Sensitivity mapping of the German Baltic Coast to combat oil spills - DE

1. Policy Objective & Theme

- 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

- Integration
- Knowledge-based
- Ecosystems based approach
- Technical

3. Experiences that can be exchanged

The ecological sensitivity mapping data were integrated into existing precautionary plans to fight oil spills. A decision making tool was created to help combat hazard spills most efficiently and with lowest possible impact on the ecosystem. It was integrated into the existing planning system. The process can easily be adjusted and applied to other coasts.

4. Overview of the case

Authorities responsible to combat hazards from shipping incidents participated in the eco-system based sensitivity mapping of the German Baltic Sea coast. Data on ecological sensitivity of coastal areas were collected and implemented into the existing electronic planning instrument (VPS) to combat spills. With its help it is easy for the involved authorities to define the most endangered and valuable areas, and to prioritise their counteraction on these specific areas.

5. Context and Objectives

a) Context

The Baltic Sea is a heavily used sea area with a high volume of shipping traffic and thus a large potential for oil spill incidents. At the same time many parts of the coasts are important conservation areas or otherwise delicate ecosystems. They also have a high economic value for the tourism and fishing economies, important factors in the mostly rural coastal zones. The sensitivity mapping was ecosystem-based and applied on a regional level.

In 1975, the federal state and coastal states decided to combine forces for combating oil spills. In 1995, Mecklenburg-Vorpommern (former GDR) was integrated, and other pollutants included. An electronic Contingency Planning for Marine Pollution Control (VPS-system) was established in the year 2000. An expert commission (Grobecker Commission) had evaluated the status of the existing emergency plans and recommended their development till February 2000. In March, the relevant federal ministries and authorities were instructed to form an expert group together with the coastal states and implement the recommendations. In 2003, a Central Command for Maritime Emergencies was installed under the shared responsibilities of all coastal states and the federal government, and an environmental expert group “effects of pollution emergencies” was established in 2004.

b) Objectives

The aim was to increase knowledge on the ecological sensitivity of the coast and to integrate the data into the existing GIS-system for hazard action planning to improve combating shipping incidents, make it more efficient by providing a quick decision tool, and reduce pollution hazards for the most sensitive ecosystems in the coastal zone.

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

a) Management

Federal and regional state authorities with responsibilities in combating shipping incidents and environmental issues were involved. GICON – Großmann Ingenieurconsult GmbH / ARCADIS Consult GmbH managed the study. The Federal Ministry of Transport, Building, and Urban Affairs, and the Central Command for Maritime Emergencies (Havariekommando), a joint command of the coastal states and coastal states' ministries were involved as well as environmental state agencies. Scientific public, private, and NGO partners supported the necessary data acquisition.

b) ICZM tools

The initiative ran from April 2001 to April 2003 and encompassed the whole German Baltic Sea coast. Six months concept refinement and literature research. Data acquisition including, evaluation of aerial photographs, sea side data acquisition, new mapping of Schlei fjord, evaluation of fish spawning grounds (July 2001-December 2002), definition of coastal area types (September 2001-January 2002), design of the sensitivity evaluation model (April-November 2002), data evaluation and processing (December 2002-April 2003), adaptation and integration into VPS system (November 2002-March 2003).

Data that demonstrate the ecological sensitivity of different coastal areas along the Baltic Sea coast were integrated into the existing computer aided Contingency Plan for Marine Pollution Control (VPS) for efficient hazard reduction in cases of oil spills, allowing quick and sound decision making. Coastal types were defined separately for the terrestrial and the marine side. The criteria for the evaluation of the sensitivity of coastal and marine areas were benthic invertebrates, macro-algae, aquatic and coastal birds, fish spawning grounds, and the morphological type of coast. Many data could be acquired from published scientific literature, other data had to be collected. The organisms were classified into four sensitivity categories: extremely sensitive, highly sensitive, moderately sensitive, and slightly sensitive. According to the occurrence of the organisms in sensitivity categories in the monitored coastal areas these coastal areas were classified. Two seasons were defined for a plausible analysis (autumn/winter and spring/summer). The results of the ecosystem classification of the coast were displayed in maps and integrated into the existing online system.

The VPS integrates the ecosystem maps of the sensitivity mapping with geographical and nautical maps, detailed pictures of the coast, a database on the location and specificities of contingency equipment, ships, personnel, and planes. Drift models aid in evaluating the propagation of an oil spill or other dangerous substances from the location of an accident. The system contains a handbook with action plans for specific areas and specific types of accidents, accident and routine logbooks, protocols and documents necessary to manage accidents. Documents and text information are accessible directly from the GIS window. The GIS maps can be used as a planning tool for a specific combat, resulting combat maps can be exported into graphic or text formats. The situation and status of a mission to combat an accident can be managed online via the system, and is thus very transparent for every involved entity. Further, the total VPS system can be used for educational purposes. The system is multilingual. All data in VPS and the sensitivity mapping data are updated regularly: addresses / phone numbers quarterly, technical data including sensitivity data yearly, nautical and other data as a basis for the nautical and other maps every three years.

7. Cost and resources

The VPS-system is financed by the federal state (50%) and coastal states (50%). The coastal states contribute according to a defined finance key. The budget for the sensitivity mapping is not known.

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

The ecological sensitivity data of the coastal zone were successfully integrated into the existing GIS-based electronic pollution combat system (VPS-system). The objectives were achieved within the set timescale.

9. Success and Fail factors

Additional benthos data had to be acquired within the project due to a lack of published data. Marine mammals were excluded from the sensitivity mapping due to their rare occurrence. The amount of data was so large that it was necessary to establish a sub-module for the existing VPS-system for the sake of clarity (VPS.sensi). Many already published data could be used for the sensitivity mapping.

10. Unforeseen outcomes

From 2003-2007, the same concept was followed to map the German North Sea for ecological sensitivity and integrate the results into action plans. In 2009, the VPS-system had been upgraded to adjust its functionality to additional organisational and technical demands. Because of a growing international interest the VPS-system has been released as a bilingual English-German version. The amount of data was so large that they were integrated in a separate module into the VPS-system. Otherwise the amount of additional information would have hampered the usability of the whole system.

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13. Sources

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