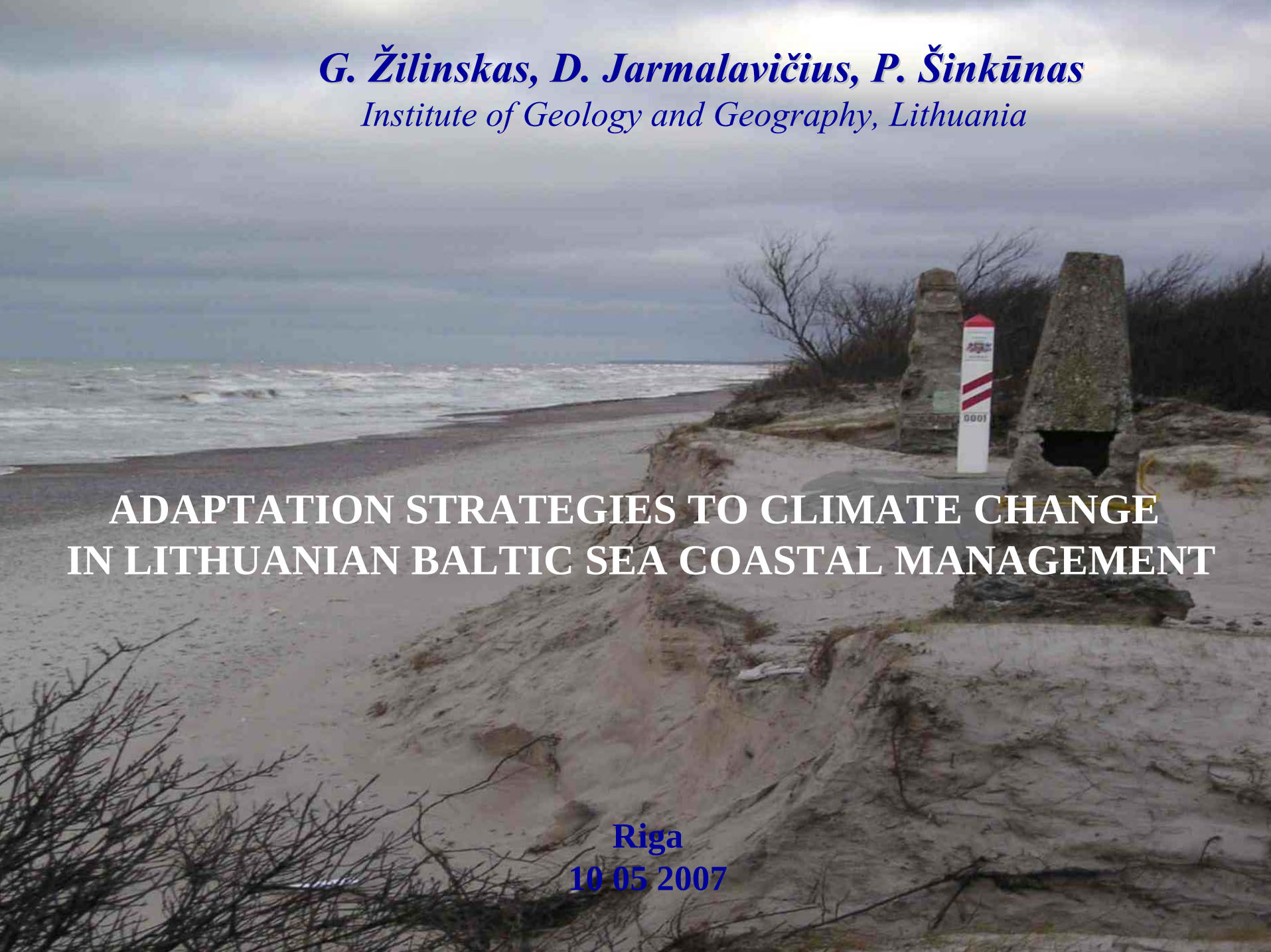




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ADAPTATION STRATEGIES TO CLIMATE CHANGE IN LITHUANIAN BALTIC SEA COASTAL MANAGEMENT

Riga
10 05 2007

Location of the study area



The length of the Lithuanian coast is 90.6 km:

- the coast of Curonian spit - 51.0 km,**
- the continental coast - 38.5 km.**

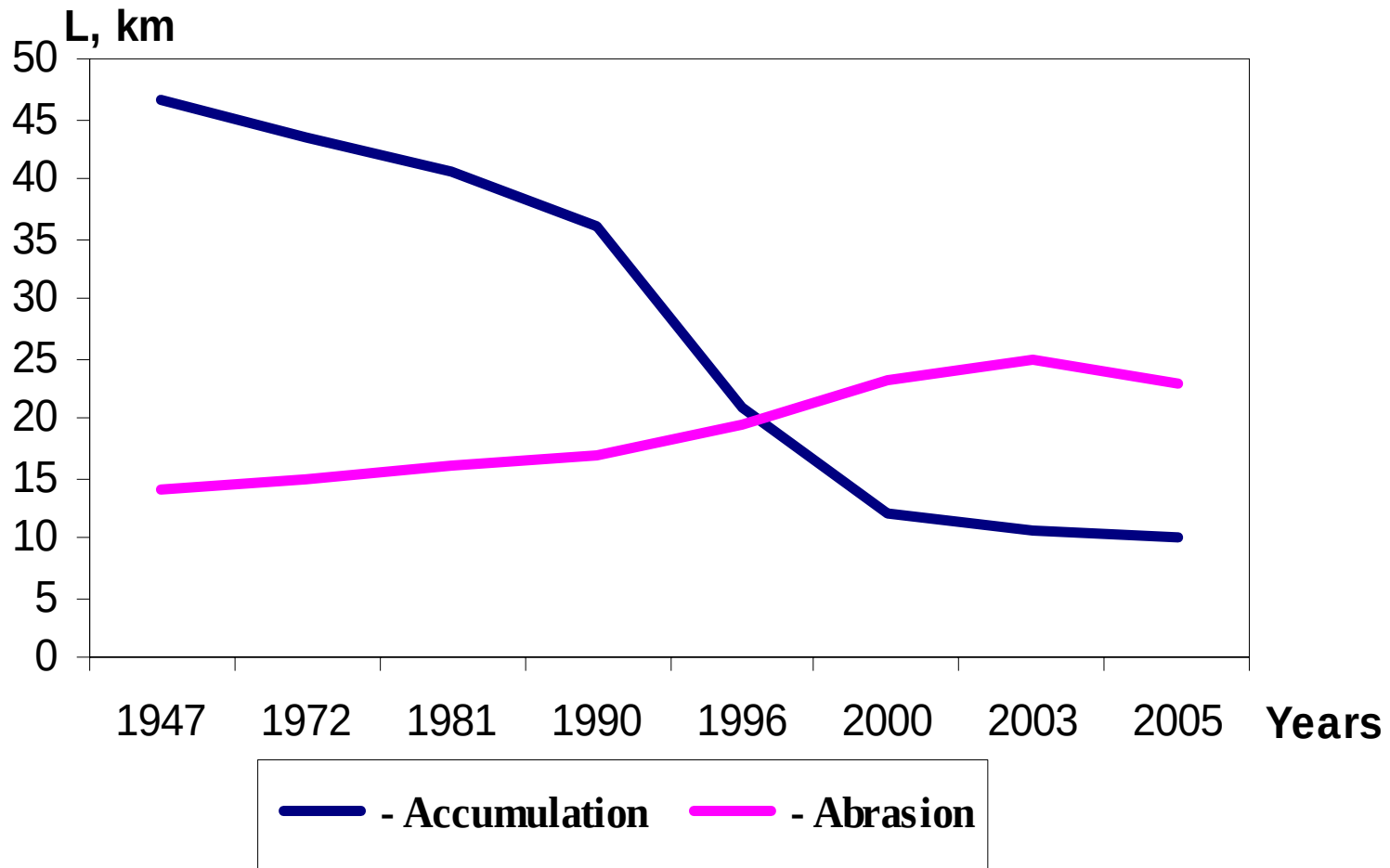
Palanga beaches after the hurricane „Anatoly“



Palanga pier after the hurricane „Anatoly“



Coastal dynamic from 1947 to 2005



increase of storm frequency, winter temperatures, water level, etc.

THE LEGAL BASIS:

- **Strategy of Coastal Management** of the Lithuanian Baltic Sea Coast (2001, No 570)
- **The law of the Coastal Zone** of the Republic of Lithuania (2002, No 73 -3091)

PROGRAMMES OF COASTAL MANAGEMENT:

- Purposive programme of the **Curonian Spit coast management** (1999, Institute of Geology and Geography)
- Purposive programme of the Lithuanian **continental coast management** (2003, Institute of Geology and Geography)
- **Modified** programme of coastal management (2005, Institute of Geology and Geography)

Law of the Coastal Zone of the Republic of Lithuania

This law **defines the objectives determining the coastal zone** and its constituent parts, **sets the regulations for use and protection** of coastal landscape, use of the land and sea area **and restrictions of economic activity**.

- Article 1. The purpose of the law.
- Article 2. Main concepts.
- Article 3. Objectives determining the coastal zone.
- Article 4. Constituent parts of the coastal zone and their boundaries.
- Article 5. Land use and management.
- Article 6. General restrictions of economic activity.
- Article 7. Terms and order of construction works.
- Article 8. Coastal management and extreme ecological situations.
- Article 9. Monitoring of the coastal status.
- Article 10. Responsibility for breaches of the law and state control.

Content of the strategy of Lithuanian coastal management

I. Introduction

- **Object of the strategy** of Baltic Sea coastal management – the Lithuanian Baltic Sea coastal zone.
- The objective of the strategy of coastal management – to ensure sustainable development of the coastal zone preserving the natural coastal complexes and creating conditions for sustainable use of natural resources.

II. Survey and evaluation of the dynamic state of the Lithuanian Baltic Sea coast.

III. Types of activity (functions) and coastal use in the coastal zone.

IV. Principles and implementation of the strategy of coastal management.

V. Financial sources.

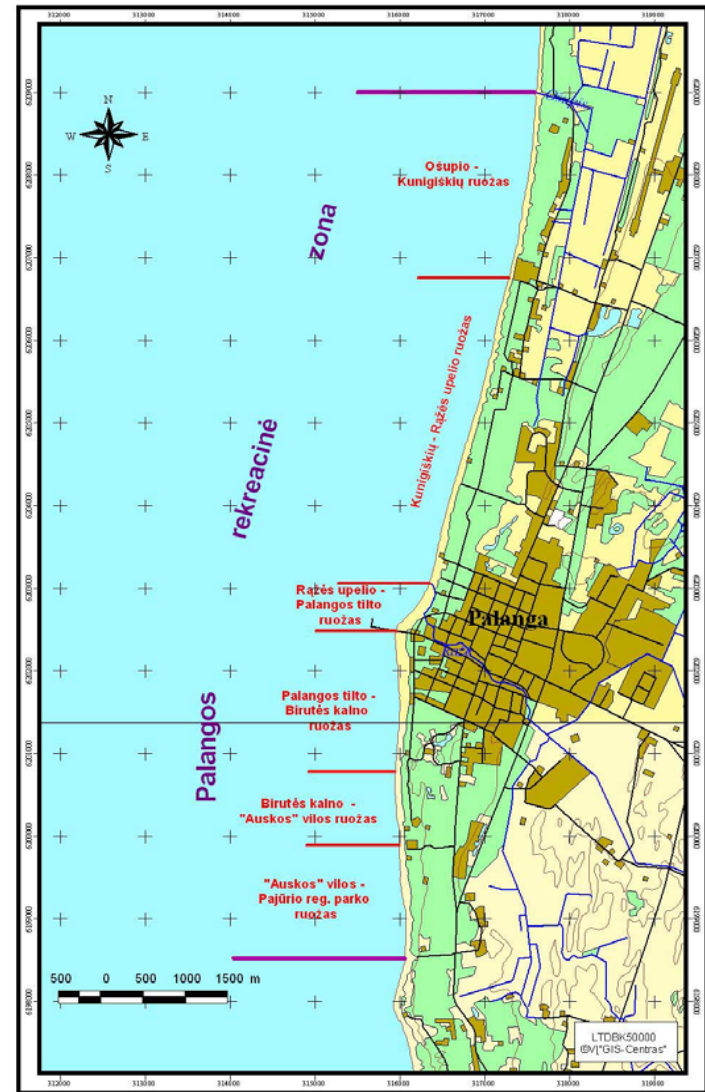
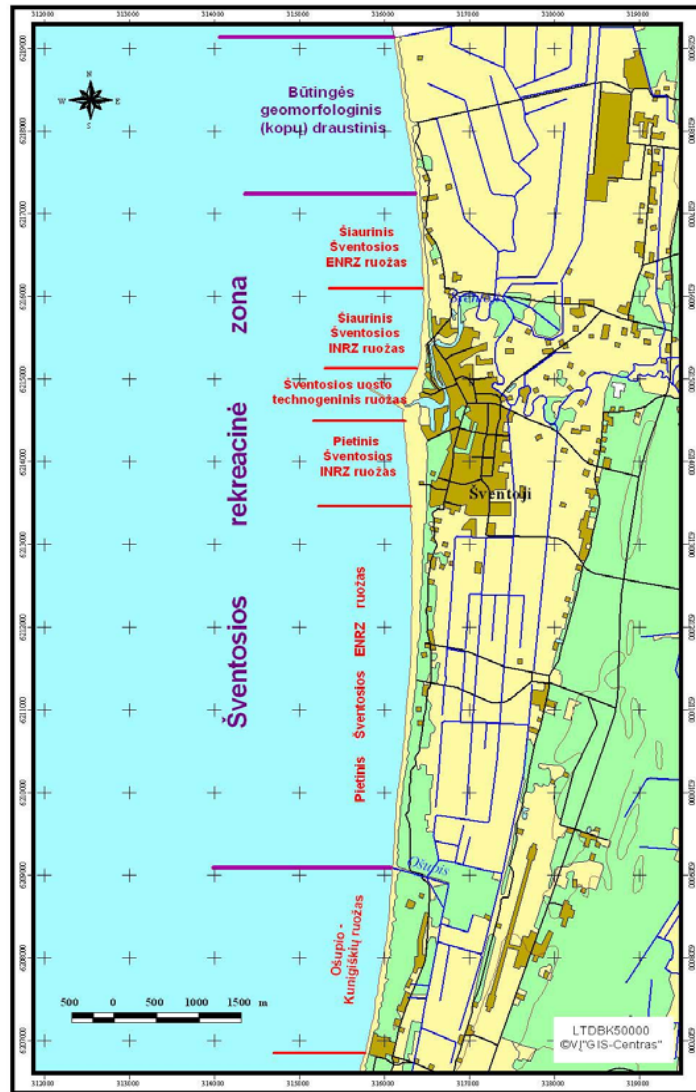
selective coastal management

IV. Principles and implementation of the strategy of coastal management

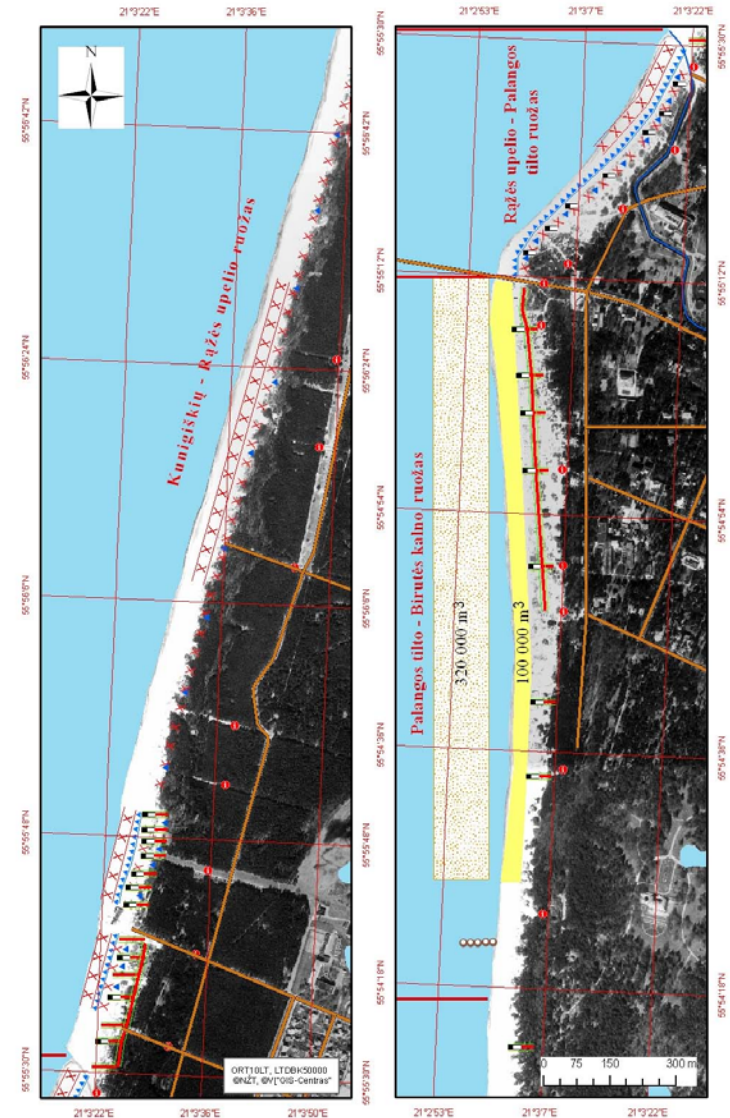
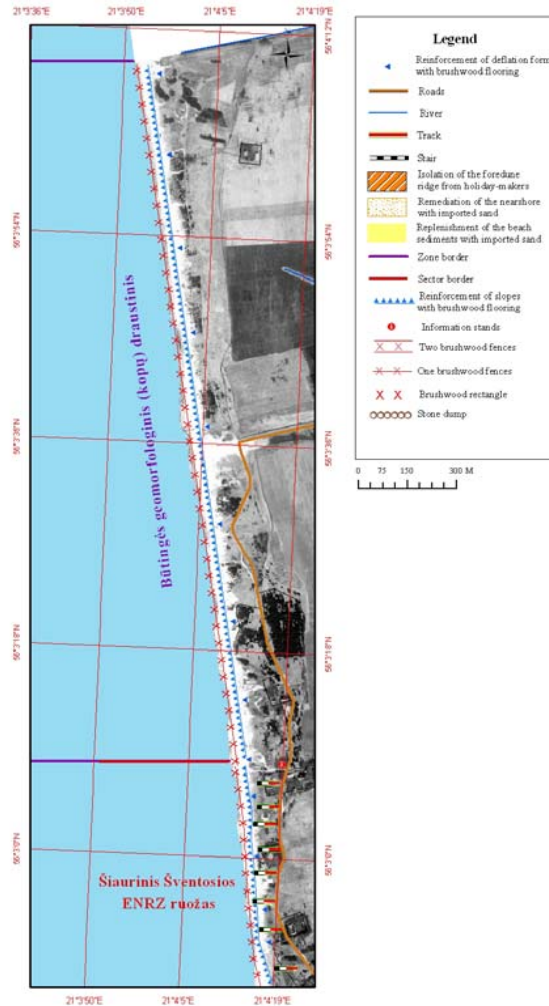
- **priority** is given to **preservation of natural landscapes** and natural **processes** of coast formation;
- **complex coordination** of coastal protection and use;
- **measures** of coastal protection are **coordinated** with regard to dynamic integrity of the processes of coast formation and applied **irrespective of administrative** distribution of departmental **interests**;
- **measures** of coastal management in one coastal sector **should not deteriorate** the state of the **neighbouring coastal sectors**;
- coastal protection **measures** are **differentiated** depending on the **coastal functions**.

*to preserve the natural processes if possible
remedy the results of anthropogenic impact*

Zones of the coast (based on shore-usage and shore state):
ENRZ – recreational zone of extensive usage;
INRZ - recreational zone of intensive usage.



Recommended measures for coastal management and their implementation



conflict zones of coastal management

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integrated shoreline management

Recreational infrastructure (building board or gravel-clay paths and stairs)



Reinforcement of deflation forms and slopes of the foredune ridge with brushwood flooring



usage of natural materials

Reinforcement of the top of the foredune ridge and its western slope with brushwood fences



regeneration of eroded elements



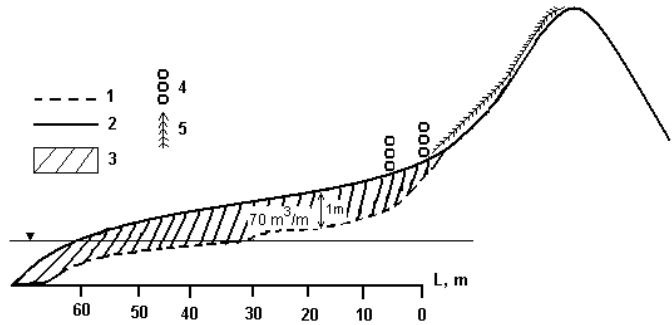
Isolation of the foredune ridge from holiday-makers



Education of holiday-makers (information stands, leaflets, etc.)



Replenishment of the beach sediments with imported sand



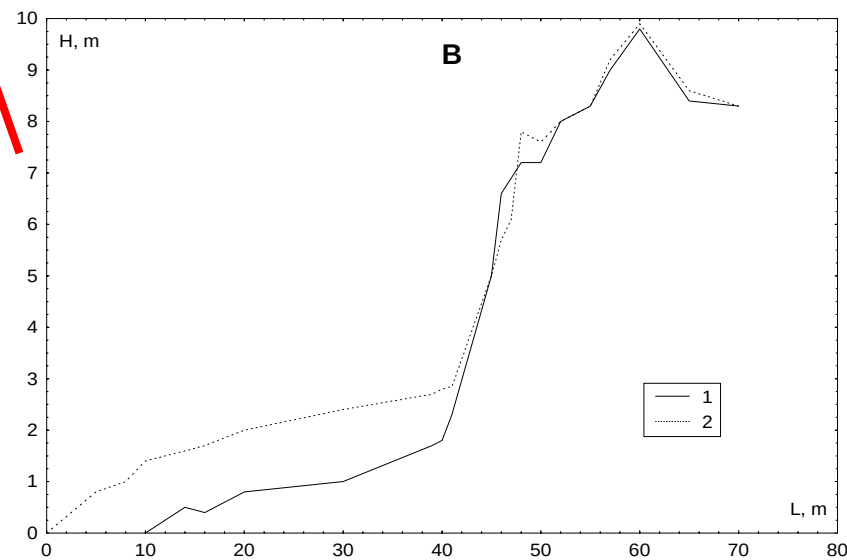
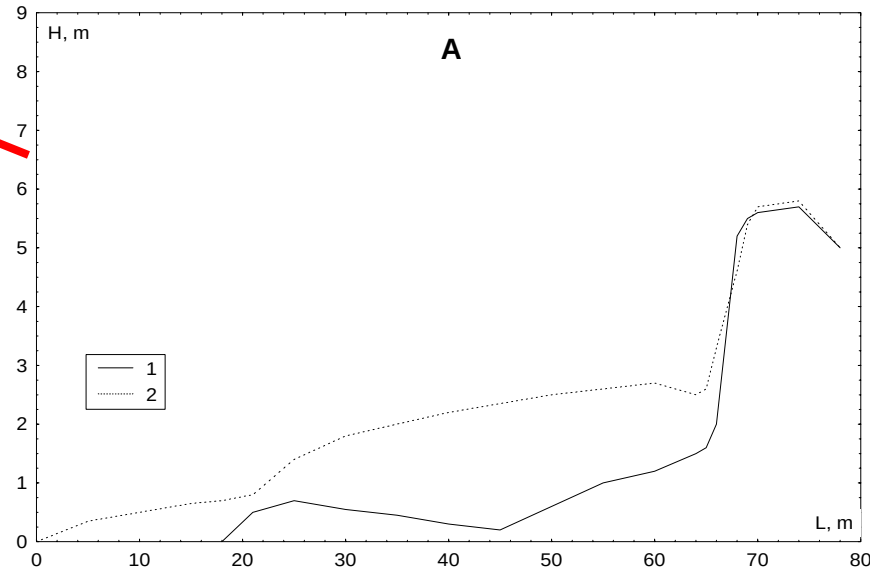
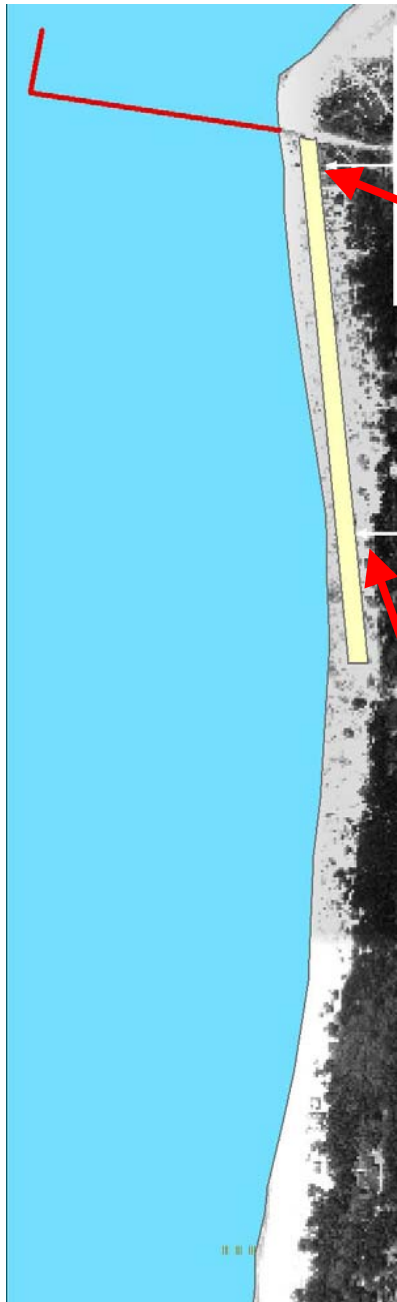
1 – initial profile; 2 – profile after replenishment;
3 - thickness of replenishment sand;
4 - brushwood fences; 5 - brushwood flooring.



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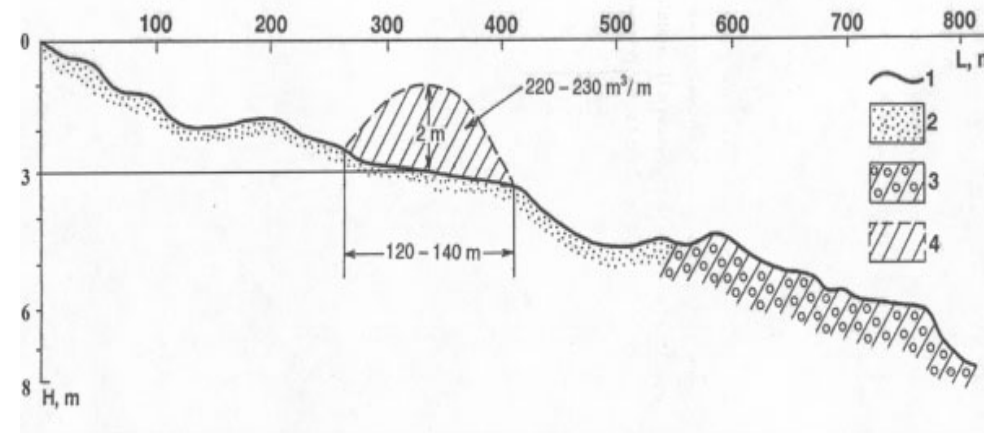


The changes of Palanga coast cross section

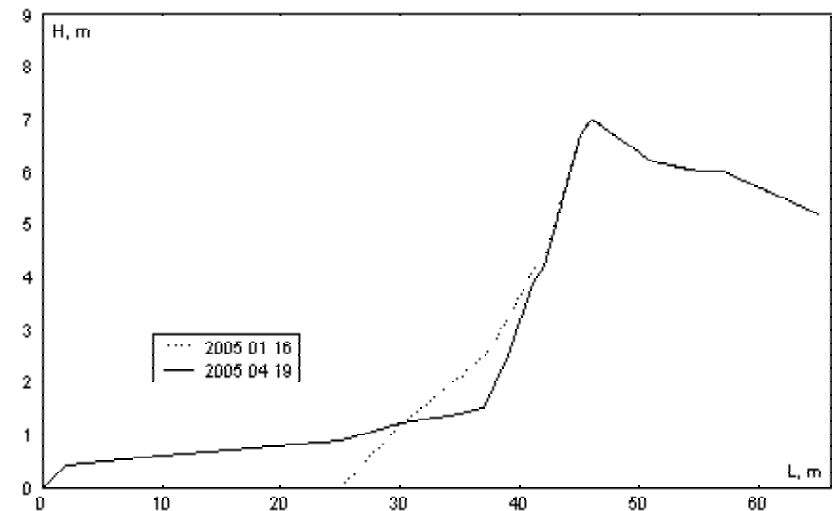


**1 - before replenishment,
2 - after replenishment.**

Remediation of the nearshore with imported sand

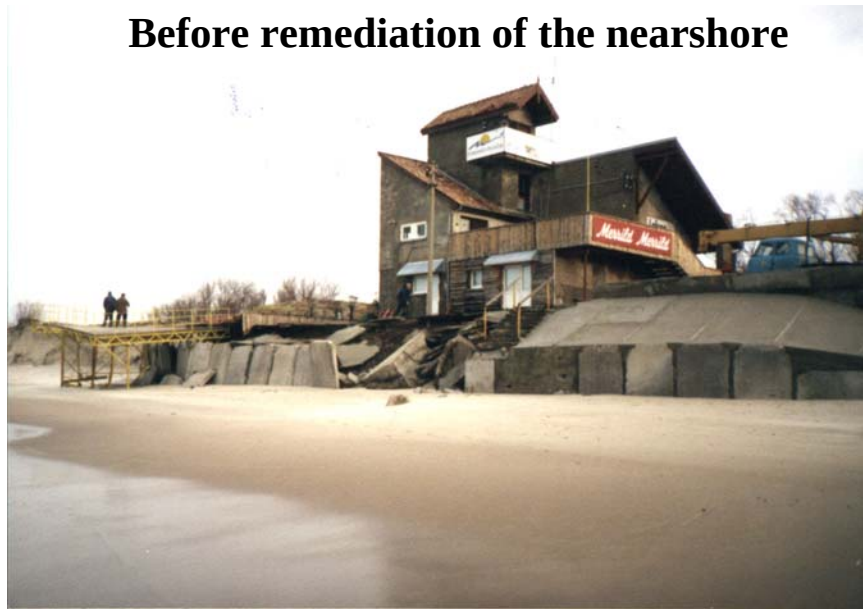


1 – underwater slope profile; 2 – sand; 3 – moraine;
4 - artificial bar



2005 01 16 - before remediation of the nearshore,
2005 04 19 - after remediation of the nearshore.

Before remediation of the nearshore



Before remediation of the nearshore



After remediation of the nearshore



After remediation of the nearshore



Groyne reconstruction



Coastal changes after reconstruction of groyne



The northern beach of pear



The southern beach of pear

Protection of natural processes

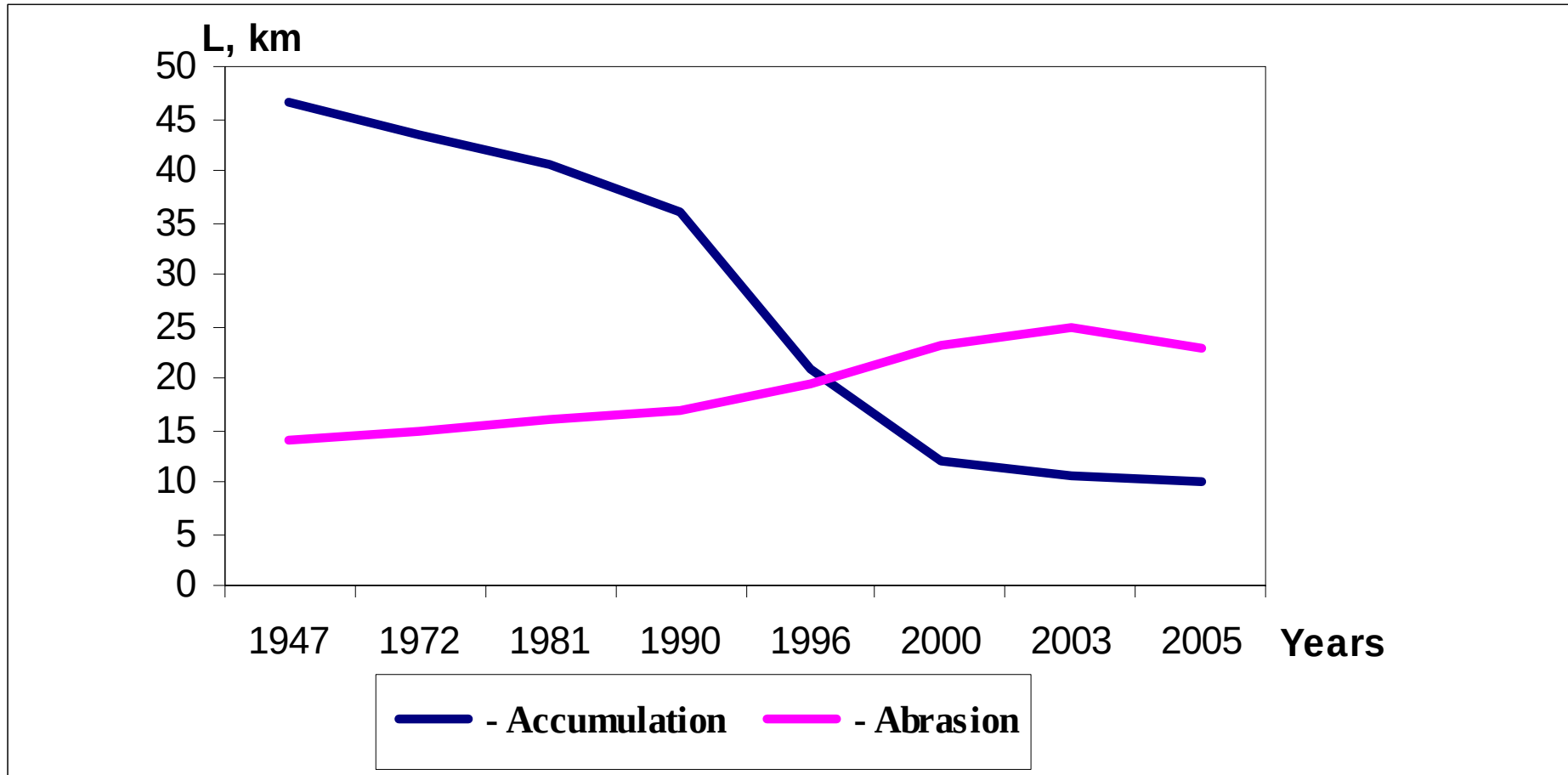


Monitoring of the coastal state



to react immediately if needed

Coastal dynamic from 1947 to 2005



measures serve the purpose
measures should be adequate



THANK YOU FOR YOUR ATTENTION