

## **13. LITHUANIA**

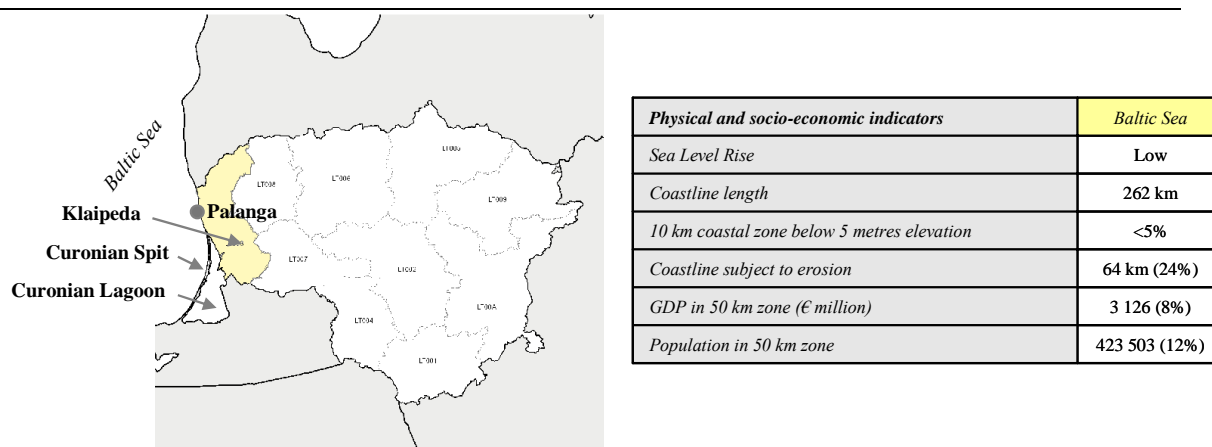
This country fiche provides a comprehensive overview and assessment of climate change adaptation in Lithuania. After detailing the vulnerability of Lithuania's coastal zones, the responsibility and financing for coastal protection is explained. Next, the fiche presents the relevant research activities, the coastal defence, risk reduction and adaptation plans available in Lithuania as well as the current and future protection and adaptation expenditure. The persons contacted and sources of information used are listed at the end.

### **13.1. VULNERABILITY OF LITHUANIA'S COASTAL ZONES TO CLIMATE CHANGE**

Lithuania is situated on the south-eastern coast of the Baltic Sea. The entire coastline measures 262 km and consists of two different parts: the continental coast and the 'Curonian Spit' coast. The Curonian Spit coast forms the southern part of the shoreline and consists of a sandy stretch of land extending 98 km, half of which belongs to Lithuania, the other half to Russia. The width of the peninsula varies from 0.4 km to 3.8 km. The continental coast forms the northern coast and is situated entirely within one county, Klaipeda.

*Figure 13-1* presents the coastal areas of Lithuania, including the Klaipeda county with Palanga as the largest beach resort as well as the Curonian Spit and the Curonian Lagoon. Furthermore, an overview is given of the main physical and socio-economic indicators of the coastal zones.

Figure 13-1: Coastal areas of Lithuania and their main physical and socio-economic indicators



Source: Policy Research based on EEA, 2006, *The changing faces of Europe's coastal areas (for Sea Level Rise and 10 km coastal zone below 5 metres elevation)*; European Commission (Euroseion study), 2004, *Living with coastal erosion in Europe: Sediment and space for sustainability (for coastline length and coastline subject to erosion)*; Eurostat 2004 (for GDP and population in 50 km zone)

The following paragraphs discuss the main climate change risks for the coastal strip of Lithuania. Storm surges pose the greatest threat, especially to the northern part of the Lithuanian coast.

**a/ Flooding and erosion**

The Lithuanian coast suffers intensive erosion due to the natural processes of wind and wave action. In the last decade, the problem has been severely aggravated by human intervention such as the construction of hydro-technical works, deepening of the Klaipeda port and recreational activities.

The Curonian Spit coast mainly consists of sandy dunes. To the north of the Curonian Spit, the continental coast changes into a coastline characterised by an erosion-accretion pattern as cliffs and sand dunes interchange. This part of the coast is exposed the most to strong and frequent storms and erosion. The problem is particularly serious for Lithuania's largest resort, Palanga, where the beach was almost totally washed away over a period of 5 years.

A succession of severe storms in the last 20 to 30 years seems to have accelerated erosion and coastline recession. Particularly devastating was the hurricane 'Anatole' of December 1999 which nearly swept away the beaches along the entire coast of Lithuania. Storm surges are predicted to intensify even further due to the reduction in sea-ice cover during winter and the strengthening of the westerly to south-westerly winds. Consequently, Lithuania is more at risk of flooding due to storm surges than Sea Level Rise (SLR).

***b/ Freshwater shortage***

At present, Lithuania does not experience any particular problems with respect to the quality or quantity of water. Groundwater, the only source of drinking water in Lithuania, is sufficiently available and generally of good quality. Nevertheless, groundwater as well as surface water bodies, such as wetlands or lakes, are protected through the designation of protection zones. These zones, in which economic activity is restricted, aim to secure sufficient water resources for the future by limiting erosion on the banks of water bodies and protecting the natural landscape.

***c/ Loss of coastal eco-systems***

Salt water intrusion and resulting changes in the coastal eco-systems has been identified as a problem in the north of the Curonian Lagoon<sup>1</sup>. An important area within this lagoon is the Nemunas river delta which includes important wetlands as well as agricultural land. The Nemunas river delta wetlands are considered globally significant and are therefore protected under the Ramsar Convention<sup>2</sup>. Furthermore, in 1992 the Nemunas Delta regional park was created to safeguard the delta's wildlife.

The Lithuanian coast surrounding the area of Klaipeda is protected through the creation of the Pajuris regional park. To protect the natural features of the Curonian Spit<sup>3</sup> the Kursio Nerija national park was created.

## **13.2. RESPONSIBILITY AND FINANCING FOR COASTAL PROTECTION AND CLIMATE ADAPTATION**

In Lithuania, responsibilities with regard to coastal protection are shared between national and sub-national authorities. Whereas policies are set out at the national level, operational management is taken care of by the Klaipeda County Head Administration as well as by several municipalities.

The *Ministry of Environment* is the main national institution involved. The *Nature Protection Department* of this ministry is responsible for assessing the evolution and natural changes of the Lithuanian coastline and for the formulation of policy recommendations in order to make coastal protection measures more effective. Planning issues are taken care of by the *Territorial Planning, Urban Development and Architecture Department*.

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<sup>1</sup> Dailidienė I., Davulienė L., Tilickis B., Stankevičius A., Myrberg K., 2006, *Sea level variability at the Lithuanian coast of the Baltic Sea*, Boreal Environment Research vol. 11 p. 109-121.

<sup>2</sup> RAMSAR sites are areas identified in the 'List of Wetlands of International Importance' in respect of the Convention on Wetlands signed in Ramsar, Iran in 1971; the sites include amongst others swamps and marshes, lakes and rivers, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs.

<sup>3</sup> The Curonian Spit was listed as a UNESCO World Heritage site in 2000.

Financial support is provided by national programmes, such as the Programme for the Lithuanian Coastal Strip Management of 2003 and EU funds. For the maintenance of protection structures the Klaipeda County Head Administration receives an annual budget from the national government. Maintenance of the coastal dunes and coastal forests on the other hand, is the joint responsibility of local municipalities and administrations of two of the state parks (Kursiu Nerija national park and Pajuris regional park).

### **13.3. RESEARCH TO LITHUANIA'S VULNERABILITY TO CLIMATE CHANGE AND CLIMATE CHANGE SCENARIOS**

To date, research into climate change vulnerability has been very limited. The only research activity that could be identified is the participation of Lithuania in the EU-funded project ASTRA<sup>4</sup>.

The ASTRA-project, which was completed in 2007, analysed climate change impacts on the seashore and coastal eco-systems, dune deflation and erosion patterns and provided recommendations for adaptation. For Lithuania specifically, inundation schemes as well as a report indicating high-risk zones were prepared for the city of Klaipeda. The partners involved in this project were the *Environmental Centre for Administration and Technology, Vilnius University, the Institute of Geology and Geography* and the *City of Klaipeda*.

### **13.4. COASTAL DEFENCE, RISK REDUCTION AND ADAPTATION PLANS IN RELATION TO CLIMATE CHANGE**

No national climate change adaptation or coastal protection strategy currently exists in Lithuania. Nevertheless, in recent years Strategic Guidelines for the Lithuanian Baltic Sea coast as well as spatial planning regulations and a dedicated law for the coastal strip have been published in reaction to the increasing frequency of storm events. At operational level, the chosen coastal protection measures under the Programme for the Lithuanian Coastal Strip Management support a limited intervention strategy, aimed at stabilising the coastal zones.

#### *a/ Strategic Guidelines for the Lithuanian Baltic Sea coast*

Following the devastating hurricane of 1999, the Lithuanian government started to devote more attention to policy development in relation to climate change in coastal areas.

In 2001, the Ministry published *Strategic Guidelines for the Lithuanian Baltic Sea Coast* to ensure sustainable coastal strip management. These guidelines concern the protected part of the Lithuanian

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<sup>4</sup> [www.astra-project.org](http://www.astra-project.org); project time-frame 2005-2007.

coastal strip covering an inland area of 300 metres as well a maritime area of up to 20 metres depth. Their priority is to save the natural landscape and the natural processes of coast formation in Lithuania. Furthermore, the guidelines stipulate that coastal management measures should be implemented in a coordinated manner to ensure that coastal protection actions in one section of the coast do not harm the state of the coastline of a neighbouring section.

***b/ Spatial planning***

Besides the operational actions undertaken under the Programme for the Lithuanian Coastal Strip Management discussed in the remainder of the text, Lithuania uses spatial planning regulations to protect its coastal zones. This soft coastal protection measure supports the limited intervention strategy Lithuania has opted for. Three laws are worth mentioning in this regard:

- Law on Territorial Planning (1995);
- Law on Forests (2001);
- Law on Coastal Strip (2002).

According to the *Law on Territorial Planning*, all coastal management issues, including coastal defence, must be integrated into the general physical planning framework. Requirements exist to prepare territorial planning documents for coastal zone management and to assess the environmental impact of the planned solutions. The system in place includes four planning levels: national planning, county planning, local comprehensive planning and ‘detailed’ planning.

In this regard, Klaipeda County Head Administration established the *Klaipeda County Master Plan* in 2002 which aims to provide clear guidelines for sustainable and integrated development priorities in the county until the year 2020. The plans provided by the municipalities establish more specific land use requirements and obligations and define the primary purposes of certain areas within a local community, town or particular property. They also determine parts of rural areas where detailed planning is mandatory. At present, there exists an approved comprehensive plan for the Klaipeda urban as well as rural municipality and for the Palanga urban municipality.

To fight coastal erosion, all forests and dunes of the coastal zone have been classified as protected and preserved according to the *Lithuanian Law on Forests*. Furthermore, coastal forests can not be cut down unless they are situated more than 1 km away from the coastline.

One year later, in 2002, the Lithuanian government passed the *Law on the Coastal Strip*. This law stresses the importance of tuning coastal management to the protection of landscapes and habitats of rare species along the Curonian Spit as well as the continental coast. Furthermore, any new exploitation of underground resources or new construction is forbidden within a coastal strip of at least 100 metres. Only reconstruction of the existing buildings or limited construction of small-scale

seaside leisure facilities could be allowed, subject to a permit from the Klaipeda governor and approval by the national government.

*c/ Programme for the Lithuanian Coastal Strip Management*

From an operational point of view, the Programme for the Lithuanian Coastal Strip Management established in 2003 and revised in 2005 is the main instrument to implement a 'limited intervention' coastal protection strategy. The programme is based on the following principles:

- Conservation of natural coastal landscapes and coastal processes;
- Differentiation of coastal management measures according to specific priorities for coastal conservation;
- Monitoring coastal development.

In 2005, the government decided to revise the programme to include the vulnerable Curonian Spit. The responsibility for the implementation of the Programme for the Lithuanian Coastal Strip Management was designated to the Klaipeda County Head Administration.

Up to 2007, the activities actually carried out under this programme were limited due to a lack of funding. The main actions were undertaken along Palanga and the Curonian Spit and focused on counteracting erosion by means of soft measures, such as beach nourishments with natural materials, as well habitat protection.

Consequently and after the award of European funds, the Programme for the Lithuanian Coastal Strip Management 2008-2013 was established. With this programme, the Lithuanian government aims to further stabilise the coastline and protect the coastal dunes by means of soft protection measures.

### 13.5. PAST, PRESENT AND FUTURE ADAPTATION EXPENDITURE

As the first Programme for the Lithuanian Coastal Strip Management was only initiated in 2003, the capital expenditure is expected to be very limited in the period before and estimated by *Policy Research* at less than €0.05 million. Also in the following years, between 2003 and 2008, only a limited amount of measures has been undertaken due to a lack of funding. For the period 2008-2013 funding has been secured through EU as well as national funds for a total amount of €5.8 million. Most likely, the majority of this amount will be spent to safeguard the continental coast.

In 2008, the total maintenance and capital expenditure amounted to €1.64 million. Over the entire 1998-2015 period, Lithuania will have spent about €10.45 million to coastal protection. More detailed information on the adaptation expenditure and budget forecast for Lithuania can be found in *Table 13-1*.

**Table 13-1: Expenditure to protect against coastal flooding and erosion (in € million)**

Year	MAINTENANCE EXPENDITURE*	CAPITAL EXPENDITURE**	TOTAL
1998	0.00	<0.05	<0.05
1999	0.03	<0.05	<0.08
2000	0.00	<0.05	<0.05
2001	0.00	<0.05	<0.05
2002	0.00	<0.05	<0.05
2003	0.14	0.04	0.18
2004	0.14	0.28	0.42
2005	0.14	0.00	0.14
2006	0.14	0.36	0.50
2007	0.14	0.00	0.14
2008	0.14	0.96	1.10
2009	0.14	0.96	1.10
2010	0.14	0.96	1.10
2011	0.14	0.96	1.10
2012	0.14	0.96	1.10
2013	0.14	0.96	1.10
2014	0.14	0.96	1.10
2015	0.14	0.96	1.10
<b>TOTAL</b>	1.85	8.62	<b>10.47</b>

\* In 1999, € 0.03 million was spent to emergency measures following hurricane Anatole

\*\* Capital expenditure between 1998-2002 has been estimated by Policy Research based on the fact that a first dedicated programme was initiated only in 2003; proxy of capital expenditure for the period 2008-2013 provided by Ministry of Environment and distributed equally over the period concerned (exchange rate used: 1 LITAS=0.289620 €); budget forecast for 2014-2015 depend on the award of EU funding and has therefore been set by Policy Research at the same level as before

## **13.6. PERSONS CONTACTED AND SOURCES OF INFORMATION USED**

### **13.6.1. PERSONS CONTACTED**

<i>Name</i>	<i>Organisation</i>
<i>Bitinas, Albertas</i>	Lithuanian Geological Survey
<i>Brazauskas, Romualdas</i>	Climate Change Department – Ministry of Environment
<i>Gudaitiene-Holiman, Dalia</i>	Nature Protection Department – Ministry of Environment
<i>Razinkovas, Arturas</i>	Coastal Research & Planning Institute - Klaipeda University

### **13.6.2. SOURCES OF INFORMATION USED**

- Astra-project, 2007, *Towards climate change adaptation in the Baltic Sea region – results of the case studies*
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- [www.am.lt](http://www.am.lt), Resolution of government of the Republic of Lithuania on the approval of the national strategy for the implementation of the United Nations Framework Convention on Climate Change until 2012
- [www.astra-project.org](http://www.astra-project.org)
- [www.corpi.ku.lt](http://www.corpi.ku.lt), Klaipeda University, Coastal Research and Planning Institute
- [baltic.eucc-d.de/baltic](http://baltic.eucc-d.de/baltic), The Coastal Union Baltic
- [www.jtc.lt](http://www.jtc.lt), Ministry of the Environment
- [www.klaipeda.aps.lt/senasis\\_puslapis/en/geograf.html](http://www.klaipeda.aps.lt/senasis_puslapis/en/geograf.html), Klaipeda County Head Administration