Baltic Sea Region Action Plan for Adaptation

Based on the BALTADAPT project

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Glossary

AP	BALTADAPT Action Plan
BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BSAP	Baltic Sea Action Plan
BSR	Baltic Sea Region
CAP	Common Agricultural Policy
CBSS	Council of the Baltic Sea States
CC	Climate change
CF	EU Cohesion Fund
CFP	Common Fisheries Policy
CIEMAT	Research Centre for Energy, Environment and Technology
COM	European Commission
DE	Germany
DK	Denmark
DTU	Technical University of Denmark; Finnish Meteorological Institute
EAFRD	European Agricultural Fund for Rural Development
ECRA	European Climate Research Alliance
EMFF	European Maritime and Fisheries Fund
ENEA	Italian National Agency for New Technologies, Energy and Sustainable Economic Development
ERDF	European Regional Development Fund
ES	Estonia
ESF	European Social Fund
EU	European Union
EUSBSR	EU Strategy for the Baltic Sea Region
FI	Finland
GDV	German Insurance Association
HELCOM BSPAs	HELCOM Baltic Sea Protected Areas
ICT	Information and Communication Technology
ICZM	Integrated Coastal Zone Management
IEA,	Integrated ecosystem assessment
JPI	Joint program initiative
KNMI	Royal Netherlands Meteorological Institute
LDGK	Local Government Denmark
LT	Lithuania

LV	Latvia
MPA	Marine Protected Area
MSFD	Marine Strategy Framework Directive
MSP	Marine Spatial Planning
NAS	National adaptation strategy
NGOs	Non-Governmental Organisations
NMI	Norwegian Meteorological Institute on behalf of the Norwegian Climate Centre; National Centre for Atmospheric Sciences
OP	Operational Programme
PL	Poland
RDP	Rural Development Programme
RU	Russia
SE	Sweden
SMHI	Swedish Meteorological and Hydrological Institute
	Technology of Spain;
WFD	Water Framework Directive

Summary

An executive summary around three pages will be provided and integrated directly into the Action Plan

1 Introduction

The overriding goal of the Action Plan (AP) is to promote the implementation of the Climate Change Adaptation Strategy for the Baltic Sea Region (BALTADAPT strategy) and specifying priority activities for the macro-region in the field of adaptation to climate change impacts. The specific objective of the AP is to reinforce the actors' capacity for action at all relevant levels and their ability to provide for themselves – often designated as 'adaptive capacity'. This starts with increasing knowledge base and improving exchange of information, continues with mainstreaming CC adaptation in other policy areas and moreover includes cooperated activities between all actors in the Baltic Sea Region (BSR). Special focus is put on actions in the four sectors: Infrastructure, Tourism, Food supply and Biodiversity. As the scope of the BALTADAPT strategy and the AP is on coastal areas and marine areas, the topics and actions provided within the AP are focusing on these areas as well. However, due to strong inter-linkages with the inland, the actions are partly covering this aspect as well for each topic. Finally, it is outlined which funds are available for specific activities. Good practice examples are included to illustrate ways and opportunities how to cope with different challenges in practice.[1]

The AP is oriented towards the objectives specified in the BALTADAPT strategy: increasing the adaptability of natural, social and economic systems and enhancing the exploitation of possible opportunities for adaptation. As the AP is not structured in the same way as the BALTADAPT strategy an overview where the specific objectives of the BALTADAPT strategy are reflected in the AP is given in the following table:

Aim of the BALTADAPT strategy	**Chapters of the AP**
• An informed region • Raising awareness of the need for action at all levels • Providing robust policy relevant research-based knowledge on impacts and vulnerabilities to CC	Informing the BSR about climate change adaptation
• Integrate climate adaptation in relevant EU Strategy for the BSR (EUSBSR) () Action Plan priority areas • Review and mainstream policies in the light of climate change adaptation concerns across all relevant areas	Strengthening adaptation to climate change in the BSR by mainstreaming
• Ensuring coherent adaptation throughout the macro-region • Reviewing policies in the light of CC adaptation concerns across all relevant sectors • Making the BSR a model region for a macro-regional approach to CC adaptation • Connected region with informed actors at all levels • Ensure platforms for a policy-research dialogue	Connecting the BSR for climate change adaptation
• Responding to CC in a way to ensure prosperity and competiveness within all four sectors	Adaptation actions for the four BALTADAPT focus sectors

[1] The findings provided in the following chapters are based on the BALTADAPT reports no. 1,3,4,5,7,11, the stakeholder workshops conducted in Poland, Lithuania, Latvia, Germany and Sweden, the Policy Forums, partner meetings as well as literature and internet review.

• Identify and give an overview on available transnational funding opportunities for CC adaptation • Ensure common development of policies for funding of CC	Financing climate change adaptation in the BSR and cooperation

Table 1 Aims of the BALTADAPT Strategy

The main target groups of the AP are representatives at EU level, especially of the different departments like DG Climate, Mare, Environment and Regio. Furthermore the following groups belong to the target group of the AP as well:

- Administrative national levels of all Baltic Sea states working with adaptation-related sectors
- Sectoral stakeholders at national levels
- Stakeholders working in bilateral and multilateral cooperation
- Stakeholders working in regional conventions/ macro-regional approaches

Local stakeholders are not the target group of the AP. However, they have key responsibilities to implement adaptation measures at local level. Furthermore, as long as some member states have no national adaptation strategies, support provided by the AP might be welcomed by this group.

Just like for the global climate scenarios, the issue of uncertainty is for smaller geographical scales, like the BSR even more of a problem. One way to deal with it is the use of the precautionary principle. The Helsinki Convention e.g. suggests that the countries of the BSR should take preventive measures when there is reason to assume that CC impacts harm people, living resources and marine ecosystems. Uncertainty should be no excuse for non-action but support non-regret measures and flexible reactions even when there is no conclusive evidence of a causal relationship between inputs and their effects. In the long-term it is crucial that science and decision-makers will work together to tackle uncertainty and improve the needs and understanding providing climate projections and using them for political decisions.

2 Informing the BSR about climate change adaptation

The availability, accessibility and transfer of knowledge and information on future CC and its associated impacts are essential elements for adequate public and private adaptation actions and plans. For this reason, actions in this chapter support the overriding aim of the BALTADAPT strategy of a connected region with informed actors on all levels. To achieve this, the objective is to provide robust, policy-relevant, and research-based common knowledge base on impacts, vulnerabilities and adaptation measures, including handling of uncertainties and estimates of costs and benefits. This chapter moreover provides platforms for exchange of experiences and gives 'good examples' with the aim to raise awareness of the need for actions on all levels. See below the following list of recommended actions with regard to this chapter.

Recommended actions for increased knowledge base

- In order to fill in the identified knowledge gaps (e.g. identified within BALTADAPT) future research (European, macro-regional, national, local) should focus on the following topics:
  - more precise data, with special focus to develop spatial models and risk maps, new and / improved models on risk assessment and improvement of monitoring
  - studies on basic ecosystem processes and interactions under CC impact
  - more focused impact assessments for sectors (e.g. health, infrastructure, tourism, agriculture, biodiversity and societal groups)
  - promotion of multi- and interdisciplinary studies on CC impacts, including scenario development and socio-economic assessments
  - economic assessments of costs and benefits of climate adaptation,
  - knowledge transfer and communication strategies on climate impacts, vulnerabilities and adaptation options to raise awareness
  - social sciences: the social context of adaptation responses, social barriers and incentives and integrated analysis of response strategies considering ecological and socio-economic limits and opportunities

Recommended actions to provide and exchange information

- Support pooling of all relevant information in the BSR on CC impacts and vulnerabilities, adaptation plans and strategies as well as adaptation measures and actions: The Baltic window will serve as macro-regional information platform for the BSR within CLIMATE ADAPT.
- Knowledge and information needs to be targeted towards different stakeholders
- Use new and innovative tools such as visualization for a good knowledge transfer
- Provision of information on uncertainty and integration of uncertainty into decision-making

2.1 Increasing knowledge base on climate change adaptation

The availability of reliable and compatible knowledge is essential to achieving the objectives of the BALTADAPT strategy. Within the BSR, however, there are currently knowledge gaps on the full ecological, social and economic impacts of CC.

2.1.1 Research needs on climate change, impacts and vulnerabilities

The fundamental basis for adaptation action is scientific-sound information on the range of potential future CC. This information must span spatial and temporal dimensions, be relevant for the BSR, and be cognizant of the associated uncertainties in these CC projections. The current state of knowledge on CC impacts for the BSR has been summarized by the BALTADAPT project in 14 Climate Info bulletins on selected indicators, such as air temperature, sea level rise or eutrophication[2]. In addition, the BALTADAPT project carried out a review of relevant vulnerability assessments for the BSR in general, as well as for the four sectors specifically addressed by BALTADAPT. Apart from this, the project has also produced impact assessments for the four sectors to serve as a knowledge base on climate impacts and vulnerabilities. Despite a ground knowledge base, many CC impacts and their effects on the region specifically are still unknown. Within the work of BALTADAPT a series of knowledge gaps that need additional research regarding climate change impacts have been identified for the coastal areas of the BSR, as shown in table 2. The research needs show regional differences. Table 3 further below presents research needs of sectors.

Climate change impact	**Research needs**
General	Poor representation of the Baltic Sea (Region) in climate models Inadequate sampling of uncertainties in the chain of CC to impact scenarios Lack of good data for model evaluation Fragmentation of existing information on CC impacts and adaptation measures– need for systemic and interdisciplinary research Missing capacity in CC modelling and doubts on the applicability on possibilities for using these approaches for the BSRLack of research and information on CC impacts on ecosystems, on ecosystems goods and services Missing knowledge on the systemic character of CC system and impacts, and therefore - how to adapt to CC Develop CC scenarios that integrate environmental, land-use, geographical and socio-economic aspects Develop tools for multi-disciplinary research (for combining various types of inform.) Impacts on habitats and organisms Impacts on turbidity
Flood risks	Altitude information is imprecise e.g., in Helsinki coastal area, leading to mistakes in:

[2] http://www.BALTADAPT.eu/index.php?option=com_content&view=article&id=154&Itemid=286

	Flood prognoses Synthesis studies, e.g. flood risk maps Research on flood dynamics Combined use of different information sources (hydrology models, hydraulic models, flood maps, etc.) Flood/drought event case studies Economic assessment of flood risks and flood risk mitigation Risk-index system needed Mathematical modeling of sand outwash dynamics
Sea level rise	Coastal zone erosion and flooding, as well as which areas and structures would be affected (e.g., detailed maps)
Extreme weather events	Development and changes/erosion of different coastal types
Precipitation	Improved understanding of changes in river runoff, nutrients loads, and eutrophication, on a Baltic Sea wide scale as well as on a local scale
Salinity	Many knowledge gaps; improved understanding of changes and their effects on the ecosystem necessary. Distinction between a variety of effects such as eutrophication and CC.
Reduced ice cover	
Change of stratification	
Water quality	Impact of CC induced land-based changes

Table 2 Research needs of climate change impacts on environmental conditions for the BSR (Baltadapt Report #5)

The table supports the general overarching needs of the coastal regions of the BSR for:

1. more precise data, with special focus on spatial models and risk maps, as well as improvement of monitoring needs;
2. new and/or improved models on risk assessment
3. studies on basic ecosystem mechanisms and interactions under CC;
4. more focused impact assessments for sectors (e.g. health, infrastructure, tourism, agriculture, biodiversity and societal groups;
5. multi-disciplinary studies, such as synthesis studies, scenarios development, socio-economic assessments of CC impacts, cost-benefit analysis, social science.

Research needs should be further identified with stakeholders as well as science-policy cooperation should be improved to develop the climate and risk models according to the needs of decision-makers, see chapter 4.

The specific research needs for the focus sectors ‘agriculture and fisheries’, ‘tourism’, ‘infrastructure’ and ‘biodiversity’ have been identified in the ‘Gap-fit Analysis on Adaptation to Climate Change Research and Policy Design’ and in the climate change impact assessments in the course of BALTADAPT. The specific research needs of these sectors are listed in table 3.

A general overview of 237 EU-funded projects focusing on climate impacts, vulnerability and adaptation showed that 186 projects do address one or more (cross-sectoral) adaptation themes.[3] Most of these research projects are focusing on CC impacts. In this context the water sector and the biodiversity sector are covered mostly. Little research on CC impacts exists for sectors such as fishery, energy, industry and health. A similar picture can be drawn for research on adaptation to CC. Not all of the research projects which address the issue of adaptation provide concrete adaptation measures as an output of the work. The projects identified are presented in **Annex A**. The existing and proposed Flagship Projects under the EUSBSR for priority areas relevant for BALTADAPT are presented in **Annex B**. Additional flagship projects are going to follow BALTADAPT in the horizontal action "Sustainable Development and Bioeconomy" under the EUSBSR.

Sector	Research needs
Biodiversity	• Modelling of ice condition changes • Risk-index systems • Impact mechanisms (e.g. ecosystem services > societal impacts) • Multidisciplinary research for adaptation to CC • Adaptation capacity need more focus, impacts are studied already a lot • How implementation of adaptation strategies really works (actors, mechanisms) • Develop CC scenarios that integrate environmental, land-use, geographical and socioeconomic aspects • Social science, economics and organization studies to proceed from studying impacts towards adaptation research • Development of tools for multi-disciplinary research (for combining various types of information) • Development of research, planning and assessment methods
Agriculture	• Research regarding cost-benefit analyses of adaptation in the agriculture sector • More focused assessment of climate change impacts in BSR • Research on adaptation options of the agriculture sector (e.g. emerging new production lines) • Analysis of international trends in economy and climate change adaptation (e.g. agriculture markets) • Research on effectiveness of water protection measures in agriculture under the CC
Fisheries	• Ecosystem dynamics, especially the impacts of CC in combination with

[3] The projects have been identified from the following funding programmes and/or web sources: INTERREG III B 2000-2006; INTERREG IV B 2007-2013; Cordis (projects funded by Framework Programmes FP4 - FP7); European Communities 2009 (European Research Framework Programme: Research on Climate Change Prepared for the Third World Climate Conference and the UNFCCC Conference of the Parties); European Commission: Research and Innovation - Environment (Link: http://ec.europa.eu/research/environment/index_en.cfm?pg=climate and http://ec.europa.eu/research/environment/index_en.cfm?pg=marine); Cost Action; ERA-net CIRCLE and CIRCLE-2

	several influencing factors • Improved ecosystem modelling to assess the human impacts on fish populations in combination to CC and to assess the potential value arising from a healthier ecosystem and from productive fish populations • Ecosystem services and non-monetary values provided by fish stocks under the changing climate • Population structures of Baltic Sea fish stocks (geographical range-shifts of fish species; effects of substitution of species and alien species) • Improved forecasts of marine ecosystem dynamics • Research on sustainable fisheries management considering ecological and socio-economic effects of CC, 'Climate-proofing' of long-term fisheries management.
Tourism	• Comparative research: exploring why some destinations are more sensitive to CC than others (e.g., diversity of supply and demand factors, or the presence of built/cultural attractions); • Improved/new impact assessments; • Studies of the impacts of extreme events on tourism and capacity to cope with it, studies on vulnerability of particular tourism sites (resorts); • Trans-disciplinary research activities linking social, economic and CC (natural sciences) researchers from different BSR countries; • Activity-oriented and participatory action research, dealing with the impacts on activities, e.g. bathing activities by concentrating on the climate linked resources of tourism; • Research on tourism behaviour change by changing climate elements and their variability
Infrastructure	• Economic (cost-benefit) and management aspects of possible CC adaptation measures, participatory action research and policy transfer (BSR-wide, EU-wide and transnational) with focus on CC adaptation options used in coastal infrastructure • Improvement of indicators used, data availability and monitoring in relation to CC impacts and adaptation measures in coastal areas • Review of coastal monitoring data • Integrated development of off-shore and coastal areas. Preparation of scenarios, adaptation strategies and intervention plans towards mitigation of impacts of CC on coastal area • Holistic approaches to identify impacts of climate and global change (including demographic changes). • CC impact assessments on coastal and island areas, including tourism and water quality (algae blooming) • Support to research and practice thus encouraging innovative activities and learning of individuals and organizations. • Support to model, pilot and demonstration actions where public, private and scientific organisations are jointly participating **Coastal protection** • Knowledge on regional/local changes and their time horizon • Hydrodynamic studies to improve understanding of coastal evolution,

	longshore sediment drift parameters and surf zone dynamic peculiarities • Monitoring of coastal geological processes • Modelling of coastal evolution **Maritime traffic and ports** • Analysis of requirements of building/construction owners/users/operators due to changed climatic conditions • Analyses of behavioural changes of building users and possibilities of achieving such • Analyses of possible adaptation of planning criteria for buildings/constructions and for determination of their energy demand as well as the design of buildings • Analysis of requirements of design, dimensioning and operational/system management • Analyses of future demand of buildings for design, dimensioning and energy demand of air conditioning systems • Maximal power of heating systems should be adapted to changing temperatures

Table 3 Research needs of the four BALTADAPT sectors

2.1.2 The need for cost and benefit assessments

In addition to the research gaps on CC impacts and their effects on the ecosystem and the human uses of the coastal region, there are also many gaps in the assessments of the costs of CC. There is increasing interest in the economics of CC in order to identify the financial consequences as well as costs and benefits of adaptation to eventually inform decision-makers and guide adaptation policies. The importance of these financial assessments was highlighted multiple times in the course of the BALTADAPT workshops, see Box 1.

Box 1 - Info: Need for assessment of adaption costs for some sectors

Agriculture

Scenario studies often ignore socio-economic conditions and adaptive capacity at farm and sectoral level. Since effects of CC differ between regions, there is need for increased attention on regional studies of impacts of CC. There is also a considerable need to better estimate the costs and cost-effectiveness of various adaptation measures including the best design of policy measures to maximize synergies between adaptation and other environmental objectives, including mitigation and provision of ecosystem services. Moreover, the linkages between adaptation at farm level and adaptation more broadly within food the system need to be understood.

Biodiversity

The information of the economic damage of lost ecosystems is limited. There are economic key numbers of the economic value of ecosystems, but there are not yet calculations of how these values will change under climatic changes. There is little information on the impact of CC on the establishment of invasive species. There is little information on the impact of weather extremes on the fluctuation and recovery of populations and effective adaptation measures.

Certain CC impacts that are expected in the BSR can induce high economic damage, such as floods and heat waves. Adaptation measures addressing these impacts will involve costs, but they will also provide benefits by avoiding the damage costs. The assessment of these costs and benefits, however, is still a challenge, that several projects are trying to tackle right now. Several European wide initiatives exist in this area and some projects in the BSR have considered the costs and benefits of CC adaptation already. Box 2 presents some of these initiatives.

Still there is research needed for new and improved methodologies and better economic assessments. To inform and support adaptation management, vulnerabilities need to be presented in monetary terms, in tandem with a comparison of the costs of adaptation measures against the cost of inaction. As a basis for this the resolution of climate models has to be improved to be applicable to smaller scale assessments. Consequently, methodologies for regional assessments must be developed at the European or BSR level. Next to the macro-regional assessments, more detailed assessments of local circumstances should be carried out on the national and local level, so as to inform decision-makers of the financial consequences and expected needs for funding adaptation to expected climate changes.

Box 2 - Good practice: Costs and benefits of climate change adaptation

The European **PESETA** project (Projection of Economic impacts of climate change in Sectors of the EU based on bottom-up Analysis) developed an innovative high-resolution, regionally focused, and integrated assessment of the physical and economic effects of climate change in Europe. It focused on the impacts of climate change on the following sectors: agriculture, river floods, coastal systems, tourism, and human health.

➔ http://peseta.jrc.ec.europa.eu/

Another European project, **ClimateCost** provided a comprehensive and consistent economic analysis of climate change impacts, including the costs and benefits of adaptation. The results of the project are aimed to inform policy makers in the debate around climate mitigation policy and adaptation issues. The project concluded that the need to recognise and work with this uncertainty – as part of integrated and sustainable policies – requires an iterative and flexible approach.

➔ http://www.climatecost.cc/

A project tackling the cost and benefits of climate change in the coastal region of the BSR was **BaltCica**. The project developed a framework for the assessment of damage cost that feed into a cost-benefit analysis and a multi-criteria decision analysis and applied this methodology to several local case studies areas such as the metropolitan region of Helsinki and the municipality of Kalundborg.

➔ http://www.baltcica.org

2.1.3 Applied adaptation research

Besides the research on CC and its impacts, more focus should also be placed on applied research, referring to research in relation to adaptation measures and actions. The BSR is still at an early stage in understanding how best to adapt to future CC, how to effectively reduce vulnerability and enhance resilience, and what the characteristics of a successfully adaptive society might be. It is critical to learn what works well or not, in which circumstances and for what reasons. Therefore, continued scientific research is necessary to develop

effective adaptation measures regarding sectors and local conditions. More pilot and demonstration projects are desirable, in which concepts and solutions for adapting to CC are developed and tested. The improvement of adaptation knowledge at the sectoral level is supported by science programmes and initiatives see Box 3, for some national initiatives in Germany and Finland.

Box 3 - Info: Examples for national initiatives for sectoral knowledge improvement from Germany and Finland

Germany:

Non-sectoral

- KLIMZUG (supported by the German Ministry for Science and Education): develope innovative strategies for adaptation to CC and related weather extremes in regions
- Social Dimensions of climate protection and CC (supported by the German Ministry for science and education), 12 projects

Urban and regional planning of coastal areas

- planB:altic (supported by the Federal Ministry for science and education): CC and regional planning – adaptation strategies in urban areas of the coastal areas at the Baltic Sea

Biodiversity

- 27 projects about biodiversity and CC; furthermore development of adaptation strategies by the Federal Ministry for the Environment to minimize loss of climate sensitive fauna and flora and provide recommendations for an adapted management in Natura 2000 areas.

Agriculture

- Conservation of genetic resources in gene banks as starting point for breeding programmes, e.g. for climate adaptation and higher efficiency of nutrients (supported by the Federal Ministry of Food and Agriculture)

Finland

Non-sectoral

Research project on Climate change adaptation and social impacts. The project assessed the impacts of climate change and climate change adaptation on rural communities and their well-being. The focus was especially on analysing and recognizing social impacts in advance and mapping the relevant actors and adaptation measures.

Urban and regional planning

- EXTREMES II - Impacts of natural hazards on infrastructure in a changing climate The Extremes II project developed methods for defining the frequency of rare weather events. A numeric regional climate model was used for studying how climate change influences the occurrence of these events especially from the point of view of built environment.

Biodiversity

- Biodiversity and climate change - Efficiency of the network of nature reserves and grazed meadows in maintaining species populations. The project produced a pre-assessment of different measures available for biodiversity conservation with an aim to study on the ability of current nature conservation areas to maintain their species

in future climate.

Fishery

- Fish in a changing climate - Changes in Finnish fish fauna, fish stocks and alien species in climate change

Agriculture

- ADACAPA - Enhancing the adaptive capacity of Finnish agri-food systems. The project developed measures to evaluate and improve the adaptive capacity of Finnish agrifood systems to global changes on various decision-making levels (farmer, trade, consumer; company, region, country). The project studied diversity within crop varieties and species, diversity of cultivation systems, farms and marketing channels, regarding them as factors that advance adaptive capacity.
- ILMASOPU - Adaptation of the agri-sector to climate change. This project produced comprehensive, regional future estimates of Finnish field and horticultural crop production, competitiveness and environmental effects in changing climate and global markets. This information serves as reliable knowledge for decision making, businesses and all anticipating actions.

Within the field of CC adaptation, the demand for social science is widely recognised and promoted by many research networks and international initiatives worldwide, given the multiple interrelations between societal responses and CC. This also applies to the BSR, where the adaptive capacity of the BSR is based on socio-economic conditions, significantly determining future vulnerabilities. Therefore multidisciplinary research and actions are required, understanding, developing and implementing social and economic responses to CC.

On the European level, this is supported by the Strategic research agenda of the joint program initiative (JPI) climate, see box 5, including enhanced knowledge on the social context of adaptation responses, social barriers and incentives to respond to CC and integrated analysis of response strategies considering socio-ecologic and socio-economic limits and opportunities of adaptation strategies.

Moreover applied adaptation research should address communication and dissemination. New methodologies have to be developed on how to improve communication and reach the targeted stakeholders to raise awareness of the need for action on all levels.

2.2 Improving provision and exchange of information on climate change adaptation

For the development and implementation of adaptation strategies and measures, access to a sufficient and relevant data and knowledge base on CC impacts and risks is required, as well as the knowledge transfer to and between all levels.

The often noted fragmentation of information on change impacts, adaptation needs and potential adaptation measures can be addressed with platforms on data and information around climate adaptation. Two European initiatives on marine and on climate data (including adaptation) are presented in box 4 and 5. These initiatives are a first step, but more open access to data is needed for the better exchange of data and information. Further cooperation with the research community is addressed in chapter 4.

Box 4 - Good Practice: The European Marine Observation Data Network - EMODnet

The European Commission (EC) launched the European Marine Observation Data Network (EMODnet) to bring fragmented and inaccessible data together, collected largely by public institutions and different levels of quality. Such platform is moreover required by the MSFD. EMODnet aims to increase the efficiency for those working with marine data – industry, public authorities and research bodies. A final EMODnet will be developed until the end of 2014.

- ➔ http://www.emodnet-hydrography.eu/
- ➔ http://bio.emodnet.eu/
- ➔ http://www.emodnet-geology.eu/

Box 5 - Good practice: Connecting Climate Knowledge for Europe - JPI Climate

The JPI climate is a long-term initiative that aims to empower European decision makers to take appropriate action on climate change. It thus intends to contribute to a highly coordinated knowledge development by improving the scientific expertise on climate change risks and adaptation options, as well as providing climate knowledge and connecting it with decision-making on safety and major investments climate vulnerable sectors in Europe.

- ➔ http://www.jpi-climate.eu

Next to the increased knowledge base of the research community, the aim is to have informed actors on all levels. Therefore an improved knowledge and information transfer to and also between actors dealing with adaptation is needed.

On the EU level Climate Adaptation Platform CLIMATE-ADAPT aims to pool all relevant information focused on adaptation for decision-makers see Box 6. With regard to the BSR, various adaptation measures have been developed and implemented and information on many of these measures is available across various information platforms, reports or national action plans. Due to this fragmentation a common collection and review of existing adaptation measures is needed in order to support policy-makers with all information available to help developing their own adaptation plans. Within CLIMATE-ADAPT the Baltic Window will pool all this relevant information on adaptation focused on the BSR and support mutual learning and exchange of best practices for the BSR, see Box 6.

Box 6 - Good practice: Online platform CLIMATE-ADAPT

This platform provides information on CC impacts and vulnerability, adaptation plans and strategies as well as adaptation measures and actions. Coastal areas and marine and fisheries are two of the sectors covered by the database (alongside agriculture, biodiversity, health, etc.). Furthermore information about the nature of uncertainty in climate research and good guidance on how to deal with this uncertainty in decision-making is available.

→ http://www.climate-adapt.eea.europa.eu/web/guest/home

Online platform for the BSR: Baltic Window *(to be further elaborated by UBA)*

To ensure a high durability and sustainability of the Baltic Window, it is planned to integrate it into CLIMATE-ADAPT.

The aim and concept of the Baltic Window is to establish a knowledge brokerage process on CC and CC adaptation between researchers, stakeholders and political decision makers across political levels.

Next to the macro-regional information platform some good national initiatives exist providing information on CC, including impacts and adaptation, see box 7. The information on these platforms is targeted at those institutions and individuals considering the need for adaptation to CC in personal, economic or political decisions.

Box 7 - Info: National Information platforms

Denmark

www.klimatilpasning.dk - -This portal provides information on the newest research and development within climate change adaptation in Denmark and abroad. The portal also contains a number of specific examples of adaptation measures. It was developed by the Task Force on Climate Change Adaptation under the Danish Ministry of the Environment in collaboration with an array of other government institutions. Language: DK

Finland

https://ilmasto-opas.fi/en/ - This platform provides information on climate change and its impacts, mitigation and adaptation. Contents are produced by Finnish research institutes. The aim is to enable Finnish research institutions, authorities and expert organisations to make their climate change information and services more easily available to society. Language: FI and EN

Germany

www.anpassung.net – This is the website of the Competence Centre on Climate Impacts and Adaptation, created by the Federal Environment Agency – (KomPass for short). It provides information on climate change and its impacts, as well as adaptation measures and their limitations. It is intended to be the interface between climate research, society, economy and politics. Language: DE

Sweden

http://www.smhi.se/klimatanpassningsportalen - The portal offers comprehensive information about the effects of climate change, risk management, how an adaptation plan can be developed and examples. The target group for the portal is currently municipalities and county administrative boards. The portal is a result of the cooperation between thirteen Swedish governmental agencies - in collaboration with Sweden's municipalities and county councils. Language: SE

For an improved knowledge transfer the manner in which information is translated or transferred to the different stakeholders groups is of considerable importance. Different dissemination strategies are required for targeted dissemination to decision-makers, industry and the wider public. This also applies to the BSR, where such targeted knowledge transfer can increase awareness and improve understanding of adaptation needs Box 8 highlights a good example of a targeted knowledge transfer instrument for the BSR. The provision of knowledge has continuously to be adapted in line with a growing knowledge base.

For decision-makers in the BSR the perceived lack of knowledge and the uncertainties surrounding climate predictions and modelling make it hard to take concrete decisions towards CC adaptation. In order to avoid postponing the implementation of adaption actions, it is important to inform and communicate with decision-makers in the BSR about this

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