BACKGROUND AND OBJECTIVES

Sediment, originating mainly from maintenance dredging, has been traditionally placed in offshore placement areas at the Turku region, Finland. Environmental impacts of these activities have raised concerns, so the Centre for Economic Development, Transport and the Environment of Southwest Finland initiated a study to find solutions and locations for onshore placement of approximately 1000000 m³ of dredged sediment with potentially elevated levels of contaminants. A group of stakeholders was invited to participate as a steering group. Sitowise Ltd. acted as a consultant.





STEP 1. CRITERIA



APPROACH

At first, a pre-qualification of placement methods was conducted using costbenefit analysis and spatial assessment. The following methods were selected for further analysis: utilization of clean clay to remediate anoxic deeps in the sea, off-shore placement in geocontainers and placement in dewatering basins at the coastal area. The current offshore placement method was considered as a reference. Placement in geocontainers and utilization of clean clay were considered to be possible with certain restrictions in the over 20 m deep areas of the Airisto sea area. These methods solve some of the problems of the present solution, but their use would require considerably more research and development work.

The survey included a preliminary regional feasibility study by GIS analysis (spatial multicriteria decision analysis), the process and results of which are intended to support decision-making. The analysis overlaid economic, environmental and other values based on the steering group's views. As a result, four potentially suitable locations were found for dewatering basin areas.



As the economic review included in the study suggests, on-shore placement of masses may become more than five times more expensive than the present offshore placement. It is essential to plan the post-use of the on-shore placement sites in advance since the economic feasibility depends on future land value. One solution could be to place only the surface layer of sediment, that has higher

STEP 2. OBJECTIVE





STEP 3. GOAL

he sea surface level

A Novel Approach for Searching Suitable Sediment Placement Sites **Combination of GIS-based Spatial**

Assessments and Cost-benefit Analysis

ASSESMENT METHOD EVALUATION CRITERIA OBJECTIVES GOAL evation/depth close to Good Close to dredging areas technoeconomic Flat topograhy No recreation or tourism areas of the regional land use plan

ar from built cultural Finding the vironments (2 km threshold most potential No nationally valuable Considering of target areas fo ndscape areas natural, cultura placing dredge sediments into ar from nationally valuable natur rtificial islands rotection areas (2 km threshold close to shore No valuable bird areas No regionally valuable andscape areas Far from inhabitation (2 Preserving km threshold) Not within 25 m from existing built cables, lines, pipes environment and No car traffic areas

RESULTS AND CONCLUSIONS

levels of contaminants, into the dewatering basins, and to remediate deeps of the sea with other masses (clean clay and surplus soil).

The on-shore sediment placement project should be considered as soon as possible in the regional planning process. Future planning and development of placement area(s) requires further studies and assessments followed by master planning, EIA, license applications and implementation plans before construction. There are several alternative types of design for the operation of placement areas as well as for the management of costs and revenues. As a result of a well-planned and controlled project development, the construction of a new sediment placement area could begin within ten years.

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STEP 4. FURTHER ANALYSIS

The best 10 % on-shore

The best 10 % off-shore





STEP 5. SELECTION OF SITES