



# Sediment management port of Rotterdam

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# Introduction

## Dredging Department

- responsible for maintenance dredging in port basins
- dredging amount 5 - 7 million m<sup>3</sup> annually

(Ministry of Infrastructure and Environment: river area)



# Why dredging?

- To deepen or maintain navigable waterways
- Restoration of navigable depth
- Removal of recently settled materials, such as sediments, sand, gravel

# Sedimentation

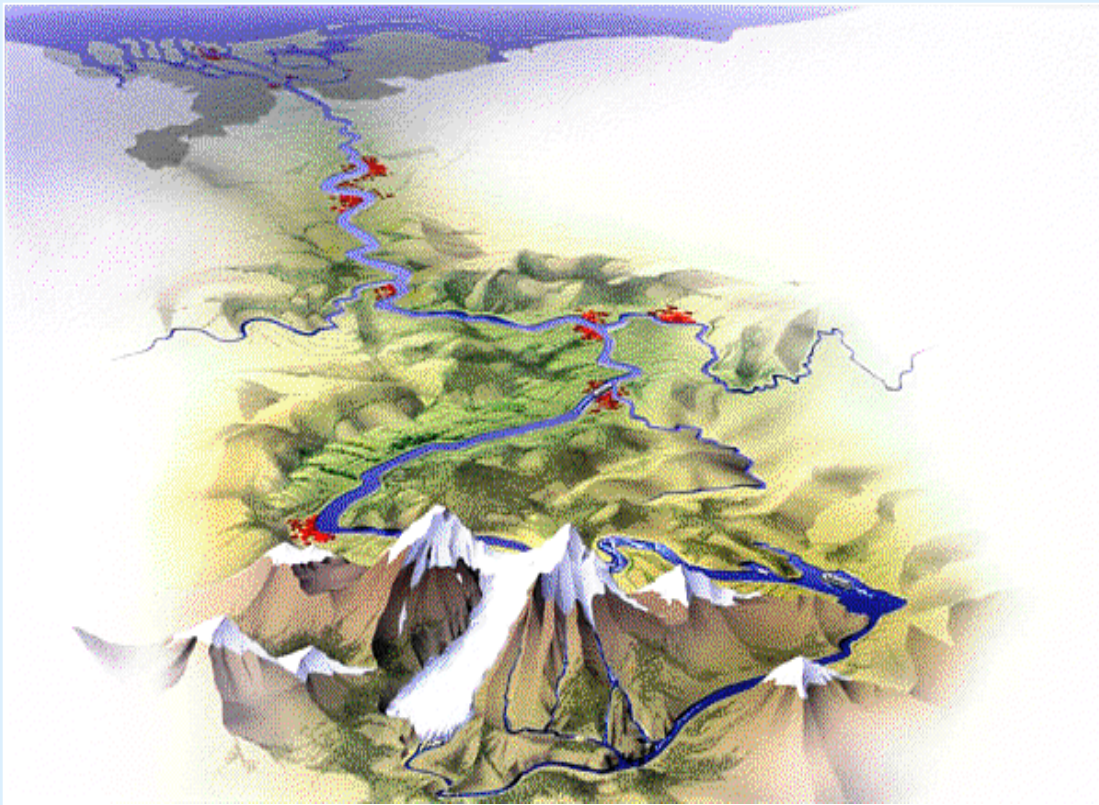
Sedimentation originating from sea & rivers





# Sedimentation

From source to sink



# Sediment Management Rhine

## Rhine Research Project 1985-2007 as starting point

### Inventory of historical contaminated sediment in Rhine Basin and its tributaries



(Foto: BfG)

Final report

October 2004

Technical University Hamburg Harburg  
in Cooperation with the University Stuttgart

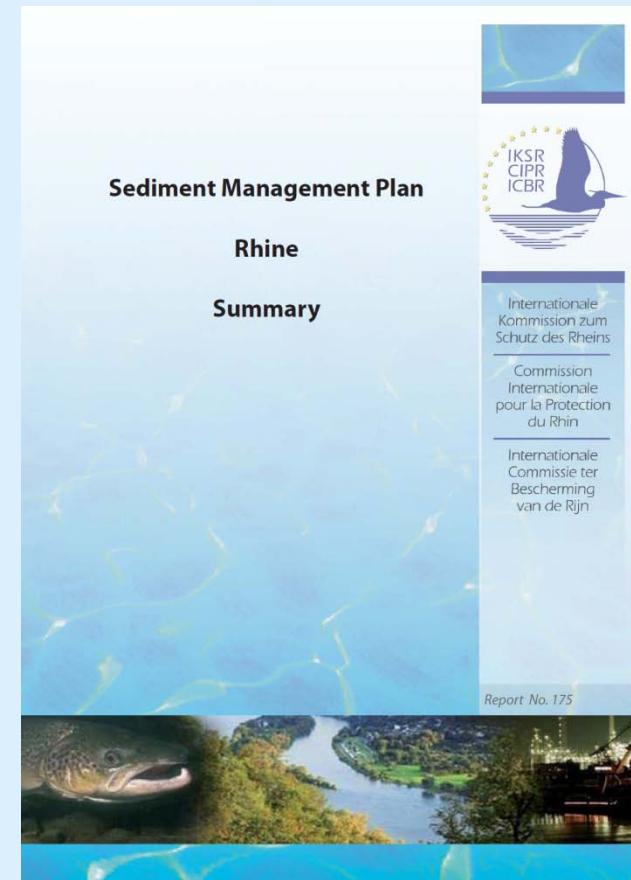


BIS



# Sediment Management Rhine

- On the agenda International Rhine Commission for the Protection of the Rhine (ICPR)
- Sediment Management Plan (SMP) Rhine 2009
- Inventory contaminated sedimentation locations
- SMP mentioned in River Basin Management Plan 2009-2015 (Water Framework Directive)
- Agreement in ICPR on 'Reporting' about measures to be taken at locations from SMP
- Good first step!
- Measures should be part of next River Basin Management Plan (2015-2021)





# Monitoring and Classification

- Monitoring Program

Annually the Port of Rotterdam Authority in cooperation with the Ministry of Infrastructure and Environment assesses the quality of the sediment in the port of Rotterdam by taking samples of the upper sediment layer.

# Monitoring and classification

## Objectives Monitoring Program

- Destination of dredged material
  - Relocation at sea or
  - Disposal at the Slufter
- **Information for license to operate**
  - restrictions during dredging (light mixture overboard, overflow)

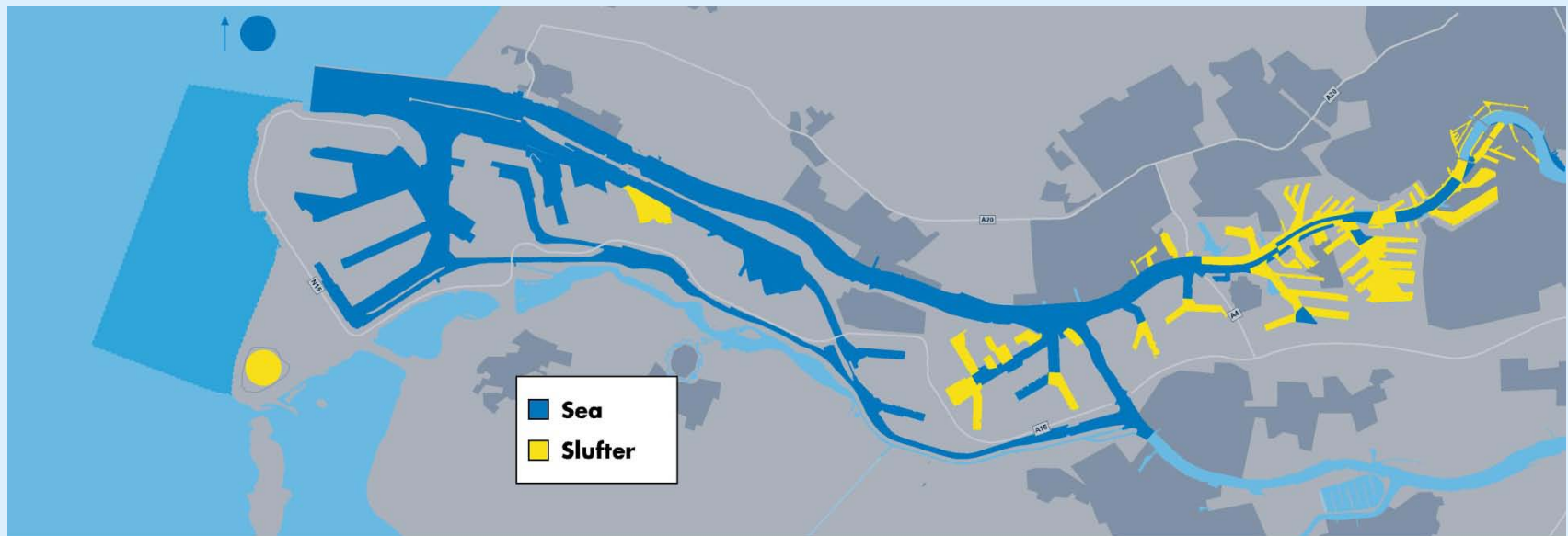
# Monitoring and classification

## Lay-out Monitoring Program

- Port contains of 225 sections
- Each section is sampled at 6 locations
- The 6 samples are mixed and analyzed at the laboratory
- Substances analyzed:
  - Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), Mineral oil, PAHs, PCBs, OCBs, TBT

# Monitoring and classification

## Dredged Material classification





# The Slufter

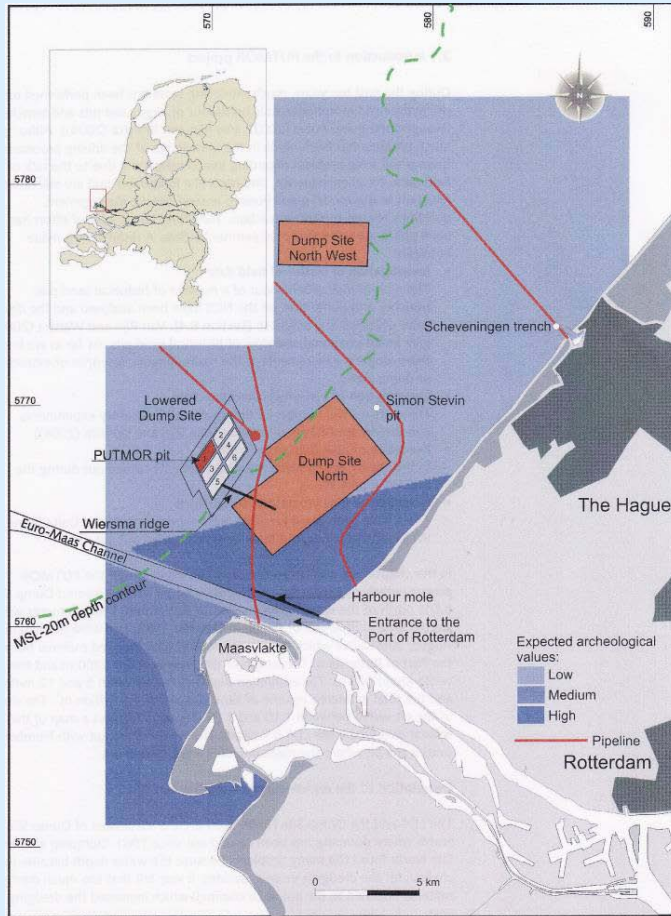


\*poster presentation about the Slufter by Ronald Rutgers

# The Slufter

- Confined disposal facility for contaminated sediments
- Partnership between Port of Rotterdam Authority & Ministry of Infrastructure and Environment
- Operational since 1987
- Surface area 250 hectares
- Bottom Slufter is 28 m below sea level, surrounding dike is 24 above sea level
- Length surrounding dike is 6 km
- Volume 143 million m<sup>3</sup> (100 large football stadiums)
- Remaining capacity more than 50 million m<sup>3</sup>

# Marine relocation



# Marine Relocation

- Sustainable relocation at sea
- Pilot project + research
- Partnership between Port of Rotterdam Authority & Ministry of Infrastructure and Environment
- Combined sand mining and relocation site
- 6 pits each of 1500 meters long and 500 meters width
- Depth of each pit is 10 meter



# Marine Relocation

## Research outcomes

- Influence area of sediment is 5–7 km, which means no effect on Natura-2000 areas
- Circumstances for ecological recovery are present
- Ecological recovery is dependent from sand sedimentation on the pit

# The end

Thank for your attention