

WP4 COASTAL PROCESSES

A wide-angle photograph of a coastal landscape. In the foreground, there is a body of water with large, white, ice-like formations that appear to be remnants of a frozen sea or a large ice sheet. The water is dark blue-grey. In the middle ground, a wide, sandy beach stretches across the frame. To the left, a wooden staircase with a ramp leads up a sandy dune or cliff. The cliff face is light brown and shows signs of erosion. On top of the cliff, there is some sparse vegetation and a small, dark structure. The sky is a clear, pale blue. The overall scene suggests a coastal environment in a temperate or sub-arctic region.

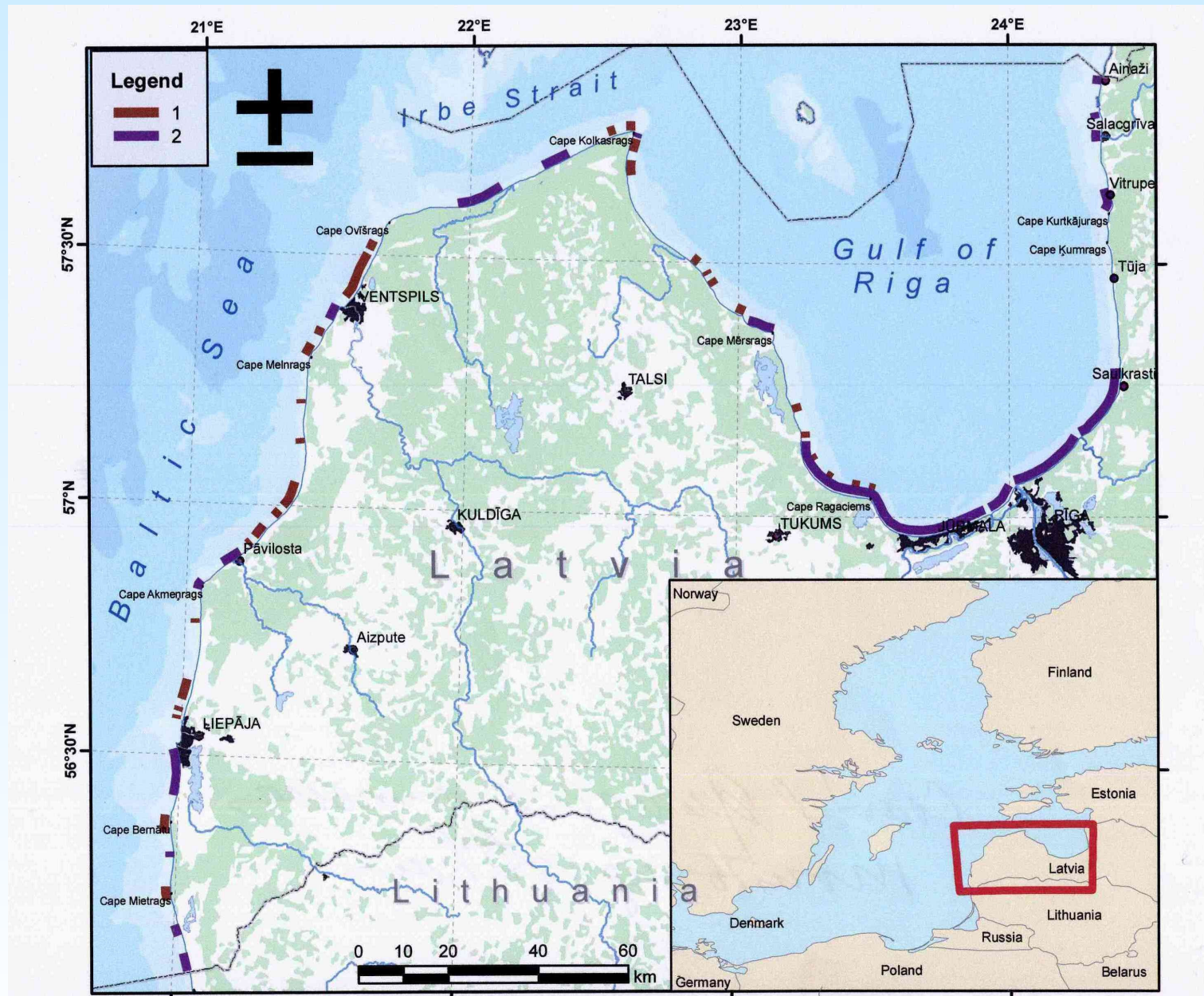
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GENERAL AIM

Research of coastal changes and forecast of climate change impact on the coastal dynamics and ecosystems in the Latvian territorial waters of the Baltic Sea, to support quality and biological diversity of the marine environment and its resources, and the sustainable use of services.



TASKS

WP4a: History of coastal processes

Tasks

To estimate the changes of coastal geological processes during the 20th century

To diagnose (determine) the changes of coastal erosion and accretion zones

Determine the influence of economic activities on coastal processes (e.g. harbors, coastal protection structures)

WP4b: Forecast (prognosis) of coastal processes

Forecast the potential changes in coastal processes and in the dynamics of high erosion risk zones in the future 30-50 years under different hydrometeorological conditions (wind regime, sea water levels, storm surges)

WP4c: Risk mapping and assessment

Tasks

To describe present coastal processes and to produce digital coastal erosion maps (for coastal administrative units for planning and management needs)

GIS processing of social, economic and ecological values of the coastal zone

Erosion risk monitoring, mapping and incorporating into planning and management

Methodology: EUROSION Guidelines for mapping of coastal erosion hazards.

Indicator-based methodology for rating regions with respect to coastal erosion and flooding

WP4d: Adaptive actions

Tasks

To estimate the influence of coastal erosion and accretion processes and possible changes in their location on coastal and near shore ecosystems



Develop recommendations:

- primary and urgent activities for the protection and sustainable use of endangered coastal segments;
- for assessment of the protective needs for national and local coastal zone planning and management
- For coastal process monitoring and monitoring program improvement

Development of dialogues with state and local institutions.

EXPECTED OUTPUTS

Elaboration of change scenarios for coastal processes and impact assessment for the future 30-50 years on endangered Latvian coastal objects (economic, cultural, historical and natural).

Assessment of coastal processes and their immediate significance for economic, social, cultural and natural objects; determination of endangered regions.

EXPECTED OUTPUTS

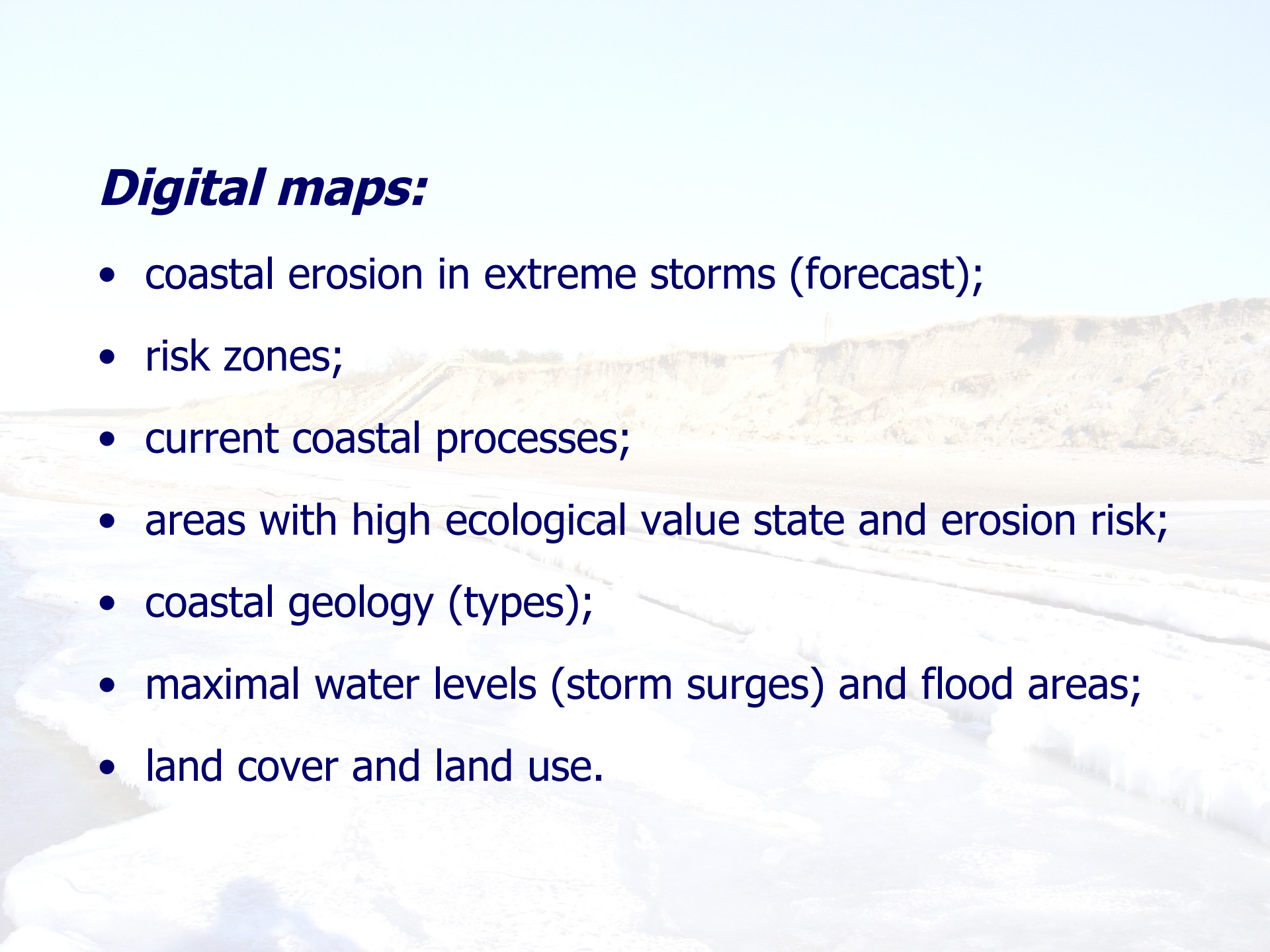
Recommendations for state and local governments and municipalities at national and regional (local) level for planning and management of sustainable development for vulnerable coastal zones and conservation of coastal biodiversity.

Recommendations for improvement of environmental monitoring programmes.

Academic publications.

Digital maps:

- coastal erosion in extreme storms (forecast);
- risk zones;
- current coastal processes;
- areas with high ecological value state and erosion risk;
- coastal geology (types);
- maximal water levels (storm surges) and flood areas;
- land cover and land use.



PLANS FOR 2007

Systematize published and archives materials (maps and plans) of the 20th century and develop coastal processes (erosion) digital maps (1957, 1963-1987, 1990-1999)

Systematize historical cartographical and bathymetry charts and maps and estimate coastal zone changes (erosion, accretion) near Latvian harbors.

Produce:

- **Map of changes in coastal erosion and accretion zones (20th century)**
- **coastal erosion maps at the beginning of 21st century (strong storms 2001, 2005, 2007)**
- **maximal coastal erosion and accretion maps (20th century and beginning of 21st century)**
- **Maps of geological and coastal types**
- **Maps of coastal administrative and maritime boundaries**
- **highest water level maps (20th century, beginning of 21st)**



Field work:

- Mapping of coastal processes and of the geological type of the coast (e.g. storm 15 January 2007)
- Measurement of coastal erosion at coastal stations
- Start the mapping of coastal protective structures in the coastal zone of the Gulf of Riga
- Start of erosion risk mapping (endangered objects and population in Roja and Saulkrasti)

EUROSION Methodology, Part III, (indicators)



Questions ?