6th Study Conference on BALTEX

Międzyzdroje, Island of Wolin, Poland, 14 to 18 June 2010

Synopsis and Session Summaries

A. Synopsis

The conference was attended by 120 participants from 14 countries, mostly from states in the Baltic Sea basin: Poland, Germany, Sweden, Estonia, Russia, Finland, Latvia, Lithuania, Belarus and Denmark, but also from other countries such as Switzerland, Serbia and the USA. 69 oral presentations and 38 posters were presented, spanning the scope of BALTEX research: regional climate change, water, energy and biogeochemical cycles and transport processes in the regional Earth system, as well as water management and extreme hydrological events. Almost 2/3 of the contributions addressed cross-discipline topics, underlining the interdisciplinary nature of the conference and BALTEX in general. The beautiful location on the fine sandy beach of Wolin, together with the mostly sunny weather contributed to the good spirit.

A number of presentations under the session heading “Climate variability and change in the past and future” dealt with the question of sea level rise in the Baltic Sea. It was shown that post-glacial land uplift will probably out-compete sea level rise in the northern Baltic Sea for at least the next 50 years; however, the southern Baltic Sea coasts of Denmark, Germany and Poland experience no land uplift, but a slight depression. This makes these regions especially vulnerable for sea level rise, calling for specific adaptation measures. An important unsolved question is whether or not sea level rise will accelerate in the future. A second emphasis of this session was an overview over recent efforts in regional climate modeling in the Baltic Sea basin, with a special view on uncertainties and detection and attribution studies. The session on “Water, energy and biogeochemical cycles in the regional Earth system” featured several presentations on nutrient and carbon cycles and budgets (including studies on seawater pH and acidification), as well as modeling efforts. It was also shown that new and efficient waste water treatment plans built in Poland in the last two decades have caused a significant decrease of nutrient inputs to the Baltic Sea through the Polish rivers Odra and Vistula. This could be a great leap forward in reducing eutrophication in the Baltic Sea. The session on “Hydrological modeling, water management and extreme hydrological events” featured presentations on the variability of extreme events like storm surges, droughts and extreme precipitation, and recent attempts to forecast those events. A new project to exploit high-resolution modeling of surface currents for environmental management of the Baltic Sea (optimization of ship routing, identification of environmental risk areas, etc.) was introduced in several presentations. A dedicated session on “Regional adaptation to climate change” presented examples of regional adaptation projects in Northern Europe. A special highlight was a multimedia presentation designed to be presented in a multimedia theatre dome, with the aim of demonstrating scientific findings on global and regional climate change in a comprehensive way to non-experts.

B. Session summaries

Opening session

The opening session was dedicated to overview presentations related to the conference location and organizations relevant for BALTEX. Opening the scientific part of the conference, **Zbigniew W. Kundzewicz** and **Rajmund Przybylak** provided some general information on Poland, its climate, its waters and its people. Poland has a moderate climate which is markedly influenced by air masses from different origins – maritime and continental, arctic and tropical. Nearly the entire territory of Poland belongs to the Baltic Sea Basin and is largely divided into two large river basins – the Vistula and the Odra basins. Poland suffers from three basic water-related problems: too much, too little and too polluted water. However, a considerable improvement of water quality has been achieved, and further improvements are expected related to the implementation of the EU Water Framework Directive. Finally, the complex history of the country was reviewed briefly, including the country´s interlinkages with the other states sharing the Baltic Sea basin.

Kaisa Kononen and **Andris Andrusaitis** gave an overview over BONUS, the funding scheme of the EU for the Baltic Sea research. The Joint Baltic Sea Research Programme - BONUS-169 - is currently developing its strategic research agenda for the years 2012-2016. It aims to develop a scientific basis for the Ecosystem Approach to Management (EAM), by fostering policy driven, excellence based research on the Baltic Sea system. To achieve this, a dynamic approach will be followed, incorporating both marine and coastal aspects, and recognizing the importance of the catchment basin. Furthermore, a stronger involvement of stakeholders is envisaged. Main research themes will be: 1: The sea-coast-catchment continuum, 2: The changing ecosystem, 3: Sustainable coastal and marine goods and services, and 4: Chemical condition of the Baltic Sea System. A poll for proposals for sub-themes and research issues to be treated in BONUS 169 in the period 2012-2016, for which funding is secured, has been launched. The first call for proposals is scheduled for late 2011.

Finally, **Pavel Groisman** presented NEESPI, the BALTEX “sister programme” within the World Climate Research Programme WCRP, GEWEX and CEOP. NEESPI strives to understand how the land ecosystems and continental water dynamics in Northern Eurasia interact with and alter the climatic system, biosphere, atmosphere, and hydrosphere of the Earth. The Baltic Sea basin covers a large part of the north-western part of the NEESPI domain. Research on regional climate change, methane emissions from the Arctic shelf seas, carbon cycle monitoring across the boreal zone of Eurasia, modelling of the regional climate, hydrology and cryosphere, as well as environmental, land use and socio-economic studies are among the topics of numerous NEESPI studies.

Topic 1: Climate variability and change in the past and future

Observations and impacts

Andreas Lehmann et al. opened the session with an assessment of climate variability of the Baltic Sea area for the period 1958-2009, in which they showed that a warming is already ongoing in the Baltic Sea area, with a slight acceleration since the eighties. **Klaus Getzlaff et al.** took on this subject by showing that changes in atmospheric conditions have an impact on Baltic Sea mean circulation. **Olga Bulygina et al.** reported that a faster snow melt in spring is a consequence of warming over North-Western Russia. **Jaak Jaagus** correlated changes in wind directions in Estonia during 1966-2008 to large-scale atmospheric circulation patterns and found that “warm” westerly winds have increased in winter, while “cold” easterly wind have decreased. This had also been reported by Lehmann et al. in their presentation.

Sea-level change is a popular topic, but the presentation by **Birgit Hünicke** demonstrated how far we are from understanding it. She gave an overview over the existing knowledge and pointed out unsolved problems. The fundamental uncertainty seems to be connected with differences between land rise due to glacial isostatic adjustment and the absolute sea level rise. Some improvement of the estimates of sea level change can be expected from satellite altimetry. On the other hand, society is more interested in the position of the sea level relative to land, as this allows identifying threats connected to coastal processes. The topic was continued by **Eduardo Zorita** and **Birgit Hünicke** who tried to estimate changes in the rate of sea level rise. On global scales, an accelerated sea level rise is under debate, but for the Baltic Sea, the forecast seems to be linear although some uncertainty prevails connected to climate factors and the dynamics of polar ice sheets. **Martin Ekman** presented an analysis of a 300-year long time series of recorded sea level data at different locations of the Baltic Sea coasts. Observations in Stockholm started in 1774 and in Swinoujscie in 1881.
Two papers (**Robert Kostecki** and **Beata Janczak-Kostecka; Wenyan Zhang et al.**) dealt with geological changes in the Baltic Sea region over geological time scales. The first paper was based on sediment analysis and described environmental changes in the Pomeranian Bay during the Holocene – its formation and further development. The second paper presented a centennial-scale (or longer) model to simulate coastal evolution due to wave and wind influence. A case study demonstrating the evolution of the Darss-Zingst peninsula during the Holocene was presented. The authors affirm that the model is general and can be applied also for coasts of other types (cliffs) after an analysis of the key processes. The model could be a suitable tool to study coastal evolution under long-term climate change. A new working group for interdisciplinary climate dynamics research in the southern Baltic Sea basin was formed at the University of Szczecin (**Andrzej Witkowski et al.**) The perspectives are the intensification of international cooperation and the establishment of a research centre at Szczecin. Recent activities and future plans were presented.

Models and impacts
Erik Kjellström et al. started the session with an overview over recent regional ensemble climate model results. They confirmed the notion of a warmer and wetter Baltic Sea area in the future. The spread of the ensembles depends largely on the chosen global models. Increasing trends in the components of the hydrological cycle were found in all RCM experiments by **Philip Lorenz et al.**, and climate change signals are in most cases larger than the decadal variability. In one of the presentations showing first results from the BONUS projects, **Björn Carlsson et al.** presented an analysis of water balance, wind and temperature over the Baltic Sea drainage basin, using dynamically downscaled climate ensemble simulations. **Grigory Nikulin et al.** reported that wind extreme projections over the Baltic Sea region show a strong sensitivity to the driving GCMs, and also a spread among the results comparable to the spread related to natural variability. The question whether anthropogenic climate change in Northern Europe can be detected was treated by **Jonas Bhend** and **Hans von Storch**. For temperature and precipitation, they stated that a change different from internal variability can be clearly detected; however, an anthropogenic explanation for the observed change seems plausible and even necessary only for temperature. For precipitation, this has not really been shown at this point. **Zbigniew Kundzewicz** and **H. Lorenc** showed an analysis of categorical temperatures (i.e. a qualitative classification of temperature values, as absolute values are not freely available in Poland) to demonstrate the warming trend in Poland. This method results in an intuitively comprehendible presentation of the warming in Poland. **Markus Meier** presented first results of the BONUS project ECOSUPPORT (Advanced modeling tool for scenarios of the Baltic Sea ECOsystem to SUPPORT decision making). The transient scenario simulations based on coupled atmosphere-ice-ocean models showed an increased runoff in the future, while mean wind speed changes are statistically not

significant, with salinity decreases smaller than in BACC scenario simulations. Oxygen concentrations decrease in the simulations but there are slight increases along the slopes (i.e. reduced hypoxic areas but oxygen decreases in the deep sub-basins). Overall, the simulations showed an increased stability at the bottom of the mixed layer and increased phytoplankton concentrations in some regions. **Vladimir Ryabchenko et al.** showed some model results simulating climate change impacts on the Baltic Sea ecosystem. They made assumptions about the development of different phytoplankton groups, speculating that the primary production of flagellates may increase during the whole century; that of green-blue algae may increase in the first half of the 21st century and decrease in the second half, and that of diatoms may experience an overall decrease. The influence of climate change on biogeochemical fluxes of nitrogen and phosphorus in the Gulf of Riga was described by **Bärbel Müller-Karulis et al**. They concluded that a more stable and longer stratification causes lower demersal oxygen concentrations, a slightly decreased denitrification, increase in phytoplankton growth and primary productivity caused by increased nutrient regeneration, and slightly increased winter nutrient concentrations. Phytoplankton species composition would remain similar in these simulations, but the spring bloom would be earlier (earlier stratification, no ice cover). Interestingly, there would be a stronger nutrient limitation during the summer, leading to a lower summer phytoplankton biomass. This could also lead to higher concentrations of non-limiting nutrients in summer and an increased nutrient export to the Baltic Proper (both N and P). The presentation by **Thomas Pluntke et al.** turned away from the Baltic Sea to the smaller catchment basins and described the impact of climate change on the water balance of the Western Bug, a mesoscale subcatchment basin in the western Ukraine, eastern Poland and southern Belarus. First conclusions of their work are that a change in the water balance is recognizable, with more rain and less snow, an increased runoff and decreased evapotranspiration, leading to good growing conditions in spring and early summer but water stress for plants in late summer. Finally, **Chantal Donnelly** presented BALT-HYPE, a model for the high-resolution simulation of nutrient reduction scenarios for the Baltic Sea catchment, which is used in the ECOSUPPORT project of BONUS.

Topic 2a: Water and energy cycles in the regional Earth system

This session dealt with a core discipline of BALTEX. **Frank Beyrich et al.** presented the current status of the BALTEX in-situ reference sites in Cabauw, Lindenberg and Sodakylä. These reference sites which provide high-resolution meteorological data are crucial for the calibration of meteorological and climatological models. **Burkhardt Rockel** presented some methodological remarks on modelling the energy and water cycle over the BALTEX domain, and posed the question whether the “closing” of the water and energy budget is really a worthwhile aim to pursue. **Daniel Michelson** presented BALTRAD, the advanced weather radar network for the Baltic Sea region. **Frederik Schenk** and **Eduardo Zorita** presented new dataset of highly resolved atmospheric forcing fields for 1850-2009, for a reconstruction of climatic conditions to be used for the BONUS project ECOSUPPORT. **Sirje Keevallik** compared wind parameters in the centre of the Gulf of Finland from measurements and HIRLAM outputs. **Anna Rutgersson** stressed the importance of air sea interaction processes (wave action, heat flux) to be included in climate models as they can have significant secondary effects in both atmosphere and ocean models. This was further elaborated by **Christoph Zülicke** in his presentation on air-sea fluxes of momentum and mass in the presence of wind waves, and **Andrus Räämet** and **Tarmo Soomere** presented a reliability study of wave climate modelling in the Baltic Sea. **Agnieszka Ponczkowska et al.** showed how the optical properties of aerosols can have an impact on climate change processes. Another interesting aspect of climate modelling was described by **Dennis Söhl et al.**: the

sensitivity to land use changes. They showed that air temperature, wind speed, and precipitation changed with changing land use.

Topic 2b: Biogeochemical cycles in the regional Earth system

Bernd Schneider lectured on the subject "Phosphate release at the sediment surface during anoxic conditions: Myths, mysteries and facts". Basing on a 40 year long data series (1969-2009), new insights into the biogeochemical behavior of phosphorus under oxic/suboxic/reducing conditions in the deep water layer of the Gotland Deep were provided. Depending on the apparent oxygen utilization, the accumulated phosphate release from the sediments into the above bottom water layer is apparently controlled by diffusion from the sediments or/and biochemical degradation of organic matter, and not primarily by the redox conditions. **Monika Nausch** presented results on dissolved inorganic phosphorus (DIP) and dissolved organic phosphorus (DOP) distributions in the Baltic Sea. Lower concentrations of DOP in the Gulf of Bothnia and the Kattegat were attributed to the general pattern of total dissolved phosphorus abundance in the Baltic Sea. **Marianna Pastuszak** and **K. Pawlikowski** delivered a presentation entitled "Response of Polish Rivers (Vistula, Oder) to reduced pressure from point sources and agriculture during the transition period (1988-2008)". A substantial reduction of nutrient loads from the Polish territory was attributed to the transformation of the economy in the early 1990s, and the associated construction of sewage treatment plants in Poland. The per-capita nutrient runoff from the Polish territory decreased by 30% in the last two decades, indicating a tremendous effort towards limiting nutrient discharges to the Baltic Sea. **Björn Helm et al.** (substituting **Tatjana Terekhanova**) demonstrated that modeling is a valuable tool in assessing loads of anthropogenic substances originating in a small-scale catchment, while experimental data on concentrations, run-offs and loads are required to validate the modeled data. **Anders Grimvall et al.** presented a trend analysis of pH data from the central Baltic. Based on the longest currently available pH time series (about 20 years) with monthly resolution (SMHI monitoring), it was shown that a decreasing trend in pH due to increasing atmospheric CO_2 is not yet detectable. It was also indicated that measurements should be complemented by process-based models for the attribution of detected changes; measured data alone provide a poor basis for trend detection. In any case, the need for an enhanced monitoring programme concerning alkalinity and pH is obvious. **Germo Väli et al.** simulated nutrient upwelling to the upper 10 m layer from different depths during an upwelling event in the Gulf of Finland, both on the Finnish and Estonian coasts. The amount of upwelled nutrients on the Estonian side of the Gulf is larger due to upwelling from deeper layers; a phenomenon possibly associated with bottom topography. **Karol Kulinski** and **Janusz Pempkowiak** presented a carbon budget for the Baltic Sea, concluding that, based on the mass balance approach, the Baltic Sea is a net source of CO_2 to the atmosphere, and that the Baltic Sea constitutes a buffer for the high input of terrestrial carbon. Excess carbon is exported to the North Sea and buried in the sediments. Retrospective simulations of dissolved organic carbon on the land surface of the Baltic Sea catchment area, connected with climate forcings, were performed by **Guy Schurgers et al.** Results showed that observed changes in total organic carbon concentration match the pattern in gross primary production and dissolved organic carbon production (increases), but not in dissolved organic carbon concentration. Dynamic simulations of DOC fluxes can help to understand the changes in past and future, but processes during river transport and changes in land use and forestry management have not been accounted for in these simulations and could play a role in past and future DOC changes. **Kari Eilola** gave an overview over the BONUS project ECOSUPPORT, a joint effort to develop a coupled physical-biogeochemical

model system. Uncertainties in the models are mostly related to the bioavailable fractions of nutrient loadings from land, and to key processes like sediment fluxes that are presently not well known.

The session showed that modeling is an indispensable tool to understand and characterize the biogeochemistry of the Baltic Sea and to estimate consequences of climate change, increasing atmospheric CO_2 concentrations and land use changes for the Baltic Sea ecosystem. The major uncertainties in the model simulations can be attributed to insufficient knowledge concerning the exchange and transformation processes at the sediment/water interface. This deficit relates in particular to phosphorus which is the major driver for the Baltic Sea productivity. Another shortcoming is related to the input data. Although the nutrient inputs by river water and atmospheric deposition are regularly assessed by HELCOM, it remains an open question how much of the discharged nutrients are bioavailable. First model results were presented for the riverine input of dissolved organic carbon which indicated the necessity to include biogeochemical processes in the catchment into a comprehensive Baltic Sea ecosystem model. Furthermore, a detailed analysis of pH time series data in the Baltic Sea implies that reports on downward pH trends in context with the "acidification" discussion may be based on artifacts and must be taken with caution.

The aim of the work by **Mariusz Zalewski et al.** was to quantitatively describe matter fluxes in the Vistula lagoon in a 3D model. The influence of climate change on the distribution of phytoplankton in the Baltic Sea was investigated by **Jaromir Jakacki et al.** by using a coupled model system, and using three different scenarios with a change in temperature, wind and short wave radiation; still, with their parameterisations, they found no any dramatic changes in phytoplankton and nutrients until 2050. An ambitious assessment of the ecological status (physical, chemical and biological) of urban water bodies in the St. Petersburg area was presented by **Natalia Nemeshko (**substituting **Valery Vuglinsky)**, in preparation of a large-scale restoration programme. **Armin Aulinger et al.** investigated the contribution of ship emissions to the total input of nitrogen, sulfur and benzo(a)piren (B(a)P) into the sea. Using a state-of-the-art chemistry transport model (CMAQ) and the data on land and ship emissions, they estimated that ship traffic contributes noticeably to the nitrogen (up to16% in summer) and sulfur (up to 10%) inputs into the sea. Ship-borne inputs of B(a)P were found to be negligible compared to land emissions. Major areas of ship-borne pollution are the Danish straits with their highest concentration of ship traffic. **Marke Hongisto** studied the changes in nitrogen deposition over the Baltic Sea as a function of the temporal behavior of the marine boundary layer characteristics for the past 15 years. The study was conducted using the weather prediction model HIRLAM and the 3D chemistry-transport model HILATAR. While most variability in nitrogen deposition is described by regional weather phenomena such as storm frequency, track latitude, and precipitation patterns, a hypothesis was proposed that some of the changes in nitrogen deposition variability are associated with large-scale atmospheric processes that cause a strengthening of the wintertime polar vortex, the poleward shift of the polar front, and changes in blocking frequency.

Topic 3: Hydrological modeling, water management and extreme hydrological events

Halina Kowalewska-Kalkowska reported on extreme storm surge events affecting the Pomeranian Bay and the Lower Odra River. The meteorological conditions causing dramatic surge events were described (the last such event occurred in October 2009). Wind surges (up to 1 m above the alarm level at their peaks) are associated with passages of low-pressure synoptic systems across the Baltic Sea. These may have disastrous effects on coastal zones of

the Pomeranian Bay, but also up to 160 km upstream the Odra river. Additional conditions affecting the strength of the surge were discussed. Certain improvements in the channel system of the Lower Odra river and, in particular, the Szczecin Lagoon, might inadvertently amplify the strength of future surge events. Hence, such "improvements" should be carefully planned and implemented to curtail negative consequences. A lively discussion was caused by the presentation of **Stanislaw Massel** on potential effects of meteorites producing tsunami waves in coastal zones of the Baltic Sea. He presented theoretical calculations of the impact of asteroids of different sizes impacting at different distances from the coast line. Focusing on small sizes (e.g., ~1 m in diameter), Massel showed that (a) they are quite frequent (the Earth is bombarded by millions small pieces of space matter each year but only ~25 of them arrive at ~1 m in diameter) and (b) while the waves that are caused by their impact are usually small, there can be situations (e.g., shallow water near the coast and a particular near-shore slope geometry) when they are sizeable. A modeling example was presented in which 2.5 m asteroid can cause a short time wave disturbance (for about 10 to 100 sec) of ±8 m as far as 1 km away from the point of impact. Changes in frequency and strength of spring floods in the Belarus part of the Baltic Sea basin, associated with changes in atmospheric circulation, were presented by **Irina Danilovich** and **Ryhor Chekan**. Belarus annually discharges ~26 km^3 of water to the Sea. Most of floods in Belarus are in spring closely following the snowmelt season. The North Atlantic Oscillation (NAO) affects the cold season circulation over Eastern Europe and Belarus. During the positive stage of NAO, when winters are milder with frequent thaws, January to March discharges of the Belarusian rivers are higher, and flood waves form as early as the end of February and the beginning of March. Thereafter, the snowmelt flood waves carry smaller discharge volumes due to a smaller snow cover water equivalent. In a negative stage of NAO, with more severe winter and more infrequent thaws, lower January-to-March discharges occurred. The snowmelt period starts later, and the peaks of the meltwater flood waves are much higher. All significant floods observed over the Belarus part of the Baltic Sea basin have occurred in the years with negative NAO indexes. The authors conclude that in the last two decades, milder winters associated with the positive stage of NAO were more frequent, causing a reduction of extreme spring flooding. **Jan Piechura** and **R. Osinsky** explained in detail the processes associated with salt water inflows into the Baltic Sea, using the inflow event of 2003 as an example. **Björn Helm et al.** reported on the integrated water resource management project for the Western Bug catchment as a multi scale, multiobjective approach, involving various scientific and non-scientific aspects. **Joana Wibig** reported on droughts in Poland, their recent variability and future projections, with the prognosis of severe water deficits in the near future. **Kalev Päädam** and **Piia Post**, on the other side of the scale, gave a presentation on the temporal variability of extreme precipitation in Estonia in 1961 and 2008, stating that for many locations in Estonia, a clear trend towards more extreme precipitation events was observed. **Sven-Erik Enno** presented changes in thunderstorm frequency and location in Estonia. He showed that while there are no statistically reliable trends in thunderstorm frequency in Estonia during the 20^{th} century, the number of thunderstorms and "thunderhours" per year are greatest in the north-eastern part of Estonia, far from the sea, which remarkably affects the annual and diurnal distribution of thunderstorms. The BONUS project Baltic Way was presented by **Bert Viikmae et al.**, **Oleg Andrejev et al.** and **Andreas Lehmann et al.**, respectively. Baltic Way seeks to make use of ocean currents in the Baltic Sea for environmental management, also including the maritime industry. The goal of the project is to identify high risk areas in the Baltic Sea and develop ways to reduce the environmental hazards by marine shipping.

Topic 4: Regional adaptation to climate change

This session was dedicated to regional adaptation measures to climate change, and was complemented with a special session to present dedicated EU and national programmes on regional adaptation. On Wednesday evening, an adaptation workshop including a presentation of a climate change visualisation programme took place.

Qianqian Zhou et al. presented a design concept for urban drainage, taking into account climate change impacts by heavy rain and flooding. He also presented assessment tools and socio-economic tools for risk integration to ensure the benefits of adaptation. **Maciej Zalewski** suggested an active regulation using "Ecohydrological dams" for compensating climate change impacts and to ensure a reduction of nutrient and pollutant fluxes from river basins to the Baltic Sea. **Triin Saue** and **Jüri Kadaja** calculated meteorologically possible potato yields for Estonia, derived from climate change scenarios. Their conclusion, based on two varieties of potato species, is that warm adapted varieties may profit in the short term, but with stronger warming in the long term, all varieties taken into account would decline, calling for a more radical agricultural adaptation measures towards the latter half of the century. Finally, **Dennis Bray** presented the results of an online survey on the perceptions of Baltic Sea region climate scientists towards climate change and the BACC book. There is wide agreement that climate change is occurring, but whether it is natural or anthropogenic is more debated (although the majority of scientists believe it is man-made). Furthermore, it can be seen that scientists see many gaps in knowledge concerning global and regional climate change, and that the identification of specific impacts which regional decision makers can respond to, is exceptionally difficult. Yet, the BACC book was considered by the majority as a useful and worthwhile undertaking.

Special session on regional climate change adaptation projects in Northern Europe

Jörgen Nilsson shortly introduced the "EU Strategy for the Baltic Sea Region", an integrated approach to identify needs, solutions and match them to available resources. It stands on four pillars which need to be effectively integrated: environment, economy, energy and transport, and safety and security. This strategy will presumably have a large impact on the member states´ research funding policy in the next years, including BONUS. He also shortly cited the White Paper by the EU commission, stating that a regional adaptation strategy at the level of the Baltic Sea Region should be established. **Sten Bergström** explained a northern European perspective on adaptation to climate change. From the northern perspective it was clear that "too much water" is considered the problem in the coming century. He showed examples of water management in the large cities Göteborg, Stockholm and St. Petersburg. Sea level rise was also considered of concern, at least for the southern coasts of the Northern countries. **Julie Wilk** presented the Interreg BSR adaptation project "BalticClimate", a project to assess challenges and chances generated by climate variability and change. **Lotte Andersson** presented the project BALTADAPT as a part of the mission to find an EU Strategy and action plan for the Baltic Sea region concerning adaptation to the threats of climate change.