

Minutes of
24th Meeting
of the
BALTEX Science Steering Group

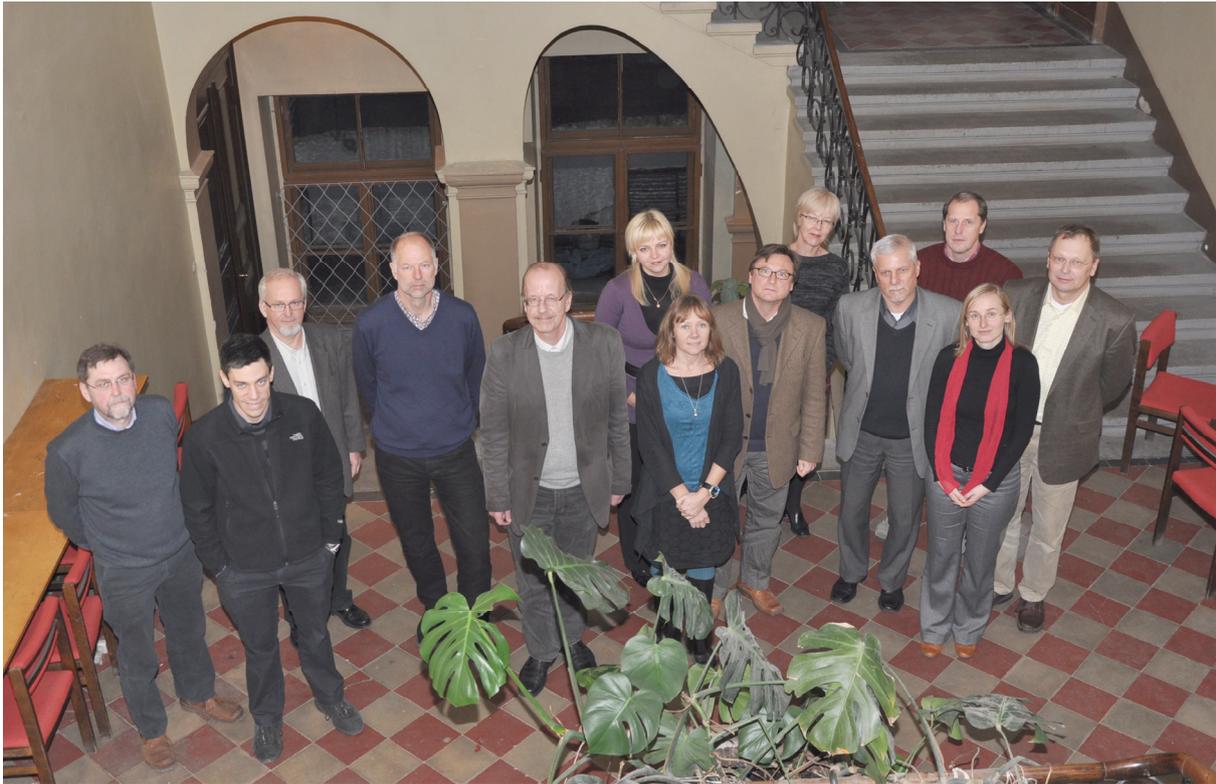
held at

*University of Latvia
Riga, Latvia*

16 - 18 November 2009

edited by

*Marcus Reckermann
and Hans-Jörg Isemer*



Participants at the 24th BALTEX Science Steering Group Meeting, from left to right: Andris Andrusaitis, Philippe Lucas-Picher, Anders Omstedt, Joakim Langner, Jüri Elken, Ala Bildziuh, Berit Arheimer, Marcus Reckermann, Sirje Keevallik, Janusz Pempkowiak, Andreas Lehmann, Birgit Hünicke, Hans-Jörg Isemer. Not on the photo: Hermanni Kaartokallio

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Summary of Decisions

DECISION 1: **Hermann Kaartokallio** and **Tapani Stipa** from the Finnish Environment Institute (SYKE), and **Philippe Lucas-Picher** from the Danish Climate Centre of the Danish Meteorological Institute (DMI) were approved as new BSSG members.

DECISION 2: The procedure of a possible **succession of a resigned BSSG member** is clarified. A BSSG member wishing to resign from the BSSG shall notify the BSSG chairman. The chairman will then notify and discuss with the BSSG on the possible profile of a successor, and may ask BSSG members to suggest potential candidates for BSSG membership.

DECISION 3: The **BALTEX data sets on hydrology and oceanography** are to be moved from the Swedish Meteorological and Hydrological Institute (SMHI) to the World Data Center for Climate (WDCC), and the current procedure to get access to the meteorological, hydrological and oceanographical data sets shall be replaced by a simplified “click” licence as soon as this procedure is implemented at WDCC.

Summary of Action Items

Action Item 1 to the BALTEX Working Group on Data Management to implement an easier online licensing system to get access to BALTEX data. Once implemented this system will be promoted via e-mail and the BALTEX web site to potential users.

Action Item 2 to Andreas Lehmann of the BALTEX Working Group on Baltic Grid to terminate the WG on Baltic Grid by communicating this in written form to the Chairman, briefly stating the reason for termination of the WG.

Action Item 3 to all BSSG members to consider and discuss ways to document BALTEX Phase II achievements in 2012/2013.

Note on Appendices

The minutes contain two sets of Appendices: Key appendices, which are limited concerning size and mainly black/white, are numbered chronologically and are part of the published paper copy. Extended coloured material, mostly copies of presentation material shown at the meeting, are included in a set of appendices available in electronic form only via the BALTEX website at <http://www.baltex-research.eu/supplementary/>. The latter appendix numbers start with an E, *e.g.* Appendix E1.

Appendices

- Appendix 1: Workshop and meeting agenda
- Appendix 2: Participants of the meeting
- Appendix 3: Report of the BALTEX Working Group on Radar (J. Koistinen)

E-Appendices

- Appendix E1: CV Philippe Lucas-Picher
- Appendix E2: CV Hermanni Kaartokallio
- Appendix E3: CV Tapani Stipa
- Appendix E4: Report of the International BALTEX Secretariat (H.-J. Isemer and M. Reckermann)
- Appendix E5: BONUS activities and plans (A. Andrusaitis)
- Appendix E6: CEOP/GEWEX developments (H.-J. Isemer)
- Appendix E7: SurBACC (B. Hünicke for D. Bray)
- Appendix E8: Baltic Sea level survey (B. Hünicke)
- Appendix E9: Questionnaire review (M. Reckermann)

Introduction

The 24th meeting of the BALTEX Science Steering Group (BSSG) was held during 17 and 18 November 2009 at the University of Latvia in Riga, Latvia. On 16 November, a joint KALME-BALTEX workshop was held in conjunction with the BSSG meeting (see Appendix 1 for the workshop's agenda). The workshop was entitled "Climate change impacts on the water environment in Latvia and implications for the southern Baltic Sea basin" and acted as final workshop of the Latvian National Programme KALME (<http://kalme.daba.lv/en/>). The scope of the KALME programme encompasses most BALTEX objectives and spans from a hydrological, geological and biogeochemical description of the system, to modelling of possible future changes. This has a high relevance for the second BALTEX Assessment of Climate Change for the Baltic Sea basin (BACC II), as the results of KALME may be representative for the southern Baltic Sea basin. More than 50 participants followed the presentations and contributed to lively discussions. Presentations given at the workshop are available via the BALTEX website at www.baltex-research.eu/supplementary/.

BALTEX Science Steering Group meeting

Opening and welcome

Andris Andrusaitis, BALTEX Science Steering group member and host of this 24th BSSG meeting, welcomed the steering group members to the University of Riga. Joakim Langner, chairman of the BALTEX Science Steering Group opened the meeting by welcoming the meeting participants (Appendix 2). As with Philippe Lucas-Picher, a new BSSG member was present on this first day, all members present shortly introduced themselves. Hermanni Kaartokallio, the second new BSSG member, joined the meeting on the second day. The third new BSSG members Tapani Stipa was unable to attend this meeting (see section 1.4).

TOPIC 1: Organisational issues

1.1 Approval of the agenda

The agenda for the 24th BSSG meeting was unanimously approved (Appendix 1) with the addition of a statement on the International BALTEX Secretariat by Hans-Jörg Isemer at the end of the meeting.

1.2 Approval of the previous BALTEX SSG meeting minutes

The minutes of the 23rd BSSG meeting were unanimously approved.

1.3 Review of previous BALTEX SSG meeting Action Items

Of the 12 action items of BSSG#23, most items were considered completely accomplished, or in progress. The pending items still awaiting accomplishment are:

Action Item 4 to Jarmo Koistinen, Daniel Michelson and the BALTEX Secretariat to undertake steps to promote the BRDC weather radar based data set appropriately both inside and outside BALTEX, and additionally to Burkhardt Rockel and Markus Meier (WG on the Utility of Regional Climate Models) to establish a small expert group with the view to

explore possibilities of using the BRDC precipitation data set for regional modelling validation and hydrological applications. *This activity is still ongoing. See also section 2.2.*

Action Item 5 to Marcus Reckermann and the BALTEX Secretariat to finalize a draft version of a *BALTEX outreach website for the public* in cooperation with authors of the BACC book annexes, BSSG members, and others, as appropriate, and launch the new website subsequently in parallel to the existing BALTEX homepage. *This work is in progress.*

1.4 BALTEX SSG membership changes

Prior to the meeting, **Timo Vihma**, **Ole Bøssing Christensen** and **Juha-Markku Leppänen** indicated their wish to resign from the BSSG. The BSSG noted these changes with regret, and expressed its appreciation to the three colleagues for their numerous contributions to the steering of the BALTEX programme. In particular, Timo's activity as BSSG vice-chairman starting in May 2006 was highlighted.

All three leaving BSSG members suggested a scientist from their home institute as their successor as BSSG members. Timo Vihma suggested **Tapani Stipa**, Juha-Markku Leppänen suggested **Hermanni Kaartokallio**, both from the Finnish Environment Institute (SYKE), and Ole Bøssing Christensen suggested **Philippe Lucas-Picher** from the Danish Climate Centre of the Danish Meteorological Institute (DMI) as new BSSG members. Tapani Stipa is research group leader at SYKE, his research interests involve multidisciplinary marine research, numerical models and operational oceanography. Hermanni Kaartokallio is senior scientist at SYKE and adjunct professor at the University of Helsinki with special interest in microbial ecology, carbon cycling and molecular biology. Philippe Lucas-Picher is research scientist at the Danish Climate Centre, focussing on regional climate modelling. CVs of all three candidates are available online in Appendices E1-3 on <http://www.baltex-research.eu/supplementary/>.

DECISION 1: **Hermanni Kaartokallio** and **Tapani Stipa** from the Finnish Environment Institute (SYKE), and **Philippe Lucas-Picher** from the Danish Climate Centre of the Danish Meteorological Institute (DMI) were approved as new BSSG members.

BSSG members are encouraged to send suggestions for a new BSSG vice-chairman as successor to Timo Vihma to the chairman. If possible, a new vice-chairman could be approved at the next BSSG meeting in Międzyzdroje, Poland, in June 2010.

A changed procedure concerning the succession of resigning BSSG members was proposed and discussed. It was suggested to change the procedure in such a way that BSSG members wishing to resign shall communicate this wish to the BSSG chairman and vice-chairs, e.g. by e-mail. The chairman will then together with the Secretariat inform the BSSG and may ask BSSG members (both current and resigning) to suggest new members with a given profile or expertise.

DECISION 2: The procedure of a possible **succession of a resigned BSSG member** is clarified. A BSSG member wishing to resign from the BSSG shall notify the BSSG chairman. The chairman will then notify and discuss with the BSSG on the possible profile of a successor, and may ask BSSG members to suggest potential candidates for BSSG membership.

TOPIC 2: Status reports and BALTEX activities in 2009

2.1 Report of the Secretariat

Marcus Reckermann and Hans-Jörg Isemer gave an overview over the activities of the International BALTEX Secretariat in 2009. The year was a busy one, with two international conferences and a summer school prominently co-organized by the IBS, plus a number of other activities and publications. A short overview is given here.

A. International events with prominent BALTEX participation

- **2 February 2009: Workshop BSSSC/BALTEX: Meeting the climate challenge.** Geesthacht, Germany. The workshop took place at GKSS Research centre, Germany on the occasion of the first Baltic Sea States Subregional Co-operation (BSSSC) Board Meeting under the chairmanship of the City of Hamburg. The workshop was attended by about 20 BSSSC Board members who are regional policy-makers from various countries around the Baltic Sea. Workshop presentations included an overview on BALTEX (H.-J. Isemer) and two papers on the results and implications of the BALTEX Assessment of Climate Change in the Baltic Sea Region (BACC) as well as on the profile and tasks of the recently established regional climate office for northern Germany at GKSS (both given by H v. Storch).
- **4 - 8 May 2009: 2nd International Lund RCM Workshop on 21st Century Challenges in Regional-scale Climate Modelling.** Lund, Sweden. Approximately 200 participants from around the world attended the workshop. Aim of the workshop was to provide an overview over different aspects of current regional climate modelling methodologies and applications. Topics included “Dynamical downscaling”, “New developments in numeric and physical parametrization”, “From weather to climate”, “Regional observational data and re-analysis”, “Results from Large Projects”, “The future of RCMs”, and “Impact studies”. A special proceedings issue featuring peer reviewed papers from the workshop is in preparation for publication in the international meteorological journal “Meteorologische Zeitschrift”. For details on the workshop, see the website www.baltex-research.eu/RCM2009, and the articles in the “American Geophysical Society - Atmospheric Sciences Section of AGU Newsletter” (Vol. 3, Issue 4, September 2009) and BALTEX (No. 13, October 2009) newsletters.
- **25 - 28 May 2009: International Conference on Climate Change – The environmental and socio-economic response in the southern Baltic region.** Szczecin, Poland. Approximately 120 participants from 13 countries attended the conference. Aim of this interdisciplinary conference was to bring together different research communities with a common interest in research on climate change and its impacts on nature and anthroposphere in the southern Baltic Sea basin. Sessions included “Marine and terrestrial proxies for reconstructions of paleo-climate”, “Modelling of past climate change and future projections”, “Climate and anthroposphere interactions”, “Prehistoric communities and climate change”, and “Climate variability and change impacts on Baltic Sea coasts”. A special proceedings issue featuring peer reviewed papers from the conference is in preparation for publication in the international journal “Climate Research”. For details on the conference see the website www.baltex-research.eu/SZC2009, and the article in BALTEX Newsletters 13 (October 2009).

- 27 July - 7 August 2009: **International Summer School on “Climate impacts on the Baltic Sea - From science to policy”** Bornholm, Denmark. 20 students from Denmark, Sweden, Finland, Estonia, Poland and Germany had been selected by the organizers from the Danish Technical University in Denmark, the University of Gothenburg, and the International BALTEX Secretariat. Emphasis of this multidisciplinary study course was on modelling and the interpretation of observations and modelling results of physical and biogeochemical processes in the Baltic Sea and the drainage basin under climate change. Next to the lectures given by a variety of prominent lecturers, the academic programme consisted of hand-on simple modelling along with group exercises, including data workup and interpretation, as well as case studies and open discussions. The students took on the tasks enthusiastically and made the course a worthwhile experience also for the teachers. A text book based on lectures and student exercises is in preparation. Main sponsors of the course were the Nordic Marine Academy (NMA), the BONUS Baltic Organisations Network for Funding Science EEIG, the University of Gothenburg and GKSS Research Centre Geesthacht. For details on the summer school, see the website www.baltex-research.eu/baltic2009, and the article in BALTEX Newsletters 13 (October 2009).
- 13-15 October 2009: **Workshop and plenary talk at the annual BSSSC Conference “Regions taking the challenge – Between the EU Baltic Sea Strategy and the UN climate summit”**, Ringstedt, Denmark. The conference covered several themes relevant for BSSSC. The BALTEX contributions were in the area of adaptation to climate change. This contribution was the second event in 2009 planned and conducted in cooperation with BSSSC, as had been suggested at the previous BSSG meeting. The plenary talk given by Hans von Storch entitled “Adaptation to Climate Change” alluded to the results of the BACC report and summarized arguments to promote both adaptation and mitigation measures in a balanced and relevant manner. A break-out workshop entitled ““Regional policy in view of climate change” prepared and chaired by H.-J. Isemer presented 4 talks given by 4 speakers representing academia, research communities and national services, and decision makers dedicated to aspects of adaptation to climate change impacts in the Baltic Sea Region.

The Secretariat report is available online in Appendix E4 on <http://www.baltex-research.eu/supplementary/>

2.2 BALTEX Working Group Reports

Of the BALTEX Working Group chairpersons only Andreas Lehmann (WG on Baltic Grid) was present at the meeting.

Jarmo Koistinen of the **BALTEX Working Group on Radar** provided a short written report in which recent developments are summarized (Appendix 3).

Anders Omstedt as representative of the **BALTEX Working Group on BACC II** briefly summarized the state the BACC II process. The BACC II steering committee has been established and is currently defining a structure for the BACC II report and identifying lead authors. This process is planned to be terminated in spring 2010, with an envisaged meeting of BACC II lead authors in connection with the 6th Study Conference on BALTEX in Miedzyzdroje, Poland, in June 2010.

For the **BALTEX Working Group on the Utility of Regional Climate Models**, Joakim Langner shortly stated for WG chairman Markus Meier that the WG is currently working on a review paper on Regional Climate Modelling, which will be the final outcome of the WG.

Joakim Langner also gave a short overview over the current activities of the **BALTEX Working Group on Data Management**. He reported that with the exception of the Radar data set, none of the other BALTEX data sets are regularly updated. It is envisaged in the near future to transfer the hydrological and oceanographic data bases from SMHI, Norrköping, Sweden, to the World Data Center for Climate (WDCC) at the Max-Planck-Institute for Meteorology Hamburg. Furthermore, an easier licence procedure (“click licence”) is envisaged for the data sets on Meteorology, Hydrology and Oceanography.

DECISION 3: The BALTEX data sets on hydrology and oceanography are to be moved from the Swedish Meteorological and Hydrological Institute (SMHI) to the World Data Center for Climate (WDCC), and the current procedure to get access to the meteorological, hydrological and oceanographical data sets shall be replaced by a simplified “click” licence as soon as this procedure is implemented at WDCC.

Action Item 1 to the BALTEX Working Group on Data Management to implement an easier online licensing system to get access to BALTEX data. Once implemented this system will be promoted via e-mail and the BALTEX web site to potential users.

Andreas Lehmann announced the termination of the **BALTEX WG on Baltic Grid**. He was asked by the BSSG Chairman to state this in written form and send to the BALTEX Secretariat.

Action Item 2 to Andreas Lehmann of the BALTEX Working Group on Baltic Grid to terminate the WG on Baltic Grid by communicating this in written form to the Chairman, briefly stating the reason for termination of the WG.

New links to accessible data bases were suggested (ENSEMBLES RT3, PRUDENCE, WATCH) and are now implemented on the BALTEX data management web site: www.baltex-research.eu/data/data_links.html.

2.3 Other reports

Jüri Elken shortly gave an overview of the newly implemented FP7 funded EU project “MyOcean”. The project MyOcean is the implementation project of the so-called Marine Core Service of the “Global Monitoring for Environment and Security (GMES)” programme, aiming at deploying the first concerted and integrated pan-European capacity for Ocean Monitoring and Forecasting. During years 2009-2011, MyOcean will lead the setting up of this new European service, grown on past investments in research & development, system development and international collaborations. MyOcean Service is expected to provide the best information available on the Ocean for the large scale (worldwide coverage) and regional scales (European seas), based on the combination of space and in situ observations, and their assimilation into 3D simulation models: temperature, salinity, currents, ice extent, sea level, primary ecosystems, and others. Maritime security, oil spill prevention, marine resources management, climate change, seasonal forecasting, coastal activities, ice sheet surveys, water quality and pollution are some of the targeted applications. Further information is available at www.myocean.eu.org/.

TOPIC 3: BALTEX until 2012

3.1 BALTEX and CEOP/GEWEX/WCRP

Hans-Jörg Isemer briefed the BSSG on recent developments and his observations concerning CEOP, as follows. CEOP is faced with some criticism from the GEWEX and WCRP levels, which may drastically be summarized as: too big and no obvious visible focus. Indeed, the numerous elements of CEOP seem to include real community efforts (such as some RHPs including BALTEX) but also initiatives based on individual interests and actions. Sometimes, it is actually difficult to identify the latter as such. The above criticism was particularly reinforced at the recent GEWEX SSG meeting.

The new future co-chair of CEOP, following Ronald Stewart probably as of January 2010, will be Dennis Lettenmaier (see e.g. at http://www.ce.washington.edu/people/faculty/bios/lettenmaier_d.html). At the recent CEOP meeting, several GEWEX SSG members were present and asked strong questions concerning regional high resolution datasets, which, indeed, has been one of the motivations for the RHPs to provide for use in the frame of CEOP-GEWEX. These questions were also directed towards BALTEX. The issues of land hydrology, water budget closure at regional catchment scale, catchment wide energy budgets and the impacts of climate change to the latter continue to be key topics in GEWEX. The appointment of Dennis Lettenmaier as new co-chair highlights the land surface hydrology topic for CEOP. Increasingly, the above core GEWEX topics seem to move to the fringes of BALTEX Phase II, maybe for good reasons. Also, many ongoing, particularly hydrological initiatives and projects in the Baltic Sea region's countries are not running under the BALTEX umbrella. The active participation of key hydrologists and projects has somewhat diminished during recent years.

BSSG shared much of the observations summarized by Hans-Jörg Isemer. The gradual shift of BALTEX towards some topics which are outside of the GEWEX-CEOP context is a fact and related to the particular regional needs and topics in the Baltic Sea Region. It was also considered obvious, that most of the actual research topics – as manifest in the objectives of BALTEX Phase II – are still contributing to the objectives of GEWEX, and thus CEOP. As to data sets requested by CEOP, SMHI will put some effort in making some BALTEX data sets available in a way easily accessible for CEOP researchers. It was however noted that the determination of dedicated joint projects with participation of BALTEX researchers and interested groups or individuals outside BALTEX (e.g. in the context of CEOP) including necessary sharing of data bases would be the preferred option rather than delivering data to data centres without feedback on the use of such data or options for joint projects. The BSSG finally welcomed again the cooperation between BALTEX and NEESPI, one of the RHPs in CEOP, with regard to the preparation of the forthcoming international BALTEX conference.

The presentation is available online in Appendix E5 on <http://www.baltex-research.eu/supplementary/>

3.2 BONUS activities and plans

Andris Andrusaitis gave an overview presentation on the history and future plans of BONUS. The current phase of BONUS+ will be terminated in 2011, and the implementation of BONUS-169 is envisaged to start in 2010 and continue until 2016 and onwards as a durable collaborative research programme. The first BONUS+ call of 2008 was considered successful, with 149 letters of intent, and 16 projects selected for a total funding of about 22 Mio €. 2/3 of this sum is to be granted by national funding agencies, and 1/3 by the EU. On 29 October

2009, the European Commission adopted the proposal on BONUS-169, with a target of 100 Mio. €, of which the EU will contribute 50%. The BONUS-169 proposal now needs the approval of both the European Parliament and the EU Member States. The full presentation is available online as Appendix E6 on <http://www.baltex-research.eu/supplementary/>.

3.3 Ongoing and planned BALTEX activities

Birgit Hünicke presented two activities which are going on in the Institute for Coastal Research at GKSS Research Centre, Geesthacht, Germany.

3.3.1. SurBACC – A survey on the perspectives of climate scientists concerning climate change and climate science in the Baltic Sea basin, with special relevance to the BACC book (Brigit Hünicke for Dennis Bray)

This survey is being conducted by Dennis Bray at GKSS Research Centre. Dennis has conducted previous similar surveys on the perspective of climate scientists on climate change, which have provided interesting insights into the way climate scientists perceive the outcome of their own research area. The survey was confined to the Baltic Sea area to allow for a Baltic specific assessment of regional climate science, and to allow the regional scientific community to comment on the process, content and possible knowledge gaps of current research, and to identify future research priorities. The second part of the survey specifically concentrates on the BACC report with the aim to evaluate the awareness and assessment of the BACC process and scientific results by the Baltic Sea area scientific community. The survey is planned to be distributed by e-mail invitation which links to an interactive web site. The survey will start in early February 2010 and will be closed at the end of March 2010. First results are expected to be communicated at the 6th Study Conference on BALTEX in Miedzyzdroje, Wolin, Poland. The presentation on SurBACC can be found in the electronic Appendix E7 on <http://www.baltex-research.eu/supplementary/>. For more infos on Dennis Bray's surveys, go to his homepage: <http://coast/staff/bray/>.

3.3.2. Overview of knowledge about sea-level variability and change in the Baltic Sea (Birgit Hünicke)

This project is a survey of published literature on sea level change in the Baltic Sea. Background is the increasing awareness of sea level rise as a possibly momentous impact of global climate change on coastal communities. In the Baltic Sea, the mean sea level depends on various oceanographic, meteorological and geological variables, making predictions here more difficult than in the open ocean. The survey, conducted by Birgit Hünicke of GKSS Research Centre Geesthacht, Germany, assembles and summarizes the available knowledge of sea level variability and change in the Baltic Sea, providing an important basis for sea level scenarios in the future. The presentation on can be found in the electronic Appendix E8 on <http://www.baltex-research.eu/supplementary/>.

3.3.3. Preparation of the 6th Study Conference on BALTEX

Some open issues for the Conference were discussed, in particular the 2nd Announcement. The title for the conference and the topic headings and descriptions were discussed, and the idea of a conference subtitle was taken up positively. The text was drafted by the Secretariat, discussed at a follow-up BALTEX chairmen telephone conference and approved by the BSSG. The conference subtitle "Changing water, energy and biogeochemical cycles in the Baltic Sea basin" was adopted to emphasize the interdisciplinary nature of BALTEX and the connection to regional climate change. The conference will consist of four main topics, which can be

further diversified if necessary, according to the submitted abstracts. The four major conference topics are:

- Climate variability and change in the past and future
- Water, energy and biogeochemical cycles in the regional Earth system
- Hydrological modelling, water management and extreme hydrological events.
- Regional adaptation to climate change.

Special sessions for the collaborating programmes BONUS, HELCOM, LOICZ and NEESPI, respectively, as well as an involvement of HyMex as a “sister programme” to BALTEX in the Mediterranean, are possible.

3.3.4. Further future BALTEX events

Apart from the 6th Study Conference on BALTEX, there are several BALTEX events which are already on the schedule for 2010-2012.

- 25th BSSG Meeting: 13 June 2010, in Miedzyzdroje, Poland, prior to the 6th Study Conference on BALTEX (see TOPIC 5).
- 26th BSSG Meeting: 22-24 November 2010 in Gothenburg. A workshop on Land Hydrology is envisaged to accompany the meeting.
- A 2nd Bornholm summer school on “Climate impacts on the Baltic Sea - from science to policy” is envisaged for 2011, presumably with a slightly different title and scope.
- First ideas have been discussed between the BALTEX and BSSSC secretariats on possibilities to jointly organize a conference on aspects of adaptation to ongoing and expected future regional climate change in the Baltic Sea Region. Such a conference would be primarily dedicated to practitioners and relevant decision makers. A possible time window and location for such a conference would be spring 2011 in Hamburg, Germany, respectively.
- A BALTEX Conference on “Climate change in the Northern Baltic Sea basin” (working title), in late 2011. This is still an early idea suggested by the BALTEX Secretariat and needs further investigation and implementation actions..
- 7th Study Conference on BALTEX on the island of Öland, Sweden, in 2012 or 2013. A suitable conference venue will be investigated in late 2010. This will be presumably the final regular International Study Conference within Phase II of BALTEX.

3.4 The profile of BALTEX Phase II and options after 2012: Questionnaire responses

Prior to the meeting, a questionnaire had been sent out by the Secretariat to all BSSG members, asking for their opinions on various issues concerning BALTEX Phase II achievements and future options. A short analysis of the questionnaire including remarks given by BSSG members was prepared by the Secretariat.

The questionnaire was divided into sections on the past and present profile of BALTEX Phase II, and the future of BALTEX, both until its scheduled termination at the end of 2012, and beyond. Here is a short summary of the responses to the 5 questions.

1. In your opinion, what are (is) the main achievement(s) of BALTEX Phase II to date?

The following list shows the responses and their frequency (how many time an issue was mentioned).

- “BACC” (6x)
- “BALTEX contribution to BONUS” (4x)
- “Broadening the scientific scope” (3x)
- “BALTEX Study Conferences” (1x)
- “Introducing the CO₂ system” (1x)
- “The summer school on Bornholm” (1x)
- “The organisation of various workshops” (1x)
- “The data management strategy” (1x)
- “Data bases for observations and model scenarios” (1x), and
- “International cooperation” (1x)

It is clear here that projects with concrete outcomes are considered most successful, i.e. the BACC book, the funded projects in BONUS, and the various events directly organized or co-organized by BALTEX.

2. If you rank the main BALTEX Phase II objectives in terms of their achievements, how would your ranking look like? (1= no achievements, to 6= very high achievements)

A simple statistical analysis was performed for this question, taking the respective arithmetic means of rankings for each objective. The mean value of 3.5 indicates a medium achievement.

Objective	Achievements ranking on a scale of 1-6
Objective 1 (Water and energy cycles)	4,1
Objective 2 (Climate variability and change)	5,0
Objective 3 (Water management and hydrology)	3,5
Objective 4 (Biogeochemical cycles)	4,2
Objective 5 (Stakeholder involvement)	3,4
Objective 6 (Education and outreach)	3,7

For Objective 2 (Climate variability and change), the best mean value of 5.0 was measured. Objectives 4 (Biogeochemical cycles) and 1 (Water and energy cycles) showed also a high ranking with 4.2 and 4.1, respectively, while Objective 3 (Water management and hydrology) ranked lower (3.5). The two non-scientific Objectives 5 (Stakeholder involvement) and 6 (Education and outreach) were also close to the mean (3.4 and 3.7, respectively).

This again demonstrates the high impact of the BACC project and also the relatively highly viewed achievements of Objectives 4 and 1.

3. How would you shortly describe the actual status of the BALTEX programme in terms of research performance, outreach, awareness levels in academic and stakeholder communities, both in your home country and in the international context? (1= very low, to 6 = very high)

When asked for the overall achievements in their own country, there were some marked differences between Poland, Germany, Denmark and Finland, who ranked the achievements in their own country rather low, and Sweden, Russia, Estonia and Belarus on the other hand, who ranked the own achievements rather high. These results, however, may be biased by the low number of responses from most countries.

When asked for the overall achievements in the international context, the result was similar, but overall responses were more positive, demonstrating the high reputation of BALTEX as a truly international programme.

4. *In the remaining 3 years until the end of BALTEX Phase II, what is your preference for actions in order to come to a successful conclusion of BALTEX Phase II?*

Here, a majority of responses noted that

- the final 7th Study Conference on BALTEX and
- a suitable summary or review publication on BALTEX Phase II
- BACC II

should be the main BALTEX Phase II actions until 2012. Apart from these suggestions, a range of activities were proposed:

- “be part in BONUS”,
- “6th Study Conference in Wolin”,
- “organisation of intl. meetings and workshops”,
- “define and make available data deliverables incl. extraction tools”,
- “implementation of a Data federation”,
- “communicating climate change and sea level rise to stakeholders and decision makers”,
- “highlight climate change impacts and eutrophication”,
- “intl. workshop on CO₂ and biogeochemical modelling”,
- “promote networking within Objective 4”,
- “validation of model output (HIRLAM, HIROMB)”,
- “involving young scientists”, and
- “search for funding possibilities”.

Question 5 asked about potential options for the time after 2012 and is treated below in TOPIC 4.

The detailed questionnaire review in table form is available online in Appendix E9 on <http://www.baltex-research.eu/supplementary/>.

3.5. How to wrap up BALTEX Phase II until 2012

With just 3 years to go until the end of BALTEX Phase II, the discussion was opened how BALTEX Phase II should be terminated and how its achievements are best disseminated. The proposed final conference on Öland will be a prominent opportunity to allow the BALTEX community to summarize BALTEX Phase II achievements. In addition to this event, one or several written final publications will be produced. This could be a series of review papers (possibly one for each objective), a special issue of an international journal, or a book. The time line could be such that first manuscript drafts could serve as presentations for the final BALTEX Study Conference. This topic will be further discussed on the next (25th) BSSG meeting on Wolin.

Action Item 3 to all BSSG members to consider and discuss ways to document BALTEX Phase II achievements in 2012/2013.

TOPIC 4: BALTEX after 2012

As a basis for discussions on possible future options for BALTEX or its successor, the Secretariat had prepared a short preliminary overview over international programmes with potential relevance to BALTEX after 2012. This list was intended not as a complete list but a first go to identify relevant existing and future research communities, programs and organisations.

BONUS-169 was identified as the prominent funding programme for many aspects of Baltic Sea research in the coming decade. International research programmes with high relevance to BALTEX include **LOICZ**, **NEESPI** and the **ESSP** programmes **WCRP/CEOP/GEWEX** and **IGBP**. Relevant national programmes may be **KALME** (Latvia), **SWECIA** (Sweden), **CliSAP**, **KlimZug** and **RADOST** (Germany). Furthermore there are two prominent stakeholder organizations which have high relevance for BALTEX: **HELCOM** and **BSSSC**. The Baltic Sea Science Congress (**BSSC**) as organizer of large Baltic Sea conferences (every two years) are considered relevant.

Question 5 of the questionnaire asked for future options after 2012.

5. In your opinion, what are options for the BALTEX programme after the scheduled termination of Phase II in 2012?

Here, a wide range of ideas emerged, given as catchwords in the following:

- Continue programme; include intensification of database; new objective: Climate change impacts on Baltic Sea basin ecosystems
- Build on available funding sources, including scientific, and socio-economic aspects
- Continue programme involving EU Strategy for the Baltic Sea region, particularly focussing on ecology, engineering, socio-economy
- Continue with Objective 4
- Form a “Baltic Sea Panel for Climate Change”
- Collaborate with other European RHPs (HyMEX, NEESPI)
- Keep Hydrology (Objective 3) as major topic; modelling biogenic-abiogenic feedback to climate change
- Terminate BALTEX as it is, but options for a follow-up programme:
- Define clear profile avoiding overlaps with other programmes
- Climate research, development, validation of RCMs, detection and attribution studies,
- Towards unifying BALTEX, BSSC, BONUS, HELCOM under one umbrella
- BALTEX Phase II profile as is too broad, too general, not visible in the Baltic Sea community

Based on this information, an open discussion on the possible future of BALTEX after 2012 was started.

It was emphasized that BONUS-169 will be crucial for much of the future research of what is now the BALTEX community, but BONUS may also profit from this network and expertise of BALTEX in defining the research needs and calls for proposals for the coming decade. While the opinion was voiced that “a BALTEX Phase III” may not be desirable, it was pointed out that it may nonetheless be wise to keep the BALTEX trademark which stands for good competence in several fields of research. In this respect, a long-term vision and a 10 years research programme with clear research questions and project ideas was considered important. Strategically it will be important to answer questions like “are we further

diversifying our research areas, or are we concentrating on few well defined areas”, or “are we going more into basic or applied research”. Keywords dropped during the discussion were

- the further concentration on “Earth System Modelling”, with a stronger linking of disciplines,
- the promotion of “detection and attribution studies”,
- the stronger involvement in “impacts of human activities on the system”,
- a further investigation on “carbon and nutrient cycles”,
- an emphasis on “linkages between the physical and biological systems on the one hand, and between land and marine systems on the other hand”, and
- “adaptation to climate change on the regional level”, which is also an EU political issue.

Furthermore, a better collaboration between countries was considered desirable. The attractiveness of the programme for researchers was considered an important issue: the programme must provide a good platform for researchers. This must be further investigated and elaborated for a follow-up programme.

BSSG members were encouraged to continue the open discussion. It will be a subject in the next BSSG meetings.

TOPIC 5: Place and time of the next BSSG meeting

The next BSSG meeting (BSSG #25) will take place in the **Hotel Amber Baltic in Miedzzydroje, Wolin, Poland**, just prior to the 6th Study Conference on BALTEX, on **Sunday, 13 June 2010** in the afternoon (starting time will be communicated by e-mail).

TOPIC 6: Any other business

Hans-Jörg Isemer announced that Marcus Reckermann will be the new head of the International BALTEX Secretariat (IBS), as of this BSSG meeting. Hans-Jörg recalled the present staff of the IBS, with Silke Köppen (half time appointed to IBS), Marcus Reckermann (full-time appointed to IBS) and Hans-Jörg Isemer (30% time appointed to IBS).

Hans-Jörg had acted as head of the IBS ever since its establishment in 1994, with a 2-years interruption during 1999 to 2001. He also recalled that the IBS is entirely financed by the GKSS Research Centre Geesthacht. In agreement with all IBS staff members as well as the GKSS directors and the BALTEX SSG chairs, who had been informed prior to this meeting, a rotation of the function of the head of the IBS to Marcus Reckermann was suggested and herewith officially brought to the attention of the BSSG and the community, effective as of this BSSG meeting. With much of the work of the IBS anyway being done by Marcus, this rotation is meant to honour his various contributions to the development of the BALTEX programme and increase his role in terms of responsibility of the IBS work. Other reasons for this rotation include the gradual shift of the BALTEX profile to biogeochemical cycles research, where Marcus has a stronger educational background.

Hans-Jörg stressed that he will continue working for the IBS, with a possibly somehow reduced visibility towards the communities the IBS is interacting with. He will focus his IBS-related work on GEWEX and BONUS connections and partly on interactions with

stakeholders such as BSSSC. Hans-Jörg re-confirmed the continuous present and future support of GKSS to the International BALTEX Secretariat, and thus to the BALTEX programme.

The BSSG chairman thanked Hans-Jörg for his commitment for BALTEX in the past (since the beginning of BALTEX) and his readiness to remain in the BALTEX management. Marcus was welcomed as the new head of the International BALTEX Secretariat.

Some Abbreviations and Acronyms

BACC	BALTEX Assessment of Climate Change for the Baltic Sea basin
BACC II	2 nd BALTEX Assessment of Climate Change for the Baltic Sea basin
BALTIC GRID	A network to share expertise and data in BALTEX
BALTRAD	BALTEX Radar Network, also project funded through INTERREG-IV
BONUS	Baltic Organisations Network for Funding Science EEIG
BRDC	BALTEX Radar Data Centre
BSR-CLIDANET	Baltic Sea Region Climate Data Network
BSSG	BALTEX Science Steering Group
BSSSC	Baltic Sea States Subregional Co-operation
BWGR	BALTEX Working Group on Radar
BWRW	Baltic Weather Radar Workshop
CEOP	Coordinated Energy and Water Cycle Observations Project
CliSAP	Integrated Climate System Analysis and Prediction (at University of Hamburg, Germany)
DMI	Danish Meteorological Institute
EC	European Commission
EEIG	European Economic Interest Grouping
ENSEMBLES	Ensemble prediction systems for climate change (FP6 project)
ESSP	Earth System Science Partnership
GEWEX	Global Energy and Water Cycle Experiment
GKSS	GKSS Research Centre Geesthacht, Germany
HELCOM	Helsinki Commission
HIRLAM	High Resolution Local Area Modelling for numerical weather prediction
HIROMB	High Resolution Operational Model of the Baltic
HyMex	HYdrological Cycle in the Mediterranean EXperiment
IBS	International BALTEX Secretariat
IGBP	International Geosphere-Biosphere Programme
KALME	Latvian National Research Program on “Climate Change Impact on the Water Environment of Latvia”
KlimZug	Klimawandel in Regionen zukunftsfähig gestalten (German Ministry for Education and Research funded programme on regional climate change in Germany)
LOICZ	Land Ocean Interactions in the Coastal Zone
NEESPI	The Northern Eurasia Earth Science Partnership Initiative
NORA	Nordic Co-operation
NORDMET	Nordic co-operation in meteorology
RADOST	Regionale Anpassungsstrategien für die deutsche Ostseeküste (Regional adaptation strategies for the German Baltic Sea coast)
RCM	Regional Climate Model
RHP	Regional Hydroclimate Project
SMHI	Swedish Meteorological and Hydrological Institute
SSC	Science Steering Committee
SSG	Science Steering Group
SurBACC	A survey on the perspectives of climate scientists concerning climate change and climate science in the Baltic Sea basin, with special relevance to the BACC book
SWECIA	Swedish research programme on Climate, Impacts and Adaptation
SYKE	Finnish Environment Institute
WCRP	World Climate Research Programme
WDCC	World Data Centre for Climate
WG	Working Group

Appendix 1: Workshop and Meeting agenda**24th BALTEX SSG Meeting**

Hosted by the

**University of Latvia
Riga, Latvia****16 – 18 November 2009****PROVISIONAL AGENDA AND EXPLANATORY MEMORANDUM**

The BSSG meeting will start with a Workshop entitled *"Climate change impacts on the water environment in Latvia and implications for the southern Baltic Sea basin"*, scheduled for Monday afternoon, 16 November 2009. For the programme, see separate agenda (below). The seminar will be held in the **University of Latvia Main Building, Raina Boulevard 19, Riga**.

The **business part of the BSSG meeting** will begin in the morning of Tuesday, 17 November (Day 2 of the meeting) and is scheduled to be concluded at noon on Wednesday, 18 November 2009. It will take place at the **Faculty of Biology, Kronvalda Boulevard 4**. Key topics of this meeting will be the discussion of potential activities for the remaining 3 years of BALTEX phase II, and an open discussion on the future of BALTEX after 2012.

Day 1: Monday, 16 November 2009

13:00 **BALTEX Workshop (University of Latvia, Main Building, Raina Boulevard 19)**

"Climate change impacts on the water environment in Latvia and implications for the southern Baltic Sea basin"

This series of presentations emphasizes on results from the national Latvian research programme KALME. The scope of the programme encompasses most BALTEX objectives, spanning from a hydrological, geological and biogeochemical description of the system, to modelling of possible future changes. This has a high relevance for the 2nd BALTEX Assessment of Climate Change for the Baltic Sea basin (BACC II), as the results of KALME may be representative for the southern Baltic Sea basin.

Chairs and Organisation: Andris Andrusaitis and Maris Klavins, University of Latvia

For the programme, see separate agenda.

18:00 **Closing of Workshop**

19:30 **Dinner**

Day 2: Tuesday, 17 November 2009**BSSG meeting (University of Latvia, Faculty of Biology, Kronvalda Boulevard 4)****9:00 Welcome by the Host and the Chairman****TOP 1: Organisational issues**

- 1.1 Approval of the agenda**
- 1.2 Approval of the previous BALTEX SSG meeting minutes**
- 1.3 Review of previous BALTEX SSG meeting action items**
- 1.4 BALTEX SSG and Working Group Membership changes**
 - *Timo Vihma, Ole Bossing Christensen and Juha-Markku Leppänen* resign from the BSSG, *Tapani Stipa, Philippe Lucas-Picher and Hermanni Kaartokallio* were proposed as new candidates: **Presentation and approval**

10:00 TOP 2: Status reports and BALTEX activities in 2009

- 2.1 Report of the Chairman (J. Langner)**
- 2.2 Report of the Secretariat (H.-J. Isemer, M. Reckermann)**
 - RCM Workshop Lund, Sweden, May 2009
 - SZC Climate Change Conference in Szczecin, Poland, June 2009
 - Bornholm Summer School, July-August 2009
 - Completion of the Revised BALTEX Phase II Objectives
 - Connections to BSSSC (Baltic Sea States Subregional Cooperation)

11:00 *Coffee Break***11:30 2.3 Working Group Reports**

- Radar (representative for Jarmo Koistinen)
- BACC II (representative for Hans von Storch)
- Regional Climate Models (representative for Markus Meier)
- Data, including BALTEX Data Centres Status (representative for M. Lautenschlager)

2.4 Other reports by BSSG members**13:00 LUNCH****14:00 TOP 3: BALTEX until 2012****3.1 BALTEX and CEOP/GEWEX/WCRP (Hans-Jörg Isemer)**

- Coordinated Energy and Water Cycle Observations Project (CEOP) – Status
- BALTEX data sets – commitments to CEOP/GEWEX
- Closing the water and energy budgets of the Baltic Sea basin – Some reflections on the key GEWEX objective

3.2 BONUS activities and plans

- Recent developments and future plans in BONUS and options for BALTEX (Jüri Elken/Andris Andrusaitis)

3.3 Planned BALTEX activities

- A survey of the perspectives of climate scientists concerning climate change and climate science in the Baltic Sea basin, with special relevance to the BACC book (SurBACC) (Birgit Hünicke for Dennis Bray and Hans von Storch)
- An assessment of current knowledge on sea level change in the Baltic Sea (Birgit Hünicke)
- 6th Study Conference on BALTEX, 14-18 June 2010, Wolin, Poland (Janusz Pempkowiak, Hans-Jörg Isemer, Marcus Reckermann)
- Others (projects, workshops, conferences, Summer Schools etc. (all)

3.4 Discussion of the BALTEX Phase II profile until 2012

- Analysis of questionnaire responses and group discussion (all)

15:30***Coffee break*****3.5 Possible format for an achievement report at the end of BALTEX Phase II**

- A discussion on how BALTEX Phase II could be concluded. There are various options, like a book, a special journal issue, a review paper, or the like. First thoughts and responsibilities will be discussed (all)

16:30**TOP 4: BALTEX after 2012**

- Short overview over current and foreseeable programmes and projects which have a scope similar to BALTEX (Hans-Jörg Isemer, Marcus Reckermann, all)
- Analysis of questionnaire responses, various options for a successor to BALTEX will be discussed (all)

18:00**Closing of Day 2****Day 3: Wednesday, 18 November 2009****BSSG meeting continued****9:00****TOP 4: BALTEX after 2012 (*continued*)**
Open discussion**TOP 5: Place and timing of next BSSG meeting****TOP 6: Any other business****13:00****Closing of the BSSG meeting**



BALTEX Workshop

"Climate change impacts on the water environment in Latvia and implications for the southern Baltic Sea basin"

16 November 2009

University of Latvia, Main Building
Raina Boulevard 19, Riga

This series of presentations emphasizes on results from the national Latvian research programme KALME. The scope of the programme encompasses most BALTEX objectives, spanning from a hydrological, geological and biogeochemical description of the system, to modelling of possible future changes. This has a high relevance for the 2nd BALTEX Assessment of Climate Change for the Baltic Sea basin (BACC II), as the results of KALME may be representative for the southern Baltic Sea basin.

Chairs and Organisation: Andris Andrusaitis and Maris Klavins, University of Latvia

Agenda

A. Presentations related to KALME

13:00 - 13:10

Andris Andrusaitis/Maris Klavins: *The Latvian Climate Change programme "KALME"*

13:10 - 13:30

Uldis Bethers, University of Latvia: *Downscaling of climate change scenarios, future runoff and sea state modelling for Latvian waters*

13:30 - 13:50

Elga Apsite, University of Latvia, and Viesturs Jansons, Latvian University of Agriculture: *River Basin Hydrology and Nutrient Run-off from Land to the Surface Waters*

13:50 - 14:10

Gunta Springe, University of Latvia, and Arturs Skute, University of Daugavpils: *Climate change impact on Freshwater Ecosystems in Latvia*

14:10 - 14:30

Janis Lapinskis and Guntis Eberhards, University of Latvia: *Geological coastal processes and forecast of the Latvian sea coast*

14:30 - 15:00 Coffee break

15:00 - 15:20

Davis Grubers, University of Daugavpils: *Climate change impact on recurrence and regime of runoff extremes: floods and lasting droughts*

15:20 - 15:40

Juris Aigars and Baerbel Meuller-Karulis, Latvian Institute of Aquatic Ecology: *Future climate scenarios for phosphorus and nitrogen dynamics in the Gulf of Riga*

15:40 - 16:00

Anda Ikaunieca, Latvian Institute of Aquatic Ecology: *Hopes and expectations: the conceptual course of future for marine ecosystems and fishery*

16:00 - 16:20

Kristine Abolina, University of Latvia: *Space and time for climate change adaptation: Challenges for society and scientists*

B. Other presentations

16:20 – 16:40

Jan Harff, University of Szczecin, Poland: *The environmental and socio-economic response to climate change in the southern Baltic region: An international conference held in Szczecin, May 2009*

16:40 – 17:00

Berit Arheimer, SMHI, Sweden: *Balt-HYPE: a tool for high resolution hydrological modelling of the Baltic basin*

17:00 – 17:20

Anders Omstedt, University of Gothenburg, Sweden: *On BACC II*

17:20 – 18:00

Open discussion

18:00 Closing of the Workshop**19:30 Dinner**

Appendix 2: Participants of the 24rd BSSG meeting

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Appendix 3: BALTEX Working Group on Radar - Report

12 Nov. 2009

**Status Summary of BALTEX Working Group on Radar (BWGR)
and BALTEX Radar Data Centre (BRDC)**

Jarmo Koistinen
Finnish Meteorological Institute

- The Working Group has been rather inactive recently after the main achievements have been reached some years ago (see the more detailed documentation presented in BSSG23 in Helsinki). There are no changes in the memberships of the WG (representatives exist from RU, FI, SE, DK, EE, LT, PL, GE, UK and NL).
- BWGR members have not been able to participate major global precipitation Conferences (e.g. GEWEX) during the year 2009.
- The annual Baltic Weather Radar Workshop (BWRW), which is a joint effort of BWGR and the activity NORA (hosted by the Nordic weather services but open for any European radar contributions) was canceled this year due to a sudden overlap with an other Workshop.
- The EU project BALTRAD (see baltrad.eu) is propagating well and the achievements will be shown in the next BALTEX Study Conference.
- The national radar networks are expanding little by little and some national networks (Germany, Denmark, Finland, Estonia) are in the updating process for dual polarization systems.
- No coordinated radar research actions have been performed jointly among the BALTEX countries but several national projects exist which serve the goals of BALTEX. Hopefully many of those will be presented in the next Study Conference.
- BALTEX Radar Data Centre (BRDC) has been receiving and archiving data mostly in autopilot mode as Daniel Michelson has been in long consulting visits in Botswana. Unfortunately during a recent visit somebody at SMHI had made a command to delete the whole database. This action was interrupted after some period. At the moment it is not known how large damage was introduced to the BRDC database.

International BALTEX Secretariat Publication Series

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- No. 1:** Minutes of First Meeting of the BALTEX Science Steering Group held at GKSS Research Centre in Geesthacht, Germany, 16-17 May, 1994. August 1994.
- No. 2:** Baltic Sea Experiment BALTEX – Initial Implementation Plan, 84 pages. March 1995.
- No. 3:** First Study Conference on BALTEX, Visby, Sweden, August 28 – September 1, 1995. Conference Proceedings. Editor: A. Omstedt, SMHI Norrköping, Sweden, 190 pages. August 1995.
- 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, 46 pages. October 1996.
- 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, 172 pages. August 1997.
- No. 9:** The Main BALTEX Experiment 1999-2001 – *BRIDGE*. Strategic Plan, 78 pages. October 1997.
- No. 10:** Minutes of Fifth Meeting of the BALTEX Science Steering Group held at Latvian Hydro-meteorological 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, 251 pages. May 1998.
- 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.
- No. 20:** Third Study Conference on BALTEX, Mariehamn, Island of Åland, Finland, 2-6 July 2001, Conference Proceedings. Editor: Jens Meywerk, 264 pages. July 2001.
- No. 21:** Minutes of 11th Meeting of the BALTEX Science Steering Group held at Max-Planck-Institute for Meteorology in Hamburg, Germany, 13-14 November 2000. July 2001.
- No. 22:** Minutes of 12th Meeting of the BALTEX Science Steering Group held at Royal Netherlands Meteorological Institute (KNMI), De Bilt, The Netherlands, 12-14 November 2001. April 2002.
- No. 23:** Minutes of 13th Meeting of the BALTEX Science Steering Group held at Estonian Business School (EBS), Centre for Baltic Studies, Tallinn, Estonia, 17-19 June 2002. September 2002.
- No. 24:** The eight BALTIMOS Field Experiments 1998-2001. Field Reports and Examples of Measurements. Editors: Burghard Brümmer, Gerd Müller, David Schröder, Amélie Kirchgäßner, Jouko Launiainen, Timo Vihma. 138 pages. April 2003.
- No. 25:** Minutes of 14th Meeting of the BALTEX Science Steering Group held at Lund University, Department of Physical Geography and Ecosystems Analysis, Lund, Sweden, 18 - 20 November 2002. May 2003.
- No. 26:** CLIWA-NET: BALTEX BRIDGE Cloud Liquid Water Network. Final Report. Editors: Susanne Crewell, Clemens Simmer, Arnout Feijt, Erik van Meijgaard, 53 pages. July 2003.
- No. 27:** Minutes of 15th Meeting of the BALTEX Science Steering Group held at Risø National Laboratory, Wind Energy Department, Roskilde, Denmark, 8 - 10 September 2003. January 2004.
- No. 28:** Science Plan for BALTEX Phase II 2003 – 2012. February 2004, 43 pages.
- No. 29:** Fourth Study Conference on BALTEX, Gudhjem, Bornholm, Denmark, 24 - 28 May 2004, Conference Proceedings. Editor: Hans-Jörg Isemer, 189 pages. May 2004.
- No. 30:** Minutes of 16th Meeting of the BALTEX Science Steering Group held at Gudhjem Bibliotek, Gudhjem, Bornholm, Denmark, 23 May 2004. October 2004.
- No. 31:** BALTEX Phase I 1993-2002 – State of the Art Report. Editors: Daniela Jacob and Anders Omstedt, 181 pages, October 2005.
- No. 32:** Minutes of 17th Meeting of the BALTEX Science Steering Group held at Poznan, Poland, 24 – 26 November 2004. November 2005.
- No. 33:** Minutes of 18th Meeting of the BALTEX Science Steering Group held at Meteorological Observatory Lindenberg – Richard Aßmann Observatory, Germany, 18 – 20 October 2005. February 2006.

- No. 34:** BALTEX Phase II 2003 – 2012 Science Framework and Implementation Strategy, 95 pages. April 2006.
- No. 35:** BALTEX Assessment of Climate Change for the Baltic Sea Basin. Summary. Editors: The BACC lead author group, 26 pages. June 2006.
- No. 36:** Minutes of 19th Meeting of the BALTEX Science Steering Group held at Ågrenska Villan of Göteborg University Sweden, 23 – 24 May 2006. October 2006.
- No. 37:** Minutes of 20th Meeting of the BALTEX Science Steering Group held at St. Petersburg, Russia, 6 – 7 December 2006. March 2007.
- No. 38:** Fifth Study Conference on BALTEX, Kuressaare, Saaremaa, Estonia, 4 - 8 June 2007. Conference Proceedings. Editor: Hans-Jörg Isemer, 209 pages. May 2007.
- No. 39:** Minutes of 21st Meeting of the BALTEX Science Steering Group held at Kuressaare, Saaremaa, Estonia, 3 June 2007. September 2007.
- No. 40:** Minutes of 22nd Meeting of the BALTEX Science Steering Group held at SMHI, Norrköping, Sweden, 23-25 January 2008. May 2008.
- No. 41:** 2nd International Lund RCM Workshop: 21st Challenges in Regional-scale Climate Modelling. Lund University, 4-8 May 2009. Workshop Proceedings. Editors: Burkhardt Rockel, Lars Bärring and Marcus Reckermann. 292 pages, April 2009.
- No. 42:** International Conference on Climate Change – The environmental and socio-economic response in the southern Baltic region. University of Szczecin, 25-28 May 2009. Conference Proceedings. Editors: Andrzej Witkowski, Jan Harff and Hans-Jörg Isemer. 140 pages, May 2009.
- No. 43:** Minutes of 23rd Meeting of the BALTEX Science Steering Group held at Finnish Meteorological Institute, Helsinki, Finland, 12 - 14 January 2009. July 2009.
- No. 44:** BALTEX Phase II 2003 – 2012 Revised Objectives. A Summary Amendment to the BALTEX Phase II Science Framework and Implementation Plan. 23 pages. November 2009.
- No. 45:** Minutes of 24th Meeting of the BALTEX Science Steering Group held at the University of Riga, Riga, Latvia, 16 - 18 November 2009. March 2010.

Copies are available upon request from the International BALTEX Secretariat.