

HANDBOOK

Climate Change Adaptation Strategies in the Baltic Sea Region

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Foreword

In light of projected climate change impacts in the Baltic Sea region, there is a strong need for enhanced understanding about adaptation needs. In this regard, the role of local level decision makers will be crucial to the success of such adaptation strategies. This primer aims to provide local decision makers with insights and knowledge on the subject.

This primer has been prepared as part of the project RADOST (Regional Adaptation Strategies for the German Baltic Sea Coast), which is funded by the German Federal Ministry of Education and Research.

For more information on RADOST, please visit our website: www.klimzug-radost.de/en



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Berlin, December 2011

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Climate Change, Adaptation and the Baltic Sea

For those living and working on the Baltic Sea coast, it can be tempting to think of climate change as something that will only be felt in faraway places and in future years. However, this comfortable thinking ignores the truth of the matter: Current research on climate change indicates that, over the next century, the Baltic Sea can anticipate rising sea levels, intensified coastline changes (like erosion), and more frequent storms, among other impacts. Even under the most optimistic scenarios for curbing climate change, these impacts cannot be completely prevented. Indeed, some parts of the Baltic Sea are already experiencing them.

...the Baltic Sea can anticipate rising sea levels, erosion and more frequent storms...

In recent years, concern over these impacts has resulted in the planning and implementation of multiple climate change adaptation strategies at the national, regional and European level. It can be time

consuming to keep up to date with the growing number of new policies being implemented across the Baltic. At the same time, we believe it is important to do so. Ultimately, successful implementation of these strategies will depend upon the knowledge base and experience of coastal decision makers, and those supporting their work. The strategies being implemented are still works in progress, and opportunities abound to absorb new ideas and best practices from the adaptation strategies being implemented in other Baltic Sea countries.

This primer aims to give a concise overview of the current state of climate change adaptation strategies in the Baltic Sea region. It covers policies being planned and implemented at the national, regional and European level. Elements of particular importance to for the local level are highlighted wherever possible, as this is often the site of decision making where adaptation measures are actually implemented.

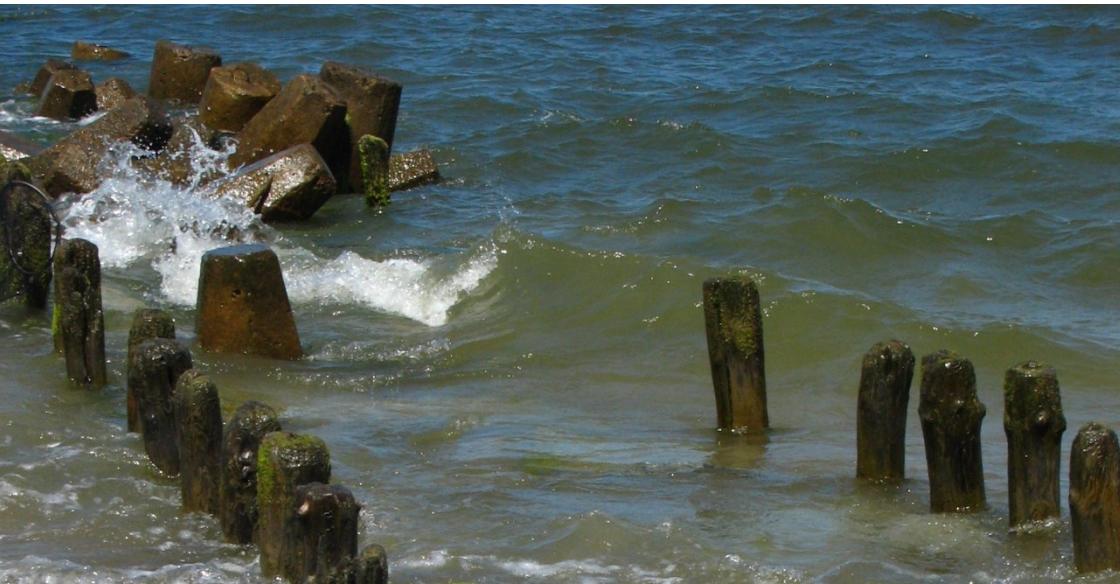
Additionally, the primer provides key definitions for common climate change adaptation terms, and a selection of relevant projects dealing with climate change adaptation in the Baltic Sea, with overviews and web addresses.

Key Definitions

- **Climate change:** A significant change in the average state or variability of the weather that persists for an extended period of time (decades or longer). Climate change includes changes in temperature, precipitation, wind and cloud cover. These may be the results of natural internal processes, or external factors, including those stemming from human activities – such as the emissions of greenhouse gases.
- **Climate change adaptation:** Actions and measures that reduce or neutralize the negative impacts of climate change, or that take advantage of benefits.
- **Autonomous adaptation:** Adaptation that occurs as a reaction to experienced climate change

impacts, or to other changes, such as in markets.

- **Planned adaptation:** Adaptation that occurs as a result of intentional policy choices, based on the idea that climatic conditions have changed or are going to change.
- **Climate protection, or climate change mitigation:** Actions and measures that aim to limit climate change by controlling the emission of greenhouse gases.



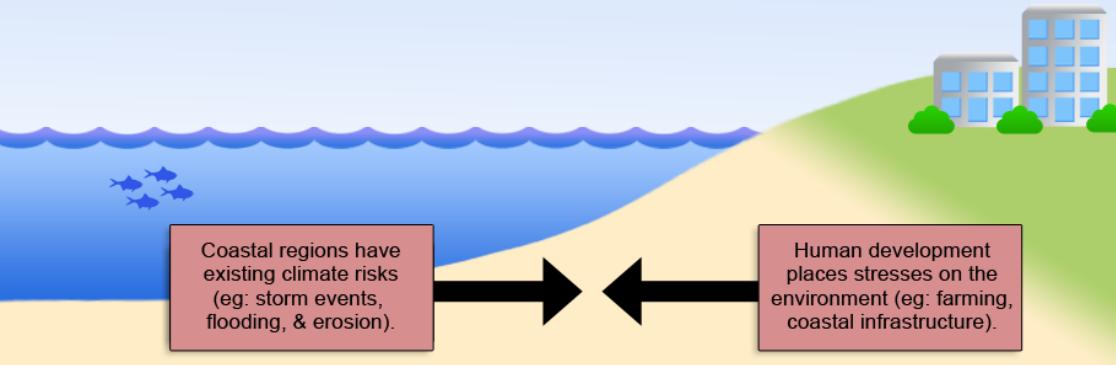
Coastal Regions and Climate Change

Besides the impacts of climate change, coastal regions already face a number of challenges from climatic forces. Their proximity to the sea means they are often uniquely vulnerable to storm events, coastal erosion and flooding. Furthermore, the impact of human settlements and activities on coastal regions adds additional stresses to these systems as they interact with the natural environment. Competing and overlapping activities like tourism, fishing, offshore energy generation and shipping place high demands on coastal regions, and are only projected to grow in the future. Compounding the problem, many of these activities – which serve as drivers of economic growth in coastal regions – are themselves highly vulnerable to climatic changes. Consequently, climate change impacts could exacerbate the existing stresses and vulnerabilities of coastal zones (see Figure 1).

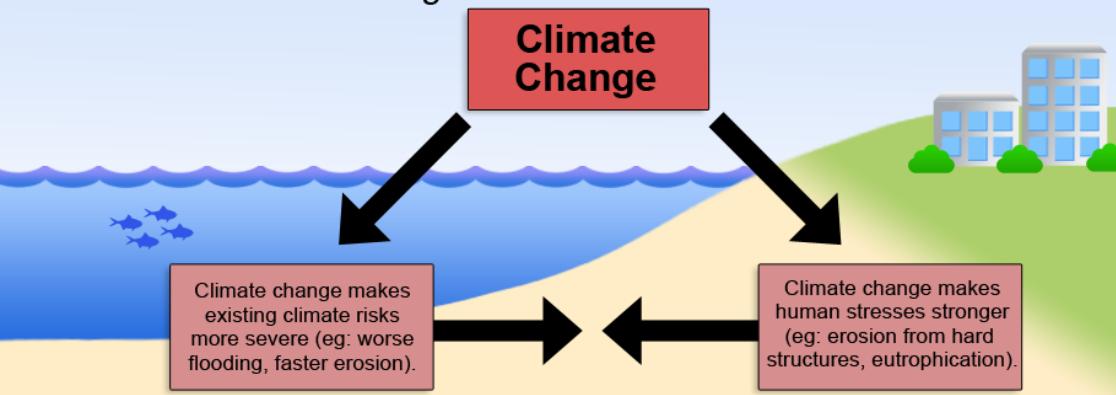
...climate change impacts could exacerbate the existing stresses and vulnerabilities....

Figure 1: The impact of climate change on existing coastal vulnerabilities and stresses

a. Without climate change



b. With climate change



These characteristics are no less true for the Baltic Sea, where climate change is expected to pose a number of impacts. Current projections estimate that average air temperature could rise in the Baltic Sea region by 2 to 5 degrees Celsius by the year 2100.

This increase will not be felt equally across Baltic states, though. Studies have suggested that the majority of this warming would occur during winter in the east and north of the Baltic, and in the south during the summer. Average ice coverage would decrease as a

...temperature could rise in the Baltic Sea region by 2 to 5 degrees Celsius by the year 2100.

result, with the Bothnian Sea and large parts of both the Bay of Riga and Bay of Finland becoming ice free.¹ Furthermore, though local contexts will differ, it is possible that sea level rise in the Baltic will be in line with the 20-80 cm increase project by the UN's Intergovernmental Panel on Climate Change. It is

¹ Climate Change in the Baltic Sea Area: HELCOM Thematic Assessment in 2007, Helsinki Commission, 2007.

important to note, however, that more recent studies have placed this global estimate as high as 2 m by 2100.² Projected increases in precipitation, which would result in lower salinity of the sea, could have a major influence on marine life such as algae and animals, with invasive species like the zebra mussel or North American jelly comb becoming more prominent³.

The need for climate change adaptation policies at all levels is abundantly clear. The next section of this primer examines the current state of adaptation strategies in the Baltic Sea region.

² The Copenhagen Diagnosis, 2009: Updating the World on the Latest Climate Science, The University of New South Wales Climate Change Research Centre (CCRC), Sydney, Australia, 2009

³ BALTEX Assessment of Climate Change for the Baltic Sea Basin, Göteborg 2006



European Union Adaptation Policy

In 2009, the European Commission published a **'White paper'** (a paper that recommends EU action on a specific issue) that outlined a framework for how the European Union can best adapt to the impacts of climate change in the years to come. The white paper is broken into 2 main phases. The first phase lasts from 2009 to 2012, and consists of four main components:

- **Strengthening knowledge and understanding** of the impact and consequences of climate change for the EU
- **Integrating adaptation** into key EU policy areas
- Using **different policy tools** (e.g. market-based instruments, and public-private partnerships) to ensure effective adaptation
- Enhancing and increasing **international cooperation** on adaptation

These elements will feed into the creation of a concrete adaptation strategy by 2013, which will then be implemented during the second phase (from 2013 onwards). The proposed framework anticipates the close cooperation of local, regional, national and EU authorities.

EU Clearinghouse

With the first issue area, the White Paper calls for an improved knowledge management by establishing a web based information system, the European Climate Change Impacts, Vulnerability and Adaptation Clearinghouse. The objectives of this clearinghouse are an enhanced information structuring and dissemination, the effective uptake of information at all levels of decision makers and a greater level of coordination among sectoral policies and institutional levels. The web-based clearinghouse mechanism, the European Climate Adaptation Platform, produced during the first implementation phase is available since March 2012.

Other relevant EU Policies

Beyond policies specifically targeting adaptation, other European policies and strategies relevant for the coastal and marine areas include aspects relating to adaptation.

In achieving the objectives of the EU's **Integrated Maritime Policy (IMP)**, which aims to support the sustainable use of the marine environment, building a knowledge and innovation base and improving quality of life in coastal regions, adaptation to climate change is stated to be an essential factor.

The **Marine Strategy Framework Directive**, the 'environmental pillar' of the IMP, aims at achieving good environmental status for all EU marine waters by 2021. As a result of efforts under this Directive, the resilience of the marine environment and therefore its ability to adapt to climate-induced changes will be improved.

Management of the coastal zones and marine waters through **integrated coastal zone management**

(ICZM) and **marine spatial planning (MSP)** respectively, both call for taking climate change into consideration for a sustainable management of these specific areas. In particular, MSP aims to provide cost-effective sustainable spatial planning solutions to climate change impacts.

The risk of flooding is assessed under **flood-risk management policy**. The effects of climate change are integrated into flood scenarios and climate adaptation measures to be taken into account in the management plans.

Further reading

European Climate Adaptation Platform, CLIMATE- ADAPT
www.climateadaptation.eu

European Topic Centre on Climate Change impacts, vulnerability and Adaptation (ETC/CCA) <http://cca.eionet.europa.eu/>

Directorate-General (DG) Climate Action:
<http://ec.europa.eu/clima/sites/change/>

DG Environment:
<http://ec.europa.eu/environment/water/adaptation/>



EU Strategy for the Baltic Sea Region

In October 2009, the EU Strategy for the Baltic Sea Region was adopted. Environment is one of the four main themes of the strategy that both integrate the objectives of the HELCOM (see page 20) Baltic Sea Action Plan, as well as of the Marine Strategy Framework Directive. At the same time, an action plan was prepared that creates the framework for cooperation among the EU member states of the Baltic Sea region in the coming years. One of the 15 objectives of the action plan is mitigation of, and adaptation to, climate change. Regarding adaptation, the strategy calls for a Baltic Sea wide adaptation strategy. This transnational strategy will be developed within the project Baltadapt (Baltic Sea Region Climate Change Adaptation Strategy), which is financed by the Baltic Sea Region Programme 2007-2013.

...one of the 15 objectives of the action plan is mitigation of, and adaptation to, climate change.

Baltic Sea Regional Strategies

In the Baltic region there are a number of collaborations and initiatives, whose work is very relevant for adapting to climate change.

HELCOM

The Helsinki Commission (HELCOM), a key player in the region, is a transnational commission of all countries bordering the Baltic Sea, including the EU Member States and Russia. It was founded in 2002 as the governing body of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention). As climate change could strongly affect the attainment of ecological objectives, HELCOM is aiming to mitigate these impacts and enhance the capacity of the Baltic marine environment to cope with climate stresses.

In 2007, the Baltic Sea Action Plan was adopted. As the first regional action plan with concrete measures and programmes, it serves as the basis for enhancing

the resiliency and adaptive capacity of the Baltic Sea environment.

Council of the Baltic Sea States (CBSS)

The Council of the Baltic Sea States is a political forum for regional inter-governmental cooperation. It consists of the Ministers for Foreign Affairs from each of the Baltic Sea states, as well as a member of the European Commission. The aim of the Council is to achieve sustainable development of the Baltic Sea region, bringing economic interests as well as environmental and climate protection in line.

Initiated by the Prime Ministers of the Baltic Sea countries in 1996, Baltic 21 is an Expert Group aiming at implementing the global Agenda 21 adopted by the United Nations Earth Summit of 1992. It was integrated into the CBSS in 2010. Baltic 21 links together a wide range of stakeholders for regional sustainable development. Climate and Climate Change constitute one of the four core areas for concrete goals and measures planned for implementation by 2015.

Figure 2:

Overview of the status of national adaptation strategies

Existing strategy

Strategy in development

Currently no strategy in development



National Adaptation Policy Frameworks

The countries of the Baltic Sea region are at various stages of preparing, developing or implementing their national adaptation strategies (see Figure 2). Progress depends first and foremost on the political will and the resources available to adapt, but also on a number of other factors, including the extent and nature of observed climate change effects and the assessment of current and future climate vulnerability. In the following section, the statuses of the European national adaptation policies in the Baltic Sea region are presented.

National adaptation strategies have been put into place in Denmark, Finland and Germany. The following themes are common to all three:

- Soil and land use
- Forestry
- Biodiversity
- Fisheries

- Water
- Energy
- Infrastructure/Transport
- Industry/Service
- Health
- Urban/Building/Telecommunication

The sector 'Coastal areas' is only addressed in Germany (as part of the "Water regime, water management, coastal and marine protection" field of action) and Denmark, but is missing in the Finnish adaptation strategy.



Germany

In 2008 the Federal Cabinet adopted the German Strategy for Adaptation to Climate Change. The aim of the Strategy is to create a national framework for action in order to prevent risks to the public, natural habitats and the national economy. This framework is intended to make it easier for the various levels of the Federation, Länder (federal states), local authorities and for individual citizens to identify impacts and adaptation needs, and to plan and implement those measures.

The Strategy focuses on the following steps to further develop and specify the Strategy:

- Develop an action plan by 2011.
- Strengthen participation and dialogue processes and also involve the economy, communities and other stakeholders from different fields.
- Enhance understanding of climate change and adaptation, to identify opportunities and



Size: 357,112 m²
Population: 81.7 million
Baltic Sea coastline:
2,247 km

National websites:

www.anpassung.net
www.climate-service-center.de



- risks, and better communicate and identify opportunities for action.
- Actively contribute to international cooperation to support adaptation in other parts of the world.

Scientific support and information is made available through the Competence Centre on Climate Impacts and Adaptation of the Federal Environment Agency (KomPass) and the Climate Service Centre.

In September 2011, the Adaptation Action Plan was adopted to support the Adaptation Strategy. It grounds the objectives of the strategy with concrete activities at the federal level. The activities of the Federation must be supplemented with measures at Länder (federal states) and local authority level. Activities under the Adaptation Action Plan are grouped into four areas:

1. The area on **knowledge and informing** draws together initiatives to increase the knowledge base, communicating information through knowledge infrastructure, expanding research and information, providing tools for decision makers

and supporting dialogue, participation and networking.

2. The area focusing on the **frameworks and incentives** set by the Federal government describes projects in which the German government offers or reviews incentives and bases for adaptation in the legal and technical fields, and in its support for policy making, as well as economic incentives.
3. The area on **activities under direct national responsibility** highlights how the Federal government can take climate change into consideration as an owner of buildings, land, and infrastructures, or as a client in construction projects.
4. The final area addresses **international responsibility** and describes Germany's role and engagement in international frameworks and agreements.

At the end of 2014, it is planned for a review to be presented evaluating the German Adaptation Strategy and the Action Plan, which will include proposals for updating and further developing them.

Implications for local decision makers

Within the Adaptation Action Plan's area on knowledge and information, focus is given to the support of municipalities, for whom adaptation is still a rather new issue. An assessment showed that knowledge transfer and the provision of methods for the assessment of climate change and its impacts is currently their main focus. To support local level activities in this regard, adaptation projects in various regions were initiated (including RADOST). The goal of these programs is to provide assistance for local decision makers and produce transferable solutions. The National Climate Change Initiative gives new possibilities for municipalities to fund adaptation measures.

The area of knowledge transfer also relates to the development and support of networks at the local level. In 2012 an online WIKI, "Adaptation to climate change" will be developed. The aim is to provide an online guide for municipalities on how to adapt to climate change.



Denmark

In March 2008, the Danish government adopted its strategy for adaptation to climate change. The strategy identifies the most vulnerable sectors to climate change and possible measures to adapt to these impacts. The strategy emphasizes the importance of all government agencies, companies and individuals to react to the consequences of climate change on their own initiative in a timely manner within the given legislative, economic and technological framework. To support this, the strategy calls for the implementation of information campaigns, a research strategy, as well as for measures to facilitate consideration of the consequences of climate change in planning and development.

To support the strategy, the Danish government established three different bodies to ensure knowledge, coordination and research:



Size: 43,094 km²
Population: 5.5 million
Coastline (incl. North and Baltic Sea): 7,314 km

National website:
www.klimatilpasning.dk

- **Coordination Forum on Adaptation:** The Forum represents the state authorities, municipalities and regions as well as a broad range of bodies and institutions. The aim is to advise the government and ensure a common basis and cooperation across sectors and authorities.
- **Information Centre on adaptation:** The Information Centre ensures the implementation of the Forum's initiatives. The general aim is to provide authorities, businesses and the general public with information about climate change and adaptation.
- **Coordinating unit for research in adaptation:** This body is to coordinate research on climate adaptation across the many research centers and ensure updated data on the future climate.

Implications for local decision makers

Of note, the Danish national adaptation strategy prioritizes autonomous adaptation activities by authorities, business and individuals. When this approach does not produce adequate results, then it is the responsibility of municipalities to implement planned adaptation measures that will encourage the appropriate behaviour.

Planning resource for local decision makers

As part of the Danish national adaptation strategy, an online portal on climate change adaptation has been produced. The portal includes a specific section targeted towards the needs of municipalities as they adapt to climate change.

The municipal section includes links to relevant studies and provides case studies of adaptation measures undertaken in some Danish municipalities, with an aim towards supporting the planning activities of local level decision makers.



Sweden

Sweden has not yet developed a national adaptation strategy. However, several research projects and initiatives exist that take climate adaptation into account. In 2007 the Swedish Commission on Climate and Vulnerability published the report “Sweden facing climate change – threats and possibilities”. It focuses on key sectors and factors of global change and their impacts on Sweden. The results served as the essential input into the 2008 climate and energy bill. It includes climate adaptation but mainly focuses on climate mitigation. The Swedish Commission on Climate and Vulnerability notes that the responsibility for adapting to climate change is shared between municipalities and the state. It proposes that the county administrative boards should be given a driving role, and the task of coordinating the climate adaptation work within their respective counties. Therefore large differences exist between the counties in their work on climate adaptation.



Size: 449,964 km²
Population: 9.2 million
Baltic Sea coastline:
3,218 km

National website:

www.smhi.se/klimatanpassningsportalen



Size: 338,000 km²
Population: 5.3 million
Baltic Sea coastline:
1,126 km

National Website:

www.mmm.fi/en/index/frontpage/ymparisto/ilmastopolitiikka/ilmastomuutos.html

Finland

Finland was the first EU country to develop a national adaptation strategy. Following the national climate strategy of 2001, the adaptation strategy was adopted in 2005. An important contribution in the development process was provided by the research project FINADAPT by the Finnish Ministry of the Environment, which examined Finland's ability to adapt to climate change. The aim of the Adaptation Strategy is to reduce the negative consequences of climate change and to make use of potential opportunities. The Strategy therefore highlights vulnerability to climate change, the potential impacts on various sectors and it also proposes measures to improve the adaptability of those sectors. The responsibility for the implementation of the national Adaptation Strategy lies with the respective sectoral ministries. Some of them have already begun to develop assessments and plans of action to integrate adaptation into other policy areas.

Finland has established a coordination group for Adaptation to Climate Change, which evaluated the implementation of the Adaptation Strategy in 2009. The most advanced sector in the implementation of the Strategy has been the water resources management sector, where adaptation is already well integrated into the decision-making process. In the transport sector, community planning, as well as agriculture and forestry, the implementation of the Adaptation Strategy has also proceeded quite well. In most sectors however, the work is only in early stages. According to a preliminary adaptation indicator developed during the evaluation process, on average, Finland is on step 2 in adaptation (out of 5). This means that among the decision makers there is at least some understanding of the impacts of climate change and the need for adaptation measures has been recognized to a certain extent.

Implications for local decision makers

Of note, the Finnish national adaptation strategy prioritizes several key areas where local communities and municipalities will need to play an active role in implementing adaptation. These include land use planning (including technical systems like water services), flood preparedness and health care. All instructions will need to be tailored to the specific context of municipalities.



Estonia

At present, no national climate change adaptation strategy is available or under preparation in Estonia. Although adaptation is no priority in Estonia some adaptation measures have been carried out in the framework of other activities, for example coastal zone management. Therefore assessments on the consequences of climate change impacts, including sea level rise, on the Estonian coastline have been carried out.



Size: 45,000 km²

Population: 1.3 million

Baltic Sea coastline:
2,549 km

Sea level information
system:

[http://on-line.msi.ttu.ee/
kaart.php](http://on-line.msi.ttu.ee/kaart.php)

Implications for local decision makers

In Estonia, coastal zones are not systematically managed at the national level. Measures in relation to coastal protection are mainly undertaken ad-hoc and foremost planned by private companies or municipalities. Municipalities are therefore the most important stakeholders related to adaptation of the coastal zones.



Latvia

Size: 65,000 km²
Population: 2.3 million
Baltic Sea coastline:
490 km

Latvia does not yet have a national adaptation strategy. Under the project BaltCICA, however, a small regional strategy has been developed for the region of Salacgriva. Furthermore, adaptation is being implemented in some broader initiatives. For example, on the national level the national strategy for spatial development of the coastal area takes adaptation into account. The expected climate impacts on the Latvian waters were identified through the national research programme KALME. Moreover the City of Riga is implementing an integrated strategy to adapt the city to the changes in hydrological processes, a project co-funded by the European LIFE+ Programme. In 2008, the Latvian government presented a first report on climate adaptation, which will serve as a basis for developing a national adaptation strategy. This was planned for the year 2011 to be managed by the Department of Climate and Renewable Energies within the Latvian Ministry of Environmental Protection and Regional

Development. Due to a lack of human and institutional capacity and financial resources the work has been temporarily suspended since late 2011.

Implications for local decision makers

In Latvia coastal zone management and coastal protection is the responsibility of municipalities. Coastal protection activities must be financed by local municipalities and are not supported by any national programme.

Lithuania

Lithuania does not yet have a national adaptation strategy. The Ministry of Environment however is in the process of developing a national climate strategy that will both deal with climate change mitigation and climate adaptation. The strategy is expected for 2012. Alongside the strategy, a plan of measures to be implemented from 2013 until 2020 is also under preparation. One objective is to integrate adaptation



Size: 65,000 km²
Population: 3.3 million
Baltic Sea coastline:
100 km

measures in the national strategies of various sectors.



Size: 312,679 km²
Population: 38.1 million
Baltic Sea coastline:
491 km

Poland

Poland does not yet have a national adaptation strategy and the Polish climate policy so far only deals with climate change mitigation. There are, however, research programmes and initiatives on climate adaptation. For example within the EU research project ASTRA, it was shown that the three sectors water management, coastal zone management and agriculture are most threatened by climate change and require adaptation measures. One of the main objectives of the long-term strategy for coastal protection is to take climate change into account. The strategy is supplemented by an operational programme for the period up to 2050. This programme is securing a budget for the period 2005-2023 for technical measures as well as the necessary monitoring and research.



The Way Forward: Getting Involved in Climate Change Adaptation

Though much uncertainty remains over the precise nature and extent of climate change's impact in the Baltic Sea, current research and experience points towards the clear need for carefully planned and implemented adaptation strategies based on sound scientific knowledge and stakeholder consultation.

...there is much you can do to support the successful implementation of these strategies.

We hope that this primer has given you a better snapshot of the array of adaptation strategies being developed and implemented in the Baltic Sea region, and some of the implications that work being done in other countries might have for your own.

This primer is, however, only a first step towards an increased understanding and exchange of adaptation practices across the Baltic Sea Region.

For coastal decision makers and those working to support them, there is much that can be done to

support the implementation of these strategies, beyond learning more about the various approaches to adaptation documented here. A number of initiatives and projects are ongoing (or recently concluded) that have produced research of significant relevance to coastal adaptation activities in the Baltic Sea. The outcomes of these projects may be of significance to your own work. Furthermore, there may be opportunities in the future to provide your own valuable insights and experiences to these projects and more. The following pages provide a brief overview of some of these projects.

www.balticclimate.org



2008-2012

The aim of the project was to enable municipalities, local and regional stakeholders to deal with the issue of climate change in a cooperative, integrated and sustainable way. The central output was the BalticClimate Toolkit as an instrument for policy makers, spatial planners and business people for considering climate change in local and regional decision making processes.

www.baltcica.org



2009-2012

The project BaltCICA "Climate Change: Impacts, Costs and Adaptation in the Baltic Sea Region" developed transnational action on climate adaptation in the Baltic Sea region. Together with local and regional partners it prepared regions and municipalities to cope with a changing climate.



2010-2013

Baltadapt is developing a Baltic Sea Region-wide climate change adaptation strategy, with focus on the sea and its coastline. The necessary actions for implementing the strategy will be included in an action plan. In order to improve the knowledge brokerage process, a “Baltic Window”, as a comprehensive information portal on climate change adaptation in the Baltic Sea Region will be developed as part of the European Climate Adaptation Platform.

www.baltadapt.eu



2011-2013

Baltclim aims to support the development of national adaptation strategies in Lithuania, Latvia and Estonia. The overall goal is to develop roadmaps to developing the final adaptation strategy for each country. These roadmaps will identify different options for overcoming barriers and obstacles to adaptation.

[www.bef-de.org/
unsere-themen-en/
projects/baltclim](http://www.bef-de.org/unsere-themen-en/projects/baltclim)

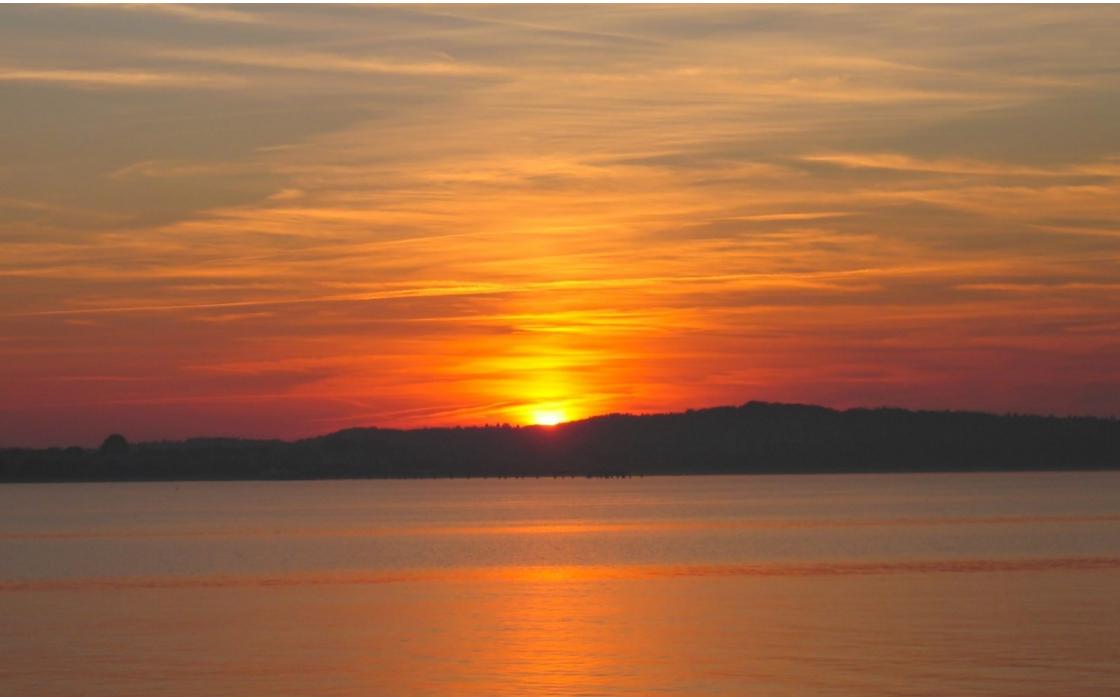
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http://europa.eu/about-eu/member-countries/index_de.htm

Coastline statistics:

www.nationsencyclopedia.com/



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