Geo- Information System for the coastal zone of Mecklenburg-Vorpommern - DE

1. Policy Objective & Theme

- ADAPTATION TO RISK: Managing impacts of climate change and safeguarding resilience of coasts/coastal systems
- ADAPTATION TO RISK: Preventing and managing natural hazards and technological (human-made) hazards
- ADAPTATION TO RISK: Integrating coherent strategies covering the risk-dimension (prevention to response) into planning and investment

2. Key Approaches

- Knowledge-based
- Technical

3. Experiences that can be exchanged

Diverse map, construction, and morphological data had to be adjusted for a standardised and interactive display in a GIS-system to enable the information to be used as a planning tool for shore line management. The GIS can provide policies and administrations in neighbouring countries with a good basis for easily understandable scientific data for coastal planning and management

4. Overview of the case

A variety of analogue and digital data about shore line morphology, sediment transport, and changes within the last 300 years exist in Mecklenburg-Vorpommern. The data formats were standardised and collected from their distributed locations. Scientific data were included in a GIS to display temporal processes, and impact-response predictions.

5. Context and Objectives

a) Context

The Baltic Sea shore line is changing by natural dynamic processes. About 70% of the 377 km outer coast length is dominated by erosion processes, 23% has an equal balance and the remaining 7% by accumulation processes. Coastal protection measures, constructions, and climate change influence these natural dynamic coastal processes. An implementation of ICZM into coastal protection planning and coastal management were desired but a generalised and easily usable information platform on data about costal morphology and dynamic processes first had to be established.

Since January 1997, the State Office for Environment and Nature in Rostock / Department Coast worked in the research programme "Coastal Zone Management of Mecklenburg-Vorpommern (Germany)” to investigate the natural and human influences on coastal dynamics along the Mecklenburg-Vorpommern coast of the Baltic Sea, with a focus on coastal protection and flood control. All these data were to be integrated in the GIS coast MV.

b) Objectives

The aim was to bring a great variety of scientific and historical data on topography, land and ocean, constructions, biotopes into a GIS in a standardised form. Easy access to the GIS and usefulness for different target user groups with diverse

educational background was desired, as well as easy and quick implementation into the everyday work of the coastal protection planning departments of the StAUN Rostock. Not only data but also planning processes were to be standardised.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Management

State Office for Nature and Environment Rostock - coast / Staatliches Amt für Umwelt und Natur Rostock – Küste (StAUN Rostock). The StAUN Rostock is responsible for planning and management of coastal protection and defence measures along the whole Baltic Sea coast of the state of Mecklenburg-Vorpommern. The other partners provided mapping data.

b) ICZM tools

The work for the implementation of the scientific data ran from January 2000-December 2002. GIS coast MV provides a technical planning tool for shoreline management for the state of Mecklenburg-Vorpommern. The GIS tool facilitates risk and hazard management, as well as conflict management. It contains scientific data on geo-morphology and sediment transport. The GIS displays the shoreline (2 km inland) down to the 10 m depth line in 3D for spatial representations of beach and underwater structures. Coastal dynamic (temporal) processes can be displayed in 4D representation (temporal processes in three dimensions).

A large amount of scientific data on coastal protection constructions, aerial and satellite photographs, and map data (planning and construction maps, historical topographic land and ocean maps from 1692 until today, biotope maps) were analysed, digitalised, standardised, and integrated in the GIS coast MV. CAD (computer aided drawing/design) was to be used to display 3D morphological structures. The focus was on geo-morphology and sediment dynamics. The data formats were digitalised, standardised and collected from their distributed locations. The system can display temporal processes, and thus impact-response predictions. For sound impact-response prediction and analysis, sustainable planning and management, it is crucial to have easy access to scientific data that are ideally presented in comparable unified standards. GIS coast MV provides a platform using standard software to display the integrated data in three dimensions. Thus, it can be used to display temporal processes as a response to impacts such as sea level rise. GIS coast MV can be used by different target groups within the state and in neighbouring regions.

7. Cost and resources

The German Federal Ministry of Education and Research (BMBF) financed the work with a budget of €800,000.

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

GIS coast MV is a tool that is a useful planning instrument for different user groups (with diverse educational background) with easy and fast access because it uses standard software for display of the maps. Practical relevance is guaranteed by directly including the decision-makers in the planning and implementation of data. Data provider and users exchange experiences and needs through close interrelations. Information on conditions, dimensions, and costs of coastal protection measures are also included in the GIS.

9. Success and Fail factors

Data management, especially the unification, and a clear and understandable display for different user groups were difficult. Data were distributed to interested persons and companies via CDs, to standardise planning processes. The software instruments became obsolete quite quickly, today all the data implemented in GIS-Küste have to be adjusted to new standards and software applications.

10. Unforeseen outcomes

Immediate feedback by practitioners (data quality, dysfunction, demand for further content or processing, etc.) due to the quick implementation of the GIS tool into everyday work of coastal protection planners. Planning documents and licences van be produced very quickly with the help of the tool. Further data from projects of private companies and research organisations were adjusted to the digital format and integrated. New state funding could be raised for additional data acquisition.

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13. Sources

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