



Thin-layer sediment dredging in the Netherlands

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CEDA**

Polite Laboyrie

- Coastal Engineer
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- Witteveen+Bos
- Chair of Environment Commission CEDA
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About CEDA

An independent membership association
Bringing together the **professional dredging community**, and **associated industries**, in Europe, Africa and the Middle East.

Representing dredging professionals and organizations, from **government**, **academia** and business, in EMEA
Promoting the understanding and advancement of dredging to the wider community

www.dredging.org



About Witteveen+ Bos Areas of expertise, 4 business lines:

1. Built Environment
2. Deltas, Coasts and Rivers
3. Energy, Water and Environment
4. Infrastructure and Mobility



The Problem

We have build Dikes and Dams and Polders.

We changed the natural flow. Even blocked a lot of rivers. Changed the natural salt or fresh water system. This had a drastic impact on ecology and biodiversity

Nature and ecology need a positive impuls



REMEDIAL DREDGING

Careful removal of contaminated material and treatment, reuse or relocation of the material

Characterised by

- Often **Small dredged quantities**
- **High contaminant** content
- **Weak** to well consolidated soil
- **Non-repetitive** activity
- **Debris** possible
- Relatively **low output**



ENVIRONMENTAL CRITERIA

Conditions and **sensitivity of ecology** at dredging and placement sites

Consideration on **social** effects

Contamination level of sediments



CRITERIA TO EVALUATE ENVIRONMENTAL EFFECTS OF DREDGING

Turbidity

Bulking

Sound

Emissions

Output

Presence of dredger



Example project

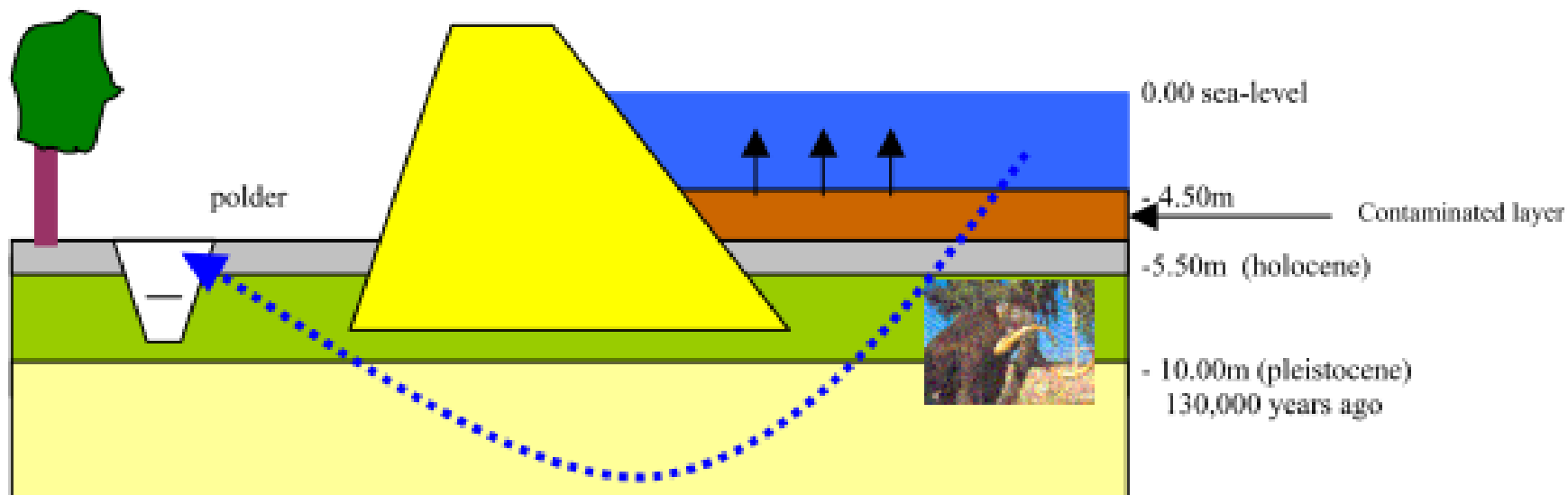


Ketelmeer
Lelystad
Created by Polders
3500 ha
PAHs, PCBs and Heavy Metals

Lake Ketelmeer



Situation

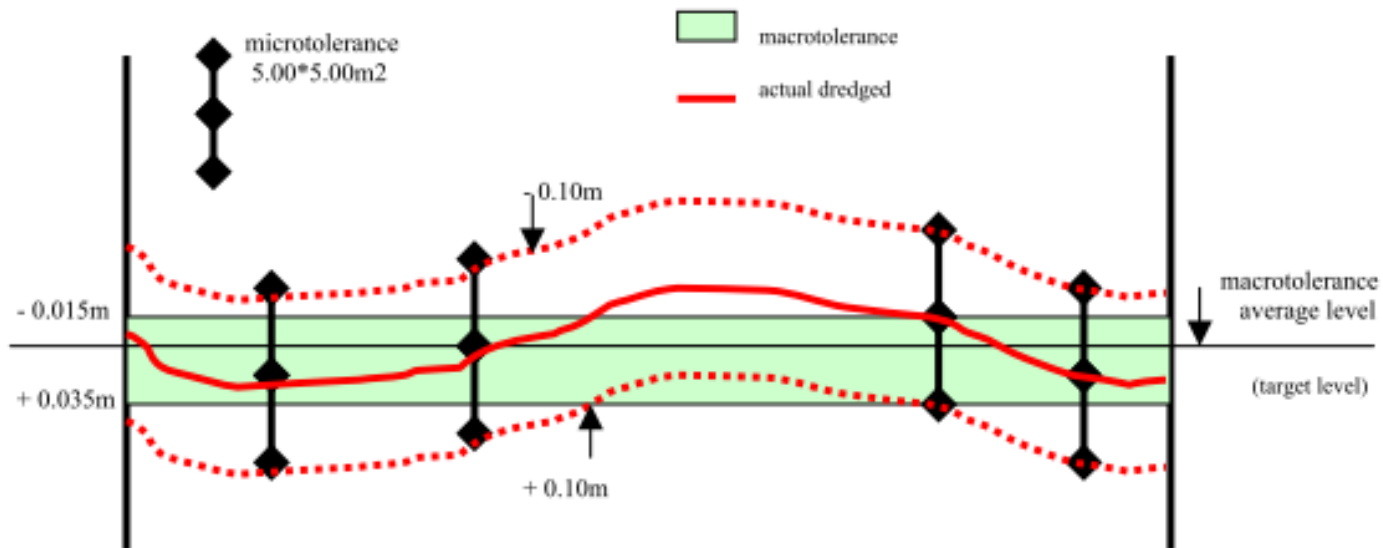


dike between Ketelmeer and polder

Remediation Lake Ketelmeer



Micro and Macro tolerances



HAM 291 Auger dredger Van Oord



De Vecht Disk Cutter Boskalis

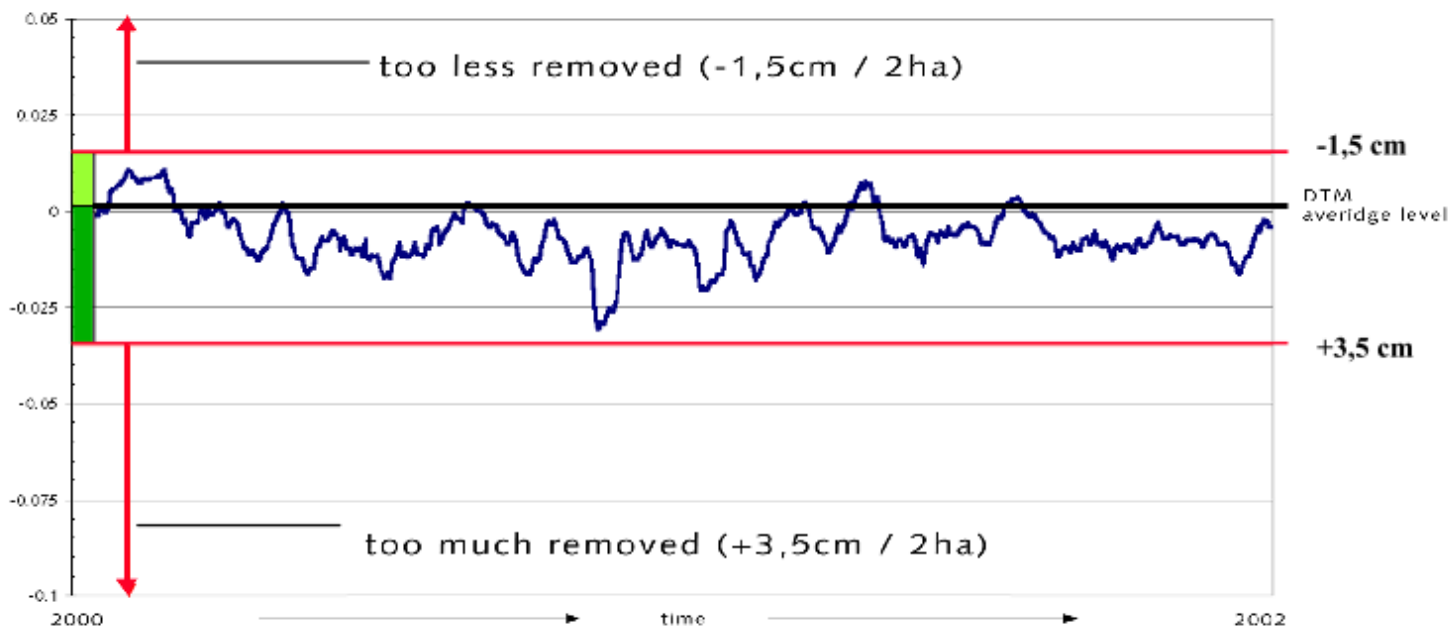


Challenges

- Maximum production and accuracy
- No time delays and not exceed tolerances
- Limit Sound (source power)
- Maximum discharge rate disposal site (5000 m³/hr)
- Direction of clean up from East to West (current)
- Proper planning of the pipelines
- Sedimentation and swelling of the peat soil constituted a risk
- High levels of precision were required in order to avoid having to return to a section a second time



Macro tolerance result over the hole operation



Productions silt material

	thickness in meters	productions m² / hour	m³/hour
auger dredger HAM 291	0,8 – 0,2	800 - 2200	700 – 400
	1,6 – 0,8	400 – 600	700 – 500
discutter Vecht	0,4 – 0,2	800 – 1200	350 – 250
	0,9 – 0,6	400 – 600	350 – 400

Conclusion

- In 2 yrs time 6.000.000 m³ successful removed
- The environmental cleanup target set in advance has been met
- Cleanup equipment carried out the job succesful
- Proved possible to remove large quantities high accuracy and high production





www.witteveenbos.com