

**National Research Program “Climate Change Impact on the Water
Environment of Latvia” (KALME)
1st International Advisory Board Meeting
Riga, May 11 – 12 2007**

Welcome, adoption of agenda

In the name of the project coordinators, Māris Kļaviņš and Andris Andrušaitis, A. Andrušaitis welcomed the participants of the meeting and thanked the members of the international advisory board for their commitment. A. Andrušaitis pointed out the significance of an international advisory board to ensure objective project guidance within the small Latvian research community.

A. Andrušaitis presented the agenda of the meeting, which was adopted, emphasizing that the discussion of KALME's goals and approaches will be integrated within the presentation of the individual work packages. Bärbel Müller-Karulis was appointed as rapporteur.

Meeting participants

Project coordinators:

Prof. Andris Andrušaitis, co-coordinator of KALME, holds a position as assistant professor at Faculty of Biology of the University of Latvia, and a position at the Latvian Institute of Aquatic Ecology. He leads the project together with **Prof. Māris Kļaviņš**, professor at the Faculty of Geography and Earth Sciences of the University of Latvia. Prof. Kļaviņš is especially interested in the impact of climate change on water quality, especially with respect to humic substances and carbon flow. Project assistant, biologist **Ineta Plikša**, ensures the administrative functioning of the project.

Advisory board members:

Prof. Ilppo Vuorinen, University of Turku, Finland, is the director of the Archipelago Research Institute. His research focuses on zooplankton and he has contributed with his analysis of zooplankton time series to the BACC (Assessment of climate change for the Baltic Sea Basin) project. **Dr. Marcus Reckermann** from the BALTEX secretariat based at GKSS (Germany) replaced Prof. Hans v. Storch at the advisory board meeting. Dr. Marcus Reckermann was also involved in assembling the BACC Assessment of climate change for the Baltic Sea Basin. **Prof. Enn Loigu** is the director of Institute of Environmental Engineering at Tallinn University of Technology (Estonia). He has participated in research projects on changes in runoff regime and water quality under climate change. **PD Gerald Schernewski** leads the research group on coastal research and management at the Institute of Baltic Sea research, Warnemünde

(Germany). His research focuses on coupling of catchment and coastal water quality models. He has also been involved in integrated coastal management projects, where he is especially interested to improve the communication between science and management.

Not present at the meeting were advisory board members Prof. Klaus-Peter Holz, Dr. Katja Phillipart and Rolands Bebris. **Prof. Klaus-Peter Holz**, Brandenburg Technical University Cottbus (Germany), is a professor in civil and hydraulic engineering. **Dr. Katja Phillipart** from the Royal Netherland Institute of Sea Research, is an expert in marine macrozoobenthos. She has led the European Science Foundation's assessment of the impact of climate change on European Seas. **Rolands Bebris** is the Director of Environmental Protection Department at the Latvian Ministry of Environment. He represents the Latvian Ministry of Environment as the local end users of the project results.

Work packages leaders:

Dr. Uldis Bethers (WP 1) is the deputy head of the Laboratory of Mathematical Modeling of Environmental and Technological processes at the University of Latvia. His primary research interest is modeling of physical processes in the environment. **Prof. Viesturs Jansons (WP 2)** is a professor at the Latvian University of Agriculture with expertise in monitoring and modeling of non-point source pollution. **Dr. Gunta Sprinģe (WP 3)** is the leader of the Laboratory of Hydrobiology at the Institute of Biology at the University of Latvia and assistant professor at the Faculty of Geography and Earth Sciences of the University of Latvia. She studies the impact of climate change on biodiversity, structure and functioning of freshwater biological communities. **Prof. Guntis Eberhards (WP 4)** is an expert on coastal processes, especially coastal erosion. He holds a position at the Faculty of Geography and Earth Sciences of the University of Latvia. **WP 5** is led by **Dr. Juris Aigars**, the director of the Latvian Institute of Aquatic Ecology. Dr. Juris Aigars is a geochemist interested in the dynamics of nutrients at the sediment water interface. At the meeting, WP 5 was presented by **Bärbel Müller-Karulis**, a researcher at the Latvian Institute of Aquatic Ecology involved in modeling the long-term dynamics of nutrients and biota in the Gulf of Riga. **Dr. Anda Ikaunieca (WP 6)** is a researcher at the Latvian Institute of Aquatic Ecology. She is a biologist working on the dynamics of marine zooplankton populations. **Dr. Kristīne Āboliņa (WP 7)** recently defended her PhD on sustainable development of cities. She is a docent at the Faculty of Geography and Earth Sciences of the University of Latvia and is primarily interested in analyzing communication between scientists, the public, and decision makers. **Prof. Artūrs Škute (WP 9)** from the University of Daugavpils is a biologist involved in freshwater ecological research focusing on invertebrates (zooplankton, zoobenthos).

KALME structure and work packages

Programme overview (A. Andrušaitis)

A description of the KALME project, its work packages and work packages leaders in English was handed out to all project participants. Further information can be found on the project web page, www.daba.kalme.lv.

KALME is funded under the Latvian national research area “Environmental research – regional impact of climate change on aquatic ecosystems and adaptation to [them], protection of the environment of the Baltic Sea and inland waters and sustainable management of their resources”. This research area is one of the nine Latvian government priorities in basic and applied research established for the period 2006 – 2009. The KALME project is expected to run from Nov 2006 – Dec 2009.

Generic goal of the Program is to assess the short-, medium-, and long-term impact of climate change on the environment and the ecosystems of the inland waters of Latvia and the Latvian part of the Baltic Sea, as well as to create a scientific basis for the adaptation of environmental and sectorial policies to climate change.

Specific goals:

- a) Create several mutually non-controversial scenarios of climate regime-determining parameters;
- b) Assess possible climate change impacts on the quality of Latvian inland waters, their availability, flood and drought risk, in order to facilitate drainage basin management adaptation and to secure protection and sustainable use of water resources ;
- c) Forecast the possible climate change impact on the physical regime, coastal dynamics, bio-geo-chemical regime, and ecosystems of the Baltic Sea, to facilitate protection of marine environmental quality, biological diversity, and sustainable use of its resources and services.

The project is organized into 9 interlinked work packages (Fig. 1) with a separate project management unit (WP 8: Program Management and Public Outreach).

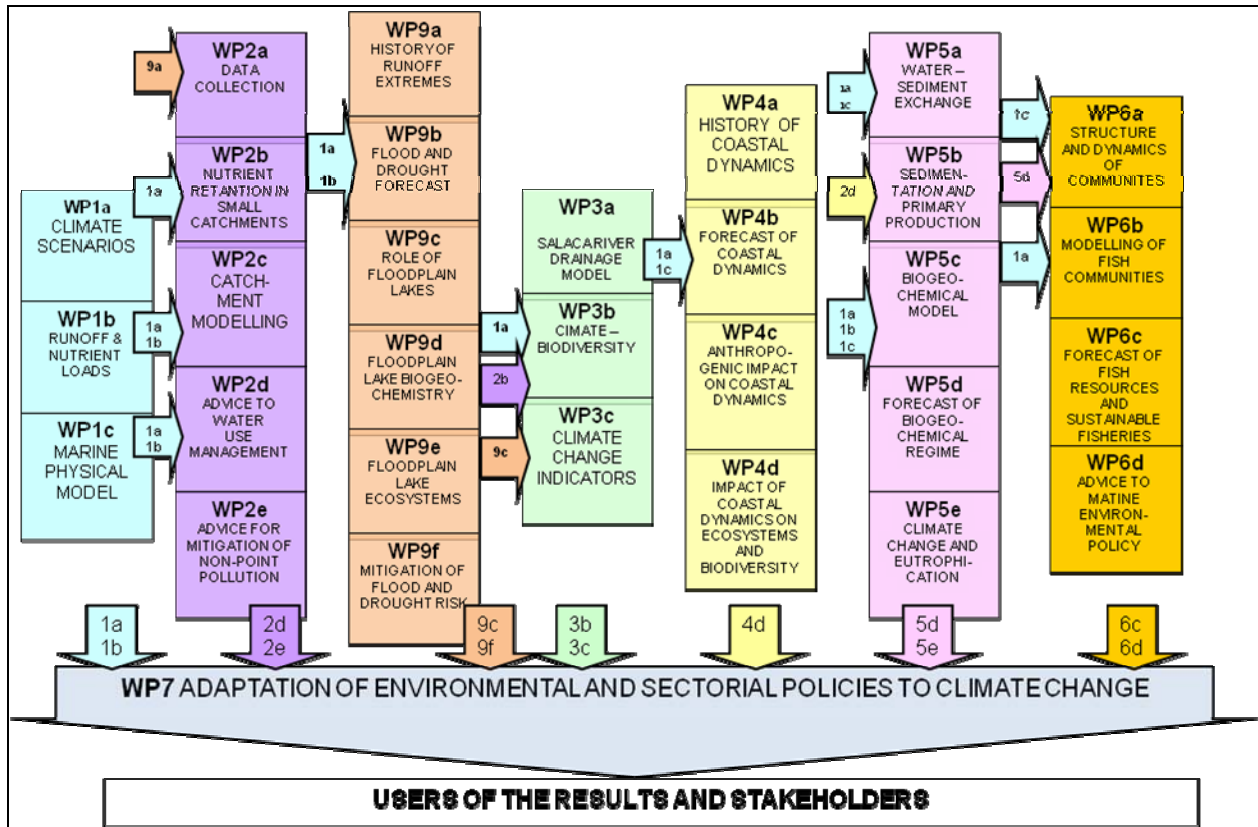


Fig. 1: KALME work packages and their interaction

About 95 researchers and research assistants from six Latvian research organizations (Tab. 1) are involved in KALME. The project will include 1260 man months, and a pool of LVL 1 350 510 (EUR 1 929 300) has been preliminarily earmarked for the program. From this amount LVL 75 000 (EUR 108 143) have been reserved for participation in BONUS ERA-NET + in 2008 and 2009 each.

Organization	Department	Work packages
University of Latvia	Faculty of Physics and Mathematics	WP 1
	Faculty of Geography and Earth Science	WP 1, WP 2, WP 4 , WP 7, WP 8
	Faculty of Biology	WP 3, WP 5, WP 6, WP 8
Latvia University of Agriculture	Faculty of Rural Engineering	WP 2
University of Daugavpils	Faculty of Natural Sciences and Mathematic	WP 9
Latvian Institute of Aquatic Ecology		WP 2, WP 5, SP 6
Latvian Fish Resource Agency		WP 3, WP 6
UL Institute of Biology		WP 3, WP 5 , WP 6

Table 1: Research organizations involved in KALME (bold – work package lead)

Advisory board questions and suggestions:

- seasonal distribution of rainfall and runoff

Enn Loigu pointed out that climate change might lead to a decrease in spring peak runoff, as the spring flood is mostly related to melting of the snowpack. Therefore the seasonal distribution of runoff is likely to change. He suggested that the work packages should take this into account and especially also include an assessment of the risk of drought, as climate change might have a large effect on low water periods. Also Ilppo Vuorinen emphasized that even though climate change might not affect the net amount of rainfall, the seasonal distribution might be changed, which should be taken into account in the KALME work packages.

WP 1: Climate change impact on runoff, nutrient flows and regime of the Baltic Sea (Uldis Bethers)

WP1 is a production WP, aiming at the delivery of

- (a) climate change scenarios - meteorological data (by IX/2007)
- (b) river runoff (water discharge and nutrients load) data series (by VI/2008)
- (c) sea state data series (by XII/2008)

The last year of the project will be devoted to modelling/data analysis support for other WPs.

The following tasks will be addressed in 2007:

- Investigate access to the numerical results of regional climate models (RCM). *Done.*
- Choose scenarios *Done.*
- Get model data series from several RCM for scenarios. *Done.*
- RCM data quality control. *In progress.*
- Deliverable: climate scenarios as data series. Expected in VI, i.e. 3 months prior to deadline.
- GIS for river run-off modelling. *Postponed so far due to communications with Latvian Environment geology and meteorology agency (LEGMA).*
- Modelling of selected pilotbasin with several models. *In progress.*
- Development of models & software for runoff modelling. *In progress.*
- Calibration and verification of runoff models incl. access to data. *Postponed due to communications with LEGMA.*
- Calculations of river runoff. *Planned in X-XI.*
- Deliverable: water runoff data series. *Planned X-XI.*
- Selection of approach for nutrient runoff. *Not started yet.*
- Domain selection for BS model. *Not started yet.*

Two tasks are postponed because the data exchange scheme with LEGMA depends on the outcome of a tender about the development of the river basin modelling system.

Deliverable - warning on misinterpretation of the predictions by regional climate models (RCM). Comparison of the present climate observations with the predictions of regional climate models should be avoided. Instead, the RCM results for the control period should be compared with RCM predictions. This is especially crucial, when employing RCM data as the forcing data for other (hydrological) models.

Advisory board questions and suggestions:

- strengthen links between WP 1 and other workpackages

Gerald Schernewski suggested to strengthen the links between the individual modeling work packages in the project. The nutrient load work package is needed as input into WP 5c (biogeochemical modeling), but the link with catchment modeling (WP 2) is less clear. He pointed out that the nutrient load scenarios developed should be targeted to enable prediction of changes in biological communities.

- shifting baseline in regional climate models

Ippo Vuorinen confirmed the difficulties in utilizing the output from regional climate models. He pointed out that RCM also predict a small natural warming, which is visible as a shift in the baseline of the control scenario of RCMs.

WP 2: Climate change impact on the nutrient runoff in drainage basin (Viesturs Jansons)

In the presentation of WP2 (Climate Change Impact on the Nutrient Run-off in Drainage Basin) the implementation of the main tasks, data collection/measurement and first modeling approaches were discussed. The long term data series collected in experimental sites since 1994 and on plot/field/small catchment scales are used as basis for studying nutrient losses and nutrient turnover, as well as for model developments.

The Bērze river catchment (900 km²) has been selected for water quality modeling. Monthly water quality analysis in the 15 sub-catchments of the river started in 2005. Due to the cooperation with the Swedish University of Agricultural Sciences, modeling software (Fyris model) is available at the Latvia University of Agriculture (LLU). Several training courses for validation and calibration of the Fyris model were organized in the framework of the Baltic Sea Regional Project for the staff of LLU (Department of Environmental Engineering and Water Management).

In the Faculty of Geography and Earth Sciences of Latvia University first successful results were achieved for calibration of the hydrological model MetQ for the Bērze River, and in the LLU for the water quality modeling. Of course, the short data series (2 years) is not enough to achieve the necessary statistical significance for water quality modeling. However, despite several shortcomings in data, the first modeling results appear promising for the future.

Advisory board questions and suggestions:

- increase sampling frequency

Ippo Vuorinen suggested to increase the sampling frequency in the Bērze river subcatchments to achieve better input time series for modeling.

- address interactions between WP 1 and WP 2

Further, Gerald Schernewski addressed the interaction between WP 1 and WP 2. Both work package leaders explained that WP 1 will use the catchment scale nutrient loss predictions generated in WP 2 to improve the parameterization of nutrient retention on country wide scale. On the other hand, WP 2 will rely on the climatic forcing generated in WP 1 to produce nutrient load scenarios in the Bērze catchment.

Andris Andrušaitis pointed out that WP 1 and WP 2 have to agree on the spatial and temporal resolution of their respective input data. Uldis Bethers emphasized that processes included into scenarios in WP 2 should be adapted to the available input data produced within WP 1.

- consider land use changes in nutrient load scenarios

Enn Loigu suggested that nutrient load scenarios should also take into account changes in land use (e.g. increase in rapeseed production for biofuel, clear cutting of forests and peat mining as energy resource in the future).

WP 3: Climate change impact on freshwater ecosystems and biological diversity (Gunta Sprīnģe)

WP3 is devoted to three main research directions:

- impact of climate change on biodiversity
- climate change indicators
- impact of climate change on ecosystem fluxes

Since the beginning of the program, the main activities were connected with aggregation and analysis of hydrochemical and biological data, as well as data characterizing climate change.

The results were presented in several conferences and are also published in the respective books of abstracts: 1st Scientific conference of The North Vidzeme Biosphere reserve “Economical, sociological and historically-cultural aspects of nature protection”, Valmiera, November 23-24, 2006 (J. Birzaks), 65th scientific conference of University of Latvia, Riga, February 6, 2007 (A. Skuja, E. Parele); 4th International Conference „Research and conservation of biological diversity in Baltic Region”, University of Daugavpils, April 25-27, 2007 (A. Skuja, J. Birzaks), The 3rd International ASTRA conference “Climate change and waters”, Riga, May 10-11 (I. Druvietis et al.), ASLO Aquatic Sciences meeting. Santa Fe, New Mexico, USA, February 04-09, 2007 (I. Kokorite, M. Klavins, V. Rodinovs), 16th European Vegetation Survey, Roma, Italy, March 22 -26, 2007 (L. Grīnberga). Three revised articles are submitted for Acta Universitatis Latviensis (ed. V. Rodinovs). I. Druvietis, E. Parele and A. Skuja have participated in the exhibition “Garden. Flora. 2007” and given information on climate-change impact to freshwater flora and invertebrates. Two PhD dissertations partly connected with climate change impact on Latvian freshwaters have been defended.

Currently, monthly sampling of hydrochemical (including organic carbon), and biological (phytoplankton) parameters takes place in the River Salaca basin. Monthly organic carbon samples are collected also from WP2 objects (Vienziemīte, Mellupīte and Bērze). In the Salaca river, sampling of benthic invertebrates and phytoplankton, as well of the spring drift of salmonid larvae has been carried out in May.

Advisory board questions and suggestions:

- consider land use changes in organic carbon budgets

Enn Loigu proposed to consider changes in land use for constructing riverine organic carbon budgets.

- ensure sufficient spatial scale and representativity

Marcus Reckermann addressed the spatial scale of WP 3 activities; however, WP 3 will not only focus on the Salaca river but also include Lake Burtnieku, so that the impact of climate change on the hydrological regime can be studied. He also suggested to link WP 3 activities to the nutrient input modeling work packages by including the same catchments both into ecological studies as well as into nutrient export scenarios. Also Gerald Schernewski pointed out that recommendations to policy makers from the KALME project should be general and applicable on a large spatial scale. Therefore it is important that the rivers included into ecological studies are representative and that the results can be transferred to other rivers.

- include invasive species and address links between riverine and marine communities

Gerald Schernewski suggested considering whether links could be established between WP 3 and WP 6 to investigate whether riverine processes affect marine biological community structure. He also proposed to include invasive species into the work package.

- specify the purpose of community indicators

Gerald Schernewski warned that finding indicators responsive to climate change might be difficult and suggested to clearly specify for which purpose the indicators should serve. Ilppo Vuorinen agreed that modeling of biota is complex because of the large number of species involved. Gunta Sprinģe replied that therefore the work package will focus on indicators and key species for ecosystem stability. Currently, the sampling programme also does not include the entire foodweb, but will focus on phytoplankton, macrophytes, macrozoobenthos and potentially also zooplankton. Fish are included, but analysis will focus primarily on changes in timing of events, e.g. spawning and larval drift.

- define type of climate scenarios required as input from WP 1

Andrejs Timuhins (WP 1) raised the question what kind of climate scenarios would be best suitable as input to WP 3 – average climate simulations or short scenarios of extreme climatic events – and proposed data mining on existing observations to define the type of simulations best suitable for WP 3.

WP 9: Runoff extremes caused by climate change and their impact on territories under flood risk (Artūrs Škute)

The aim of this work package is to forecast climate change impact on the recurrence and regime of runoff extremes - floods and droughts – and to identify the impact of these phenomena on floodplain ecosystem in the Middle-Daugava region.

Location of the study area

The study area is allocated in the valley of the river Daugava from Kraslava down to Jēkabpils. The largest natural floodplains as well as the four largest floodplain lakes of the Daugava River are located in this area.

Tasks

- Assessment of historical and current frequency of flood recurrence and climate change impact on it
- Forecast changes in regime of floods and drought based hydrological regime scenarios
- Identify the role of natural floodplains in stabilizing the hydrological regime
- Determine flood and drought impact on bio-geochemical fluxes in floodplain systems and the catchment
- Assess the impact of floods and droughts on floodplain-lake ecosystems of the river Daugava
- Mitigation of flood and drought risk

Outputs

Using results of the study and the scenarios established, recommendations will be developed for agriculture, forestry, and territorial planning bodies with the aim of minimizing the negative impact of floods and droughts on the well-being of population and local economy.

Advisory board questions and suggestions:

- integrative role of WP 9

Gerald Schernewski pointed out that many work packages link with WP 9. Shifts in the spring flood described by WP 1 should be used as input in WP 9, and the hydraulic effects on river and floodplain systems should be used in WP 3, so that the ecosystem effects can be described. Also WP 6 should use the output of WP 9, because a shift in spring flood, which might be one of the most important climate change effects to be expected, will also affect coastal ecosystems.

- careful use of historical runoff data

Juris Seņņikovs (WP 1) cautioned using historical data to describe the hydrological regime of the Daugava floodplain. Storage effects in the floodplain can lead to higher discharges in Daugavpils than further downstream (e.g. Jēkabpils). Historical data might have been “adjusted” to create “plausible” discharges that always increase along the flow path.

- consider impact of damming

Juris Seņņikovs also pointed out that currently damming projects are discussed in the Daugava floodplain because the pressure of land-owners to reduce the flood risk increases. In addition, a 4th hydroelectrical dam on the Daugava river is still under discussion, as well as the construction of a waterway to connect Daugava and Dņepr. Enn Loigu added, that potentially hydropower production could also affect the flood risk, because electricity generation is optimized at high reservoir water level, possibly leaving little room for flood storage.

WP 4: Coastal Processes (Guntis Eberhards)

WP 4 aims to describe the impact of climate change on coastal dynamics, especially on coastal erosion at the Latvian Baltic Sea coast.

The work packages consists of:

- historical analysis of coastal processes

Erosion at the Latvian coast is mainly determined by the wind direction of strong storms. Historical changes in erosion and accretion zones will be analysed and the influence of economic activities (e.g. harbor jetty construction, coastal protection structures) on coastal processes will be described.

- coastal process scenarios

Expected changes within coastal processes, especially in the dynamics and locations of erosion risk zones during the coming 30 – 50 years under different climate forcing scenarios (wind regime, sea water levels, storm surges) will be identified.

- risk mapping and assessment

GIS layers of coastal processes and erosion zones will be produced based on the EUROSION guidelines for mapping coastal erosion hazards. The EUROSION guidelines will be adapted to conditions in Latvia and an indicator based methodology for rating regions with respect to coastal erosion and flooding will be developed

- actions and adaptation

As a final outcome, the work package will present adaptation strategies, including recommendations for the protection and sustainable use of endangered coastal segments, as well as an assessment of the protective needs for national and local coastal zone planning and management. Recommendations for coastal process monitoring will also be presented.

Advisory board questions and suggestions:

- formulate contribution of WP 4 to the final project outcome

Ilppo Vuorinen suggested to identify WP 4 contributions to the overall programme goal. For example, WP 4 could develop a national programme for adapting to and mitigating climate change with respect to coastal erosion

- consider impact of coastal erosion on biodiversity and coastal ecosystems

Gerald Schernewski pointed out that coastal erosion also can have important impacts on coastal ecosystems.

- oceanographic model input (WP 1) to WP 4

The input from WP 1 to WP 4 was discussed briefly. Uldis Bethers (WP 1) pointed out that sediment transport cannot be included into WP 1, but time series of water level and waves, including the monthly distribution of storms, their wave setup and sea level during storms, can be provided. This information can be generated for both surf zone and coastal slope.

WP 5: Biogeochemical processes and primary production in the Baltic Sea (Bärbel Müller-Karulis, WP leader Juris Aigars)

WP 5 aims to predict the impact of climate change on biogeochemical cycles in the Baltic Sea ecosystem of the Latvian economic zone.

The work package consists of six tasks:

- a) **Boundary layer processes**
Laboratory experiments with sediment cores will be used to simulate the response of the sediment water interface to critical conditions expected under climate change, e.g. extended thermal stratification and hypoxia in the Gulf of Riga
- b) **Production and sedimentation**
Seasonal sedimentation will be studied with a multitrapp to refine relationships between primary producers, abiotic factors controlling sedimentation and the resulting vertical particle flux.
- c) **Biogeochemical modeling**
Development and calibration of a biogeochemical model for the Gulf of Riga, using the output of WP 1 and WP 2 as well as the results of WP 5 a and b to refine parameterization of biogeochemical processes
- d) **Ecosystem state predictions**
Scenarios for environmental quality in the Gulf of Riga based on the results of the biogeochemical modeling.
- e) **Recommendations**
Development of adaptation and mitigation strategies according to the predicted changes in the Baltic Sea environment due to climate change

During 2006, literature was reviewed to define the experimental conditions relevant for sediment incubation experiments. Technical specifications for laboratory (oxymeter) and field equipment (multitrapp) were drafted and procurement was initiated. Refinement and adaptation of the Gulf of Riga biogeochemical model was started and calibration data (especially for phytoplankton) was processed. During 2007 and 2008 field work, laboratory experiments and biogeochemical modeling are planned. Due to funding delays equipment procurement is delayed and experimental and field work is slightly behind schedule.

Advisory board questions and suggestions:

- consider 3D modeling for better spatial resolution

Gerald Schernewski proposed to consider 3D biogeochemical modeling, because the current box model formulation does not resolve river plumes and coastal processes. Technically, calibration of a 3D biogeochemical model would require tight cooperation with WP 1. Presently, the box model formulation allows precise fitting of the observed long-term nutrient dynamics, while a 3D model is more difficult to calibrate. Gerald Schernewski suggested to look for additional funding sources to expand the biogeochemical modeling part to a 3D model.

- display results of the work package in a public-friendly way

The output of WP 5 should be presented in an accessible way to public and decision makers/

WP 6: Climate change impact on ecosystems and biological diversity of the Baltic Sea (Anda Ikauniece)

The central objective of the WP6 is to estimate the extent of marine biota variability under the consequences of climate alterations. Therefore both pelagic and benthic systems in almost all size classes are considered. WP 6 participants are from 4 institutions – Latvian Institute of Aquatic Ecology, Latvian Fish Resources Agency, Institute of Biology (University of Latvia), Faculty of Biology (University of Latvia) – and they will try to fulfill the given tasks on forecasting and modeling the ecosystem response as well as providing advice on implementation of environmental policy and sustainable management of marine resources. The expected output will include forecasts and advice according to the tasks and certainly new level of knowledge on marine processes which is planned to be expressed in several publications.

Activities for the first part of the project in 2006 and 2007 include the revision and digitalization of data for further statistical use, field work and experiments. In accordance with the work-plan the first deliverable – a prognostic fish community model as a result of data revision and combination of existing models should be ready at the end of 2007. Field work – sampling of plankton and benthos - is concentrated at the Baltic Proper part of the Latvian marine areas in order to have sufficient information on the natural variability of ecosystem components in different seasons and hydrological conditions. The experimental work is devoted to describing the short-term responses of the marine phytoplankton community to changing environmental parameters (mostly water temperature). In 2008-2009 work will focus on the analysis of samples and data obtained both from field work and experiments, on modeling the impact of climatic variation on biodiversity and productivity with the help of WP1 and WP5, and on forecasting the ecosystem response on all food-web levels and providing advice for marine environmental policy in cooperation with WP7.

Advisory board questions and suggestions:

- identify important influence factors

Ippo Vuorinen suggested identifying the factor that might have the most significant impact on biota. Depending on the group of organism, Anda Ikauniece explained that probably salinity will be most important, followed by temperature, changes in upwelling frequency and differences in currents. Ippo Vuorinen pointed out that salinity predictions might be available also from other Baltic climate modeling groups, but Uldis Bethers (WP 1) assured that predictions of the saline water inflow frequency into the Baltic will be used in WP 1.

- scope of the work package

Gerald Schernewski warned that the development of fish community models might be ambitious within the scope of the work package and recommended to adapt existing fish community models. Andris Andrušaitis pointed out that the modeling work planned will focus on multispecies models to include fish as top-down forcing on the entire community. Andris Andrušaitis also emphasized that the community

indicators addressed in the work package will be an important contribution to the development of the Water Framework Directive, the EU Marine Strategy and the HELCOM Baltic Sea Action Plan, because effects of climate change are so far not incorporated into marine ecosystem assessment strategies.

WP 7: Adaption of environmental and sectorial policy to climate change (Kristīne Āboliņa)

For implementation of the tasks of this year, team of WP7 (2 social scientists from University of Daugavpils and 3 researchers from University of Latvia) started work in the following areas:

- Initial in-depth interviews of KALME project work package leaders;
- Analysis of existing development policies and planning documents;
- Analysis of decision-making environment
- *Survey (of public administration; decision-makers and planning personnel)*
- *On-going dialogue with stakeholders*
- *Elaboration of policy recommendations (will be started)*

Crucial issues

- Use results of international research
- Identify and agree on priority Climate change issues in Latvia
- Careful interpretation of WP results for other packages
- Identify most effective and appropriate forms to communicate with stakeholder groups
- Cooperate with policy-makers
- Find the most appropriate time

Promote practical implementation of Program outputs

- National Climate Change Adaptation Strategy should establish policy coherence spatially and between EU, national, regional and municipal stakeholders
- Create link between the KALME project and National Climate Change Adaptation Strategy
- Coordinate new National Sustainable Development Strategy and National Climate Change Adaptation Strategy
- Make climate change an explicit responsibility of municipalities – incorporate in municipal statutes = “forced mainstreaming”

Advisory board questions and suggestions:

- improve communication and dissemination

Ilppo Vuorinen noted that the work package provides a good communication and dissemination initiative, but so far there seems to have been little public interest as the response to invitations was low. He suggested establishing a plan for improving communication and dissemination, for example by a series of several press conferences and news releases (once per half year), together with a series of article in the largest newspapers (e.g. each WP leader contributes one article). The dissemination material could then be

aggregated into a book at the end of the project. Ilppo Vuorinen also suggested hiring an advertising agency to produce dissemination materials.

Kristiine Abolriņa pointed out that the first newspaper article, focusing on the ASTRA conference, will be published shortly. Further, at the end of the project, a climate change brochure for stakeholders is planned. It is also planned to produce specific information for different audience, (e.g. real estate agents), and potentially also advertisements and radio programmes could be used as dissemination media.

- actively address stakeholders

Gerald Schernewski advised to directly address policy makers (individual members of parliaments) and stakeholders with specific wishes for support. Personal contacts might also be important for addressing public authorities and administrations, but interest can be raised only if the implications of the project for their respective areas of work can be clearly stated (e.g. climate change impact on implementation of WFD, NATURA 2000).

- employ synergy effects with other climate research programs

Synergy effects with other climate research programs in Latvia should be employed to organize a common conference addressing a larger audience. For example, the second phase of ASTRA ("Developing Policies & Adaptation Strategies to Climate Change in the Baltic Sea Region", INTERREG) could be used as a vehicle to disseminate information on the KALME project results.

- link to Latvian climate change adaption strategy and local policy programmes

Andris Andrušaitis explained, that the Latvian Ministry of Environment is currently developing a climate change adaption strategy, which should be finalized in 2008. Therefore it is important for the project to have first results available already within this timeline. He pointed out that also the Ministry of Regional Development and Spatial Planning is an important stakeholder, as they are responsible for coastal zone issues (e.g. integrated coastal zone management). Currently, the association of coastal municipalities in Latvia is going to arrange a seminar on coastal erosion problems and has asked for cooperation and input from the KALME project.

- project coordinators are actively involved in dissemination

Andris Andrušaitis pointed out that dissemination and public outreach is primarily a responsibility of the project coordinators.

- attractive framework for dissemination activities

Uldis Bethers (WP 1) reported on the positive response of Latvian stakeholders to the BOOS/PAPA project awareness meeting and recommended to use a hotel/commercial setting for dissemination activities with a short programme of attractive presentations. He also suggested expanding the stakeholder groups to be invited and to include for example representatives from agriculture and fisheries.

Recommendations for future project development

The final discussion emphasized the need to strengthen the links between project work packages and to work towards common project products.

- exploit links between work packages and connect to international research programs

Gerald Schernewski emphasized that the links between work packages should be strengthened within the project and proposed that KALME should also interact with international research programmes, e.g. BONUS). Further, several approaches were discussed to improve the cooperation between work packages. Andris Andrušaitis proposed to increase the internal meeting frequency in the project from quarterly project meetings to a bi-monthly schedule. Project meetings should, besides clarifying technical issues, also have a scientific focus.

- identify common project outputs, messages to policy makers, and joint publications

Ilppo Vuorinen emphasized that the KALME project contains all necessary elements to assess the impact of climate change on the Latvian aquatic environment. However, the advisory board strongly advised that joint outcomes for the entire project should be planned and clearly specified. To focus the project outputs, each work package could, as a mental exercise, formulate its key message for a “final common project press conference”.

Joint publications between working groups would improve cooperation between the project work packages. Ideas for common publication from Ilppo Vuorinen were

- biodiversity in freshwater and marine systems (communalities, differences, impact of climate change in both systems)
- changes in phenology and seasonality observed in all work packages

Organization of future international advisory board meetings

Advisory board organization

The advisory board emphasized, that a representative of the Latvian project end users (Ministry of Environment) should chair the international advisory board to ensure efficient flow of information. Andris Andrušaitis will contact the ministry to nominate a representative and chair.

Next advisory board meeting

For the next international advisory board meeting a project progress report should be available to the advisory board. It was agreed that during the next meeting more consideration should be given to cross work package output and products.

To include the recommendations of the next international advisory board meeting into the annual project progress report which has to be delivered to the Latvian Science (Dec 15, 2007), it was proposed to organize the next international advisory board meeting in early December 2007.

Other issues

Public awareness meeting

Uldis Bethers raised the idea to organize a national awareness meeting in Latvia to improve the dissemination of project results. However, during 2007 a public awareness meeting is not included into the project budget. Andris Andrušaitis proposed to organize a public awareness meeting at a more mature project stage with first results already available. The public awareness meeting could then potentially be linked to an international advisory board meeting.

BACC and the BALTEX programme

Marcus Reckermann gave an overview over the BACC project which is part of the BALTEX programme and invited KALME to participate in BALTEX.

BALTEX (the Baltic Sea Experiment, www.baltex-research.eu) is part of the Global Energy and Water Cycle Experiment (GEWEX) within the World Climate Research Programme (International Council for Science, World Meteorological Organization, Intergovernmental Oceanographic Commission of UNESCO).

Phase I of BALTEX focused on energy and water cycles, whereas Phase II will be oriented towards applied research, public integration and awareness (Fig. 2). As a contribution to Phase II, BALTEX has produced an assessment of climate change for the Baltic basin (BACC). Led by Hans v. Storch, more than 80 scientists from 12 countries are involved. The BACC report will be published as a comprehensive text book in the second half of 2007. The report was adopted by HELCOM and will be published as HELCOM Thematic Assessment on Climate Change in the Baltic Basin, based on the BACC material.

BACC presents a combination of evidence on climate change and related impacts on marine, freshwater and terrestrial ecosystem in the Baltic Sea basin, both in the catchment area and in the water body. According to BACC, changes are presently and in the next few decades limited to temperature and directly related parameters (e.g. ice cover).

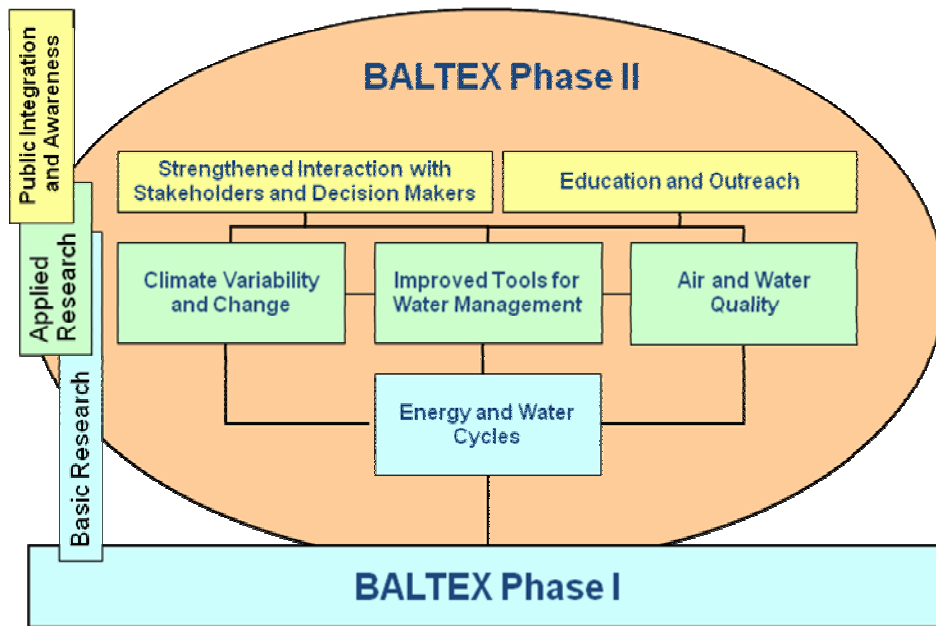


Figure 2: BALTEX focus areas

BALTEX is an international consortium of research projects. It is open for participation of interested research groups, which gain access to the BALTEX group as a discussion platform, can use the BALTEC “quality label”, benefit from the BALTEX publicity, and have access to the BALTEX databases. Interested groups can apply with a description of their research topic. Marcus Reckermann invited KALME to consider becoming a BALTEX member.

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