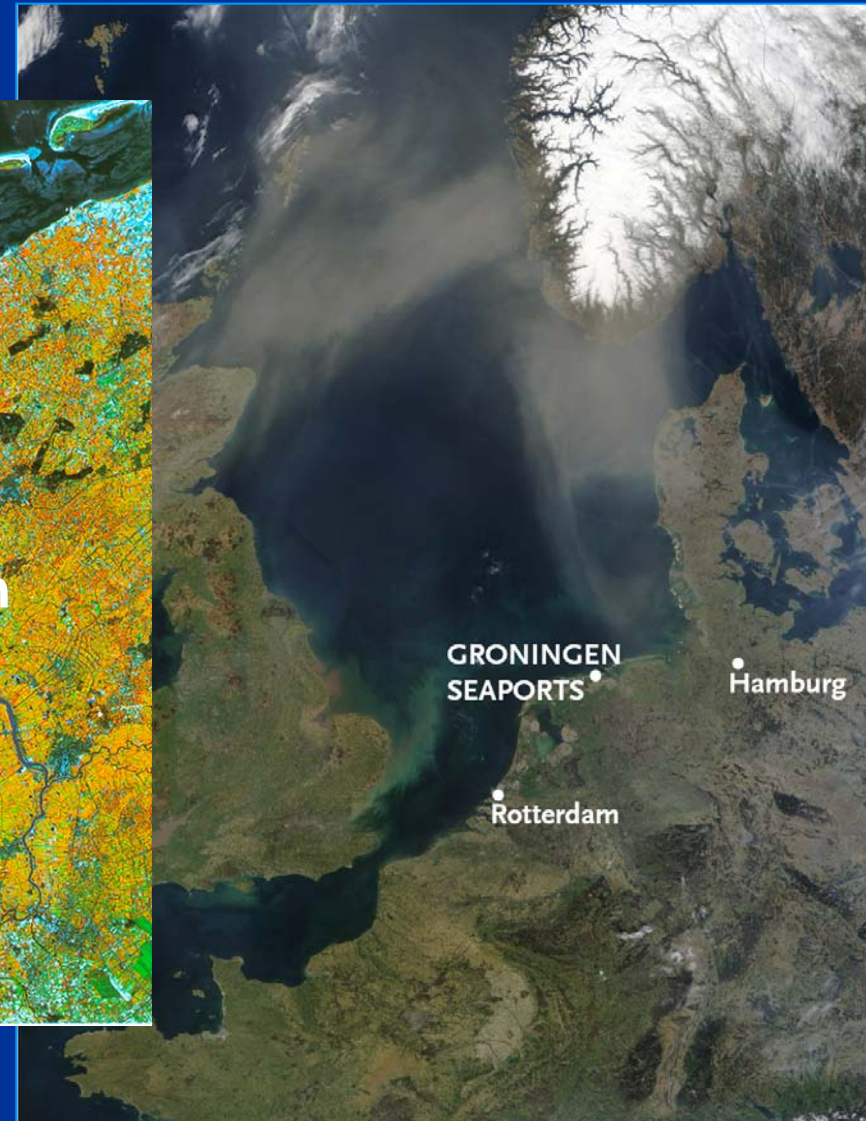
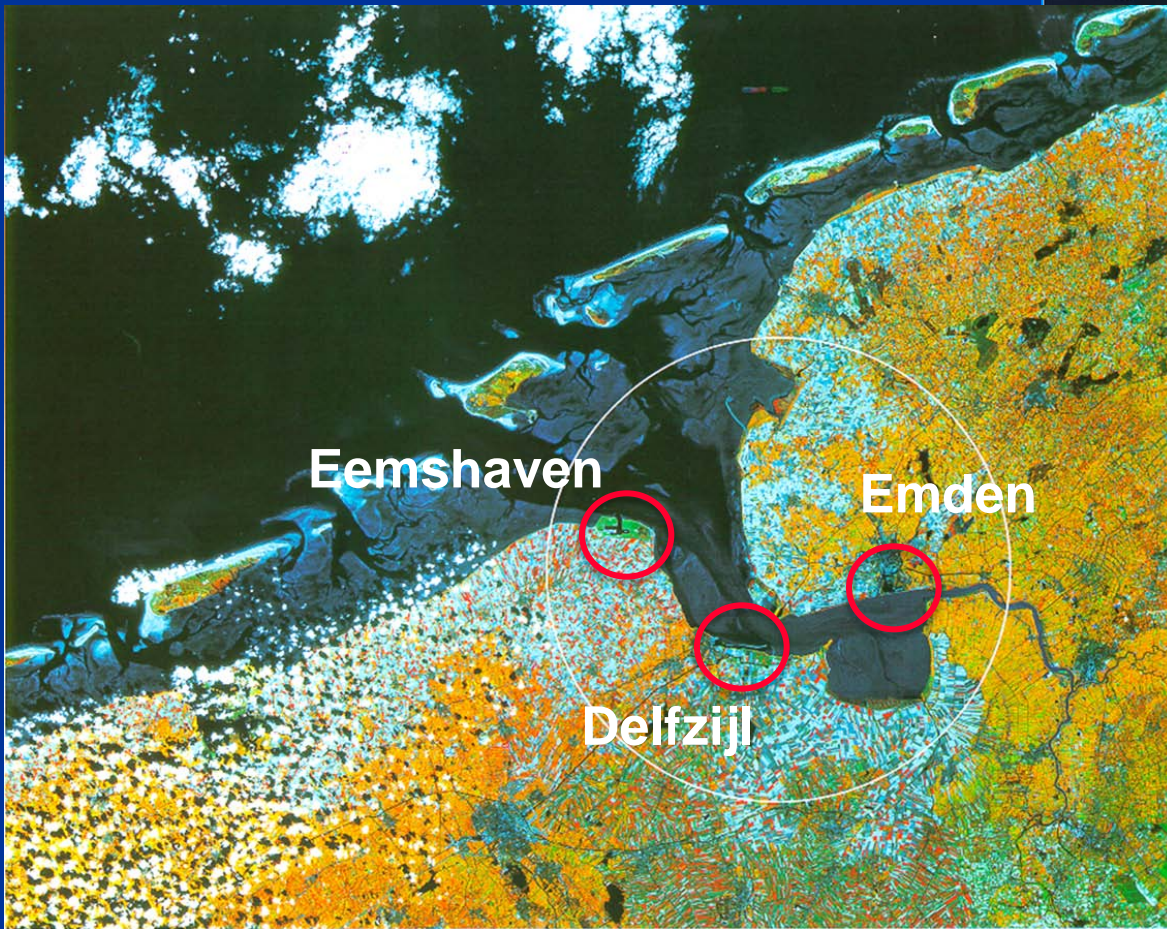




# GRONINGEN SEAPORTS

Jannes Kamphuis  
Manager Dredging & Maintenance







## Port of Delfzijl :

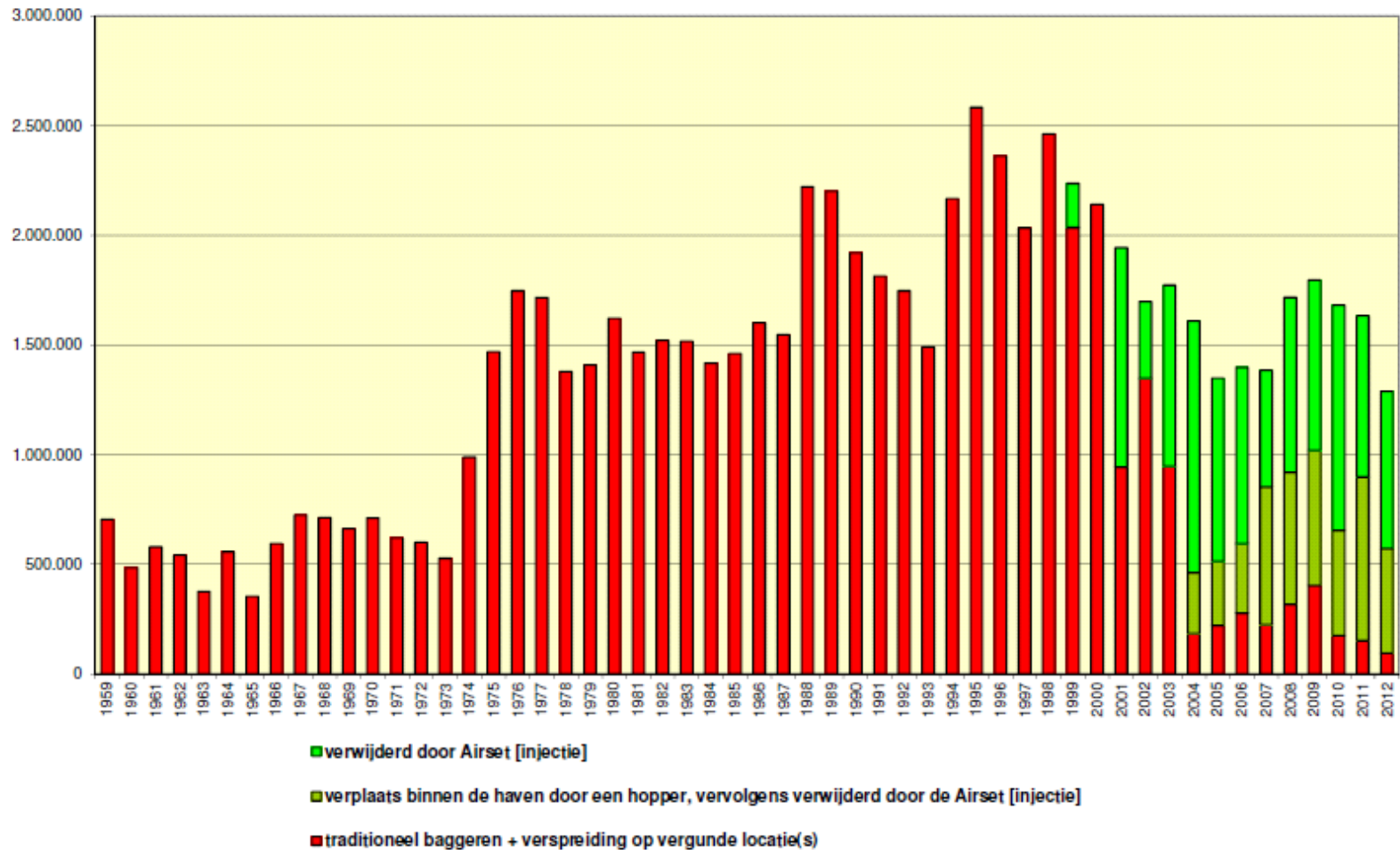


- Contract: 8 years (2016)
- Performance specifications: 2/3 depth and 210Kc depth
- Value: €1,8 mio/year



# Onderhoudsbaggerwerk Delfzijl

Gebaggerde hoeveelheden in m3 [excl Paapsand Süd]



Gebaggerde hoeveelheden Delfzijl.xlsm

Groningen Seaports

## Discussions in Port of Delfzijl:

- Pilots: problems with manoeuvrability, 'dead water' effects?
- Dump locations in Wadden Sea (Eems estuarium: Natura 2000, World Heritage)
- Sustainable dredging: Ecoports







## Sustainable dredging in Port of Delfzijl; keep the sediment navigable

Stakeholders: pilots, portmaster, ship-owners,  
Waddenvereniging, Milieufederatie  
Waddenfonds

### Fases:

- |    |                       |                   |
|----|-----------------------|-------------------|
| 1. | Feasibility study     | mrt '10 – mei '11 |
| 2. | Simulations           | mei '11 – dec '12 |
| 3. | Full scale test       | 2013-2014         |
| 4. | New dredging strategy | 2014              |





Use of data and know-how from:

- Delfzijl, Emden, Harlingen, Zeebrugge
- Ghent University (Prof. Vantorre)
- Flanders Hydraulic Research (Sludge Tank)
- DotOcean: Gravi-probe



## Fase 1 en 2:

Simulations:        locale pilots  
                         1700TUE scaled down to 169x25, draught 8m  
                         90 runs

Conclusions:        safe navigation with UKC of -7%  
                         full scale test

# Fase 3

## Full scale testing

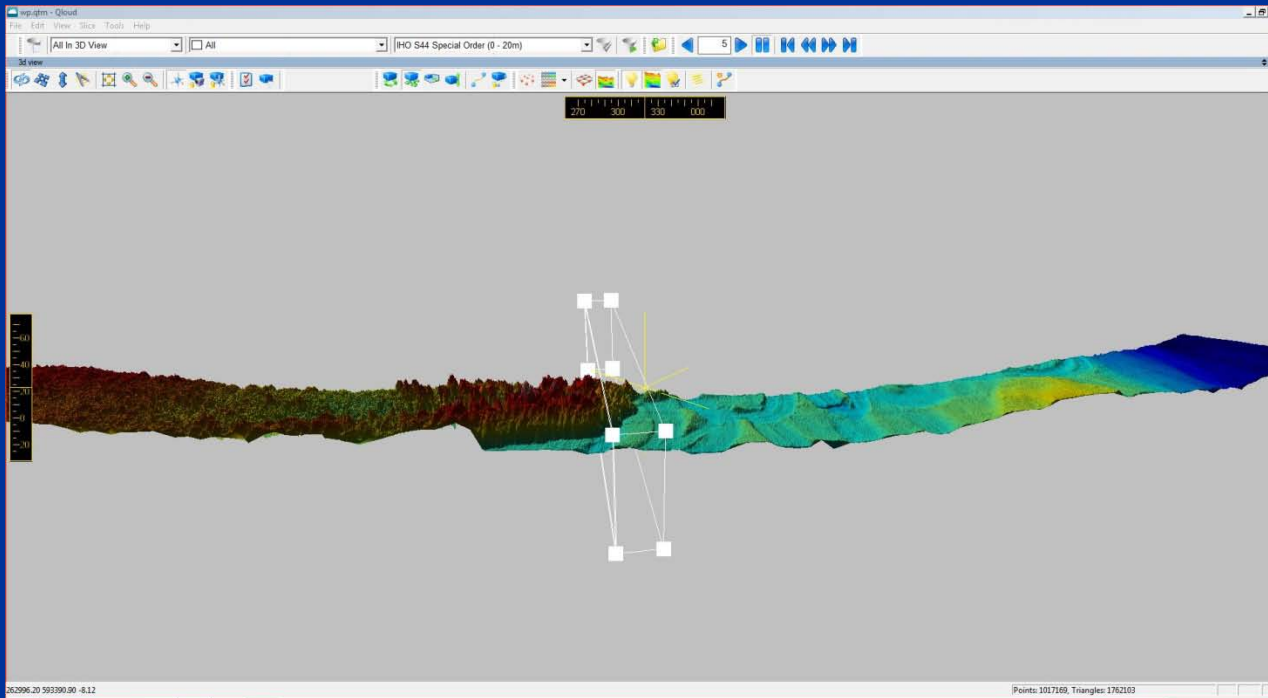


Built	.....	1983
Type	.....	Belt Self Unloader
Length Overall	.....	117.90 metres
Breadth	.....	20.50 metres
Depth	.....	11.00 metres
Holds/Hatches	.....	4/4
Total Hold Capacity (including hatches)	.....	9,689 cubic metres
Deadweight	.....	10,142 tonnes
Draft	.....	8.466 metres
Displacement	.....	13,613 tonnes
Gross Tonnage	.....	6,944 tonnes
Thruster	.....	1 fwd
Length of Boom	.....	47.82 metres
Speed	Light .....	13.0
	Loaded .....	12.0
Consumption	Light .....	12.5
	Loaded .....	12.5
Discharge Rate (maximum)	.....	1,800 tonnes/hr
Previous Names	.....	Tinnes

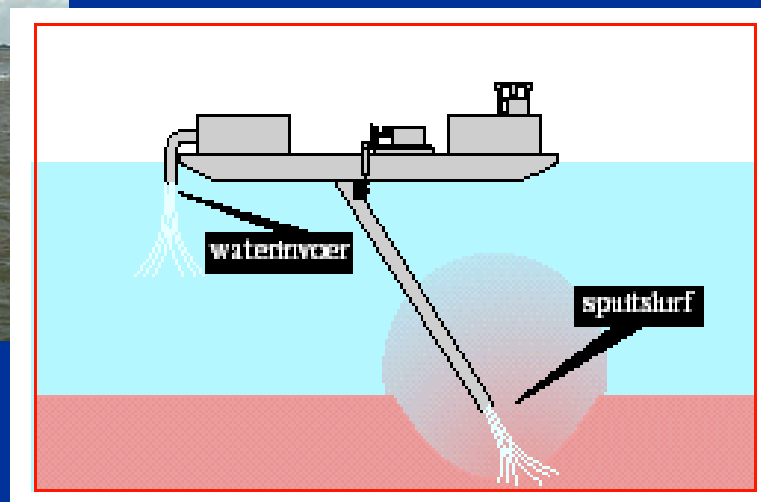


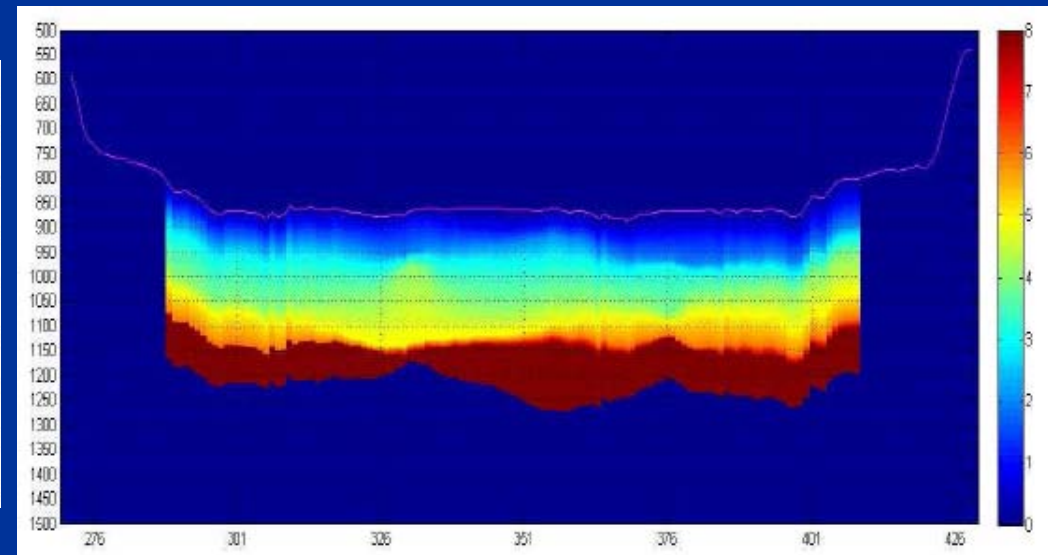
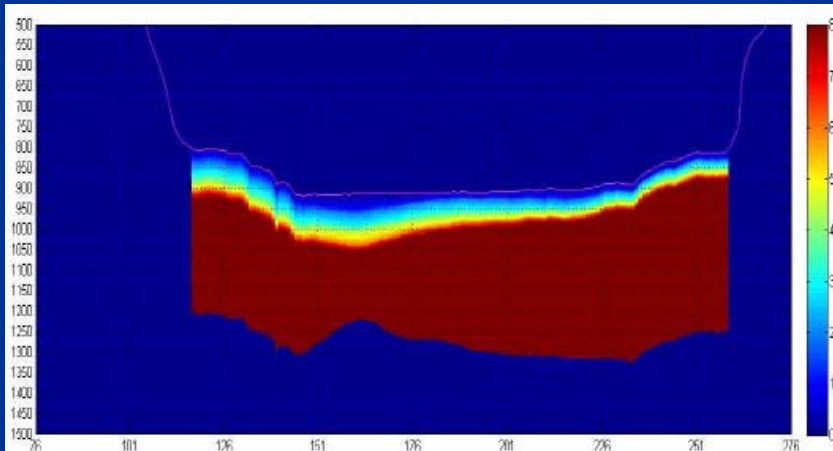
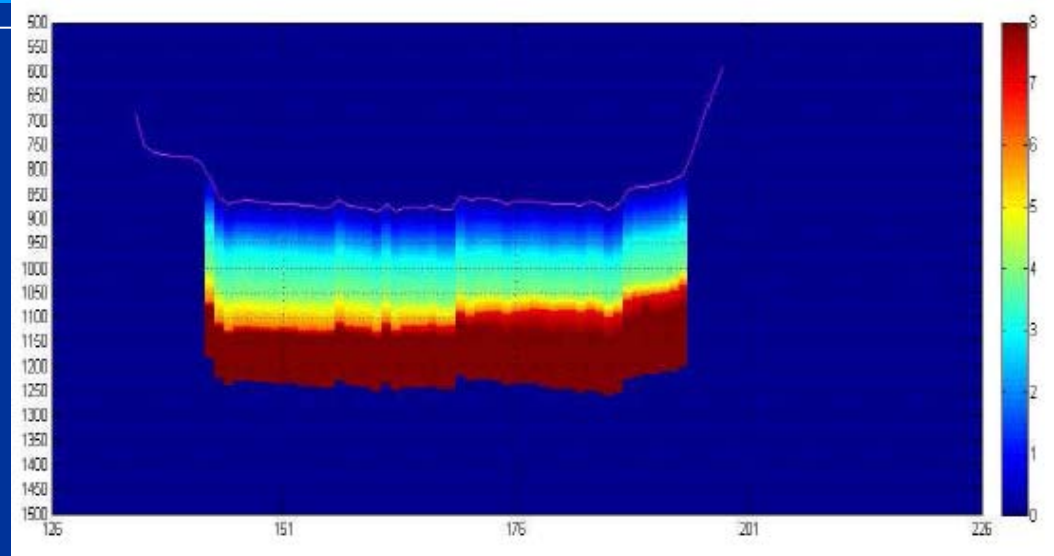
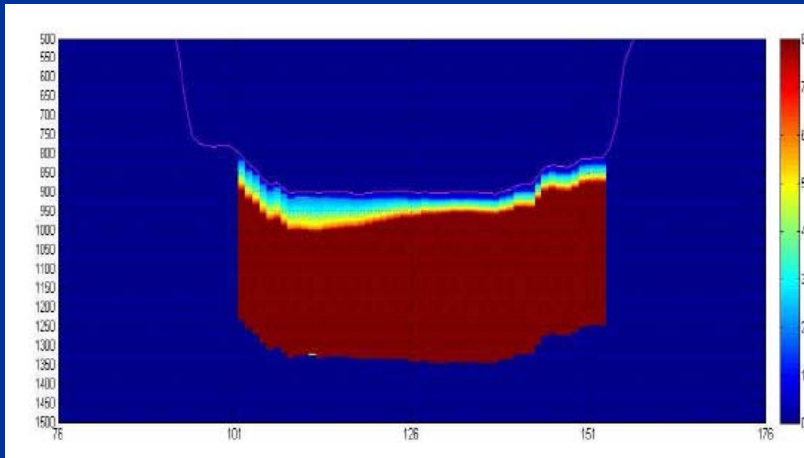


T0:

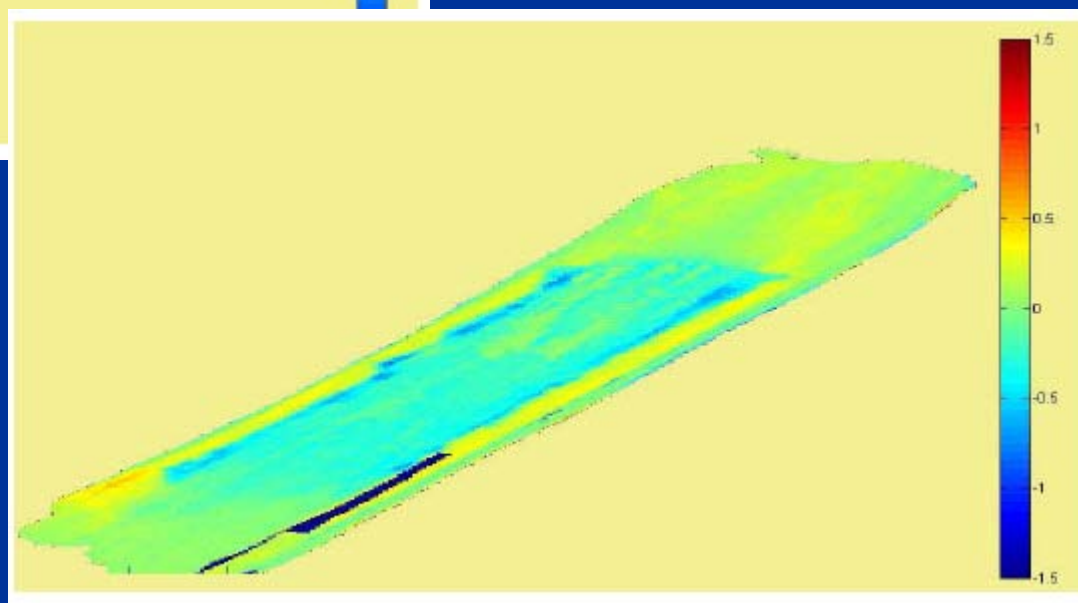
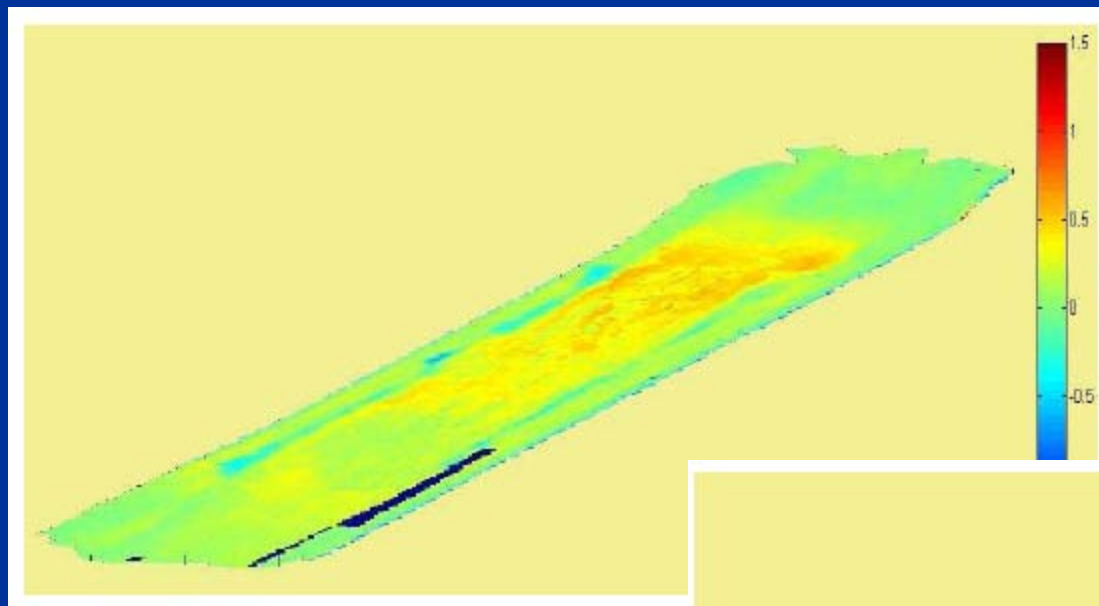


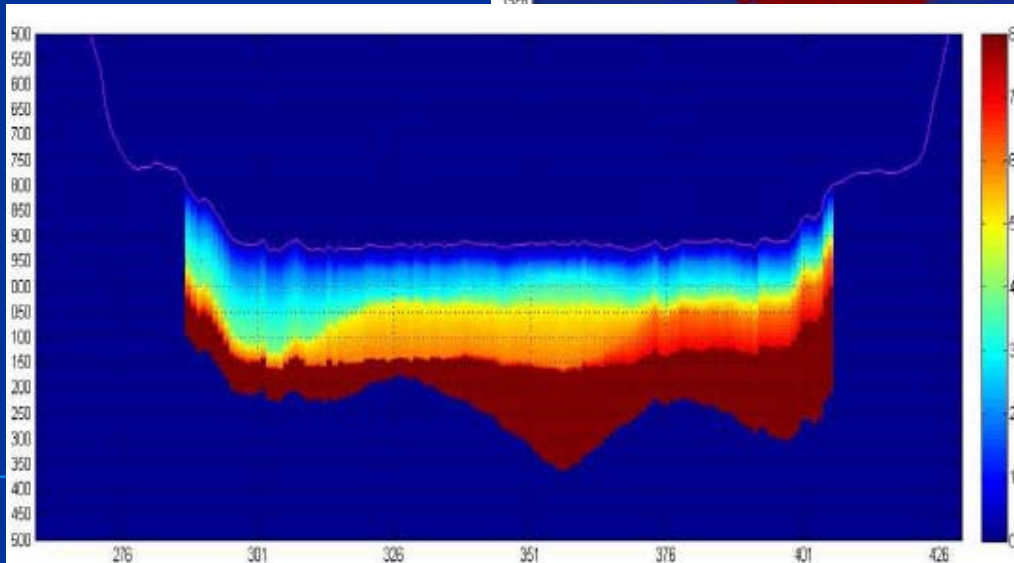
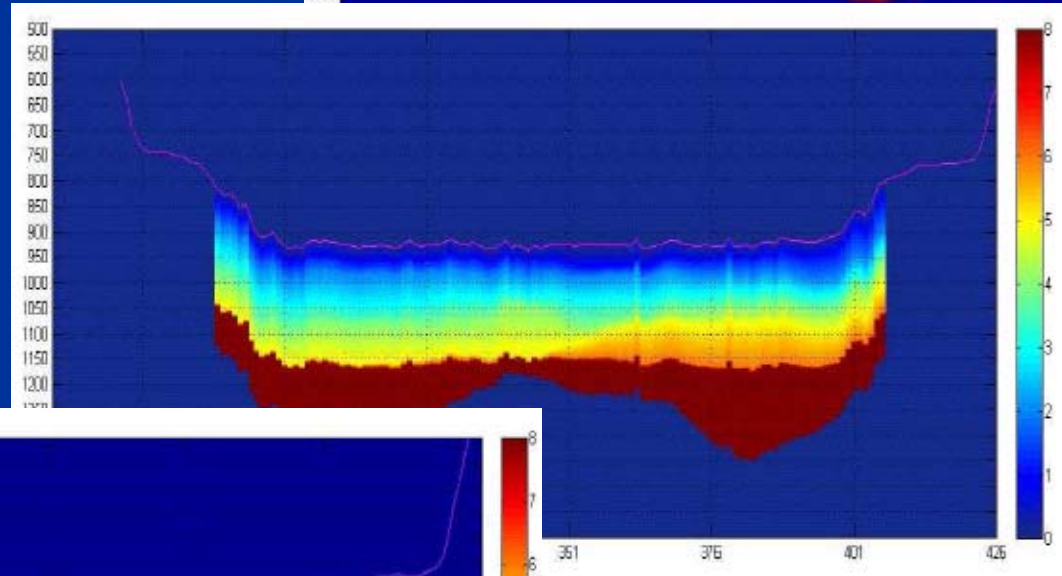
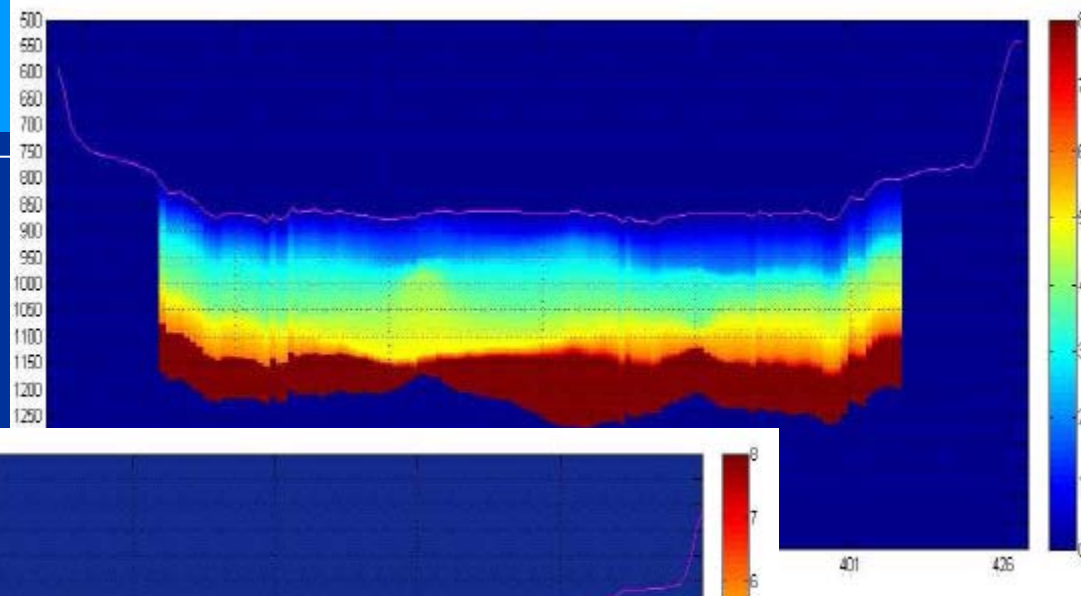
# Airset

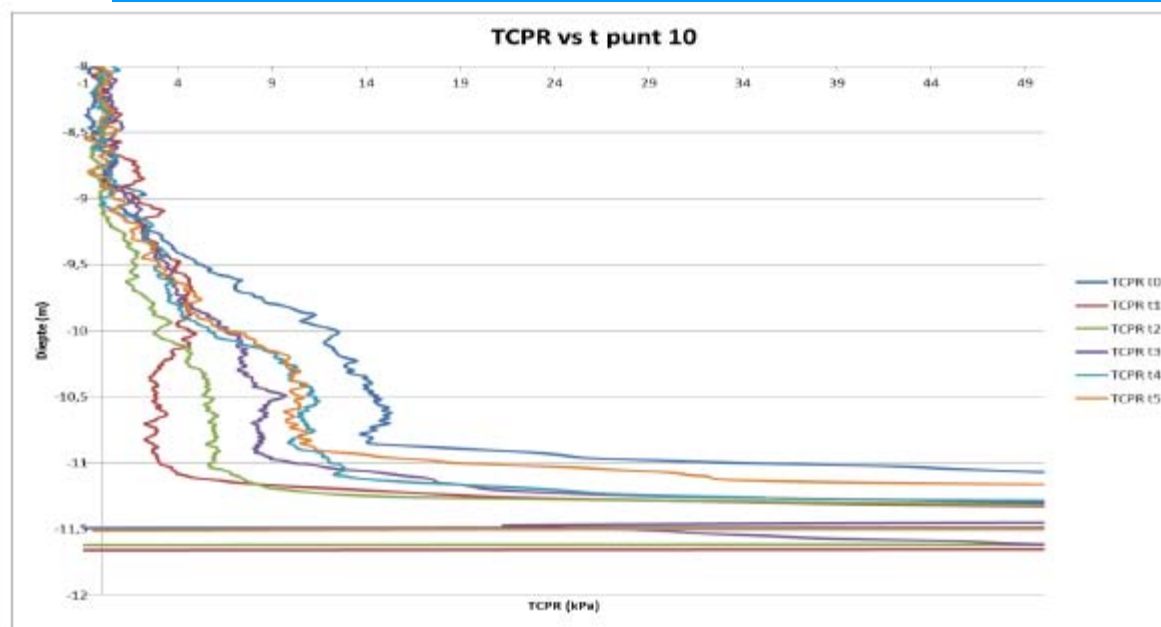




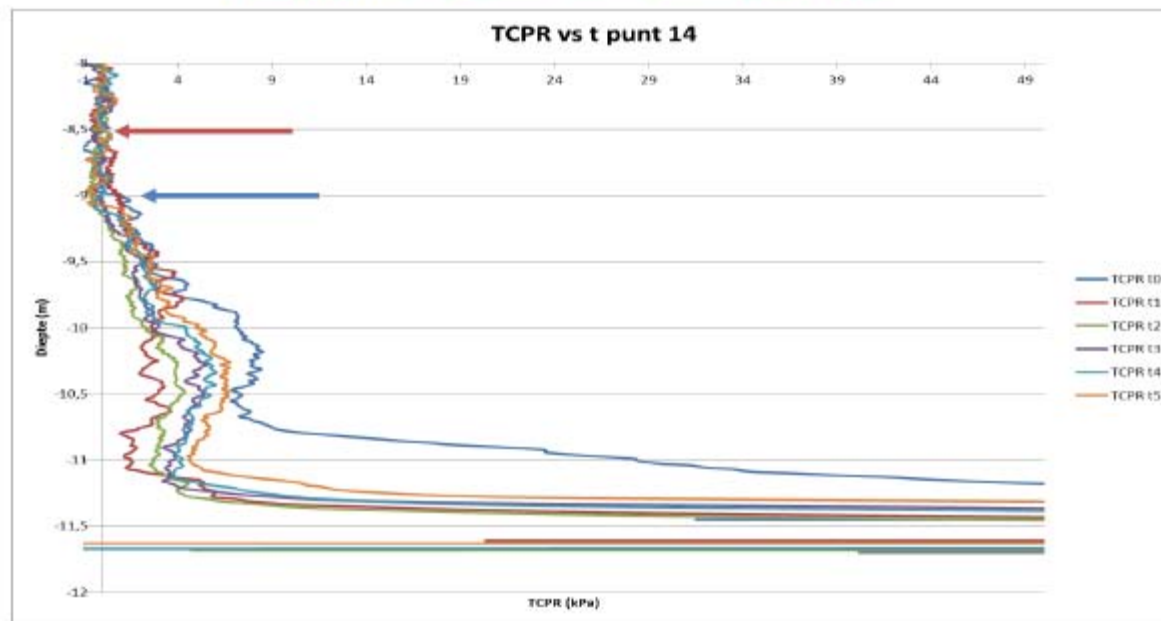








Figuur 147: TCPR ("Total Cone Penetration Resistance") evolutie in de tijd, punt 10



Figuur 148: TCPR ("Total Cone Penetration Resistance") evolutie in de tijd, punt 14



## Conclusions:

1. Sediment is navigable in Port of Delfzijl
2. New dredging strategy based on strenght of the mud
3. Conditioning frequency: 6 weeks



Questions?