

Large scale sand extraction. Monitoring effects on morphology and ecosystem.

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The largest marine sand extraction in Europa was executed in the North Sea for the reclamation works to enlarge the port of Rotterdam, the Netherlands. In a period of 3 years an amount of ca. 200 million m³ of sand was extracted in the marine area off the Dutch coast. To minimize the effect on the benthic fauna The area of the extraction pit was decreased by increasing the extraction depth to 20 m below the sea floor. In a water depth of about 22 m this was nevertheless a large scale operation.

To determine the effects on the ecosystem, the morphology and other use of the sea a comprehensive monitoring program was set up focusing on the effects of suspended matter on benthos and N2000 areas, changes in morphology and hydrodynamics, underwater noise and recolonization of benthic fauna.

In the monitoring program field data were combined with modelling. For example, for the effect of the sand extraction on the concentration of suspended matter satellite images were used to improve the modelling and to produce atlases of the suspended matter in the area. Measuring and modelling the underwater sound before and during the extraction gives insight on the effect on marine mammals. Far filed effects on benthos were determined by sampling the benthic fauna in a large area around the sand pit.

In general the monitoring of the effects shows that the actual effects are less than the effects anticipated in the Environmental Impact Assessment.

Keywords: large scale sand extraction, effect monitoring, suspended matter, recolonization, underwater noise

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