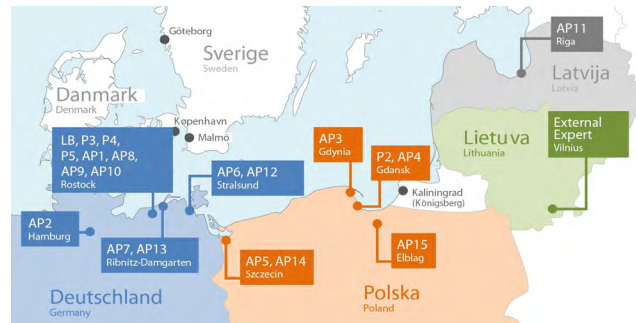


Who is DredgDikes?

Lead partner of the DredgDikes project is the chair of *Geotechnics and Coastal Engineering at the University of Rostock*. Besides the overall project coordination the university is responsible for the Rostock lab and field tests, the scientific evaluation of the pilot dike and the production of the multilingual guideline. The chair of *Geotechnics, Geology and Coastal Engineering at the Gdansk Polytechnica* is the main research partner and responsible for the Polish lab and field tests as well as the project controlling on Polish side. The pilot dike will be built under the authority of the *water and soil association „Untere Warnow - Küste“*. The *Civil Engineering and Harbour Construction Office of the Hanseatic City of Rostock* is responsible for the construction of the German test dike. The *Department of Applied Landscape Planning* (Steinbeis Innovation gGmbH) is dealing with quality control, ecological and vegetation issues.

The following associated partners from important federal, state, and regional authorities in Germany, Poland and Letland as well as private companies support the project:

- AP1: State Agency for Agriculture and Environment, Rostock
 - AP2: Federal Waterways Engineering and Research Institute, Hamburg
 - AP3: Maritime Office, Gdynia
 - AP4: Pomeranian Head of Melioration, Gdansk
 - AP5: Ekotech sp. z o.o., Szczecin
 - AP6: Baugrund Stralsund Ingenieurgesellschaft mbH, Stralsund
 - AP7: Hartmann & Partner Agricultural Company, Klockenhagen
 - AP8: Colbond GmbH & Co KG, Obernburg/ Rostock
 - AP9: Huesker Synthetic GmbH, Rostock
 - AP10: Heinrich Hirdes GmbH, Rostock
 - AP11: Latvian State Environmental Service, Riga
 - AP12: State Agency for Agriculture and Environment, Stralsund
 - AP13: City of Ribnitz-Damgarten, Building Authorities
 - AP14: West Pomeranian Head of Melioration, Szczecin
 - AP15: Zulawski Head of Melioration, Elblag
- External Expert:
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DredgDikes

Dredged Materials in Dike Construction

Implementation in the South Baltic Region
using Geosynthetics and Soil Improvement

www.dredgdikes.eu



Part- financed by the European Union
(European Regional Development Fund)



Section two of the Rostock test dike

What is DredgDikes?

The project DredgDikes was initiated by the University of Rostock and Gdansk Technical University to investigate the application of dredged materials, geosynthetics and different ashes in dike construction. The international cooperation of universities, authorities, associations and companies is part-financed by the EU South Baltic Cross-border Cooperation Programme 2007-2013.

In Mecklenburg-West Pomerania (M-V), a total of 750 km of dikes exist, protecting approximately 53,500 ha of land. In the Pomeranian region in Poland a total of 650 km of dikes protect over 140,000 ha of coast and lowlands. In M-V an investment of Euro 50 M is estimated for the improvement and reconstruction of coastal dikes until 2014, followed by 15 M per year for coastal protection measures until 2020. In Poland investments of Euro 160 M are planned for dike construction, improvement, and reconstruction in the next two decades.

There is an increasing regional shortage of glacial limy marl, which is usually used as dike cover layer along the Mecklenburg-West Pomeranian Baltic Sea coast. Usually the marl has to be extracted from natural deposits with negative effects on the natural landscapes. Due to both ecological and economic reasons the project aims to replace these materials with dredged materials (non-contaminated, ripened muds and sediments).

Therefore the rather fine-grained batches of the dredged materials from river deltas, coastal backwaters (Bodden), lakes and marine waterways of M-V will be used for dike cover layers. The materials often show organic contents of up to ten per cent. The use of Geosynthetics shall level inhomogeneities of the dredged materials and also allow for steeper slopes than usually applied. Rolled erosion control products are used against

surface erosion and for root reinforcement, geogrid reinforcement to minimise shrinkage cracking and drainage composites to control the seepage line inside the dike cross-sections.

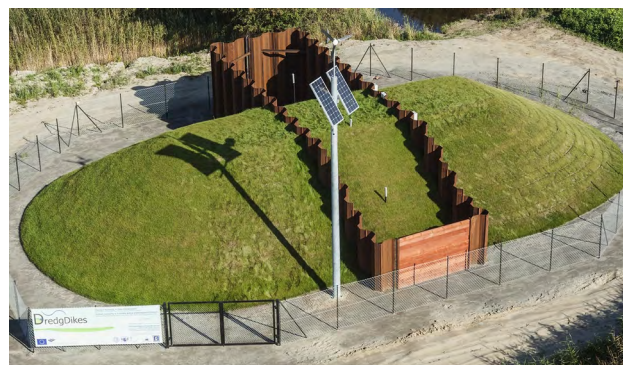
In Danzig sand-ash composites are investigated with respect to their applicability in dike construction. On the one side sandy dredged materials is improved with particular ashes, so that it can be used as dike cover material, on the other hand investigations will show how ash-sand mixtures can be used to build stable dike cores.

To investigate the different dredged materials and material combinations both in Rostock and Gdansk full scale test dikes have been built. A large number of measurements will be performed, including geotechnical field measurements, vegetation monitoring, measurements with respect to the release of contaminants (if needed), as well as seepage and over-flowing tests.

The findings from the experiments form the basis for a pilot dike construction. An already planned dike section of approximately 500 m length at a stream called „Körkwitzer Bach“ near Ribnitz-Damgarten in M-V will be built with a fine-grained organic dredged material. The existing flood protection dam at the stream urgently needs reconstruction and the new methods may save construction costs.

All project findings will be summarised in a multilingual best practice guideline about the application of dredged materials in dike construction. It will be the basis for planning and approval of such projects, addressing planners, authorities, and construction companies. The guideline will be developed in close cooperation with the associated partners to meet all their requirements with respect to such a guideline.

All project related results, a periodical newsletter, and all events within the project lifetime will be published regularly on the project website www.dredgdikes.eu. Two final conferences about dredged materials, geosynthetics and ashes in dike construction will be held in Rostock and Gdansk in May/June 2014.



Gdansk test dike



Dredged material pumped onto a spoil field

What are Dredged Materials?

While maintaining the navigability of waterways and harbours considerable amounts of sediments have to be removed by means of dredging. Particularly in coastal areas large amounts of these dredged materials (also: dredged silt, dredged sediment) accrue. Sediments also often need to be removed due to construction works or in ecological revitalisation projects. The dredged materials consist of different fractions of mineral and organic components.

The characteristics of dredged materials differ widely (e.g. with respect to the organic content). Besides, the dredged materials from the North Sea are not comparable to those from the Baltic Sea, and the materials from Mecklenburg-West Pomerania differ from those in the Polish region of Pomerania.

In the majority of dredging works the relocation (or ocean dumping) of dredged materials is chosen. However, if the material characteristics do not allow relocation (e.g. due to a high content of fines) the dredged materials need to be removed from the water body. A large portion of the uncontaminated materials is dredged directly into containment areas on shore. These materials may be used as soil or construction material after sedimentation, dewatering and ripening. If the sediments contain contaminations that exceed the precaution values of soil and water protection jurisdiction so that the re-use is excepted, they may only be deposited.

In the Rostock spoil fields an annual amount of approximately 100,000 m³ of fine-grained dredged materials is processed. The materials are not contaminated and are re-used on shore. As yet the materials have been used in agriculture, landscape construction and in the recultivation of landfills. The use of dredged materials in dike construction is a new and promising possibility.