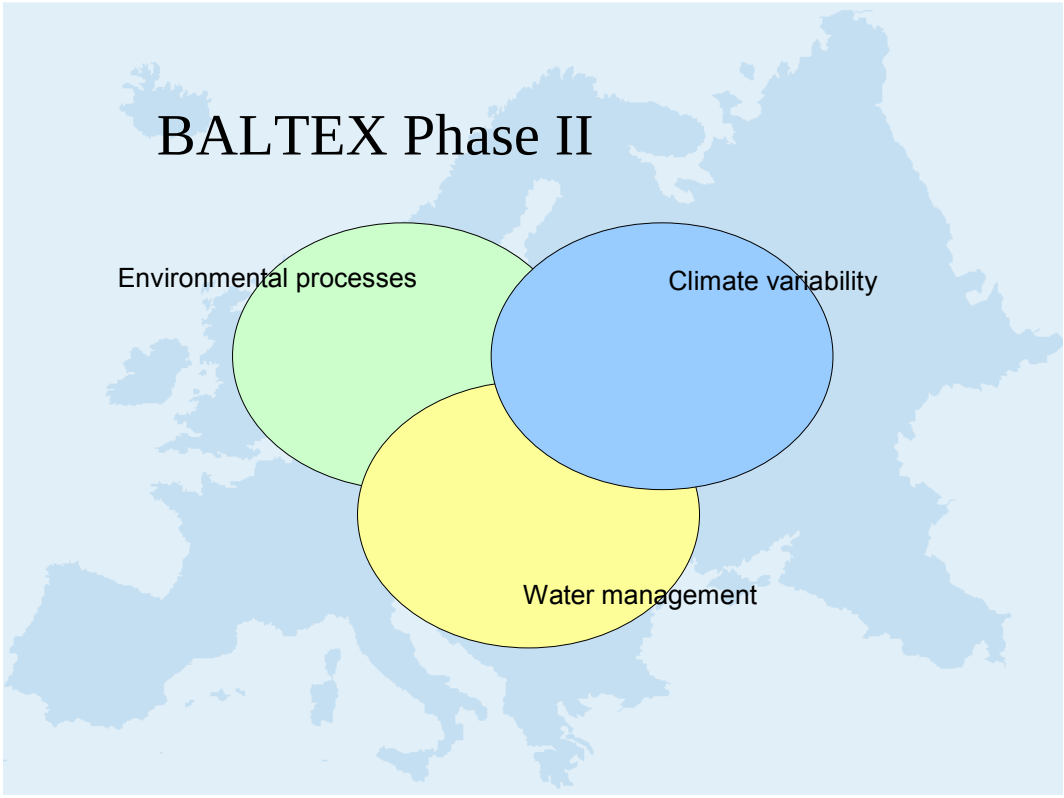

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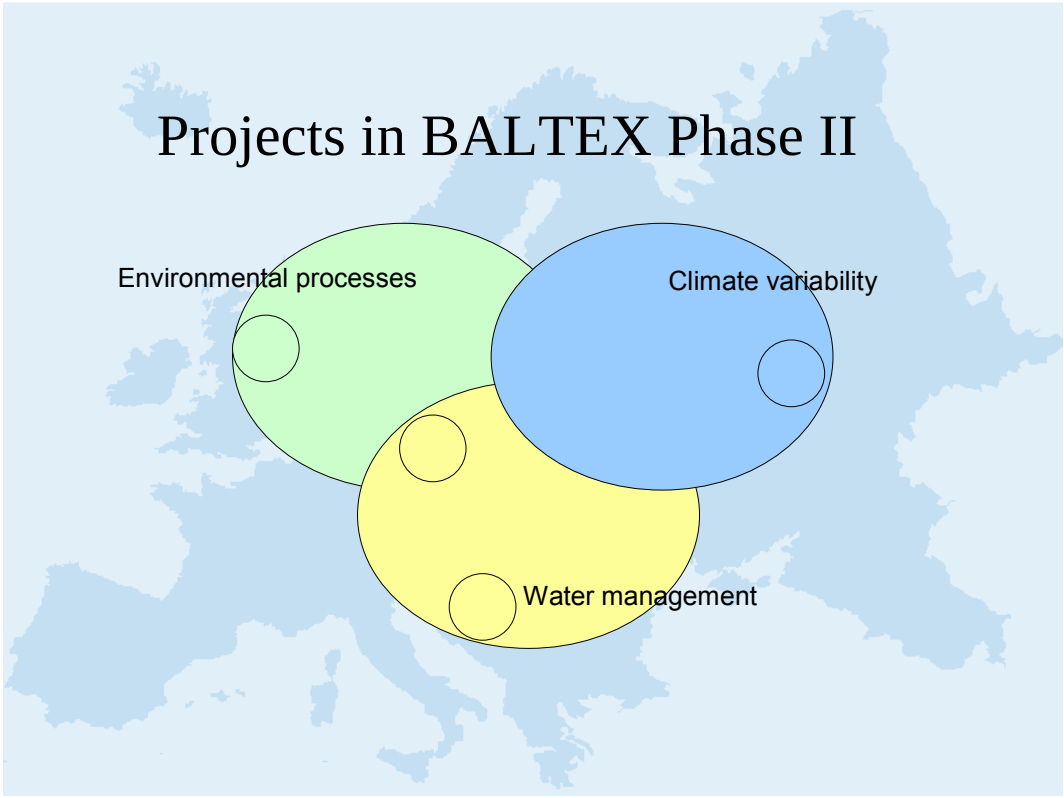

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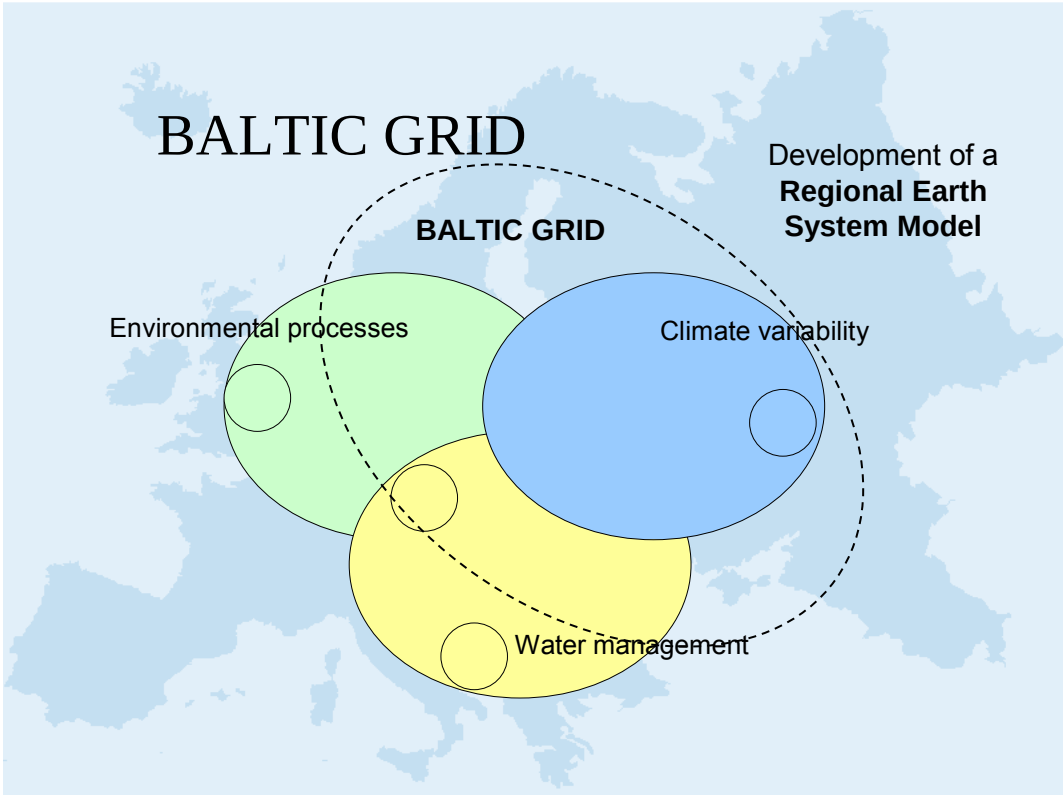

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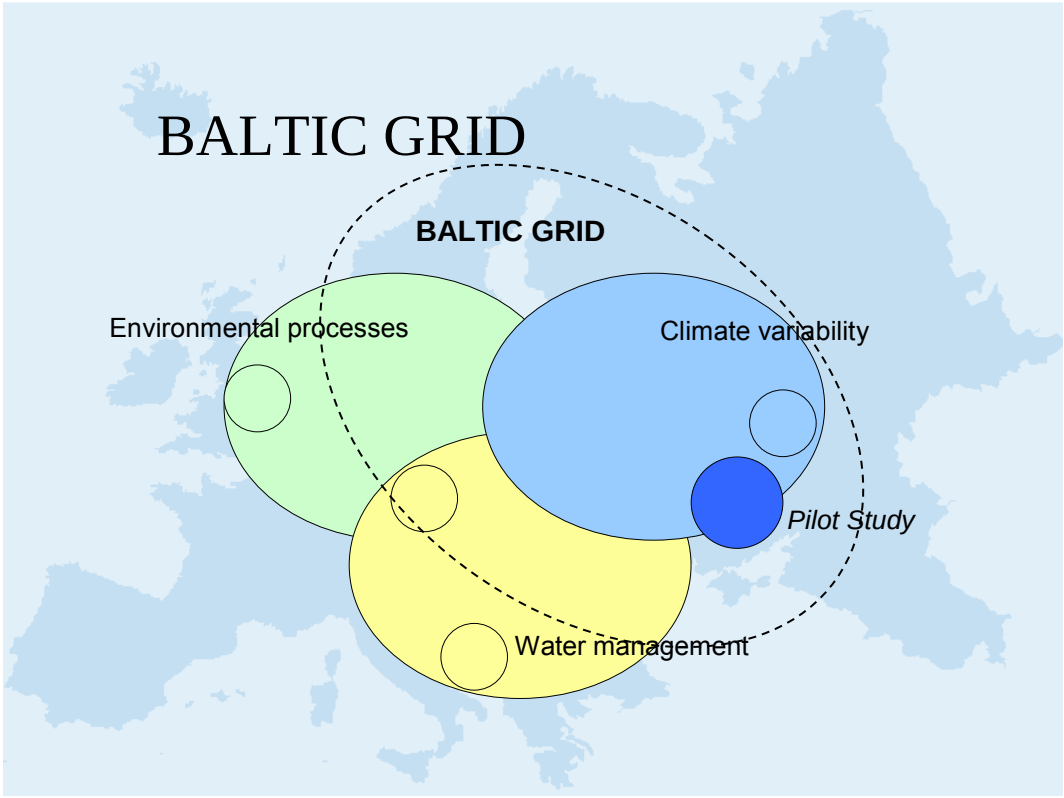

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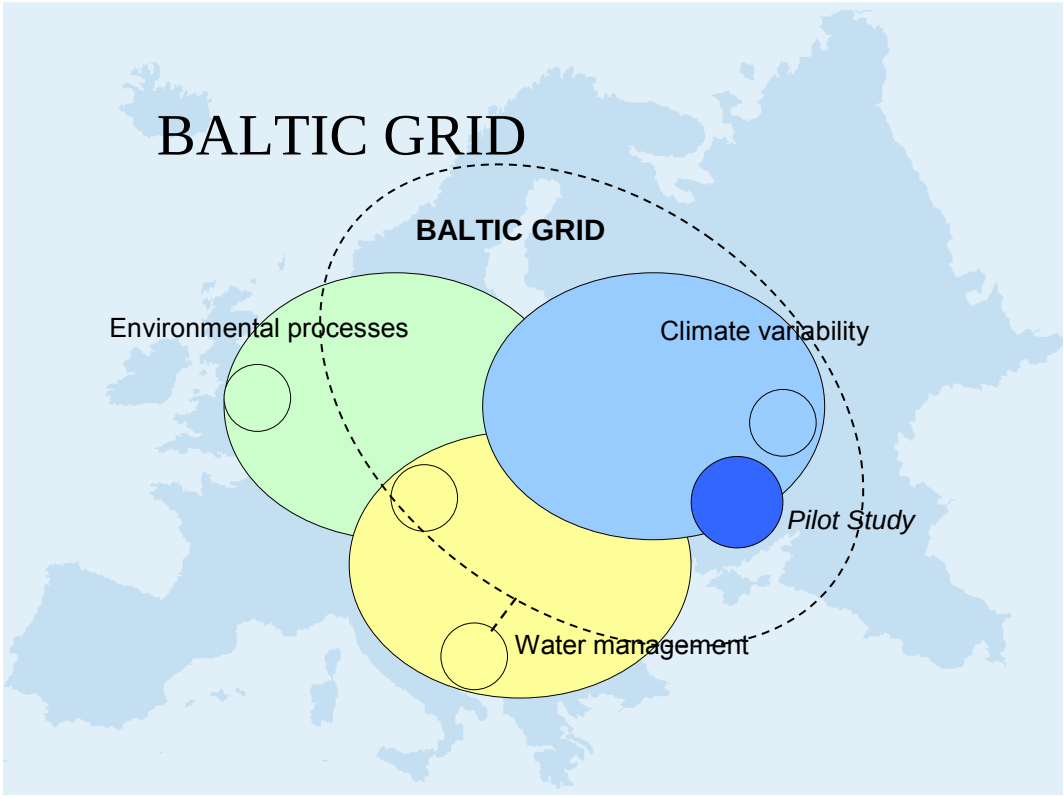

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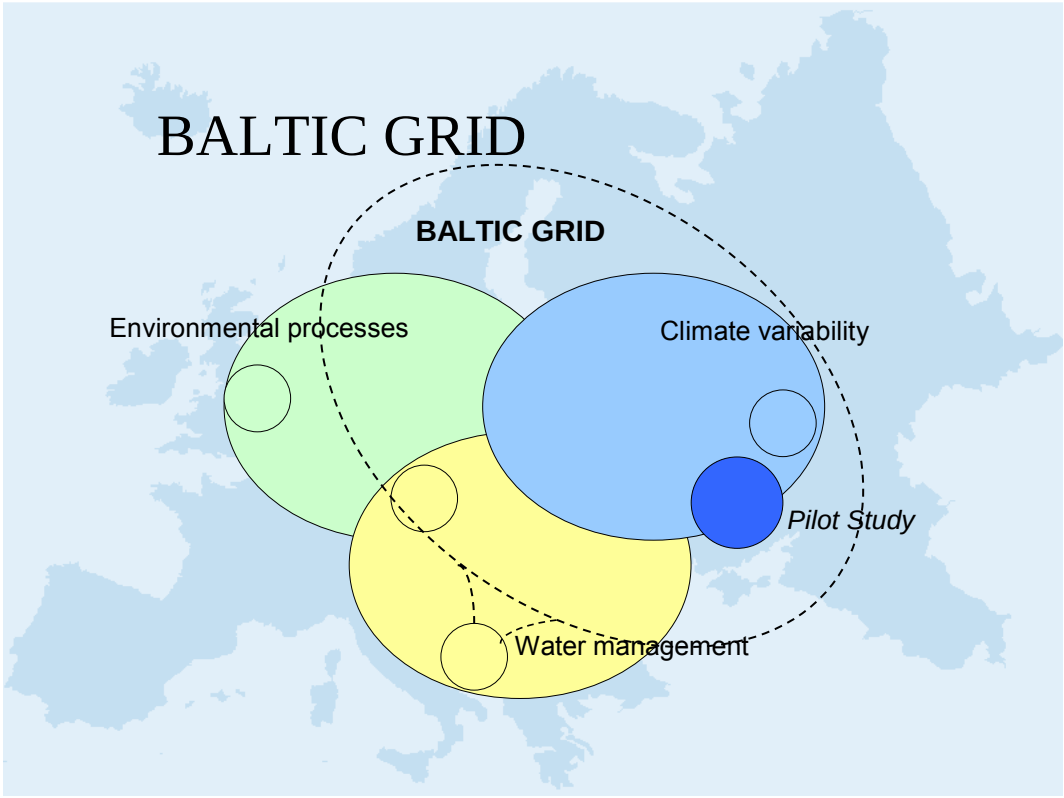

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Suggestion for an Implementation Plan Structure

Foreword

Executive Summary

1 BALTEX PHASE II – THE BALTIC SEA EXPERIMENT

1.1 Introduction

1.2 The BALTEX Phase II Scientific Objectives

1.3 Contents of the BALTEX Phase II Initial Implementation Plan

1.4 Time Plan for BALTEX Phase II, 2004 – onwards

2 WHAT WILL BALTEX PHASE II ACHIEVE?

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Suggestion for an Implementation Plan Structure

3 ANALYSIS OF CLIMATE VARIABILITY AND PROVISION OF FUTURE CLIMATE PROJECTIONS ON THE BALTEX REGION

3.1 Scientific goals (e.g. detection and understanding of regional climate change)

3.1.1 General goals (e.g. development of a regional earth system model)

3.1.2 Stakeholder driven goals (e.g. regional climate change, forecasting of floods etc.)

3.1.3 Phase I Objectives continued (e.g. need for long timeseries and process studies

3.2 Explicit projects

3.3 Special data for this scientific field (for common data see chapter 8)

4 MODEL DEVELOPMENT WITH EMPHASIS ON EXTREME EVENTS AND LONG-TERM CHANGES

4.1 Scientific goals

4.1.1 General goals

4.1.2 Stakeholder driven goals

4.1.3 Phase I Objectives continued

4.2 Explicit project

4.3 Special data for tis scientific field (for common data see chapter 8)

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Suggestion for an Implementation Plan Structure

5 EXPLORING LINKAGES BETWEEN CLIMATE AND ENVIRONMENTAL PROCESSES

5.1 Scientific goals

5.1.1 General goals

5.1.2 Stakeholder driven goals

5.1.3 Phase I Objectives continued

5.2 Explicit projects

5.3 Special data for this scientific field (for common data see chapter 8)

6 BALTIC GRID – NEW LINKS FOR BALTEX RESEARCH

6.1 Introduction

6.2 Outline of realisation

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Suggestion for an Implementation Plan Structure

7 OVERVIEW OF PROJECTS IN PHASE II

7.1 List

7.2 Time Plan

8 BALTEX DATA MANAGEMENT

8.1 In-situ observational data needs

8.1.1 Inventory of existing data

8.2 Remote sensing data needs

8.3 Data management and policy

9 STRENGTHENED INTERACTION WITH DECISION MAKERS

9.1 Definition of interaction with stakeholders

10 OUTREACH AT THE INTERNATIONAL LEVEL

10.1 GEWEX

10.2 WCRP and GEWEX Programmes and Relevance

10.3 Global Change Research Programmes (GWSP,…)

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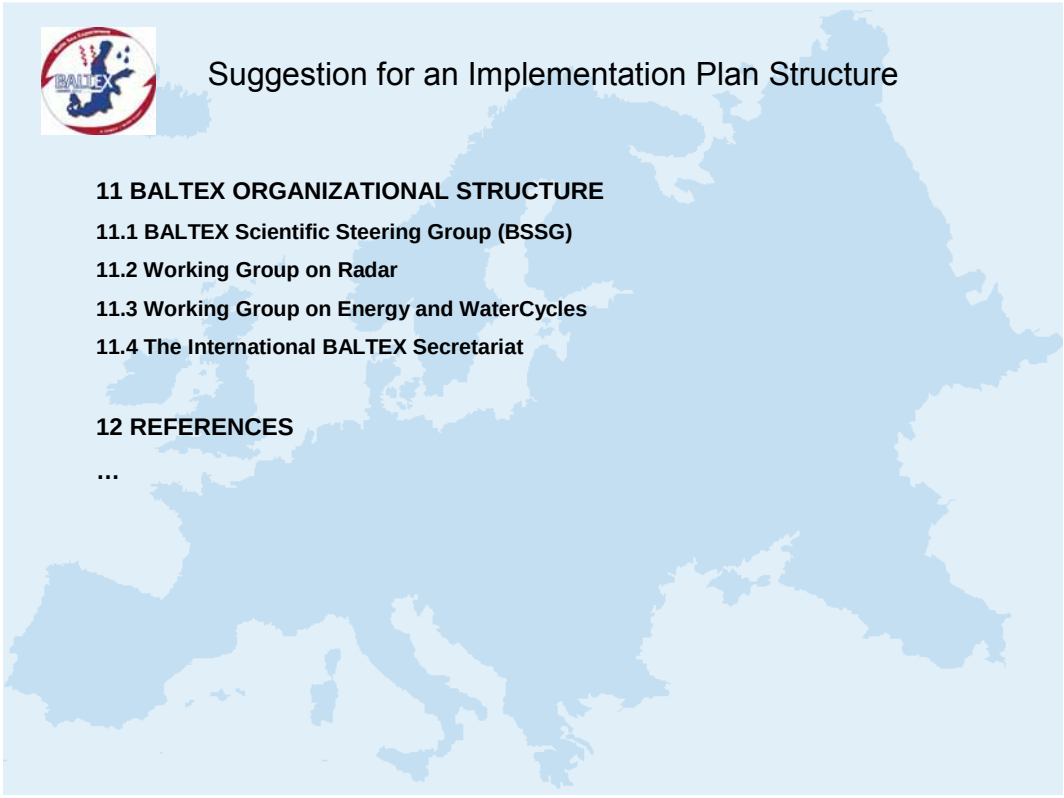
Suggestion for an Implementation Plan Structure
11 BALTEX ORGANIZATIONAL STRUCTURE
11.1 BALTEX Scientific Steering Group (BSSG)
11.2 Working Group on Radar
11.3 Working Group on Energy and WaterCycles
11.4 The International BALTEX Secretariat
12 REFERENCES
…

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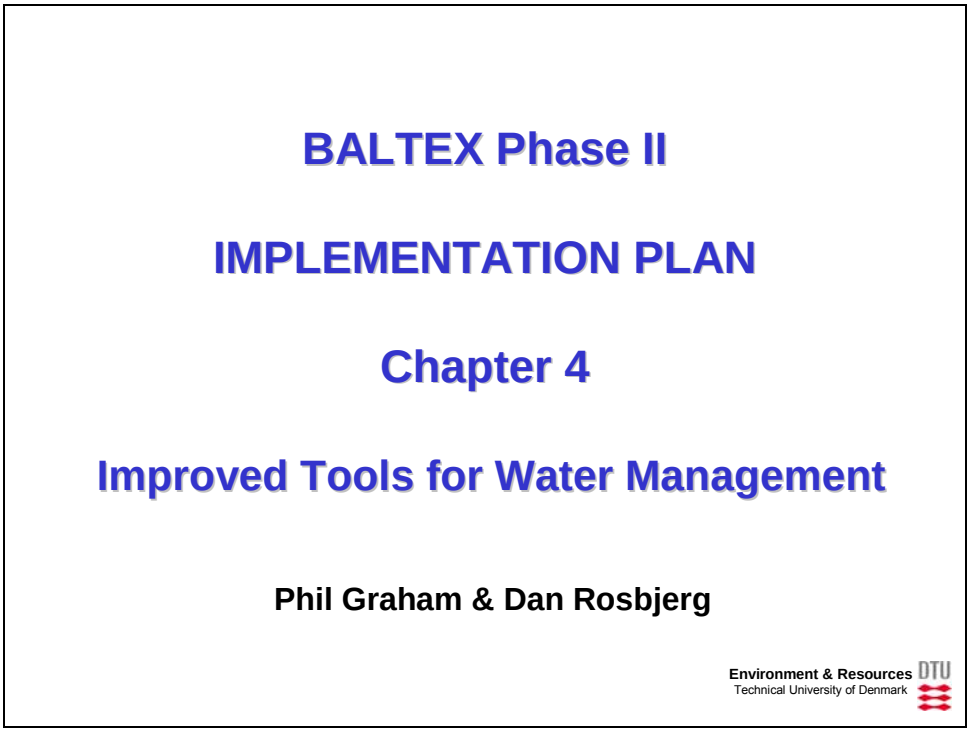
Appendix 11: Outline of Chapter 4 of the Implementation Plan

by Dan Rosbjerg



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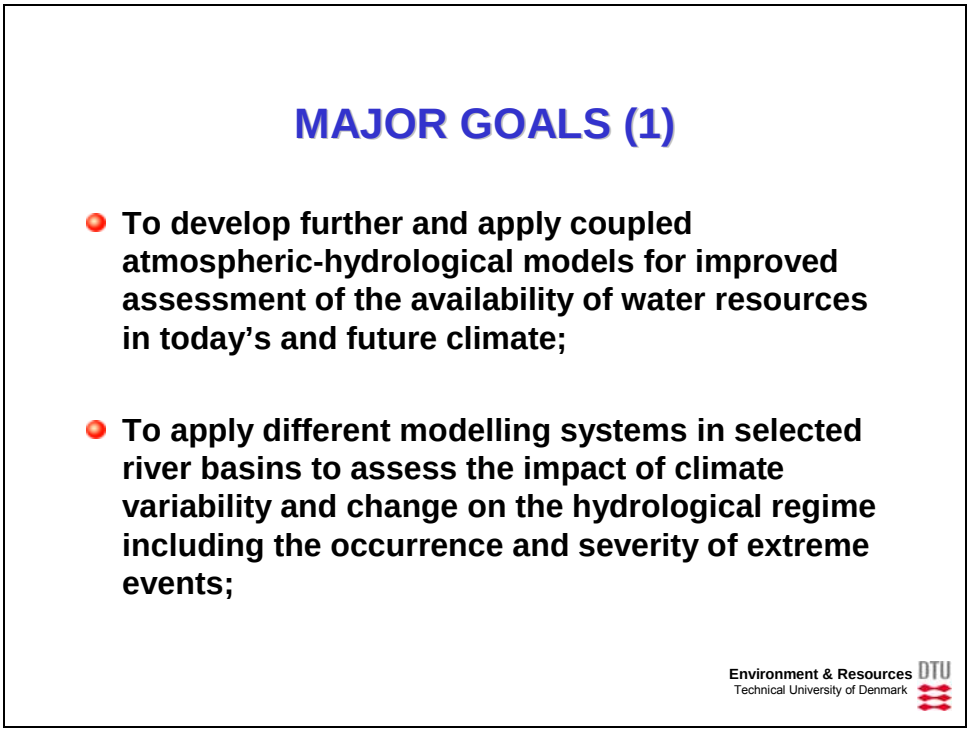

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MAJOR GOALS (2)

- To explicitly take account of the societal use of groundwater and surface water resources, as well as man-made changes of land use, in studies of the future risk of water shortage and impacts of extreme events;
- To develop further and apply real-time flood forecasting models.

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slide 3

How to achieve these goals (1)

- Both well-established operational and experimental science driven hydrological models should be applied in the Baltic Sea basin;
- Coupling of atmospheric and hydrological models at regional and even smaller scales should be aimed for in an effort to develop more precise and reliable forecasting tools;
- A focus on both surface water and groundwater resources and hydrological modelling over a range of scales is needed to address societal needs for water management;

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slide 4

How to achieve these goals (2)

- Attention should be paid to the fact that the Baltic Sea basin includes many lake-rich areas that are both an integral part of the hydrological cycle and an important resource to local communities;
- Detailed basin studies should be a priority. The decision of where such studies are carried out should be based on (1) type of application, (2) availability of data, and (3) specific climate issues. Examples of two basins that would be likely candidates for further study in phase II are the Torne River Basin in the north and the Odra River Basin in the south.

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slide 5

Development and Validation of Coupled Hydrological-Atmospheric Models

- Further work is required in coupled hydrological-atmospheric modelling, focussing on either improving the representation of hydrology directly as an integral part of their atmospheric model, or linking existing or modified hydrological models to atmospheric models;
- Coupled modelling should be accomplished at both the 10-20 km scale with the present state-of-the-art atmospheric models and conceptual-type hydrological models, and at a model scale of 1 km based on non-hydrostatic atmospheric models and distributed process-oriented hydrological models.

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slide 6

Development and Validation of Hydrological Models for BALTEX Large River Basins

- More detailed models that represent finer basin scales can provide more useful information to water managers on how extremes in both the present climate and the future climate will impact on specific river basins. Representation of groundwater at such scales is a component that is presently lacking and should be addressed. Better representation of the physical processes and exchanges of lakes is also needed.

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slide 7

Studies of Climate Change Impacts on Water Resources Availability and Extreme Events

- Driving hydrological models with both retrospective and future climate scenarios provides detailed information to water resources managers on how hydrological regimes respond to changing conditions. This will allow them to make risk assessments on the performance of their respective systems in a variable climate and identify how this may change with changing climate. There exist a number of uncertainties associated with both the scenarios and modelling techniques and attempts to account for them must be pursued in this work.

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slide 8

Real-time Flood Forecasting

- In association with improvements of coupled hydrological-atmospheric models, improvements in data assimilation techniques for both hydrological and NWP models should be pursued, including ensemble forecasts. Inputs from now-casting methods should be further tested in hydrological models. Downscaling of the output of weather forecast models to the usually much smaller scales of the hydrological counterparts is an important issue, especially in relation to precipitation.

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slide 9

Involvement of Stakeholders

- Within water management, the potential stakeholders range from international and national agencies to individual landowners. Their involvement will vary according to the type and scale of projects initiated. Examples are dam owners/operators, national rescue services, municipal water suppliers, farmers, newly established EU water district authorities, national environmental agencies etc. Stakeholders should help define the types of studies to be performed, provide additional inputs for researchers where possible and make active use of delivered results to improve performance of management tools.

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slide 10

Potential Projects

- High Resolution Hydrological Modelling
- Improvement of Parameter Estimates for Distributed Hydrological Models
- Coupling Hydrological Models to Regional Climate Models
- Analysis of the Consequences of Climate Change for Hydrology and Water Resources Management
- Hydrological Modelling with Radar-derived Precipitation Applications

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slide 11

Specific Data Needs

- Accurate precipitation datasets are particularly important. Alternative data sources like re-analysed data that lead to better estimates of Baltic-wide precipitation and evapotranspiration and, e.g., microwave links and satellites of the GMM/EGPM mission when available should be pursued. Also, disaggregation of precipitation data based on radar measurements should be considered. Any datasets, e.g. remotely sensed temperature and soil moisture content of the land surface layer, that help to improve both calculations and validation of evapotranspiration would be highly desirable.

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Appendix 12: Outline of Chapter 5 of the Implementation Plan

by Sven-Erik Gryning

Gradual Extension to Air and Water Quality Studies

The aim is to gradually integrate physical modelling concepts obtained in BALTEX phase I into environmental modelling and define and execute - when necessary due to missing data and knowledge - appropriate measurements concepts as described in the science plan for BALTEX phase II.

Berit Arheimer, SMHI
Ann-Sofi Smedman, Uppsala University
Lise-Lotte Sørensen, Risø
Sven-Erik Gryning, Risø

slide 1

To enhance the modelling capability for pollution and dispersion calculations by implementing recent progress in climate modelling within the BALTEX community such as coupled models;

To initiate first steps towards inclusion of the nutrient-carbon cycles and the full carbon cycle into the BALTEX modelling platforms.

To use recent developments in remote sensing of water and environmental parameters; to use novel flux measuring techniques such as Relaxed Eddy Accumulation of environmental components.

To engage in field experiments that address missing or insufficiently known processes relevant for environmental issues.

These goals will be achieved through implementation of ground-based measurements, satellite data and modelling efforts.

slide 2

Background

Eutrophication of inland and coastal waters is associated with urbanisation and efficient industrial and agricultural production. The effect of eutrophication is high production of plankton algae, excessive growth of weeds and macroalgae, leading to oxygen deficiency, which in turn may lead to fish kills, reduced biological diversity and bottom death.

slide 3

Include Pollution and Dispersion Calculations in Climate Models

To enhance the modelling capability for pollution and dispersion calculations by implementing recent progress in climate modelling within the BALTEX community such as coupled mod

slide 4

Towards Inclusion of the Nutrient-Carbon Cycles and the full Carbon Cycle into Climate Models

The modelling of nutrient and carbon fluxes, especially the processes during the transition period between winter and summer in the sub-arctic and processes controlling air-sea exchange needs improvements. This will be studied by using BALTEX coupled model systems for extension to ecosystem modelling.

slide 5

Inclusion of new Data Sources and Measurement Methods

Remote sensing from satellite is increasingly demonstrating its potential for high resolution monitoring of the terrestrial and marine environment. The known measurement techniques and algorithms shall be used for dedicated field experiments and model studies in BALTEX phase II (e.g. algae occurrence and concentration). Newly developed technologies for flux measurements of gases and particles (i.e. Relaxed Eddy Accumulation) shall be applied.

slide 6

Dedicated Field Experiments Addressing Insufficiently Known Processes Important for Environmental Issues

Monitoring and short term field experiments should be carried out on moving and stationary platforms to investigate the processes controlling the air-sea/land/snow exchange of energy, nutrients, carbon and pollutants. These data sets will form the basis for flux parameterisation of other environmental substances and for model validation.

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In the marine boundary layer fluxes of momentum, latent and sensible heat and the sea state shall be measured together with air-sea exchange of CO_2, gaseous and particulate nitrogen. Supporting measurements of biogeochemical parameters in the marine waters shall be carried out.

Over land surfaces meteorological measurements at least at the BALTEX super sites should be complemented with measurements of fluxes of nutrients and carbon. Relations between hydrological/hydro-chemical parameters and physio-graphical characteristics should be investigated.

slide 8

The most important stakeholders are:
•HELCOM

•EEA
•Authorities at national, regional and local level
•Industries
•Farmers
•Fishery
•Tourism

slide 9

Potential Projects:

Coupling of Biogeochemical Models of Air-Sea and Land-Sea Exchange

Here a development of coupling between meteorological, air chemistry, oceanographic, marine nutrient and ecosystem models for the Baltic Sea will take place. This will cover both development of scientific and applied models such as high resolution hydrological models for water quality assessment and air pollution models for improved abatement strategies.

A result of this project shall be calculations of carbon budgets and quantification of nutrients responsible for algae blooms in the Baltic Sea.

slide 10

Enhanced Understanding and Parameterisation of Biogeochemical Processes in the Marine/Coastal Area

New direct flux measurements, such as Relaxed Eddy Accumulation (REA), eddy correlation and the inertial dissipation technique, are needed to help investigating the coupling between the carbon and nitrogen cycle in air-sea exchange. Due to recent developments especially in the REA technique, measurements of nutrient and carbon fluxes in the atmospheric marine boundary layer are now possible. Furthermore, method developments for the estimation of sea surface properties and primary production by Satellite observations is needed for the retrospective analyses of the occurrence of algae blooms.

slide 11

Coupling of Biogeochemical Models in Air-Snow/Ice Exchange

Here a development of coupling between meteorological, air chemistry and surface models, with special emphasis on the sub-arctic area of the BALTEX region, will take place.

slide 12

Enhanced Understanding and Parameterisation of Biogeochemical Processes in Sub-Arctic Area

New measurements to investigate the coupling between the carbon fluxes and surface processes (snow/ice melt) are needed for model parameterisation. The special conditions which should be considered for the sub-arctic region are e.g.; low sun angle in spring and the short transition from winter to summer including rapid snow melt and short blossoming.

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Eutrophication in Lakes (Modelling and Measurements)

In this project the development of a coupling between meteorological, air chemistry, nutrient and ecosystem models for lakes is foreseen. This shall be done on the basis of the models which have already been developed in BALTEX phase I. A special emphasis will be put on investigations of the eutrophication. Therefore calculations of nutrients responsible for algae blooms in the lakes should be carried out. Furthermore, measurements need to be carried out to improve the understanding of the special exchange processes over lakes caused by horizontal and vertical gradients in physical parameters.

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Specific Data Needs

Time series of fluxes from e.g. Östergarnsholm and Christiansø representing open Baltic Sea conditions are strongly needed for development of new parameterisation and model validation. Additional time series for Sodankylä representing ice and snow are needed. Also long term measurements from the measurements sites of Lindenberg and Cabauw covering typical Northern European climate conditions are of interest.

slide 15

To complement measurements and enhance our understanding of the environmental system data from existing environmental monitoring programmes (nutrient concentrations in air, water and precipitation, water temperature, salinity, algae concentrations, water discharge etc.) and satellites will be used. To obtain emissions a close cooperation with stakeholders will be necessary (e.g. local research groups, national authorities, HELCOM).

Forcing data for air and water quality modelling will be based on detailed climate data to achieve higher spatial resolution.

slide 16

Air-Sea Exchange, Atmospheric Chemistry and Radiation Interactions in the Marine Atmospheric Boundary Layer

slide 17

Strategic objectives addressed: The overall objective is to identify and quantify the effect of air-sea exchange processes on radiation transfer and hence climate change. This will be done by improving our understanding of the air-sea exchange processes influencing the particle and gas composition in the marine atmospheric boundary layer in order to model the composition and concentration of atmospheric particles and gases on local and global scale. The model tools of ASECARE will be used to study the feedback caused by alteration of the radiation budget on air-sea exchange of gases and particles, for different scenarios of environmental parameters.

slide 18

Project participants:
Risoe National Laboratory (RISO), Denmark
ISAC-CNR, Italy.
Uppsala University (UU), Sweden.
University of East Anglia (UEA), UK
Southampton Oceanography Centre, (NERC-SOC) UK
Swedish Environmental Research Institute, IVL, Sweden
Institute of Oceanology, (IOPAS), Poland
Netherlands Organisation for Applied Scientific Research, TNO, Netherlands
Laboratoire des Sciences du Climat et de l'Environnement, CEA-LSCE, France.
University of Patras, (UP), Greece
Elsam Engineering (EE), Denmark

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Appendix 13: BALTEX Phase II Implementation Plan - further actions

as decided at the 17th BSSG meeting in Poznan, 25/26 November 2004

Timetable:
The contributions as indicated below shall be sent to Sigrid Meyer and Andreas Lehmann (*sigrid.meyer@gkss.d*e and *alehmann@ifm-geomar.de*) **until December 31st.** The thorough implementation will last approximately until the end of January and will be concluded with a circulation of the final version to the members of the SSG and the Implementation Plan Writing Team. This version will then be sent to the three reviewers (Rick Lawford, Sylvain Joffre and Fredrik Wulff) for the external review.

Responsibilities:
If no explicit name is given for an action, the responsible person for the whole chapter is in charge of this action.

General decisions – valid for the whole Implementation Plan:
- additional reviews by any SSG and Implementation Plan writing team member are welcome until 31 December
- no citations shall be made except for general BALTEX publications, e.g. science plan, website
- explicit model names shall be avoided
- explicit specification of institutes shall be avoided (except for e.g. the location of data centres)
- one figure per chapter shall be included

Action Items

Chapter 1: *General responsible person: Andreas Lehmann*
1. The part of achievements of phase I shall be extended by a short version of the state of the art report of BALTEX and a short summary about sea-ice by Timo Vihma.
2. “GRID technology” needs to be defined more – how will Baltic Grid look like and what will be the major steps towards it regarding a vision until 2012?

Chapter 2: *General responsible persons: Anders Omstedt and Clemens Simmer*
1. A paragraph explaining the title in more detail shall be inserted directly before the beginning of subchapter 2.1. It shall include that the energy and water cycle will be investigated down to the local scale.
2. Specific data needs concerning the estimation of runoff by satellite data will be taken up by Anders Omstedt.
3. Daniela Jacob shall send suggestions to Clemens Simmer and Anders Omstedt if anything shall be described more precisely. Within subchapter 2.2.4 she will make a suggestion to take soil moisture into account as well.
4. The 40 years re-analysis as part of subchapter 3.4.1 shall be included in 2.4.1. Thereby BRIDGE and ERA 40 shall be looked at further.
5. In 2.3 Jörgen Nilsson shall replace an indicated sentence with reference to data policy.
6. Clemens Simmer will break the second sentence of subchapter 2.4.4 into shorter sentences in order to increase its understandability.

Chapter 3: *General responsible persons: Markku Rummukainen and Hans von Storch*
1. The 40 years re-analysis project is shifted from subchapter 3.4.1 to subchapter 2.4.1.
2. Daniela Jacob will make a more concrete suggestion to rephrase 3.2.2.

3. Markku Rummukainen and Hans von Storch to be asked whether “proxies” are not too much in the direction of palaeoclimatology and should thus be removed within chapter 3.4.1 or further explained why this should be done within BALTEX phase II.

Chapter 4: *General responsible persons: Phil Graham and Dan Rosbjerg*
1. Explicit model names shall be avoided here as well as in the whole Implementation Plan.
2. Clemens Simmer will include the precipitation forecast in this chapter.
3. Daniela Jacob will include wetlands, permafrost, etc. in subchapter 4.2.1.
4. Within the bullet point in 4.2.3 the part “as well as man-made changes of land use” shall be erased, but included in the following description.

Chapter 5: *General responsible person: Sven-Erik Gryning*
1. Anders Omstedt will rephrase 5.2.1 concerning a) for what HELCOM’s 50% reduction target was defined in 1998 and b) the sentence “However, this goal has not been achieved for the largest point sources …”. Sven-Erik Gryning and Berit Arheimer will be consulted for the final version.
2. Sven-Erik Gryning will add in 5.2.2 that “submodules for chemistry, … and aerosols should be brought in” and in 5.2.3 that a dynamical vegetation is needed for these issues.

Chapter 6: *General responsible person: Andreas Lehmann*
1. This chapter shall be rephrased so that a) its crucial point, the knowledge management of every issue mentioned comes out more clearly; b) it is made clearer that everybody can join the activities planned; c) it becomes clearer that the “Pilot GRID Project” will be a pilot study towards a GRID project, but not a whole GRID project itself.

Chapter 7: *General responsible persons: Andreas Lehmann and Franz Berger*
1. The working group on data management shall be mentioned within this chapter together with its responsibilities (e.g.: review data policy concerning in situ and satellite data as well as model output data and model source code itself and review the data centres concerning e.g. usefulness of the data and missing data streams). These shall follow the terms of references which will be defined by the group.
2. The services of each data centre shall be explained shortly within subchapter 7.1.
3. Do the “basic data needs” within chapter 7.1 need further extension?
4. Franz Berger will add sensors to subchapter 7.2. Additionally, this chapter will be sent to Jürgen Fischer for comments by the secretariat.
5. Andreas Lehmann and Franz Berger will update the data policy from the Initial Implementation Plan of BALTEX phase I for subchapter 7.3. Jörgen Nilsson will give advice on this update with regard to the data services concerns. The developed data policy shall be included as an appendix to the Implementation Plan with a general outline of it included as 7.3.

Chapter 8: *General responsible person: Jörgen Nilsson*
1. Hartmut Graßl and Hans-Jörg Isemer will make a suggestion for a subchapter 8.2 “Interaction with other Stakeholders” on the basis of the subchapters “Involvement of Stakeholders” of the thematic chapters (2,3,4,5). Jörgen Nilsson will review it.

Chapter 9: *Responsible administrative person: Sigrid Meyer*

The former subchapter 9.2 “Scientific Exchange“ will be altered into an own chapter called “Scientific Cooperation”.
For the following special programmes, projects and initiatives half a page each shall be

written to give an overview and to describe the kind of exchange planned:
1. HELCOM: by the secretariat following the presentation held by Timo Vihma
2. LOICZ: by Götz Flöser
3. IGBP, CLIC: by Hartmut Grassl
4. ENSEMBLES: by Ole Bøssing Christensen
5. POMORE: by Valeri Vuglinsky
6. GWSP: by Marcel Endejan
7. IAHS (PUB): by Dan Rosbjerg
8. COSMOS: by Daniela Jacob

Chapter 10: *Responsible administrative person: Sigrid Meyer*
The time schedule shall be based upon distinct defined projects. The already defined "potential projects" of the thematic chapters are too vague to assign a time scale to them. Therefore the "potential projects" will be redefined to "potential activities".
1. The Implementation Plan writing group shall define distinct projects underneath these already existing "potential activities" and shall give them a time horizon in years (e.g. "2.4.1.1
Regional Reanalysis … (*short distinct description)* … from mid 2006 until 2008").

Chapter 11: *Responsible administrative person: Sigrid Meyer*
1. The Working Group on Data Management will be added as well as a remark that further Working Groups may be established.
2. The figures from the Initial Implementation Plan of BALTEX phase I will be updated and included.

Foreword and Executive Summary: *Responsible administrative person: Sigrid Meyer*
1. Hartmut Grassl has volunteered to write the Foreword as well as the Executive Summary.

Appendix 14: Presentation on IPCC

by Z. Kundzewicz

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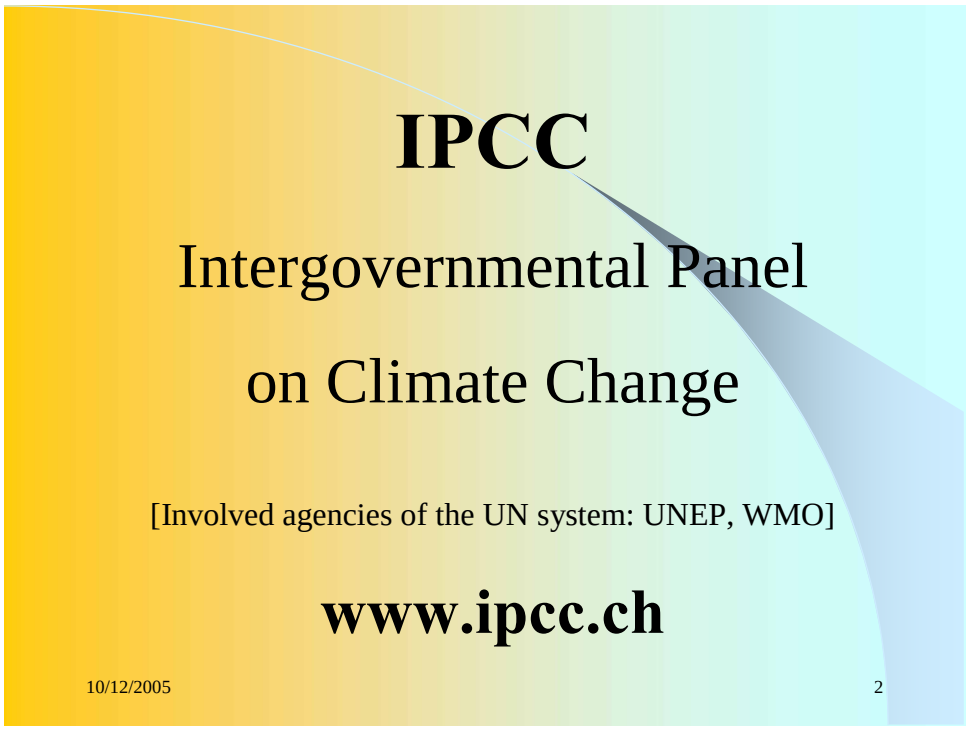

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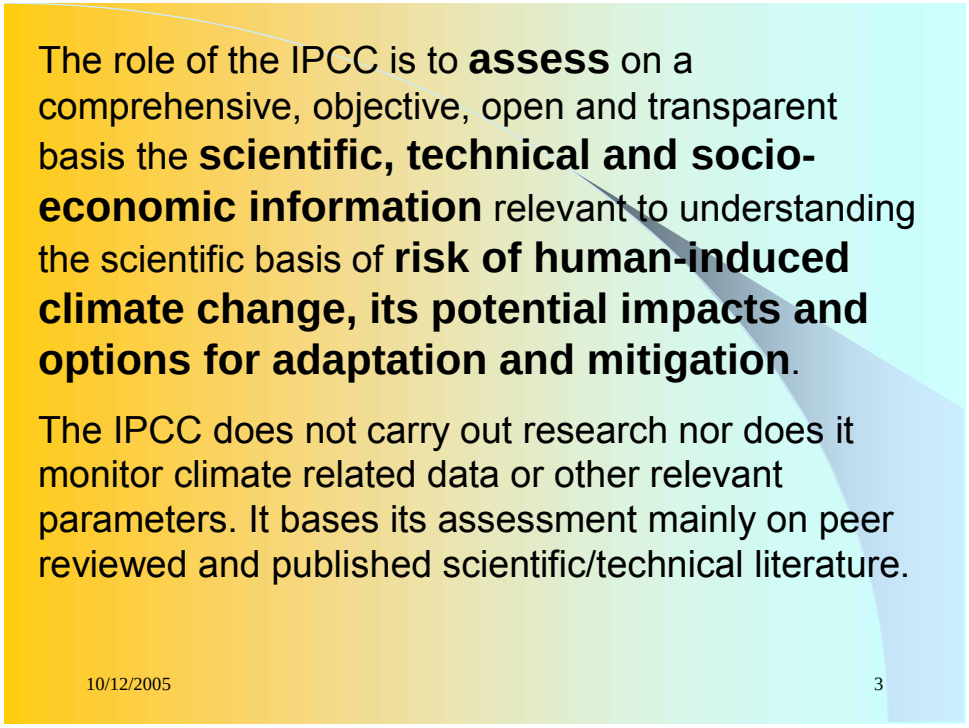

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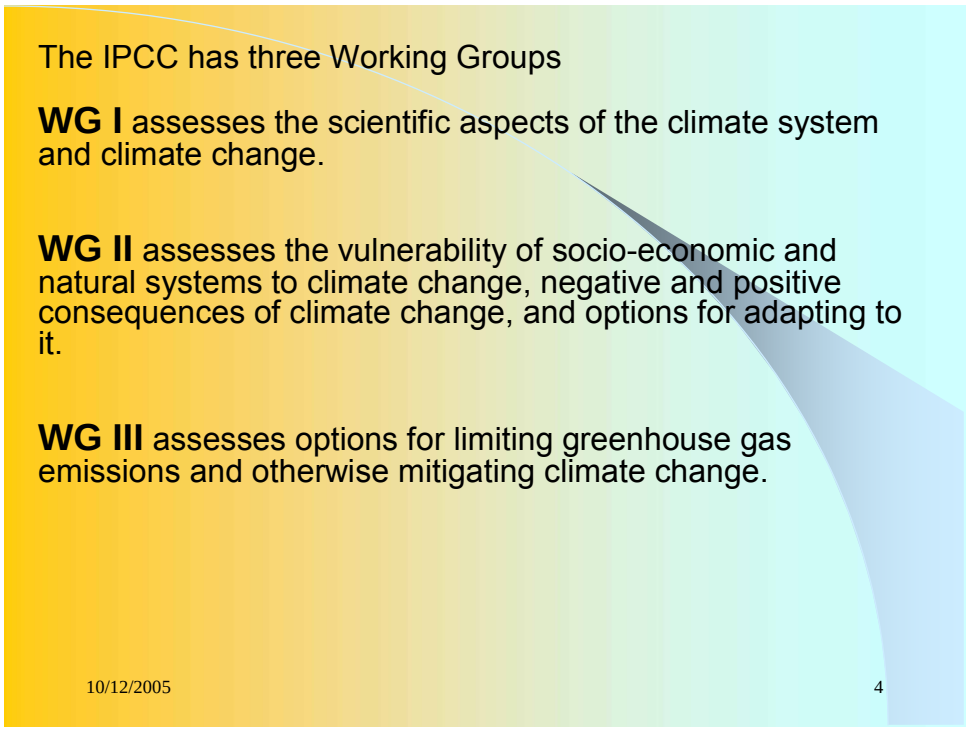

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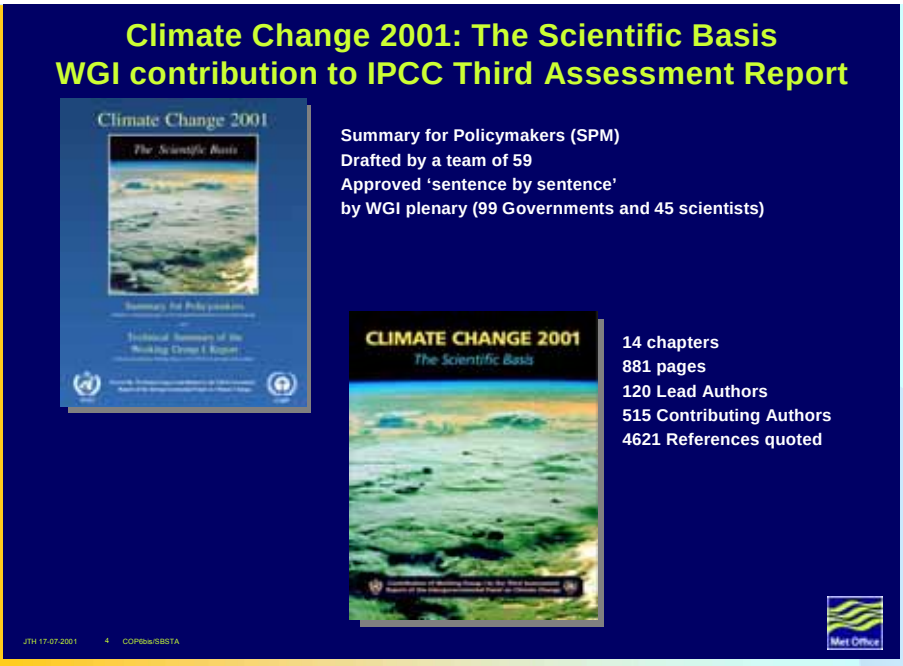

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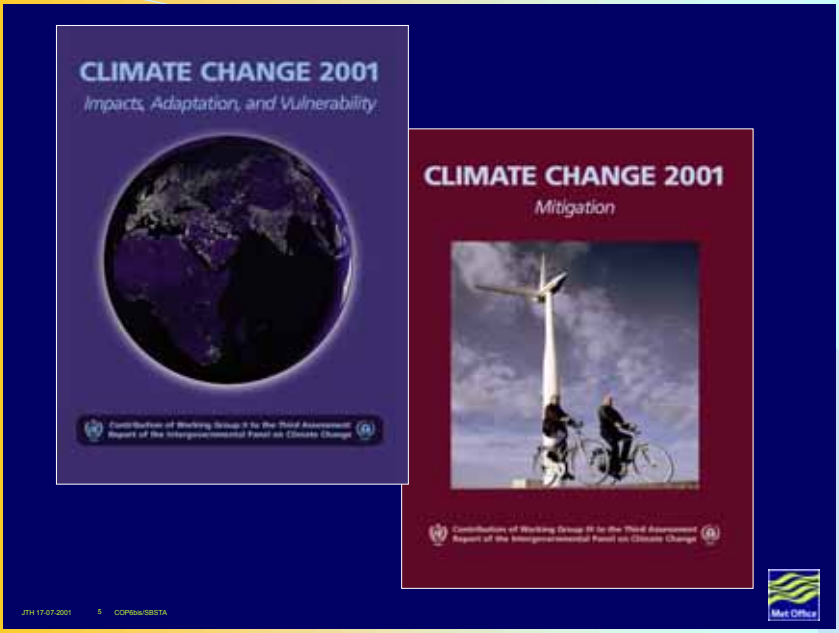

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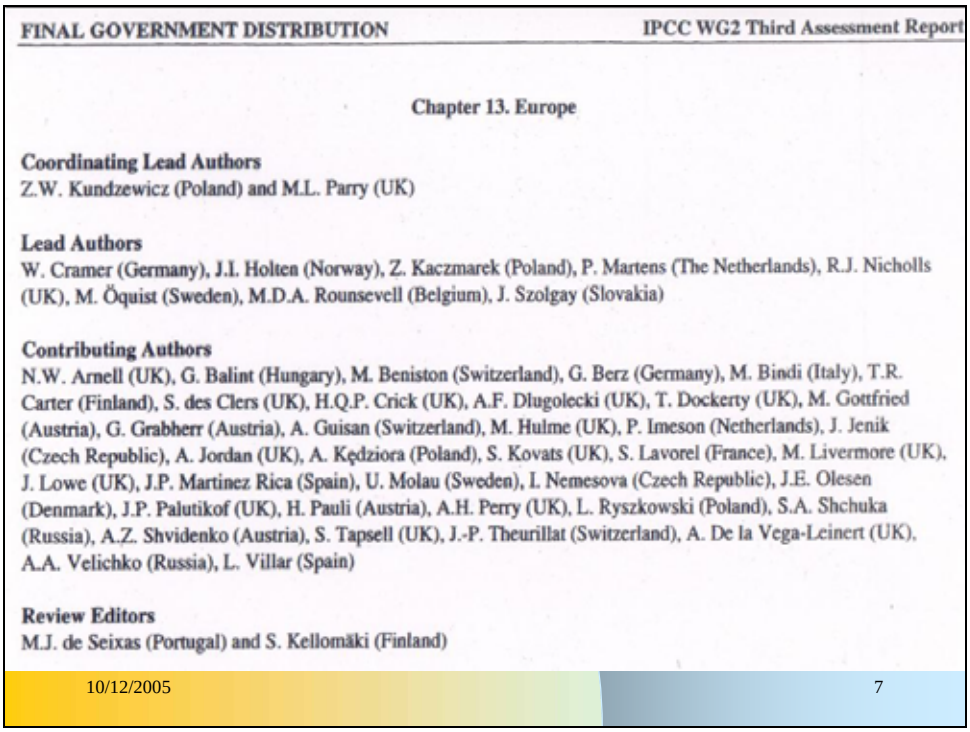

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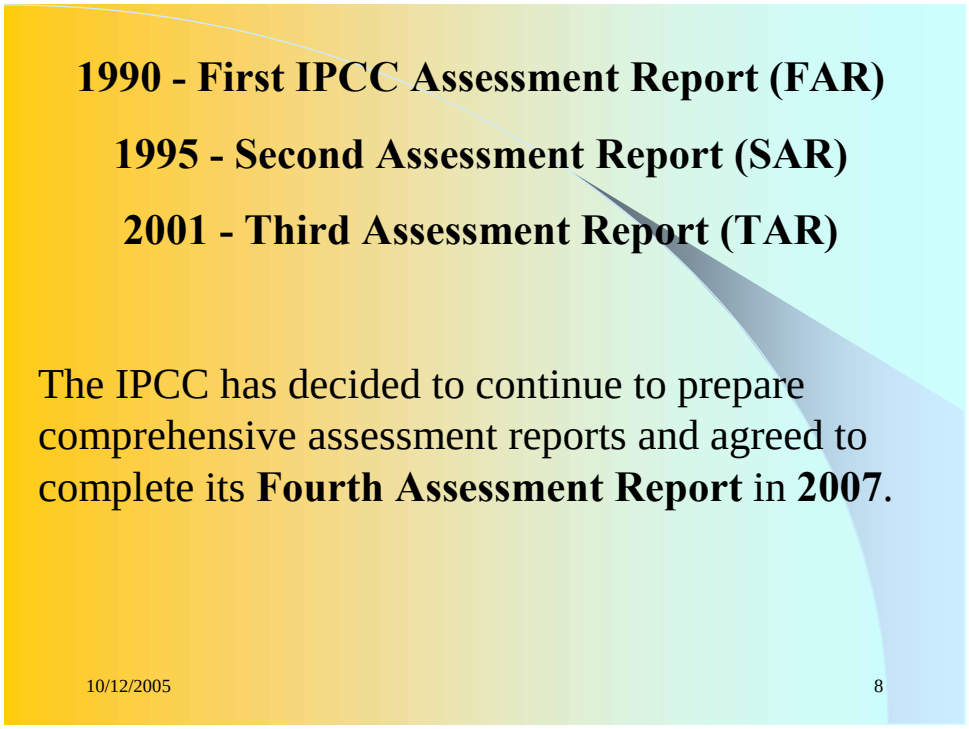

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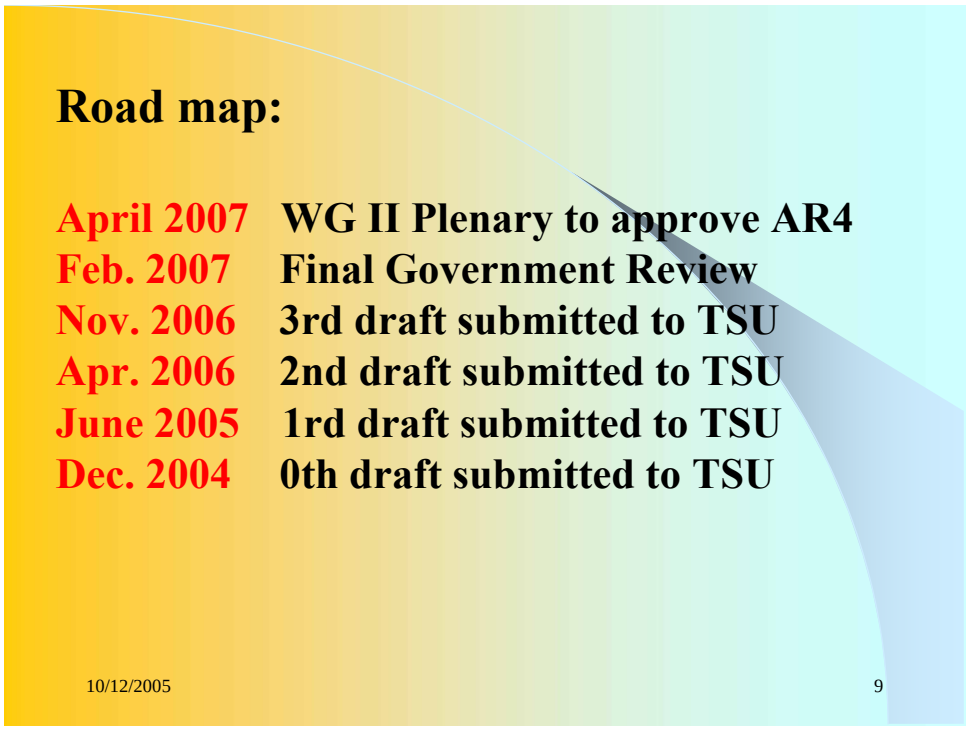

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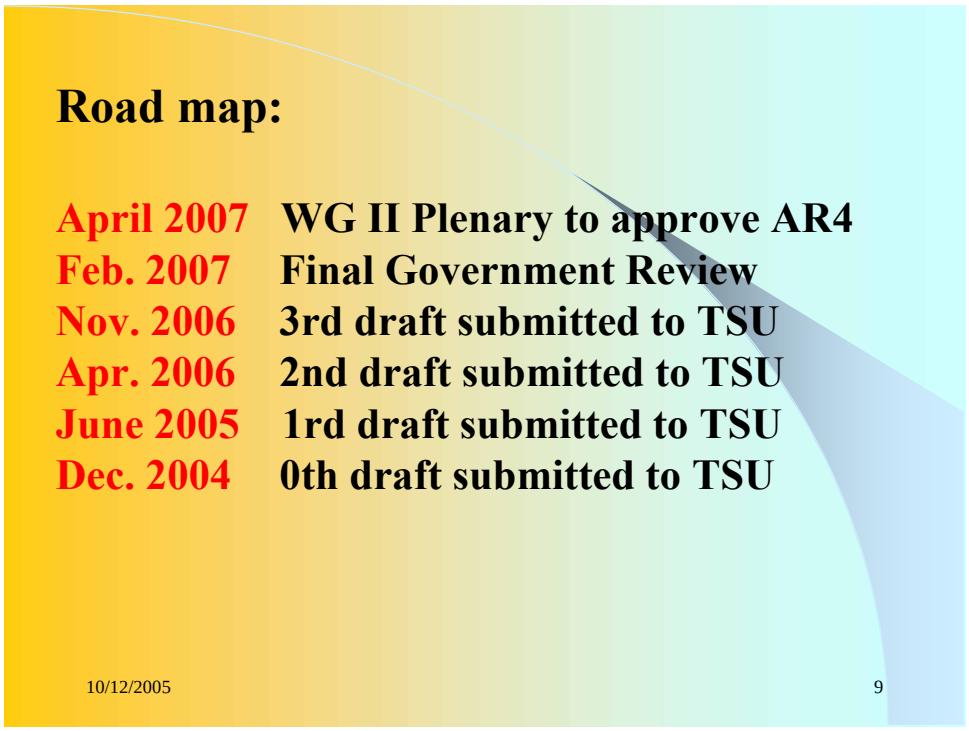

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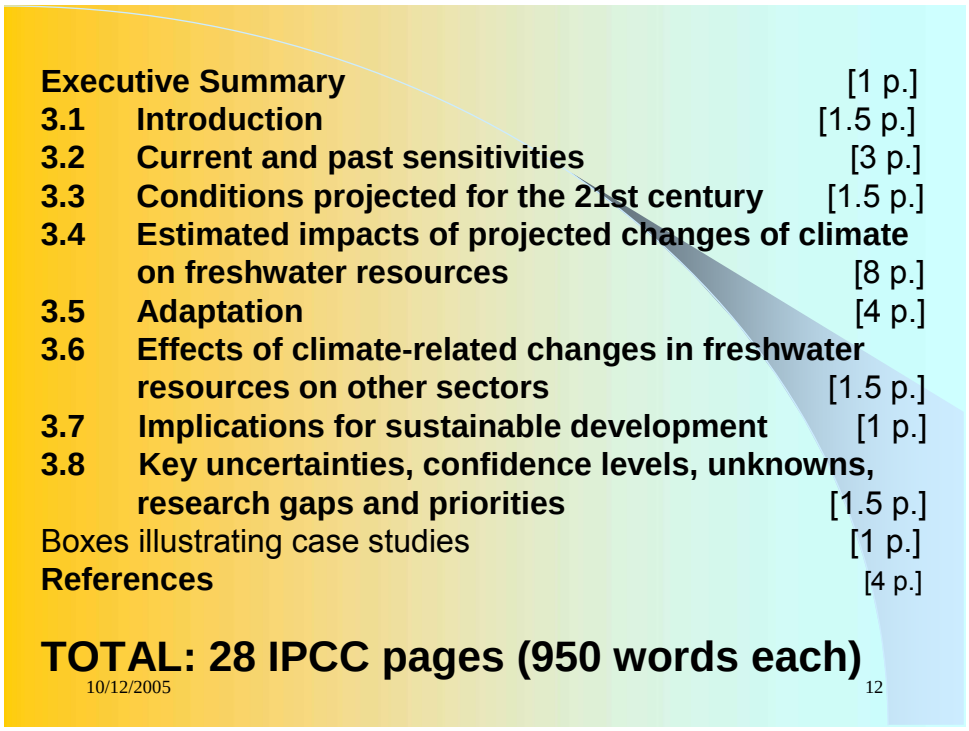

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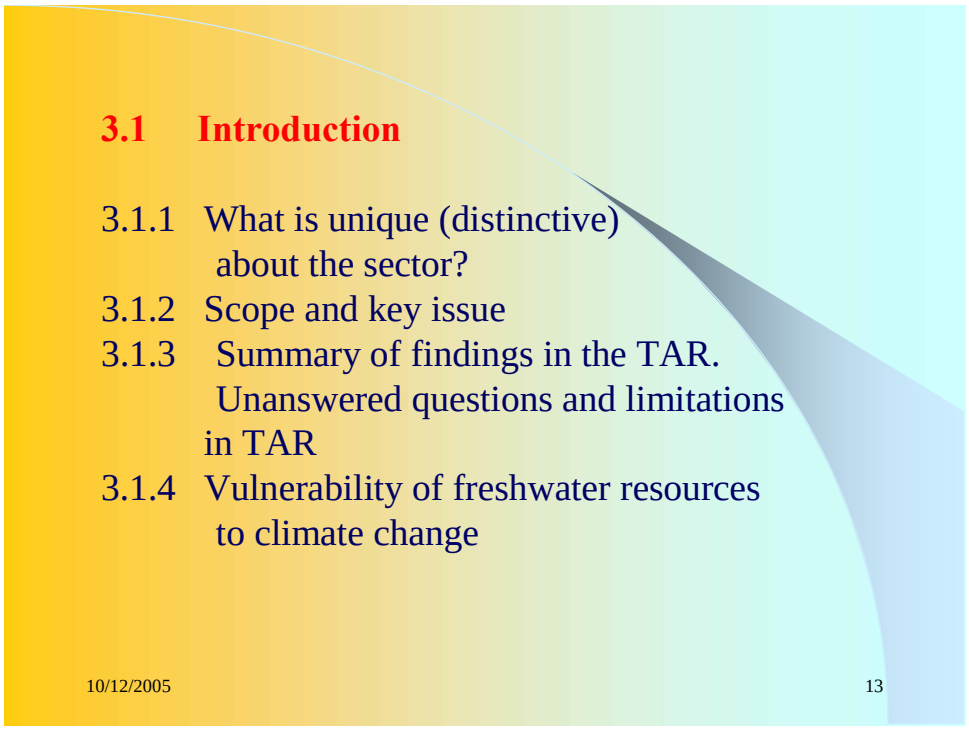

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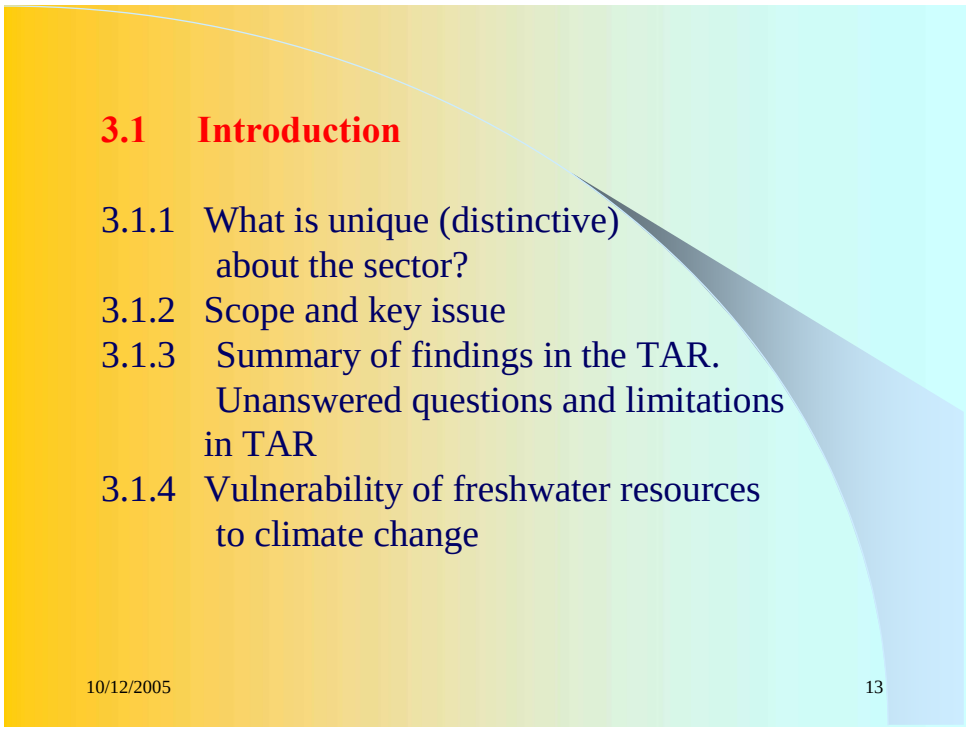

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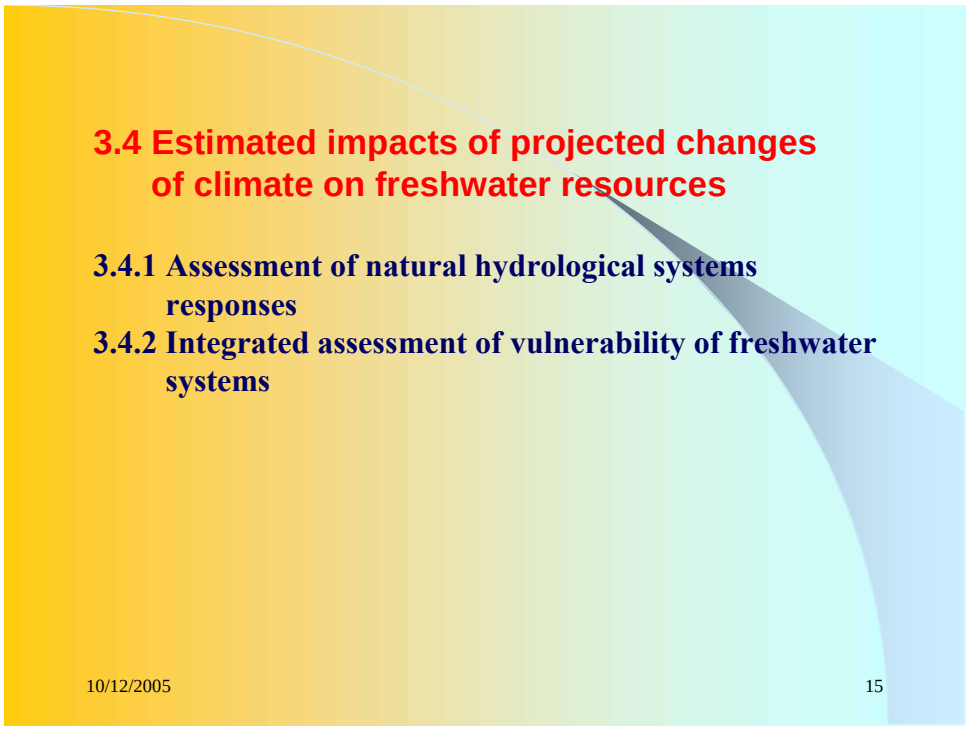

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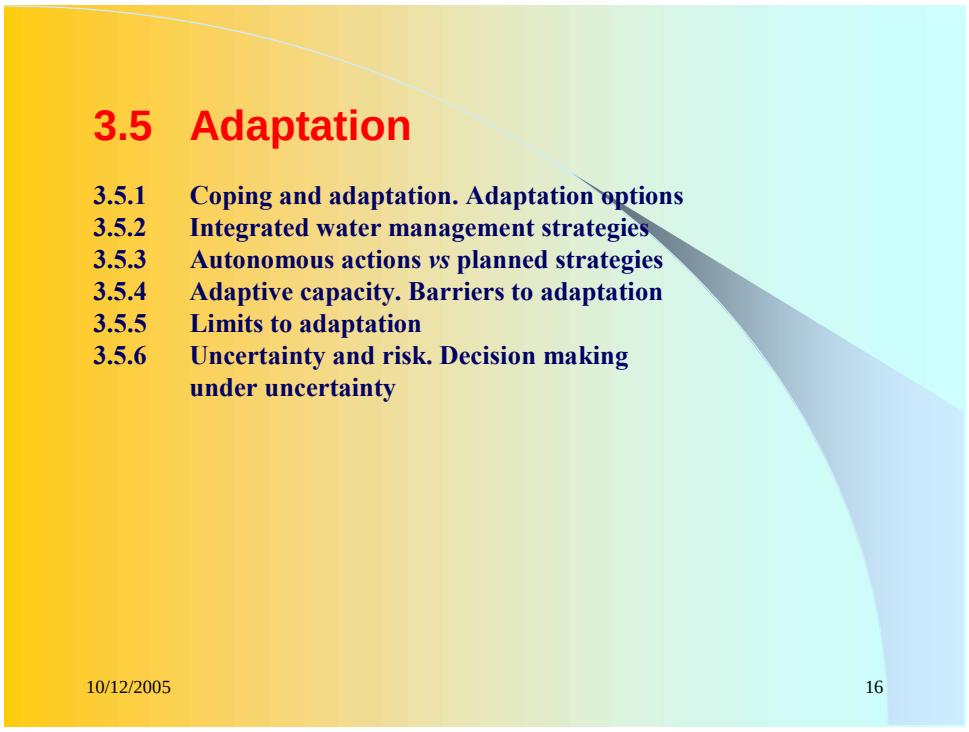

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3.6 Effects of climate-related changes in freshwater resources on other sectors

[Agriculture – virtual water trade, energy, industry, transport, settlements (floods, droughts, climate-related migrations), health, insurance, other]

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3.7 Implications for sustainable development

3.8 Key uncertainties, confidence levels, unknowns, research gaps and priorities

One or two boxes illustrating case studies (e.g. detailed case study on the Thukela, S. Africa; Volta basin; Dutch case with advanced adaptation)

References

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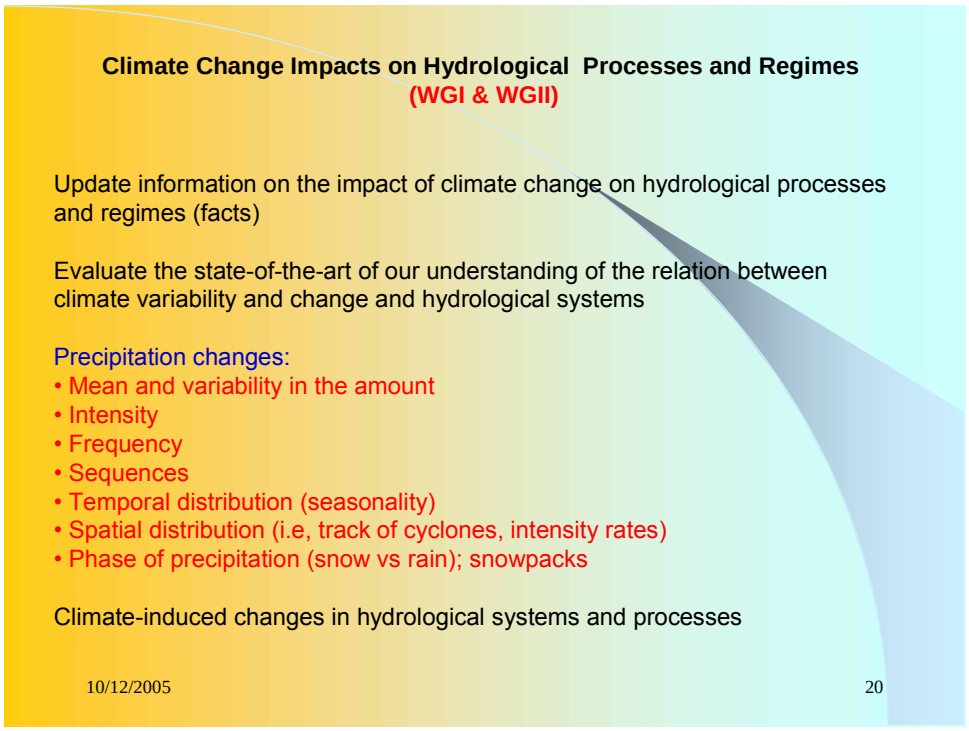

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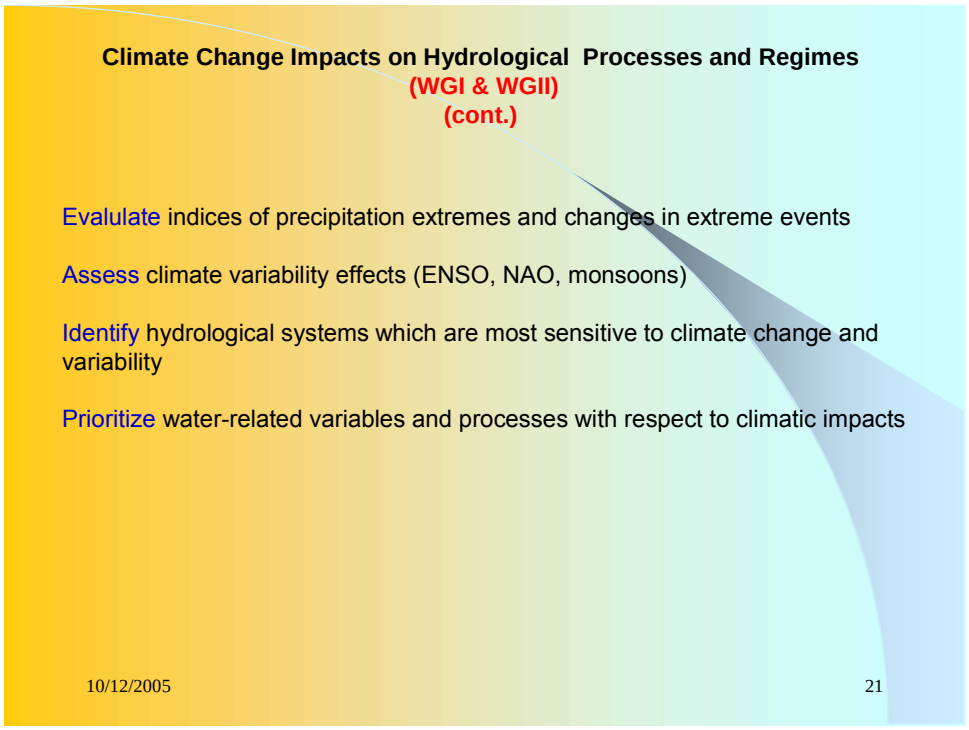

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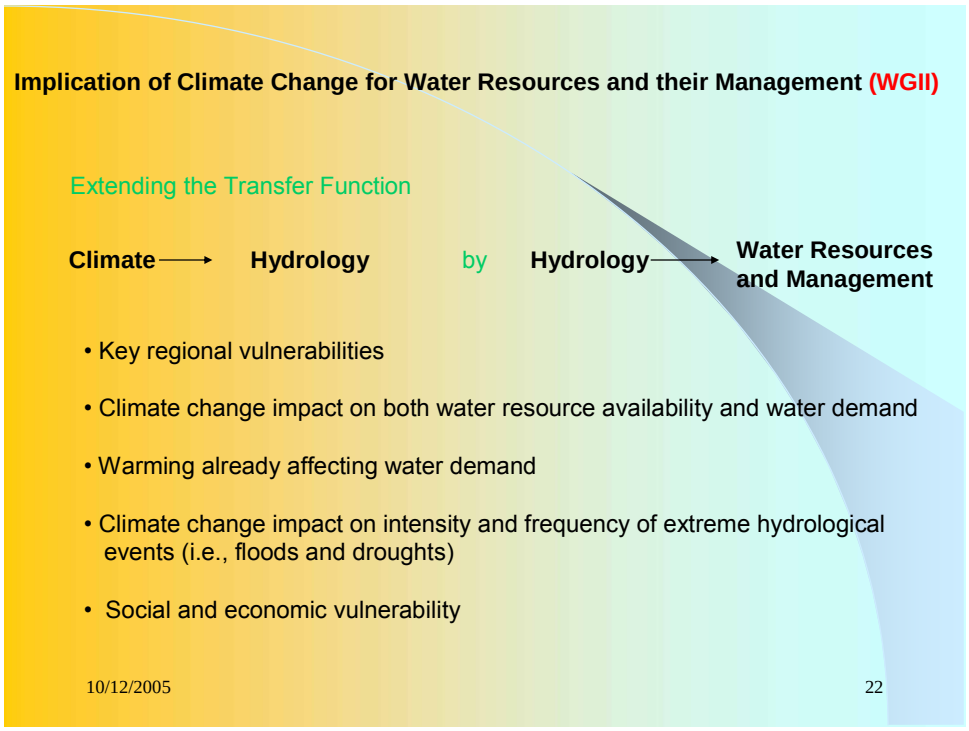

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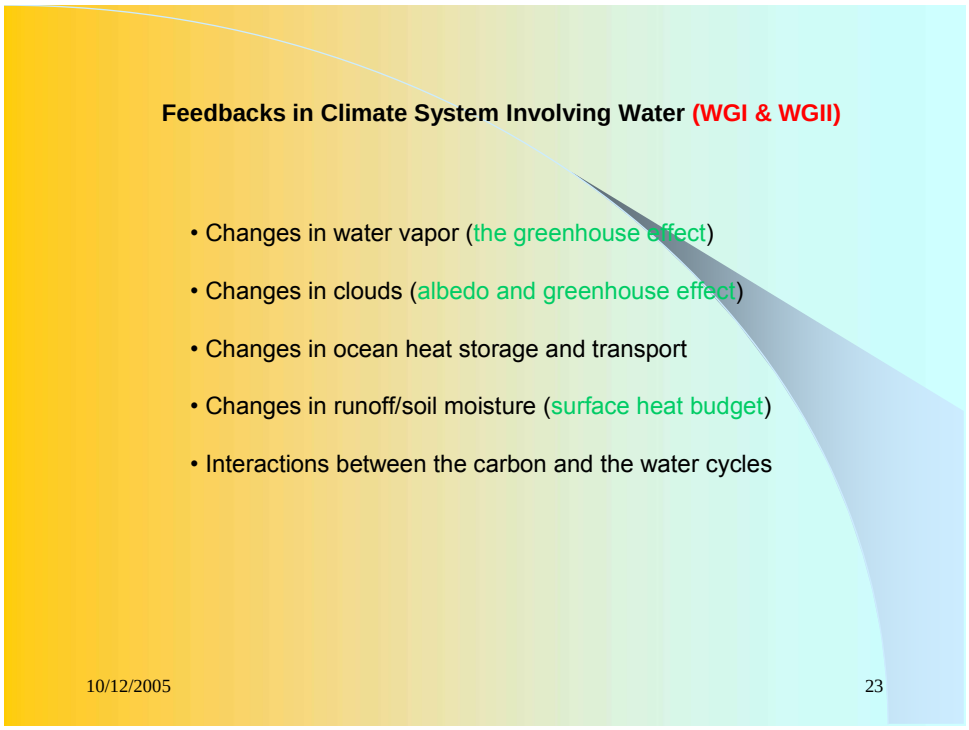

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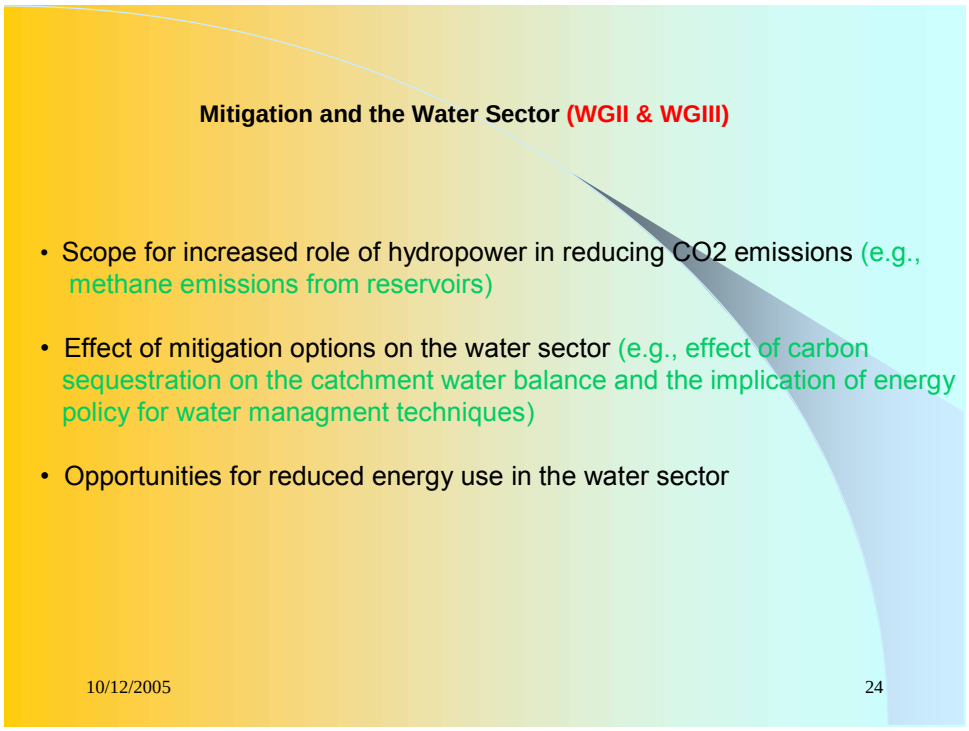

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IPCC Technical Paper on Climate Change and Water

Authors of scoping paper: Kundzewicz & Mata

Objectives:

The technical paper will seek to **improve our understanding** of the links of anthropogenically induced climate change, its impacts, and adaptation and mitigation response options with water issues.

In particular, it will **inform policy makers and stakeholders** about the implications of climate change and climate change response options for water resources, as well as the implications of water resources for climate change and climate change response options, including associated synergies and trade-offs.

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OUTLINE OF TPCCW
STRUCTURE AND CONTENTS (~150 pages)

Executive Summary

1 Introduction to Climate Change and Water (~25 pages)

1.1 Background
1.2 Observed and Projected Changes in Climate
1.3 Observed and Projected Changes in Socio-economic Conditions

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2 Linking Climate Change and Water Resources (~75 pages)

2.1 Observed Change and Variability in Hydrology and Water Resources

2.2 Climate Change Impact on Hydrological Cycle

2.3 Climate Change Impact on Water Resources Management. Adaptation

2.4 Extreme Hydrometeorological Events – Floods and Droughts

2.5 Feedbacks Mechanisms in Climate Involving Water

2.6 Climate Change and Water and Mitigation Activities

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2.7 Analyzing Implications of Interlinkages between Climate Change and Water Resources in Critical Areas (Systems and Sectors)

agriculture and food security
human health and sanitation (e.g., water-related ill health)
settlements
land use and forestry
natural ecosystems (both aquatic and terrestrial)
coastal systems
energy
financial services and insurance
industry
transportation

Sample of problem areas: Water availability and demand in different sectors. Water and nature (e.g. biodiversity, wetlands). Opportunities for energy use reduction in water sector (i.e., scope for energy efficiency gains). Opportunities for increased contribution of hydropower to meeting energy demands. Extreme events and insurance.

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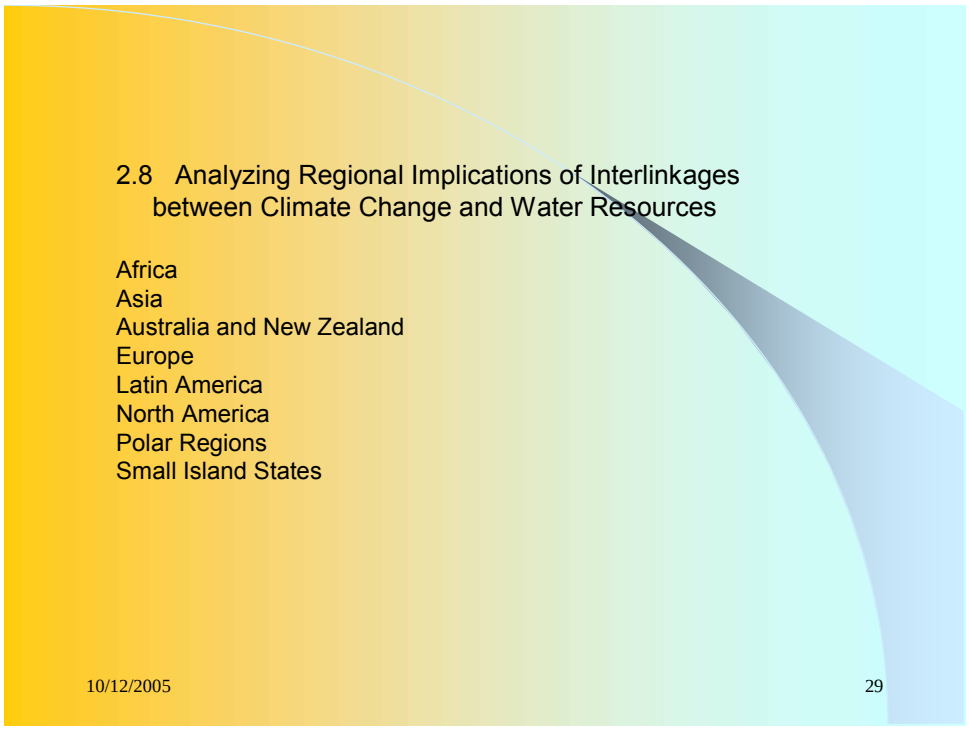

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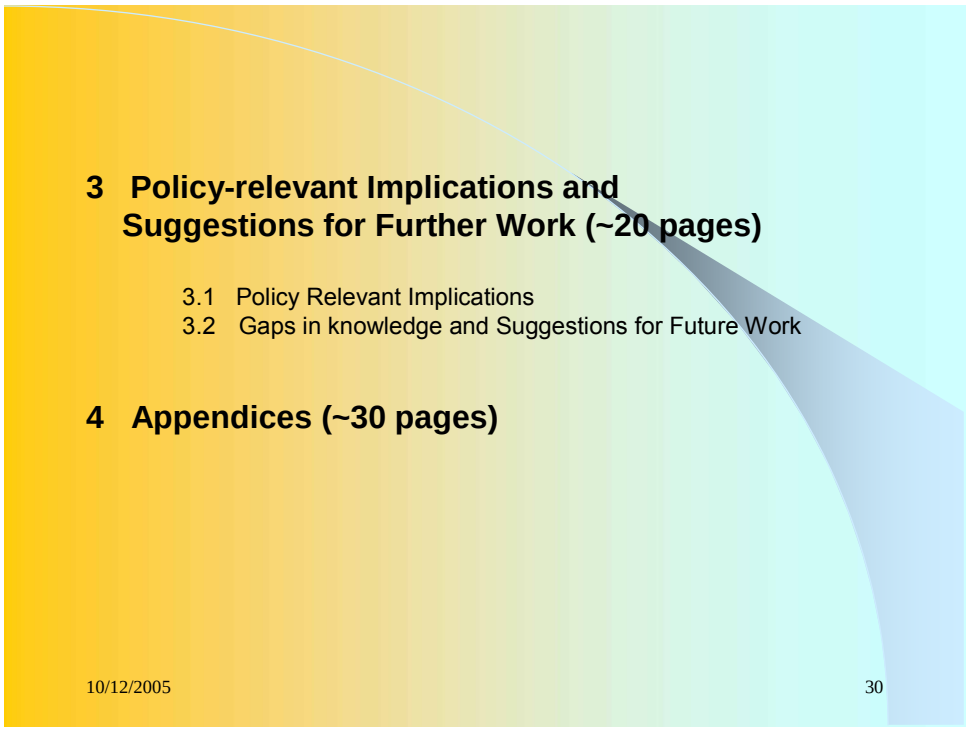

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Appendix 15: Collaboration proposal HELCOM – BALTEX

by T. Vihma

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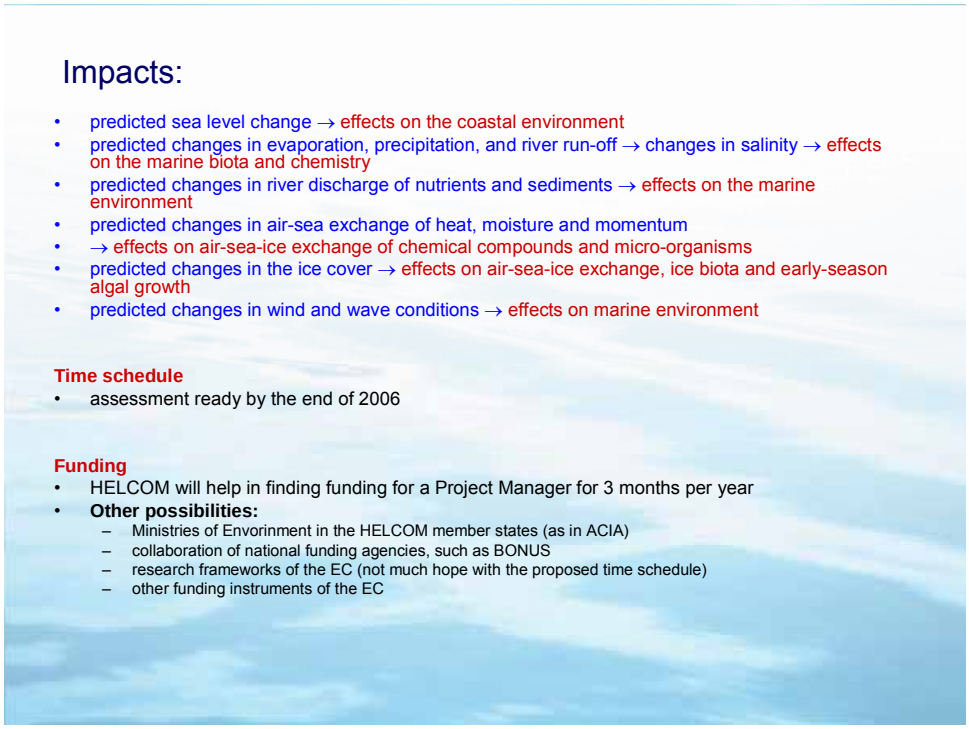

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Appendix 16: EC Funding Options, Handout for Item 7.4

H.-J. Isemer, International BALTEX Secretariat

CUTOUT DRAFT TEXT FOR THE „GLOBAL CHANGE AND ECOSYSTEMS" WORKPROGRAMME, 4th CALL 2005
Priorities with possible relevance for BALTEX include:

Water scenarios for Europe and for neighbouring countries
(Topic for IP)
The project should be based on the development of medium-long term (15-25 years) model-supported consistent scenarios, based on advanced policy, demography, socio-economic and technological option design strategies. They should blend qualitative and quantitative approaches and combine anticipatory/exploratory ones. The participation of third countries should cover in particular the areas surrounding the EU and associated candidate countries borders in order to cover the whole geographic Europe - up to the Urals and Caucasus -, and the whole Mediterranean and Black Sea areas. The project should provide the basis for regional strategic planning of water management and technology options. The participation of third countries is requested. The project will support the EU Water Initiative. To maximise synergies, the project should link with and get inputs from on-going European research activities on climate change and on the water cycle.

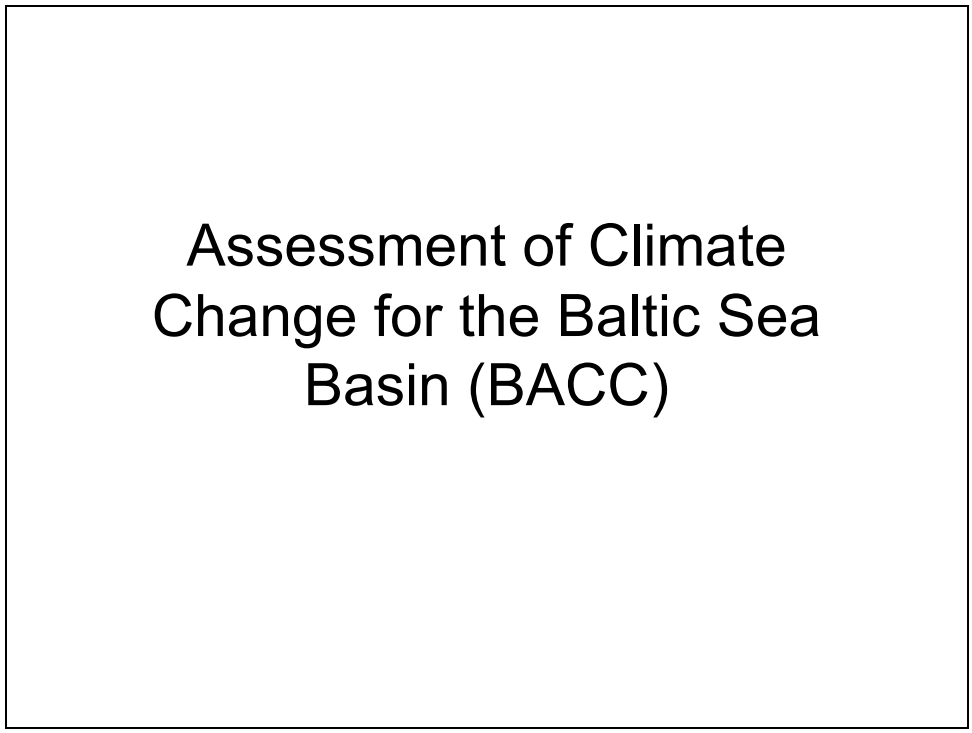
Climate change impacts in the Mediterranean area and the central-eastern Europe.
(Topic for IP)
Integrated quantification of climate change impacts in the region of the Mediterranean (including North Africa and the Middle East) and in the region of central/eastern Europe. Probable changes over the next decades to a century including e. g. changes of weather patterns, extreme events, Mediterranean sea circulation, water resources and air pollution levels should be addressed within an integrated framework. Possible mitigation and adaptation strategies should be discussed.

Integrated development of European coastal and regional seas forecasting systems
(Topic for /instrument to be decided)
Support the consolidation, integration and development of existing networks (remote sensing and in-situ observations) into an integrated pan-European system able to make long-term systematic measurements of oceanic parameters, including biological parameters, in the regional and coastal seas of Europe. Such a system is targeted at detecting environmental and climate changes, predicting their evolution, producing forecasts and developing decision support systems, taking particularly into account the GMES and GEO initiatives. Such a system should be designed to respond to the end-users needs as stressed in the GMES 2004-2008 Implementation Plan. Emphasis will be given to international co-operation and to the participation of SMEs and to international cooperation partners, as well as on the potential for technology transfer.

European atmospheric observation systems
(Topic for/ instrument to be decided)
Continuation, optimisation and analyses of long-term ground based atmospheric observations complementary to satellite measurements. Significant improvement in the coordination between ground-based and satellite measurements is required for the optimization of the European observing capabilities related to atmospheric composition, radiation and climate change. The project will contribute to the GEO aims for atmospheric composition.

Appendix 17: Assessment of Climate Change for the Baltic Sea Basin

by Anders Omstedt for Hans von Storch



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The **purpose**

of the BACC assessment is to provide the scientific community with an assessment of ongoing climate change in the Baltic Sea basin. An important element is the comparison with the historical past (until about 1800) to provide a framework for the severity and unusualness of the change. Also changes in relevant environmental systems, due to climate change, shall be assessed – such as hydrological change, ecosystems, and ocean waves.

The overall format is similar to the IPCC process, with author groups for the individual chapters, an overall policymaker-summary, and a review process.

It is hoped that the results may enter the Forth Assessment Report of the IPCC.

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The effort is lead by a Scientific Steering Committee, which has been formed on an ad-hoc basis. The members of the SSC are

Chair: Hans von Storch
DK Jens Hesselbjerg Christensen, Eigil Kaas, Morten Søndergaard
S Markku Rummukainen, Anders Omstedt, Sten Bergström
D Bodo von Bodungen, Hans von Storch
F Jouni Räisänen
P Zbigniew Kundezewicz

The BACC report is part of the ongoing BALTEX activities.

slide 3

The assessment will take on the form of a book with four chapters

1. Overall assessment and summary
2. Past and current climate change, detection and attribution (atmospheric, ocean, sea-ice, land-use, hydrology) – *Raino Heino and Heikki Toumenvirta*
3. Projections of future climate change – *Phil Graham*
4. Climate related ecosystem change – *Bodo von Bodungen*

Special emphasis should be given to literature in languages other than English, as this body of knowledge all too often is not entering the IPCC process.

Springer Verlag has been approached, and has responded positively.

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The time schedule is

Completing chapters 1.4.2005
Workshop - April 2005
Review until 31.5.2005
Revision until 30.6.2005
Finalization until 20.8.2005
Publication report: 1.9.2005
Completion web presentation 1.11.2005
Completion book manuscript

We have **no** allocated funding for travel for his effort. However, it may be possible to supply some of the members of the writing teams, which are known to be badly funded, with limited travel funds.

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Chapter 1

- Overall assessment and summary

  … to be prepared after completing Chapters 2-4 by the SCC of BACC

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Chapter 2

2. PAST AND CURRENT CLIMATE CHANGE, detection and attribution
2.1 Executive Summary
2.2 Introduction, incl. a brief paleoclimatic overview (ca. 10.000 years)
2.3 ATMOSPHERIC CHANGES
Changes in surface climate
- Temperature
- Precipitation
- Atmospheric moisture and clouds
- etc.

Changes in atmospheric circulation
Patterns of variability and changes in extreme events
2.4 TERRESTRIAL CHANGES
Lakes (temperature, ice cover…)
Rivers incl. runoff
Snow cover and frozen land
2.5 BALTIC SEA
Water temperature
Ice
Sea levels
Salinity
Inflows and stagnation periods

Appendix: Techniques, error estimation and measurement systems

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Chapter 2 – list of contributors

- Rudolf Brazdil (brazdil@porthos.geogr.muni.cz)
- * Lars Bärring (lars.barring@nateko.lu.se)
- * John Cappelen (jc@dmi.dk)
- * Deliang Chen (deliang@gvc.gu.se)
- * Bo Gustafsson (bo.gustafsson@gvc.gu.se)
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- * Raino Heino (raino.heino@fmi.fi)
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- Göran Lindström (goran.lindstrom@smhi.se)
- * Miroslaw Mietus (miroslaw.mietus@imgw.pl)
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- Kai Myrberg (kai.myrberg@fimr.fi)
- * Anders Omstedt (anders.omstedt@gvc.gu.se)
- * Tadeusz Niedzwiedz (niedzwie@ultra.cto.us.edu.pl)
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- * Heikki Tuomenvirta (heikki.tuomenvirta@fmi.fi)
- Valery Vuglinskiy (wuglins@vv4218.spb.edu)
- * Eduardo Zorita (zorita@gkss.de)

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Chapter 3

– TENTATIVE outline –

- 3.1 Global climate change
- 3.2 Climate change in the Baltic Sea drainage basin: projections from global climate models
- 3.3 Climate change in the Baltic Sea drainage basin: projections from regional climate models
- 3.4 Changes in climate variability and extremes
- 3.5 Changes in hydrology
- 3.6 Changes in the Baltic Sea
- 3.7 Changes in the cryosphere
- 3.8 Summary of projections

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Chapter 3

– TENTATIVE outline –

- 3.1 Global climate change
  - general context, IPCC estimates 1.4-5.8C, regional changes increase with increasing global warming, model-dependent rather than universal
- 3.2 Climate change in the Baltic Sea drainage basin: projections from global climate models
  - CMIP2 simulations (idealized, but useful for comparing different models), SRES forcing scenarios

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Chapter 3

– TENTATIVE outline –

- 3.3 Climate change in the Baltic Sea drainage basin: projections from regional climate models
  - some background (pre-PRUDENCE), PRUDENCE simulations, focus on details not resolved by global models
- 3.4 Changes in climate variability and extremes
  - mainly based on PRUDENCE simulations, but incorporating results from GCM studies

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Chapter 3

– TENTATIVE outline –

- 3.5 Changes in hydrology
  - methods used, change in average runoff, change in extreme runoff, regional distribution of changes
- 3.6 Changes in the Baltic Sea
  - modelling ocean processes, changes in water temperature & ice cover, regional sea level change, other aspects (salinity, major inflows etc.)

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Chapter 3

– TENTATIVE outline –

- 3.7 Changes in the cryosphere
  - snow, Baltic Sea ice
- 3.8 Summary of projections

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Chapter 3

participants by subject area

GCM summary - Jouni Räisänen, Kimmo Ruosteenoja

RCM summary - Erik Kjellström, Burkhardt Rockel, Ole Bøssing Christensen

Hydrological response - Phil Graham (& others as needed)

Ocean response - Markus Meier (& others as needed)

synopsis of russian literature (primarily from the Baltic States) - Valentina Krysanova

synopsis of Polish literature - Maciel Radziejewski

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Chapter 4

3.1 Introduction: The Baltic Sea

Short history of climate influence on the Baltic Sea Ecosystem during the Littorina Stage with special emphasis on the last 1000 years before the agricultural and industrial revolutions

Background information: ongoing changes due to postglacial eustatic and isostatic processes

3.1.1 Geological development
3.1.2 Coastal dynamics
3.1.3 Eustasy and isostasy
3.1.4 Oceanographic peculiarities
3.1.5 Climate and climate change
3.1.6 Catchment area of the Baltic Sea
3.1.7 Water cycle in the Baltic Sea
3.1.8 Biocoenosis in the Baltic Sea
3.1.9. Cultural and political development

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Chapter 4

3.2 Human related ecosystem change

Brief overview in order to differentiate between ancompare anthropogenic induced changes and climatically forced changes/variability

3.2.1 Sources and distribution of nutrients
3.2.2 Sources and distribution of organic pollutants
3.2.3 Sources and distribution of trace metals
3.2.4 Agriculture and eutrophication
3.2.5 Aquaculture and eutrophication
3.2.6 Influence of fisheries
3.2.7 Influence of sea traffic
3.2.8 Influence of tourism
3.2.9 Hot spots
3.2.10 Atmospheric input

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3.3 Climate related marine ecosystem changes

Observed changes/variability since onset of regular Baltic Sea oceanographic research (~last 100-120 years) in the various compartments of the ecosystem and comparison with system behaviour during the medieval Warm Period and the Little Ice Age

With focussed discussion on

- changing redox conditions
- resulting matter cycles
- sink and source functions (including external loads)
- habitat change

3.3.1 The physical-geo-chemical system
3.3.1.1 Temperature
3.3.1.2 Salinity
3.3.1.3 Sea ice
3.3.1.4 Oxygen
3.3.2 The biological system
3.3.2.1 Bacteria
3.3.2.2 Phytoplankton
3.3.2.3 Harmful algae blooms
3.3.2.4 Zooplankton
3.3.2.5 Benthos
3.3.2.6 Fish
3.3.2.7 Marine mammals
3.3.2.8 Birds

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Chapter 4

3.4 Consequences for the human society?

3.4.1 Lessons from the Medieval Warm Period?
3.4.2 Lessons from the Little Ice Age?
3.4.3 Outlook into the future?

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Chapter 4

- Assoc. Prof. Ben Smith, Lund University, Dept of Physical Geography and Ecosystems Analysis, Sölvegatan 13, SE-22362 Lund
- Prof. Martin Sykes, Lund University, Dept of Physical Geography and Ecosystems Analysis, Sölvegatan 13, SE-22362 Lund
- * B. v. Bodungen, IOW Warnemünde
- Kay Emeis, Hamburg University
- Ilppo Vuorinen of Turku Universitet;
- Kristine Garde, DHI Horsholm
- Ulo Mander (EST)
- Tumas Rimvydas (LT)

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International BALTEX Secretariat Publication Series
ISSN 1681-6471

No. 1: Minutes of First Meeting of the BALTEX Science Steering Group held at GKSS Research Center in Geesthacht, Germany, 16-17 May, 1994. August 1994

No. 2: Baltic Sea Experiment BALTEX – Initial Implementation Plan. March 1995, 84 pages

No. 3: First Study Conference on BALTEX, Visby, Sweden, August 28 – September 1, 1995. Conference Proceedings. Editor: A. Omstedt, SMHI Norrköping, Sweden. August 1995, 190 pages

No. 4: Minutes of Second Meeting of the BALTEX Science Steering Group held at Finnish Institute of Marine Research in Helsinki, Finland, 25-27 January, 1995. October 1995

No. 5: Minutes of Third Meeting of the BALTEX Science Steering Group held at Strand Hotel in Visby, Sweden, September 2, 1995. March 1996

No. 6: BALTEX Radar Research – A Plan for Future Action. October 1996, 46 pages

No. 7: Minutes of Fourth Meeting of the BALTEX Science Steering Group held at Institute of Oceanology PAS in Sopot, Poland, 3-5 June, 1996. February 1997

No. 8: *Hydrological, Oceanic and Atmospheric Experience from BALTEX*. Extended Abstracts of the XXII EGS Assembly, Vienna, Austria, 21-25 April, 1997. Editors: M. Alestalo and H.-J. Isemer. August 1997, 172 pages

No. 9: The Main BALTEX Experiment 1999-2001 – *BRIDGE*. Strategic Plan. October 1997, 78 pages

No. 10: Minutes of Fifth Meeting of the BALTEX Science Steering Group held at Latvian Hydrometeorological Agency in Riga, Latvia, 14-16 April, 1997. January 1998

No. 11: Second Study Conference on BALTEX, Juliusruh, Island of Rügen, Germany, 25-29 May 1998. Conference Proceedings. Editors: E. Raschke and H.-J. Isemer. May 1998, 251 pages

No. 12: Minutes of 7th Meeting of the BALTEX Science Steering Group held at Hotel Aquamaris in Juliusruh, Island of Rügen, Germany, 26 May 1998. November 1998

No. 13: Minutes of 6th Meeting of the BALTEX Science Steering Group held at Danish Meteorological Institute in Copenhagen, Denmark, 2-4 March 1998. January 1999

No. 14: BALTEX – BASIS Data Report 1998. Editor: Jouko Launiainen, 96 pages. March 1999.

No. 15: Minutes of 8th Meeting of the Science Steering Group held at Stockholm University in Stockholm, Sweden, 8-10 December 1998. May 1999

No. 16: Minutes of 9th Meeting of the BALTEX Science Steering Group held at Finnish Meteorological Institute in Helsinki, Finland, 19-20 May 1999. July 1999

No. 17: Parameterization of surface fluxes, atmospheric planetary boundary layer and ocean mixed layer turbulence for BRIDGE – What can we learn from field experiments? Editor: Nils Gustafsson. April 2000

No. 18: Minutes of 10th Meeting of the BALTEX Science Steering Group held in Warsaw, Poland, 7-9 February 2000. April 2000

No. 19: BALTEX-BASIS: Final Report, Editors: Jouko Launiainen and Timo Vihma. May 2001

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