NEWS

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RA:dOst
Regional Adaptation Strategies for the German Baltic Sea Coast

The Bay of Kiel Climate Alliance Receives three years of BMU Support

The work of the Bay of Kiel Climate Alliance (KBKB), initially started as a RADOST implementation project, has been secured until 2016. The association of Baltic Sea communities from Schleswig-Holstein, research institutes, and administrative agencies will be supported in the future by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

In the coming three years, there will be much to do: The KBKB intends to expand further and encompass more thematic areas as well as a larger geographic one. The main idea underlying the new project phase is to develop the KBKB region into a model for climate change adaptation in northern Germany under the motto:

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Regional products as buildings blocks for a climate-friendly vacation destination: highland beef in the Bay of Gelting.

Content

HELCOM Workshop in Warnemünde: Experts Agree on a Position Paper regarding Climate Change Impacts in the Baltic Sea

Approximately 50 experts met in Warnemünde on 5 and 6 February 2013 to take up the invitation of the Helsinki Commission (HELCOM) and the research program "Baltic Sea Experiment" (BALTEX) and provide advice on the much-needed adjustments to the Baltic Sea Action Plan, whose implementation aims to re-establish good ecological quality of the Baltic Sea by 2021. "The consequences of climate change for the Baltic Sea as stated in the present form of the Baltic Sea Action Plan are not sufficiently considered and urgently must be integrated into its comprehensive list of measures," says Ulrich Bathmann, Director of the Leibniz Institute for Baltic Sea Research Warnemünde (IOW) and host of the workshop. "HELCOM, as a link between science and policy, has recognized this need and has acted accordingly."

Experts from all the Baltic Sea countries, including scientists, representatives of HELCOM and BALTEX, experts from politics, the responsible authorities, and environmental organizations took part. The participants came to the consensus that, in order to improve the ecological status of these waters, all factors need to be taken into account. In addition to "hard" benchmarks, "soft" factors such as socio-cultural values and economic conditions play an important role in motivating stakeholders to implement adaptation measures at the regional and local levels in Baltic Sea riparian states.

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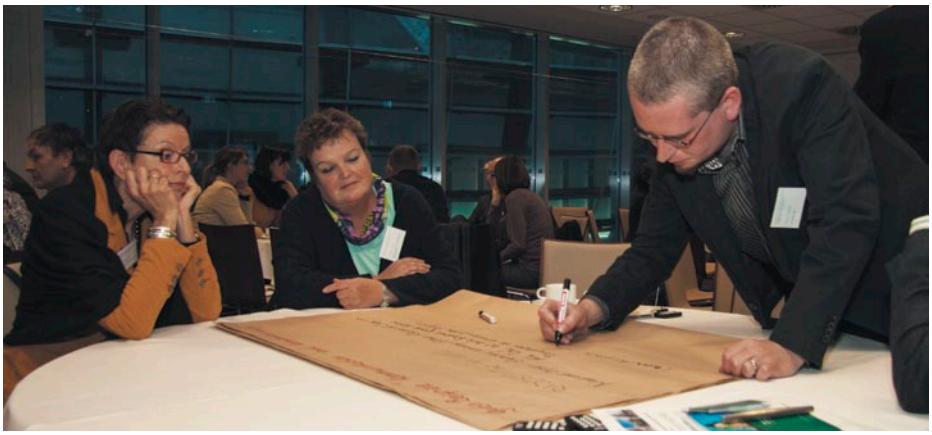
Northern German Regional Conference Provides a Forum for Exchange on Climate Change Adaptation Issues

The second regional conference of the federal government and the northern German coastal states, entitled "Climate Adaptation in the Coastal Region," took place on 8 and 9 November 2012 and was very well-attended: more than 300 participants took up the invitation to come to Bremerhaven. In five parallel thematic workshops, various facets of regional climate change adaptation were discussed. The RADOST project was actively engaged in two of these.



Working on group results at the workshop entitled "Communication and Networking."

At the workshop entitled "Regional planning-fitting the toolbox to climate change," Professor Peter Fröhle of the Hamburg University of Technology represented RADOST and presented the technical planning perspective on coastal protection. Jan Spiekermann (University of Oldenburg) subsequently presented the results of the KLIFF-IMPLAN project from Lower Saxony. The topic of coastal protection was viewed here from a more comprehensive land-use planning perspective: Is raising dikes enough, or do additional measures need to be taken up in the interior in order to counteract the increased waterlogging of low-lying areas? How can measures to pump out excess water be fit to the schedule of renewable energy generation, e.g., such that large volumes of water can be stored temporarily and then pumped out when energy supply is high? Can former clay removal sites be redesigned for touristic experiences in order to reduce the demand pressure on traditionally highly frequented vacation destinations?

Dr. Gabriele Hoffmann from the Regional Planning Association of Western Mecklenburg gave an introduction to the climate change toolkit that was developed as part of the European project BalticClimate. The electronic guide includes climate change mitigation as well as adaptation, and three different versions were developed to respond to the needs of policy makers, spatial planners, and business people. In a hands-on training session at the workshop, the participants were able to slide into a role of their choice for a moment in order to experience what the toolkit has to offer. As explained by Dr. Hoffmann, the public's awareness of the impacts of climate change has grown much since the beginning of the project. While the acceptance of the topic itself still needed to be secured at that point, climate change adaptation has meanwhile already been integrated into several formal planning documents.

At the workshop entitled "Communication and Networking," the participants had the opportunity to discuss their experiences in a "World Café" format. The following conclusions could be drawn from the discussions as well as presentations of successful implementation cases:

- In order to provide a strong basis for adaptation activities, not only must a wide array of participants be engaged, but certain key actors must also take part that can actively promote the project and get the ball rolling through their relevant contacts: "Top-down implementation won't work, but without the top it won't work either."

- One obstacle to getting actors involved in practice is that communication is often phrased predominantly in terms of research developments and research questions. As an alternative, concrete vulnerabilities and problems that are already relevant for the targeted participants, such as floods and storm surges experienced in the past or the problem of soil erosion in agriculture, should be placed in the foreground, and solutions should be discussed that integrate scientific findings on future climatic changes.

- Particularly because the inclusion of all relevant parties has been identified as a main requirement for the successful planning of adaptation measures, a large number of surveys and consultation processes have been initiated, and this has resulted in stakeholders being approached several times from different angles. The consequences have already been characterized by some as "stakeholder burnout." In order to maintain continued stakeholder participation, such processes should be characterized by a high level of commitment and should entail a clear added value for those participating.

Extensive documentation of the regional conference is currently being prepared and will likely be available at the end of March at:
www.klimzug-radost.de/termine/regionalkonferenz-bremerhaven

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"turning challenges posed by climate change into opportunities." Exploratory discussions with partners are already taking place. The planned activities should address the following questions:

1. How can the storm surge and erosion problems faced by coastal communities be dealt with through a sustainable and participatory system of coastal management that satisfies all stakeholders and participants? Which measures and mechanisms are available here?

2. How can public awareness of climate change in this region be increased? What informational and educational needs do local actors and coastal communities have?

3. How can, using a concept of a "climate-friendly vacation and relaxation," climate protection effectively and synergistically be integrated with climate adaptation, and how can best practice examples be developed and implemented locally?

4. How can the KBKB effectively use the successful cooperation structures that have been established between communities and the public as part of the "Framework Plan for the Kiel Fjord" project to facilitate the region's development as a model for climate adaptation?

5. Which (in)direct measures are necessary to ensure adequate climate adaptation, and how can they be implemented? How can Kiel use its planned adaptation strategy to serve as a role model for nearby communities?

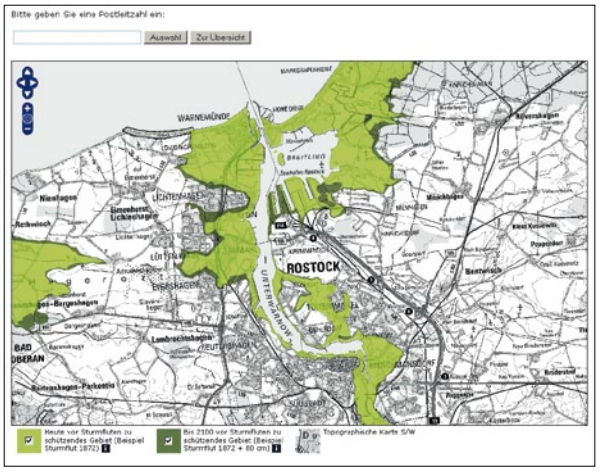
6. How can these activities contribute to meeting the goals of the German Adaptation Strategy and the adaptation roadmap ("Fahrplan Anpassung an den Klimawandel") of the State of Schleswig-Holstein?

Perhaps the most important innovation is that the KBKB will now concern itself with exploring what the intersection of climate protection and adaptation might look like as well as what opportunities or conflicts can be expected, especially regarding tourism and coastal protection. "There is great need for climate change information and research in the region," said project leader Professor Horst Sterr of the Department of Coastal Geography of the University of Kiel. "We are happy to hear that the good contacts and structures developed through RADOST can now be complemented with additional content."

Additional information:
www.klimabuendnis-kieler-bucht.de

New Website Provides Information about the Need for Coastal Protection on the German Baltic Sea Coast–Today and in the Future

Although no one still lives amongst us today who experienced the disastrous storm surge of 12 and 13 November 1872, over 140 years ago, such high water levels could still hit at any time. Today, the approximately 1,700 km² along the Baltic Sea coast that are threatened by storm surges are home to 1.7 million people and are much more densely populated and intensively used than before. A storm surge of the magnitude seen in 1872 could, without substantive coastal protection measures, cause much greater harm than in the past. Especially in the face of a changing climate, it is extremely important to keep awareness of the possibility of storm surges very high. A changing climate can affect the need for protection along the Baltic Sea coast, even to the extent that private actions could become more important in the future.



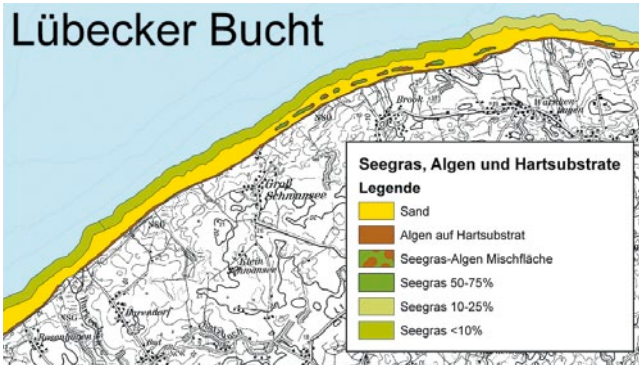
Screenshot from www.kuestenschutzbedarf.de, region of Rostock-Warnemünde

A newly conceptualized website from the Northern German Climate Office at Helmholtz-Zentrum Geesthacht will allow political decision makers, planners, and inhabitants to find out, by providing their postal code, whether their area requires coastal protection measures today, or whether this could be the case in the future.

Based on the assumption that the sea-level rise along the German Baltic Sea coast continues to mirror the global average, the baseline for future storm surges could increase by 2100 by an additional 20 to 80 centimeters. On top of that, the contribution of possible changes in wind patterns along the coast to even higher maximal storm surge levels is still being researched. Existing studies suggest that the influence of the rising sea level will be the predominant factor even in the future. Projections for future coastal protection needs are therefore based on increased water levels of 80 centimeters (compared to the level at the time of the storm surge in 1872), reflecting the highest expectation of sea-level rise up to 2100. In such a scenario, the area along the German Baltic Sea coast that requires coastal protection from storm surges could increase by 25% by the end of the 21st century.

More information is available at:
www.kuestenschutzbedarf.de/ostsee.html

RADOST GIS Presents new Data on Water Quality Indicators



Sediments, algae populations, and eelgrass fields east of Travemünde

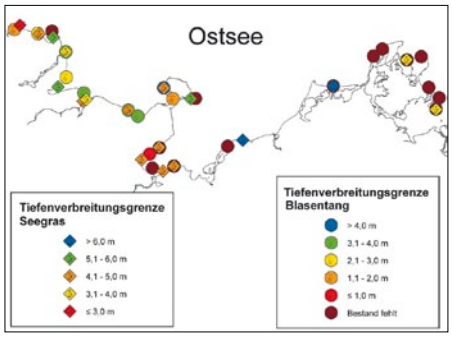
Eelgrass and bladderwrack serve as important indicators for the ecological quality of coastal waters in the German Baltic Sea. A RADOST implementation project involves investigating populations of these two aquatic plants as well as identifying locations with fitting habitat for species reintroduction. The web-based Geographical Information System (GIS) of the RADOST project now includes data resulting from this project as well as those from additional field mapping expeditions and other sources. As a result, research data for three different spatial units are available.

For the **waters along the German Baltic Sea coast**, the depth distribution profile of eelgrass and bladderwrack as well as the distribution of potential growth substrates for bladderwrack are provided. *The depth distribution of eelgrass* and bladderwrack is an important criterion for the assessment of water quality according to the Water Framework Directive (WFD): Although both species used to be found at depths as far as ten meters, worsening environmental conditions have restricted the depth at which they can grow, especially for the bladderwrack. Today, populations can only be found at depths of two or, maximally, three meters. It has been postulated that this could be the result of reduced water visibility caused by increasing nutrient pollution.

Because bladderwrack can only grow on solid surfaces, *areas with hard substrates* (stone boulders and marl formations) are necessary for reintroduction. As a result of the historical "stone fishing" that has taken place in the area, many suitable stones have been removed from the seafloor that would have been fitting for bladderwrack colonies. For 47 stations along the German Baltic Sea coast, the RADOST GIS provides figures detailing the proportional relationship between hard substrates suitable for bladderwrack and softer substrates.

The *availability of hard substrate* in the **RADOST focus area of the Bay of Lübeck** is presented in detail. These data are made up of side-scan sonar readings that were taken as part of RADOST. Alongside these substrates, the *current populations of eelgrass and various algae species* are presented. Bladderwrack could not be found here despite the existence of suitable substrate at varying depth levels. Eelgrass, on the other hand, grows in a zone parallel to the coast along almost the entirety of the Bay of Lübeck.

For the **coastal waters of the Baltic Sea in Schleswig-Holstein**, *chlorophyll a-concentrations* are presented, which represent another important parameter for the assessment of coastal water quality according to the WFD. Chlorophyll a-concentrations increase along with the amount of plant plankton, which in turn



Depth distribution profile for eelgrass (*Zostera marina*) and bladderwrack (*Fucus vesiculosus*) along the German Baltic Sea coast

increases with the level of nutrient pollution. High levels of plankton reduce the *aquatic visibility* considerably, and this is also reflected in the RADOST GIS. This effect is important because it can directly affect the depth distribution of eelgrasses and marine algae.

More information and the RADOST GIS can be found here:
www.klimzug-radost.de/fakten/daten/karten

Coastal Research, Use, and Protection

From 4 to 6 March 2013, around 300 coastal researchers, users, and conservationists met in Hamburg in order to exchange insights about the current state of knowledge regarding the German North and Baltic Sea coasts. The organizers of this event included the RADOST partners Helmholtz-Zentrum Geesthacht and the Hamburg University of Technology along with the Alfred Wegener Institute for Polar and Marine Research. Additional RADOST partners participated at the conference as contributing experts as well. Thematic foci included future wind energy production in coastal waters, land use conflicts in the coastal area, and climate change adaptation.

Further information about the event:
www.klimzug-radost.de/en/events/dialogue_coastal_research-use-protection

Transatlantic Dialogue about Regional Climate Adaptation Continues: RADOST at the Dupont Summit 2012 in Washington

On 7 December 2012, the RADOST project organized a podium discussion entitled "Local and regional climate change adaptation strategies: exchanging established approaches and a comparative analysis of the USA and Germany" at the Dupont Summit 2012 in Washington, DC. The Dupont Summit is an annual discussion forum on pressing policy issues related to science, technology, and the environment. It is organized by the Policy Studies Organization, whose goal is to bring about better exchange between scientists and decision makers.

As the RADOST project leader Grit Martinez (Ecologic Institute) highlighted in her opening remarks, super storm 'Sandy' has provided a stark vision of a possible future where storm surge disaster frequently could threaten people in coastal cities and regions. Accordingly, the need has arisen for US authorities to examine solutions from coastal cities like Rotterdam or Hamburg, where sea walls, flood zones, and floating city blocks have been implemented. Additionally, much knowledge and expertise has already been generated in the US by locally based research centers and coastal communities coping with the impacts of sea-level rise, land-use change, stormwater runoff, and non-point source pollution.

Tanja Srebnotjak from Ecologic Institute's San Mateo (California) office presented a current assessment of climate adaptation planning in the San Francisco Bay Area. Her analysis examined on-going challenges in coordinating efforts between different jurisdictions and included thoughts on the coming challenges the region will need to address and how various governmental entities could work together to approach them.

Living shorelines are the preferred method of protecting shorelines in Maryland and, if designed properly, can adapt to rising sea levels.

Dr. Srebotnjak's presentation set the stage for a comparison of the efforts and challenges faced in the Chesapeake Bay area and the Baltic Sea basin. Jeff Allenby from the NGO the Chesapeake Conservancy highlighted the progressive way in which Maryland is dealing with sea-level rise in the Chesapeake. Representing the Baltic region, Dr. Martinez offered comments on the state of research and examples of measure implementation being carried out under the RADOST project and laid out its future national and transnational initiatives. In conclusion, it was noted that current research projects can make a significant contribution to improving the decision-making basis for policy makers in both the US and Europe—especially when transatlantic dialogue facilitates the exchange of experiences and best practices.

Pre-announcement: KLIMZUG Final Conference on 26 and 27 November 2013 in Berlin

The Federal Ministry for Education and Research (BMBF) is inviting participants to the final conference of the funding initiative "KLIMZUG – Managing climate change in the regions for the future" on 26 and 27 November 2013. RADOST and the other six KLIMZUG projects will present the results of five years' worth of research at the two-day conference.

The focus of the conference will be on the practical application and local implementation of adaptation measures.

In parallel thematic sessions, scientists, practitioners, and representatives from politics in the KLIMZUG regions will discuss the challenges of adapting to climate change. The research results produced by the seven KLIMZUG regions will be available for viewing at an accompanying technical exhibition.

The KLIMZUG final conference is designed for regional and superregional decision makers, adaptation practitioners, and experts from industry, politics, administration, and the scientific community. Additionally, representatives of regional initiatives and federal and regional agencies as well as the general public are encouraged to attend.

The conference program and further information can soon be found here:
www.klimzug.de/de/1206.php

International Activities/Publications

HELCOM Workshop in Warnemünde: Experts Agree on a Position Paper regarding Climate Change Impacts in the Baltic Sea

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Dr. Grit Martinez of Ecologic Institute, Berlin, reported in her contribution from the RADOST project that, at the local and regional level, actions are often designed to fit local circumstances and contexts.

On the final day, the participants agreed on a position paper with recommendations to be presented by the environmental ministers of the HELCOM Baltic Sea states at a meeting in early October in Copenhagen.

The most important requirements set out in the position paper are as follows:

- Climate change diminishes the positive effects of the Baltic Sea Action Plan measures that have been implemented to date. Therefore, especially the planned reductions of nutrient inputs should be intensified in order to prevent the further spread of anoxic zones, areas in which no more oxygen is available.

- The impacts of climate change also exert additional pressure on the biodiversity of the Baltic Sea. Therefore, the already existing pressures exerted by humans on biodiversity should be significantly reduced, including the deposition of toxic substances such as PBT (i.e., persistent, bioaccumulative, and toxic) chemicals and pesticides, hunting and fishing beyond established limits, the by-catch of marine mammals and seabirds in fisheries, underwater noise, and especially nutrient runoff.

- The warming of the Baltic Sea is creating new "ecological niches" for non-indigenous, invasive species. Monitoring programs should be designed as an early warning system, especially in ports and in the vicinity of fish farms, where the risk of immigration of so-called "alien species" is particularly high.

- The oceans absorb about a quarter of the carbon dioxide released by human activities. The resulting acidification of the water and its consequences for marine organisms have hardly been investigated in the Baltic Sea and will have to be more diligently addressed in future research programs.

- Local adaptation strategies vary based on socio-cultural and economic circumstances. The support of local actors is very important for successful implementation of adaptation measures.

In his positive summary of the event, IOW Director Bathmann declared, "The workshop again demonstrated the importance of international coordination in the Baltic Sea region in order to achieve its good ecological status. Collaboration between science and politics at all levels is therefore becoming increasingly important."

Contributors:

Dr. Ivo Bobsien (State Agency for Agriculture, Environment and Rural Areas), Nils Ehrenberg (Leibniz Institute for Baltic Sea Research, Warnemünde), Sandra Enderwitz (University of Kiel), Dr. Insa Meinke (Helmholtz-Zentrum Geesthacht), Daniel Blobel, Dr. Grit Martinez, Jenny Tröltzsch, Dr. Martin Hirschnitz-Garbers, Andrew Ayres (Ecologic Institute)

Baltic Sea Coast 2100–On the Way to Regional Climate Adaptation: Results of the 2012 RADOST Tour

Comprehensive documentation of the RADOST Tour entitled "Baltic Sea Coast 2100—On the Way to Regional Climate Adaptation" is now available as part of the RADOST report series. The discussions at the 16 tour stations have been summarized and illustrated with photographs of the events. The report is organized along the lines of the six RADOST focus topics: Coastal Protection, Tourism and Beach Management, Water Management and Agriculture, Ports and Maritime Economy, Conservation and Land Use, and Renewable Energy. These topics are complemented by sections covering the cross-cutting areas of international exchange and communication and dissemination.

The report (in German) can be downloaded free of charge at:
www.klimzug-radost.de/Bericht16/RADOST-Tour

Integrating Climate Change into Economic Analyses under the EU Water Framework Directive

In the future, climate change can impact the effectiveness and costs of water quality improvement measures. This must be taken into account when selecting measures to implement in accordance with the EU Water Framework Directive (WFD). Until now, the consequences of climate change have not been systematically incorporated into the economic analyses called for by the WFD. A new study in the RADOST focus topic "Water Management and Agriculture" evaluates the basic approaches used to date, thereby contributing to the necessary discussion on how existing and future programs of measures consider and integrate the consequences of climate change.

According to the WFD, river basin management plans (RBMPs) must be routinely established for all European river basins. The new RADOST study analyzes the RBMPs from 18 selected river basins in Germany and other European countries, including the five river basins in the German states of Mecklenburg-Western Pomerania and Schleswig-Holstein. According to the analysis, effects of climate change on water body management are expected in all of the investigated river basins; however, so-called climate checks were only incorporated in the economic analyses of approximately half of the river basins. The climate checks serve to identify the management measures that are the most robust, cost-efficient, and therefore effective under different climate change scenarios.

The introduction of economic analyses in RBMPs opens up ways to adequately consider the consequences of climate change in management plans, although they were hardly used in the first round of RBMPs, which lasts until 2015. A reason for this that has been noted in several case studies is that sufficiently precise and regionalized data from climate change models are lacking, which creates significant challenges for economic evaluations.

The following main conclusions can be drawn from the results of the new RADOST study:

1. In the face of climate change, the temporal aspects of RBMPs must be considered more strongly. Decisions on the selection of management measures with long-term effects must consider both their future effectiveness and their possible future costs. This also applies to the determination of exceptions, since measures that are disproportionately expensive today could become quite economical if their cost-benefit relationships improve in the future.

2. The benefit calculations made in cost-benefit analyses until now should be re-examined, and if necessary, they should integrate new adaptation-oriented benefits, like protection from droughts.

3. The integration of possible climate change impacts poses an extra challenge for the already complex management planning processes. To make this complexity more manageable, techniques from participatory scenario development can be used. These participatory techniques offer the chance for different stakeholders to integrate their estimations and expertise, creating a basis for robust and cost-efficient management plans. A good example of an application of these participatory techniques can be found in the RBMP for the Odense River in Denmark.

The study (in German) can be downloaded free of charge at:
www.klimzug-radost.de/Bericht17/Klimawandel-WRRL

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Regional Adaptation Strategies for the German Baltic Sea Coast

Events

12th INTERNATIONAL COASTAL SYMPOSIUM
8–12 April 2013, Plymouth, UK
www.ics2013.org

KLIMZUG-Northern Hesse Conference
10–11 April 2013, Kassel, Germany
www.klimzug-nordhessen.de/index.php?id=1594

Adaptation to climate change in Mountain & Coastal Areas: a transatlantic dialogue
16–19 April, Hamburg, Germany
www.klimzug-radost.de/termine/adaptation-climate-change-mountain-coastal-areas-transatlantic-dialogue

31st Annual Meeting of the Working Group on "Geography of Seas and Coasts" (AMK)
18–21 April 2013, Köln, Germany
http://databases.eucc-d.de/plugins/events/index.php?show=2112

European Seafood Exposition and Seafood Processing Europe
23–25 April 2013, Brussels, Belgium
www.euroseafood.com

Climate Change in Cities and Regions – Conference 2013
2–3 May 2013, Berlin, Germany
www.bbsr.bund.de/cln_031/nn_22702/BBSR/DE/Aktuell/Veranstaltungen/Programme2013/Klimawandel__info.html

Climate Change and Regional Response 2013 (CCRR -2013)
27–29 May 2013, Dresden, Germany
www.regklam.de/ccrr-2013/

Resilient Cities 2013 – 4th Global Forum on Urban Resilience and Adaptation
31 May–2 June 2013, Bonn, Germany
http://resilient-cities.iclei.org/

Conference "A Climate-robust and Sustainable Germany"
11–12 June 2013, Dessau, Germany
www.anpassung.net

KLIFF Conference "From Global Climate Change to Regional Adaptation Strategies"
2–3 September 2013, Göttingen, Germany
www.kliff-niedersachsen.de.vweb5-test.gwdg.de/?page_id=3302

International Conference "Adaptation to Climate Change in the Baltic Sea Area"
3–4 September 2013, Riga, Latvia
www.baltadapt

Imprint

Overall coordination

eco logic

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Berlin, March 2013

Project Partners

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