

RADOST-Tour: Science on Tour along the Baltic Sea Coast

About two-thirds of the way through the RADOST project, the RADOST Tour "Baltic Sea Coast 2100 – On the Way to Regional Climate Adaptation" provided an opportunity to discuss the results achieved thus far at ten expert workshops and six

public evening events from Greifswald all the way to Kiel and Husum. Between 15 and 80 participants attended each event. The Tour was covered by over 110 articles in print and online media.

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Exchange about the future of Baltic Sea ports at the podium discussion in Lübeck

Climate Pavilion Schönberg Inaugurated

Finally completed after a long wait: the Climate Pavilion in Schönberg near Kiel, partially financed through the RADOST project (see the RADOST Newsletter 02/2012), was inaugurated in celebratory fashion on 16 September 2012. The main piece is a model, built by Miniatur Wunderland in Hamburg, that depicts the expected regional climate change impacts and options for preparing for them. It is complemented by six information boards. The inauguration was attended by prominent representatives from the state, region, and municipality. The opening hours of the pavilion are the same as those of the neighboring tourist information office in 'Kalifornien,' the beach area where the pavilion is located, and thus tied to the summer beach season.



Celebratory inauguration of the climate pavilion with Dr. Andreas Wasilewski (Ministry of Energy, Agriculture, the Environment and Rural Areas), Prof. Dr. Horst Sterr (University of Kiel), Wolfgang Vogel (State Agency for Agriculture, Environment and Rural Areas – concealed), Wilfried Zurstraßen (Community of Schönberg), Sönke Körber (AktivRegion Ostseeküste) (from left to right)

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Coastal protection issues were discussed at the relevant state authorities, the State Agency for Agriculture and Environment of Central Mecklenburg (StALU MM) in Rostock, and Schleswig-Holstein's Government-Owned Company for Coastal Protection, National Parks and Ocean Protection (LKN) in Husum. Future sea-level rise continues to present a huge point of uncertainty, and RADOST is tackling this problem by presenting adaptation options for coastal management that fit scenarios of sea-level rise ranging from 30 to 90 centimeters by the year 2100.

The public evening event in Rostock addressed not only coastal protection but also **flood protection and urban planning**.



Evening event in Stralsund: opportunities to gather information on regional adaptation projects

Current plans for coastal protection installations in Warnemünde were presented, which, with the help of glass retaining walls, can be easily integrated into the cityscape.

Water quality in the Baltic Sea was discussed at symposiums at the State Agency for the Environment, Nature Conservation and Geology of Mecklenburg-Western Pomerania (LUNG) in Güstrow and at the State Agency for Agriculture, Environment and Rural Areas of Schleswig-Holstein (LLUR) in Flintbek.

There, it was repeatedly noted that future water quality is more dependent on the development of nutrient input from agriculture than climate change. If the goals of the Baltic Sea Action Plan to reduce this source of pollution were achieved in all the Baltic Sea riparian states, the water quality in the sea could be significantly improved. However, this would require extremely ambitious measures, especially given the renewed intensification of agricultural production associated with increased price levels for agricultural products as well as the expansion of bioenergy crop production.

This connection was further developed at the tour station about **renewable energy** at the Ministry for Energy, Infrastructure



change **impacts on fish, birds, and microorganisms**. The composition of the flora and fauna is determined by complex, climate-sensitive interactions that affect food chains and reproductive conditions. What this composition will look like in 100 years is therefore highly uncertain. However, it is almost certain that we will encounter new species in the Baltic Sea while others will be restricted in their habitat.

In the port city of Lübeck, the **adaptation needs and capacities of the German Baltic Sea ports** were intensively discussed. The predominant opinion was that climate change impacts are less important here than other factors, such as climate protection, other environmental regulations, and general economic development. Nonetheless, ways to smoothly and sensibly integrate adaptation measures into urban planning should be explored beginning now.

and State Development of Mecklenburg-Western Pomerania in Schwerin. It was noted that the bioenergy boom is currently dying down due to changing support conditions and that Mecklenburg-Western Pomerania is, relative to others, not really a hotspot for agricultural runoff. The **effects of offshore wind energy production** on ecosystems in the Baltic Sea, in turn, were comprehensively delved into at an event at the Oceaneum in Stralsund.

The evening event that followed at the Oceaneum concerned itself with climate

Regional Activities

Opportunities arising from climate change were the main topic at the evening event in Kiel. Practical adaptation

This is certainly nothing new for the representatives of Timmendorfer Strand, where an extensive dialogue with the

Coast of the USA was involved in discussing this **communal experience in order to ensure both sides of the Atlantic** are able to profit from one another's experiences. An even broader sweep of international experiences was achieved at the evening event in Greifswald, where examples of climate adaptation from Sweden, Poland, and the USA were presented.



Tour of the GEOMAR aquarium after the RADOST evening event in Kiel

measures developed as part of the RADOST project were discussed here, including the construction of artificial reefs and the cultivation of mussels. In the beginning, the participants were asked about their perception of climate change: over forty percent expect mainly positive effects from climate change in the region around the Bay of Kiel.

The day event in Kühlungsborn was also the opening event for a long-term cooperation with the Mecklenburg association of Baltic Sea resorts (VMO). Hotel operators, tourism organizations, and community representatives discussed with RADOST scientists whether the climate and tourism will be "friends or foes" in the future. The answer to this question depends not least of all on the active **strategizing of the tourism sector**. Although vacationers can always "adapt" spontaneously and choose new locales, climate friendly and well-adapted regions have a better chance of keeping their guests in the long term.

citizens was part of the drafting and implementation of a coastal protection project that particularly respected the needs of the tourism sector. An expert from the Chesapeake Bay on the East

Dialogue and communication as well as international exchange were highlighted at the day event at the Climate Service Center (CSC) in Hamburg as being critical for effective adaptation. Together, the CSC and RADOST intend to foster a continued public debate about climate change adaptation in Germany, even beyond the RADOST project's duration.

The great resonance and exciting discussions that we experienced on tour validate the RADOST project's approach of broadly communicating research topics and results and provided valuable input for further work.

Documentation of the Tour activities can be found here:

www.klimzug-radost.de/RADOST_Tour_2012



Speakers and participants taking a tour of the Oceaneum in Stralsund

Regional Activities

New RADOST Partner: Hamburg University of Technology

Professor Dr.-Ing. Peter Fröhle, who leads the focus topic of coastal protection for RADOST, was recently granted the position of Professor of River and Coastal Engineering at the Hamburg University of Technology (TUHH) and has been the head of the Institute of River and Coastal Engineering since 1 March 2012. Before that, the RADOST subproject about coastal protection was led by the Department of Coastal Engineering at the University of Rostock, of which Professor Fröhle had been the head for many years. With the transfer to the TUHH, the subproject can be continued there seamlessly. At the same time, the University of Rostock remains involved in the RADOST project.



Professor Fröhle speaking during the RADOST Tour

In the RADOST focus topic of coastal protection, strategies for the future of coastal protection along the German Baltic Sea coast are being developed. Potential areas of conflict with other sectors, such as tourism and nature conservation, are especially being considered. Additionally, the participation of the Institute of River and Coastal Engineering at the TUHH provides many synergies with the KLIMZUG-NORD project, in which the institute is involved, for certain parts in a leading role, in the topical areas of Estuary River Management and Integrated Urban Development.

First Organic Mussels from Kiel

A regional specialty is introduced to the world: the first organic mussels from the Baltic Sea have been harvested in Kiel. In combination with algae, mussels have been cultivated on long lines in the Bay of Kiel and, beginning in the winter season 2012/13, are being marketed as a regional product.

Blue mussels (*Mytilus edulis*) are considered a delicacy in many countries. The mussels from the Bay of Kiel grow just as quickly as their traditionally cultivated cousins in the Wadden Sea. However, they have certain culinary advantages over the mussels from the North Sea: they contain more meat, are tenderer, and have a more subtle taste. The Kiel "fjord mussels" are low in fat, and the fat they do contain is rich in Omega-3 fatty acids and vitamin E. This valuable seafood has been produced using organic aquacultural techniques in the Bay of Kiel for the last year by the companies CRM (Coastal Research & Management) and oceanBASIS.

The development of the farm took a lot of time and effort: in total, two years were

required for technical development, including construction of a working vessel, before the monthly food safety inspections required by law could be carried out for a year. In May 2011, the inspection for EU organic certification took place; since then, the mussels from the Kiel Fjord have earned the right to be called "organic" mussels.

The first 5 tons of mussels from sustainable aquaculture will be marketed in the winter season 2012/13. Levent Piker, CEO of oceanBASIS, is convinced that the organic mussels from the Kiel Fjord will not be able to cover demand: "The demand for our mussels is enormous and emboldens us. We see this as a confirmation that sustainable management of marine resources can bring economic opportunities with it."

Mussels from Kiel have been a popular specialty in the Baltic Sea region and beyond since the 18th century and have been cultivated since then. At that time, tree trunks were secured to the seafloor, whose branches were then colonized by



Mussels cultivated via line aquaculture in the Kiel Fjord

mussels. After harvest in winter, the mussels were transported to Hamburg, Prague, and Hungary and marketed as a delicacy. After over 100 years, mussels from the Kiel Fjord have once again found their way into the kitchens of Schleswig-Holstein.

Climate Change Impacts in the Baltic Sea Region: Assessment Report Provides Opportunity for Discussion

BALTEX (The Baltic Sea Experiment) is an international research network for the Baltic Sea region that concerns itself with the analysis and modeling of the physical, chemical, and biological environment in the Baltic. In the second BALTEX Assessment of Climate Change for the Baltic Sea Basin (BACC II), a comprehensive assessment of the state of research regarding climate change impacts in the Baltic Sea has been undertaken. On the occasion of the completion of the BACC II Report, RADOST project leader Dr. Grit Martinez moderated a podium discussion at the International BACC Conference on 7 September 2012 in Tallinn that included climate scientists and political representatives from the international, national, and regional level and focused on experiences in disseminating climate knowledge in the Baltic Sea region.

Over 80 scientists from the region contributed to the drafting of the BACC II report, which will be published by Springer in 2013. At the request of the Helsinki Commission (HELCOM), recommendations for the recreation and sustainable protection of the ecological

balance of the Baltic Sea are being drawn from the scientific compendium for the next ministerial meeting of the Baltic Sea riparian states in early 2013.

Despite the expansive, successful work of HELCOM with direct implications at the national level, information about the climate-driven impacts and ecosystem changes in the Baltic Sea that is tailored to the needs of local and regional offices, cities, and communities is just beginning to be produced.

During the podium discussion, potential communication channels for and general experience with speaking with both political decision makers and the general public were discussed for regions in the Baltic Sea riparian states. As examples of successful knowledge dissemination, vivid materials produced by the Baltic Sea projects RADOST and BALTADAPT about the regional impacts of climate change and the political framework for adaptation were mentioned. Additionally, the importance of cooperating and collaborating with regional disseminators was highlighted by the panel



participants. For example, the Archbishop in the region around Szczecin, Poland, is also speaking out about the need for environmental education along the Polish Baltic Sea coast. The panel participants were unanimous in their belief that knowledge transfer must be undertaken in the respective languages of each Baltic Sea riparian state and should be anchored in the social and cultural environment of local coastal stakeholders.

Additional information can be found at: www.baltex-research.eu/BACC2/tallinn2012

New project: Bottom-up Climate Adaptation Strategies towards a Sustainable Europe

Beginning in October 2012, RADOST is accompanied by the EU project BASE (Bottom-up Climate Adaptation Strategies towards a Sustainable Europe), in which Ecologic Institute is leading a work package on knowledge transfer and dissemination across various sectors throughout Europe. The project especially aims to improve the availability, integration, and utilization of knowledge

about bottom-up adaptation approaches which can be used as a blueprint for mainstreaming adaptation activities throughout Europe.

Case studies will be used to understand facilitators of, and barriers to, adaptation. Over 20 cases have been selected in and outside Europe to reflect the diversity of adaptation activities, simultaneously paying attention to the need for generalization and comparability. The gap between top-down strategic assessments of costs and benefits and empirical context-sensitive bottom-up analyses will be bridged using novel combinations of

models and qualitative analyses. BASE will also support stakeholder involvement through novel participatory and co-design techniques.

BASE will provide policy guidelines by integrating lessons from past experiences, case studies, insights provided by modeling, and stakeholder participation. Issues of multilevel, cross-sectoral, and inter-temporal governance that are presently weakly tackled will be highlighted. Potential conflicts and synergies of adaptation with other important policies will be explored to overcome constraints caused by context-related inertias.

International Activities/Publications

Transatlantic Exchange of Adaptation Measures between the Baltic Sea Coast and the Chesapeake Bay

On 19 September 2012, the RADOST project, together with Mayor Hatice Kara, hosted the event "Transfer of the best local experiences to adapt to climate change: Timmendorfer Strand in dialogue with communities on the East Coast of the USA." The event took place as part of the RADOST Tour "Baltic Sea Coast 2100."



Coastal planner Jeff Allenby describes the situation in the Chesapeake Bay

The event focused on the specific coastal protection measure implemented in the community of Timmendorfer Strand ("Timmendorf Beach"): After a comprehensive consultation process with broad participation, a heavy stone revetment was built with a retention wall in a way that took touristic requirements and the overall appearance of the locality into account. Inhabitants of the community who took part in the implementation of the project, as well as representatives of the coastal protection authorities at State level, recalled success factors and exchanged views on the possibilities of further development of their exceptional coastal protection measure, as well as the transferability of such measures to other communities. The discussion also touched upon other "beach-tasks" that the community is envisaging to further address challenges associated with climate change.

Jeff Allenby, coastal planner in the RADOST partner region of the Chesapeake Bay and member of the NGO Chesapeake Conservancy, participated in the event via video conference. Although the US government's reaction to climate change is limited and

the states generally show a similarly hesitant attitude, Mr. Allenby presented Maryland as a progressive state actively engaged in climate change adaptation activities and ready to fund additional measures with local grants. These measures are indeed necessary. By 2100, the sea level is expected to rise one meter in the Chesapeake Bay.

Therefore, explained Mr. Allenby, Timmendorfer Strand's approach is of considerable interest among planners and communities in the (smaller, yet geo-morphologically similar) Chesapeake Bay.

RADOST is engaged in transferring ideas from the successful Timmendorfer Strand example of an integrated coastal protection project to other coastal regions of the Baltic Sea and beyond. The community representatives from Timmendorfer Strand will gladly serve as mentors for the dissemination of these ideas. More face-to-face workshop discussions between the coastal planners and the community representatives from Chesapeake Bay and Timmendorfer Strand are envisaged for spring 2013. The continuation of this learning and reflection process via face-to-face exchange is made possible by funding from the U.S. Department of State in cooperation with the U.S. Embassy in Berlin.

Documentation of the event:

www.klimzug-radost.de/info/radost-tours-timmendorf

RADOST Provides Support for Master Theses

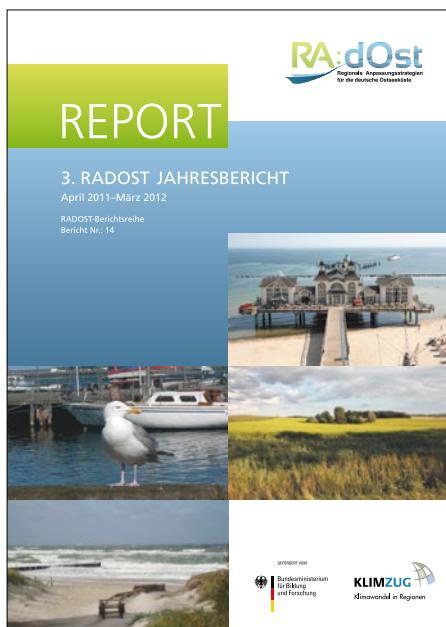
Currently, four students from the Nicholas School of the Environment at Duke University in North Carolina are dedicating their master theses to RADOST's international research program. Their work is guided by the research hypothesis that socio-cultural, historical, political, and economic factors as well as differences and similarities in local knowledge and values influence the ambition, uptake, and mainstreaming of adaptation measures. The master's project compares and contrasts the socio-cultural perceptions of climate change and the local and state-level policies related to climate change adaptation in several case study areas along the East Coast of the United States. Simultaneously, the same research is being carried out by Ecologic Institute in case studies from the German Baltic Sea area focusing on communities in Mecklenburg-Western Pomerania and Schleswig-Holstein. This is expected to expand knowledge about bottom-up adaptation measures and facilitate the transfer of good adaptation practices amongst communities along the Baltic Sea and in other world regions with similar geo-morphological features.

Another master's thesis on "The role of socio-cultural construction in decision-making for adaptation to climate change and sea level rise in three US states" was completed in August at the Development Planning Unit of the University College London and co-supervised by RADOST.

All degree dissertations will be published in the series of RADOST reports on the RADOST website.

Third RADOST Annual Report

After three years of the RADOST project, the third RADOST annual report vividly describes the project's developments and achievements from April 2011 to March 2012. The report goes into the state of applied research and network building in



the six focus topics of Coastal Protection, Tourism and Beach Management, Water Management and Agriculture, Ports and Maritime Economy, Conservation and Land Use, and Renewable Energies. Additionally, the report provides an overview of socio-economic analysis, research in the natural and engineering sciences and socio-economics as well as activities in national and international exchange and project dissemination.

The report is designed for stakeholders in Schleswig-Holstein and Mecklenburg-Western Pomerania from administration, business, academia, and NGOs in addition to the general public. It is available in print and online.

The report (in German) can be downloaded free of charge at:
www.klimzug-radost.de/bericht14/3-radost-jahresbericht

"The Baltic Sea Facing Climate Change" – Handbook Published

Climate change is taking place and may accelerate along the Baltic Sea coast. This is the consensus reached by ten years of consecutive research activities from all around the Baltic Sea region. The International BALTEX Secretariat and the Northern German Climate Office at Helmholtz-Zentrum Geesthacht have summarized the most important research results in an understandable way in a handy booklet entitled "Ostseeküste im Klimawandel" ("The Baltic Sea facing Climate Change").

Climate change along the Baltic Sea coast can already be measured clearly and has impacted many animal and plant species. Coastal protection, tourism, fisheries, and agriculture are only a sample of the areas that must consider climate change in long-term planning.

With this new handbook, the researchers from Geesthacht are reacting to the growing public demand for scientifically informed and understandable information about climate change in the Baltic Sea region. They are also providing it free of



charge. The handbook's content is based on the BALTEX Assessment of Climate Change for the Baltic Sea Basin (BACC) as well as the information provided by the Northern German Climate Office.

Additional information and a download can be found here:

www.klimzug-radost.de/publikationen/ostseekueste-im-klimawandel

Potential Development of Photovoltaic Energy in the Face of Climate Change

Following a study on near-surface geothermal energy (see RADOST Newsletters 02/2012), a new study investigates how climate change will affect the potential for photovoltaic energy production along the German Baltic Sea coast. Specifically, the expected regional climate changes are analyzed for their impacts on the parameters that determine the natural, technical, and economic potential of photovoltaic resources.

The results of the study can serve both as a starting point for further research and as a basis for integrating climate concerns into the long-term planning and development within the region. In the

next step, RADOST will formulate possible adaptation strategies for the production of photovoltaic energy under changing environmental conditions.

The study (in German) can be downloaded free of charge at:
www.klimzug-radost.de/Bericht15/Photovoltaik

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Events

CLIMATE 2012

5–9 November 2012, Online Conference

www.climate2012.de

21st NSW Coastal Conference

6–9 November 2012, Kiama, Australia

www.coastalconference.com

2. Regionalkonferenz Klimaanpassung Küstenregion

8–9 November 2012, Bremerhaven, Germany

www.umwelt.bremen.de/regionalkonferenz2012

XtremRisK-Abschlusskonferenz

14 November 2012, Hamburg, Germany

www.xtremrisk.de

Dynaklim Symposium 2012:

„Klimawandel in der Region: Vom Wasser lernen“

14 November 2012, Hamm, Germany

dynaklim.ahu.de/dynaklim/index/service/veranstaltungen/konferenz/termine/121114_dynaklim-Symposium-2012.html

5th Baltic Sea Tourism Forum

14–16 November 2012, Germany and Denmark

bst.tmv.de/index.php?id=12&tx_ttnews%5Btt_news%5D=15&tx_ttnews%5BbackPid%5D=12&cHash=72c38564b0

Perspektiven einer nachhaltigen Gewässer- und Auenentwicklung

20–21 November 2012, Lenzen, Germany

www.bfn.de/0324_tagung_gewaesserentwicklung.html

LITTORAL 2012 – Coasts of Tomorrow

27–29 November 2012, Oostende, Belgium

www.littoral2012.eu

Konferenz „Klimawandel und Extremereignisse“

30 November 2012, Magdeburg, Germany

www.sachsen-anhalt.de/fileadmin/Elementbibliothek/Master-Bibliothek/Landwirtschaft_und_Umwelt/K/Klimaschutz/Klimawandel/Konferenz_30_11_12.pdf

5. KLIWA-Fachsymposium

„Klimaveränderung und Konsequenzen für die Wasserwirtschaft“

6–7 December 2012, Würzburg, Germany

www.kliwa.de/index.php?pos=veranstaltungen/2012

Symposium: Küstenforschung, Küstennutzung, Küstenschutz

4–6 March 2013, Hamburg, Germany

www.hzg.de/public_relations/events/033229/index_0033229.html.de

European Climate Change Adaptation Conference 2013

18–20 March 2013, Hamburg, Germany

www.eccaconf.eu

Imprint

Overall coordination



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Berlin, October 2012

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Gesellschaft für Energiewende mbH



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Institut für Gewässerphysik



Leibniz INSTITUTE FOR
OSTSEEFORSCHUNG



INSTITUT FÜR ÖKOLOGISCHE
WIRTSCHAFTSFORSCHUNG



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