

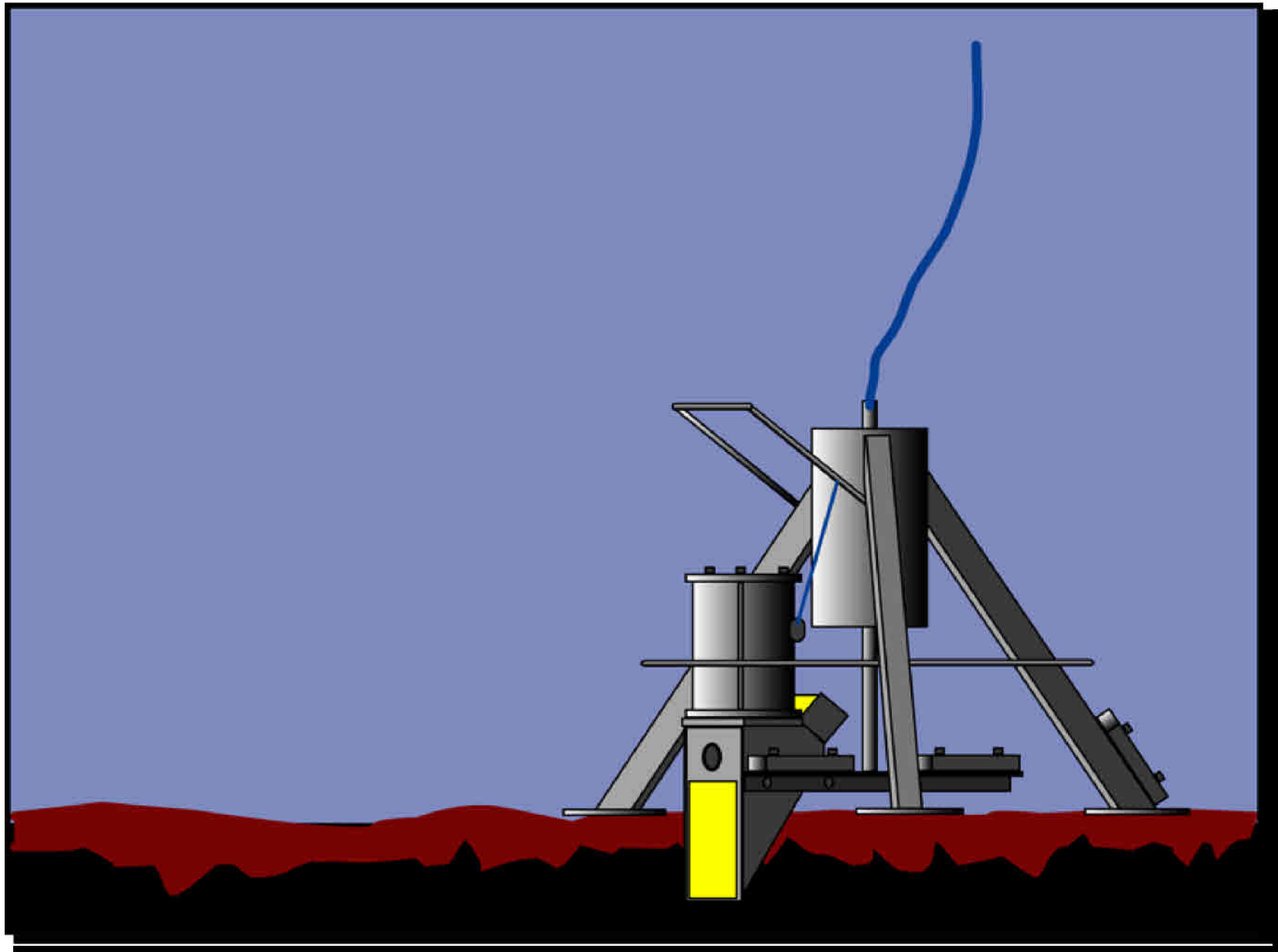
Sediment quality assessment by Sediment Profile Imaging (SPI) in a contaminated Norwegian harbour (Oslo)

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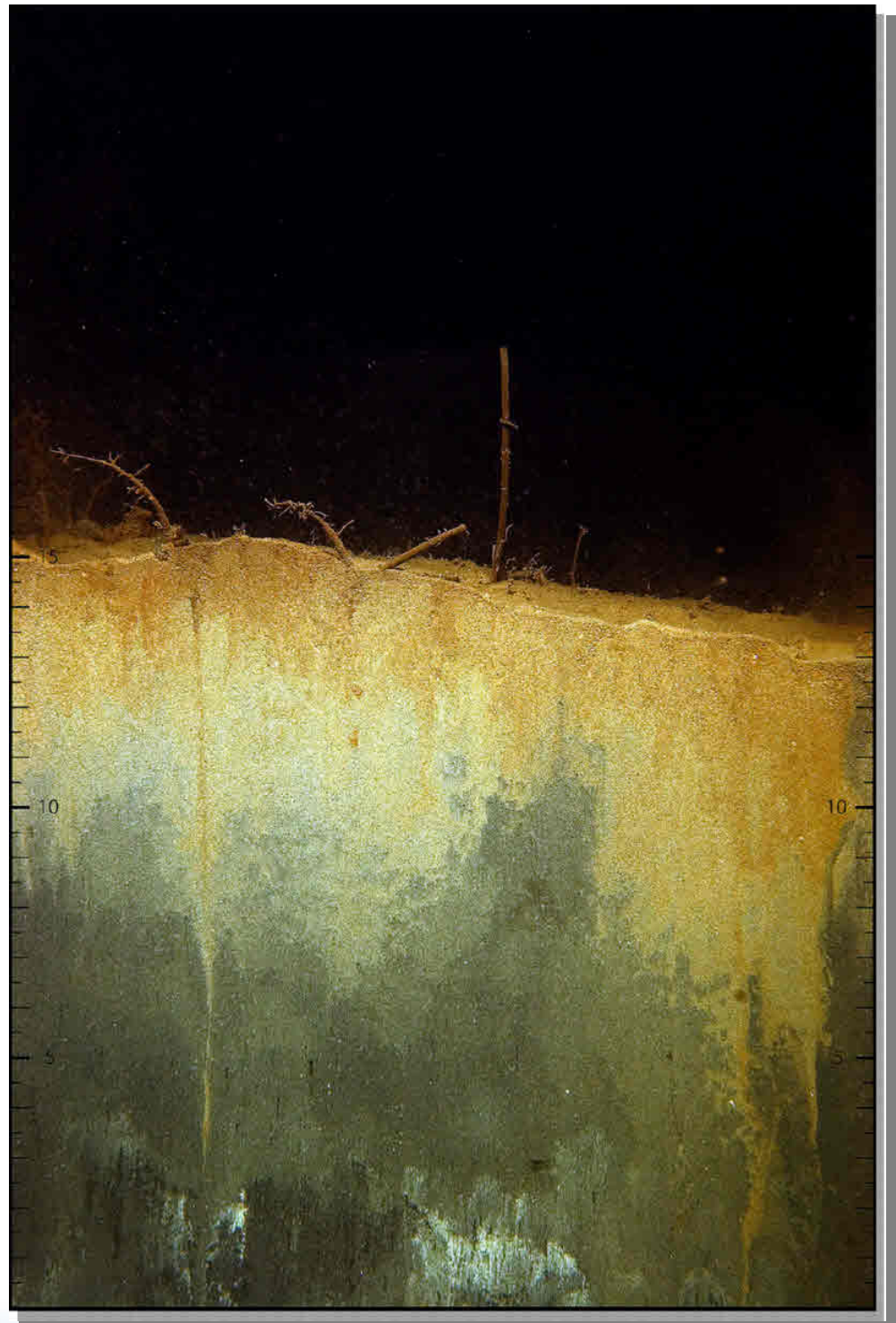
- Sediment Profile Imaging
 - Technique
 - Analysis
 - Interpretation
- Oslo harbour
 - Ecological status
 - Dredging and capping
 - Deep water deposit



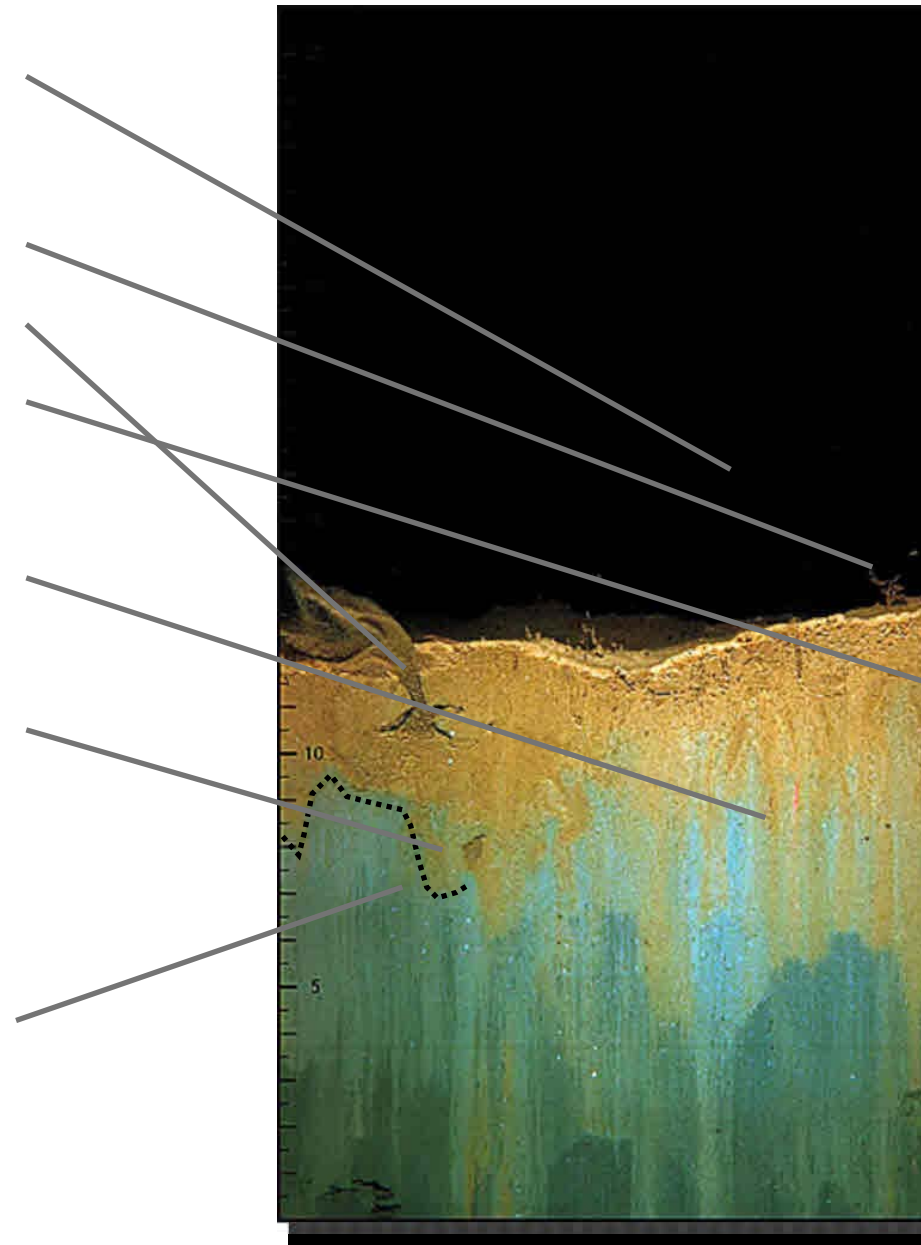


sediment surface

aRPD

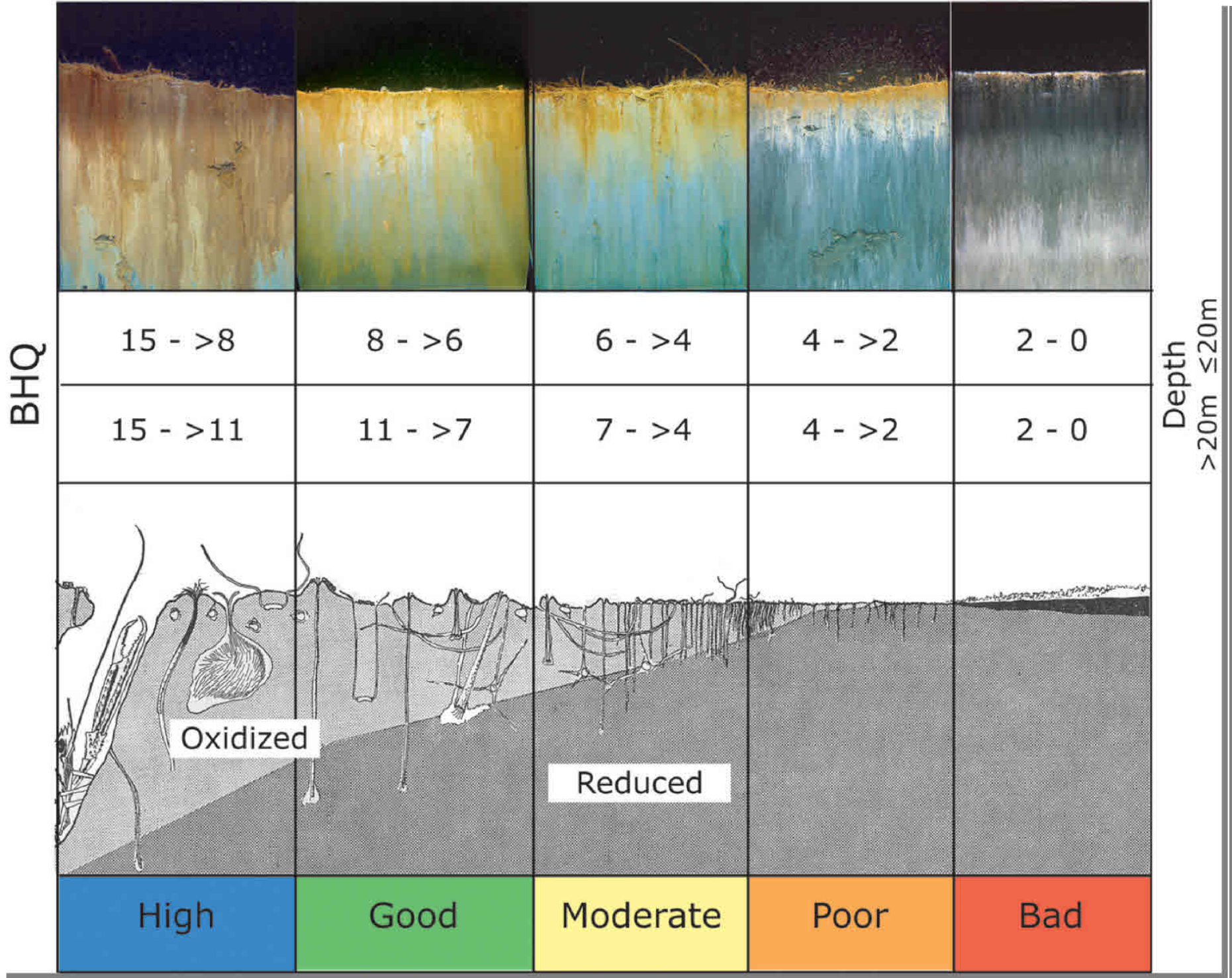


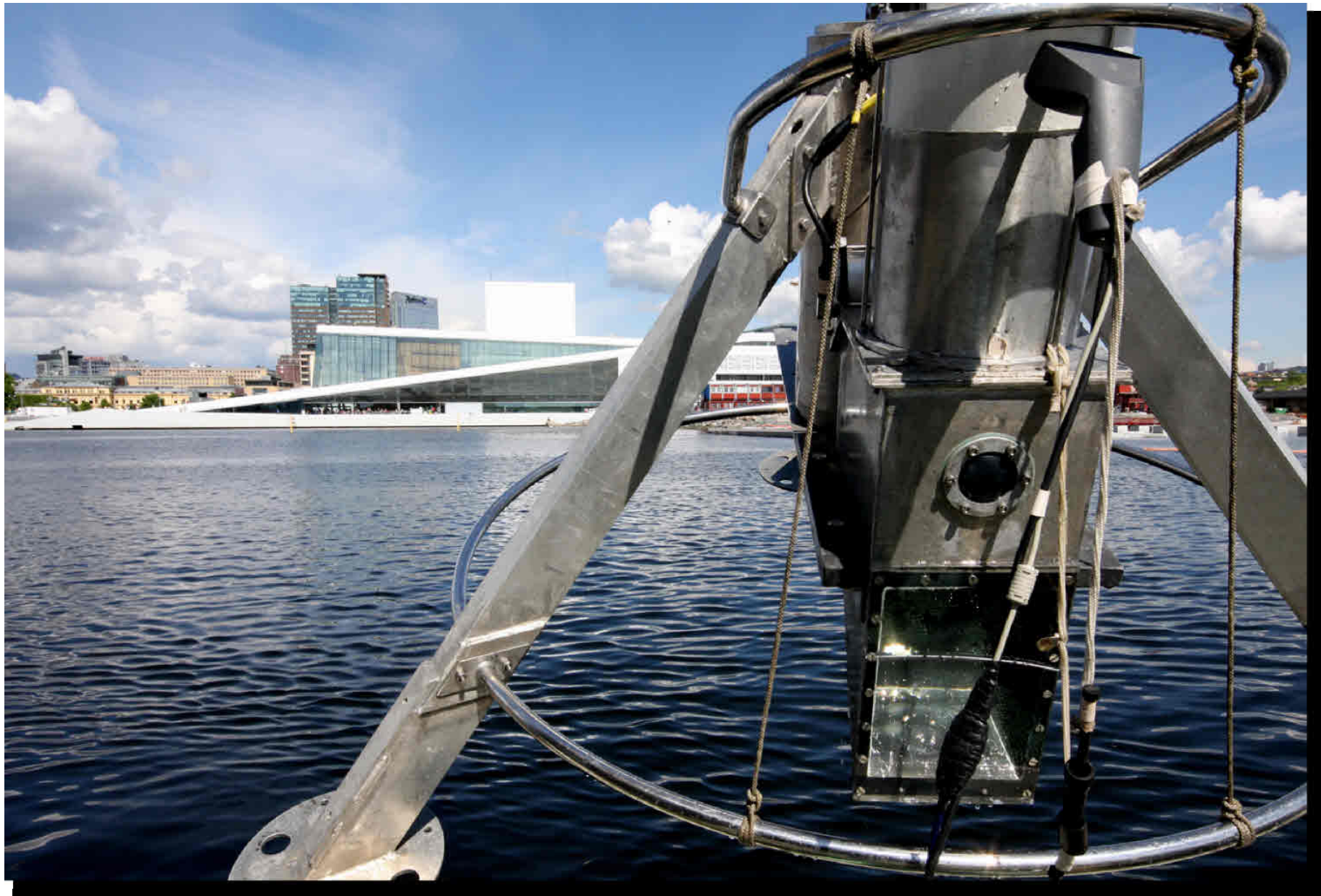
Surface structures		Fecal pellets	1
		Tubes \leq 2mm	1
	or	Tubes $>$ 2mm	2
		Pit or mound	2
Subsurface structures		Infauna	1
		Burrows # 1 - 3	1
	or	Burrows # $>$ 3	2
		Oxic void at \leq 5cm	1
	or	Oxic void at $>$ 5cm	2
		0cm	0
		0.1 - 1.0cm	1
		1.1 - 2.0cm	2
		2.1 - 3.5cm	3
		3.6 - 5.0cm	4
		$>$ 5.0cm	5



Wainwright & Rosenberg (1997, 2000 & 2006)

$$HQ = \sum \text{Surface struc.} + \sum \text{Subsurface struc.} + aRPI$$





Overall aim for remediation of
contaminated sediment in Oslo harbour

- the use of Oslofjorden should not be negatively affected by contaminated sediments

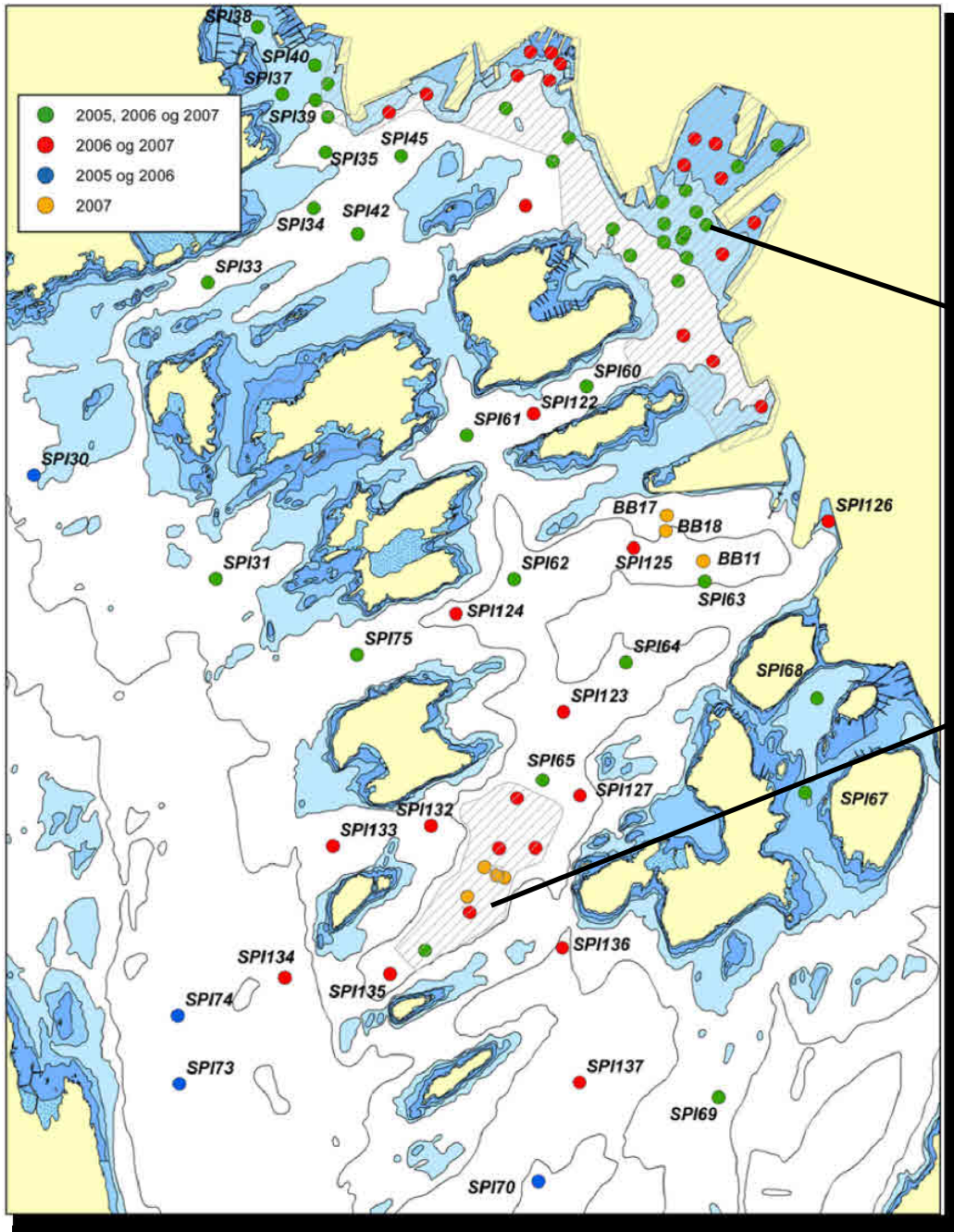
Monitoring programme with SPI

- ecological status of softbottoms

- dispersion of dredged sediments during operations

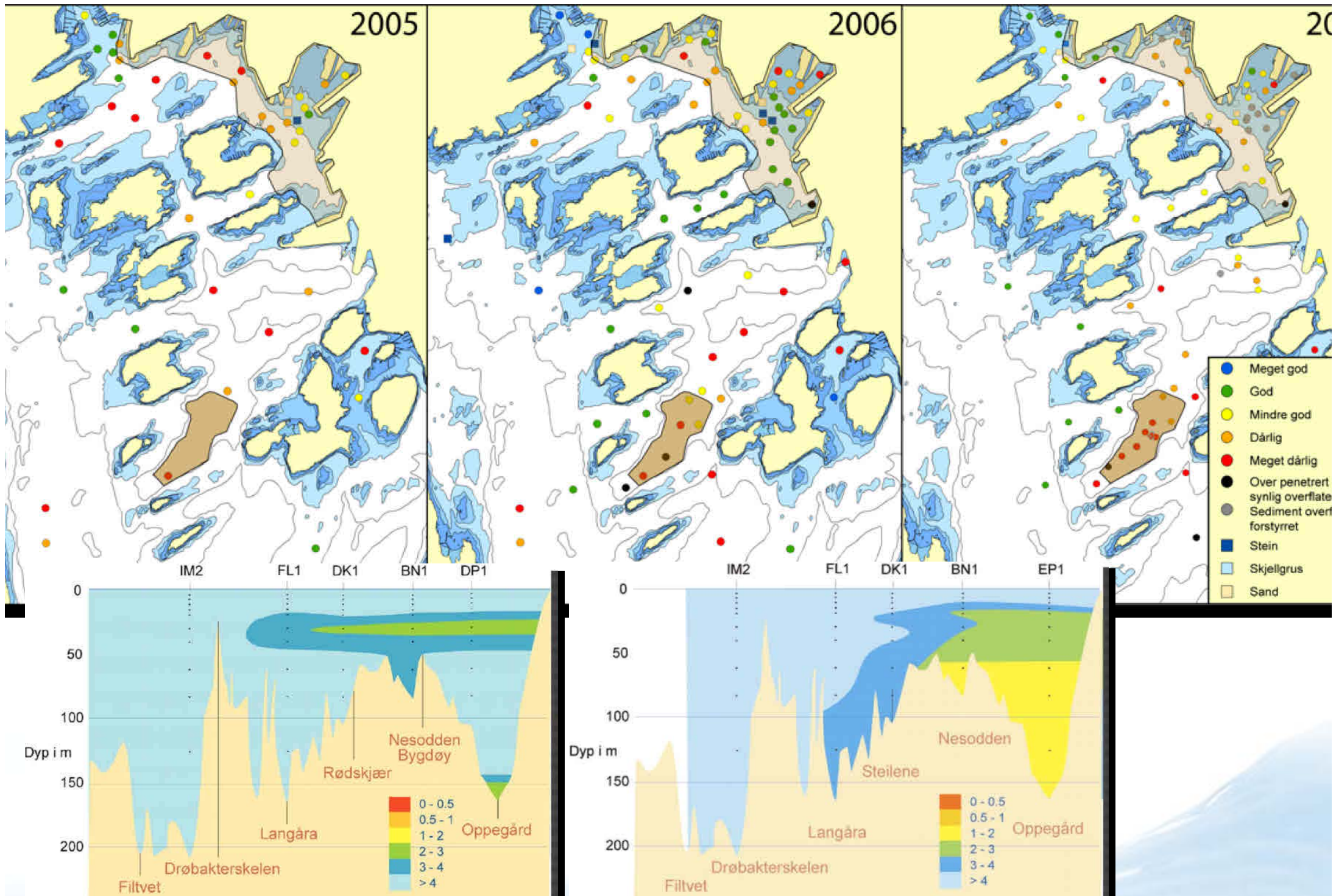
- capping event and succession





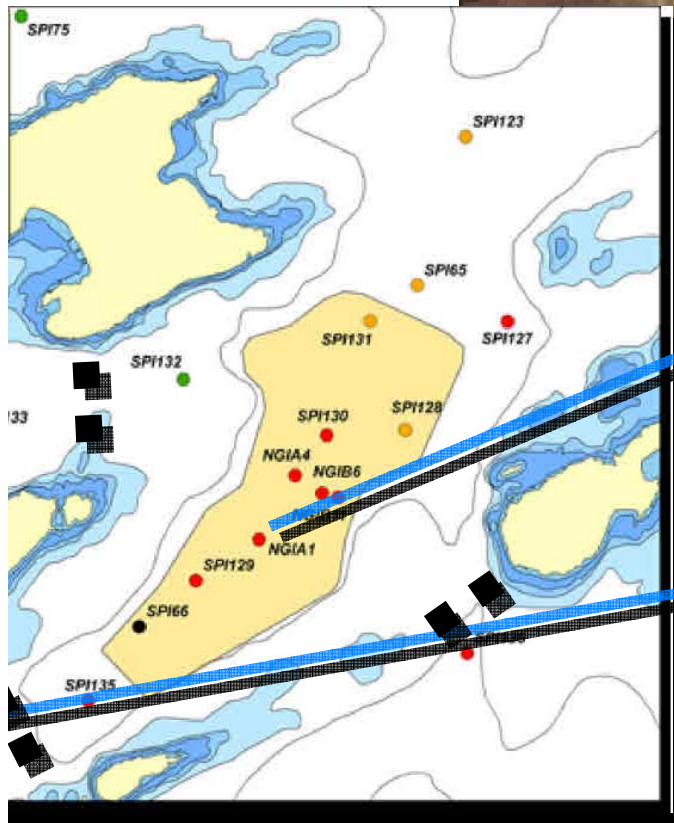
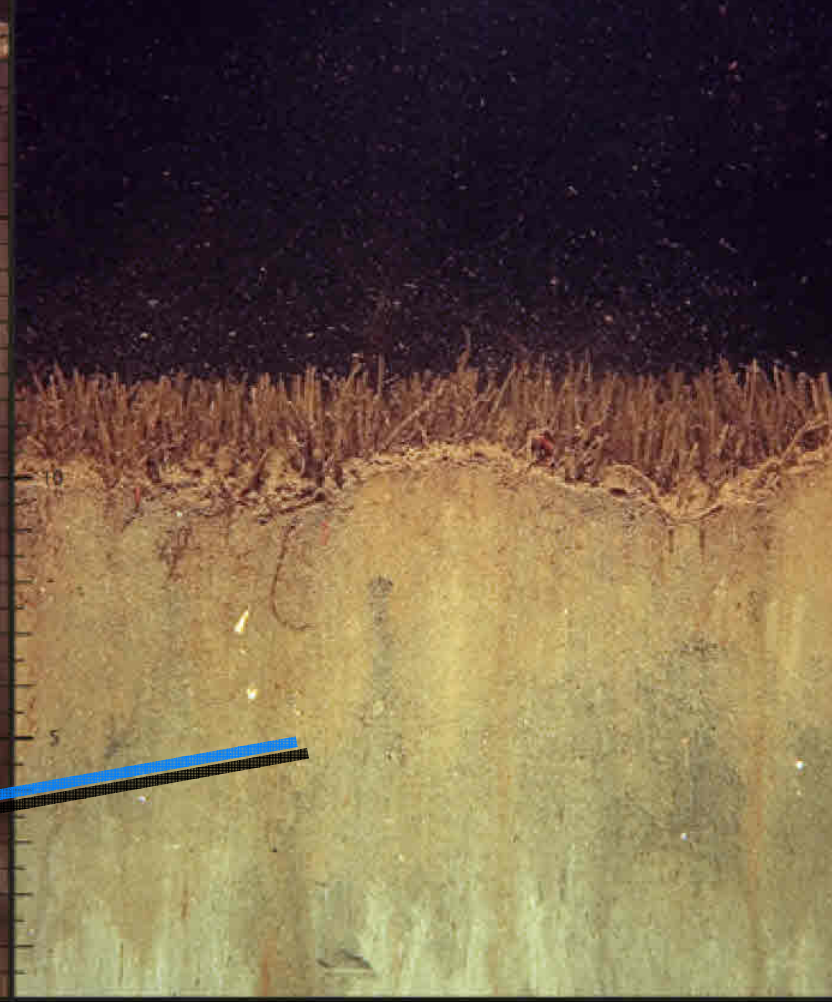
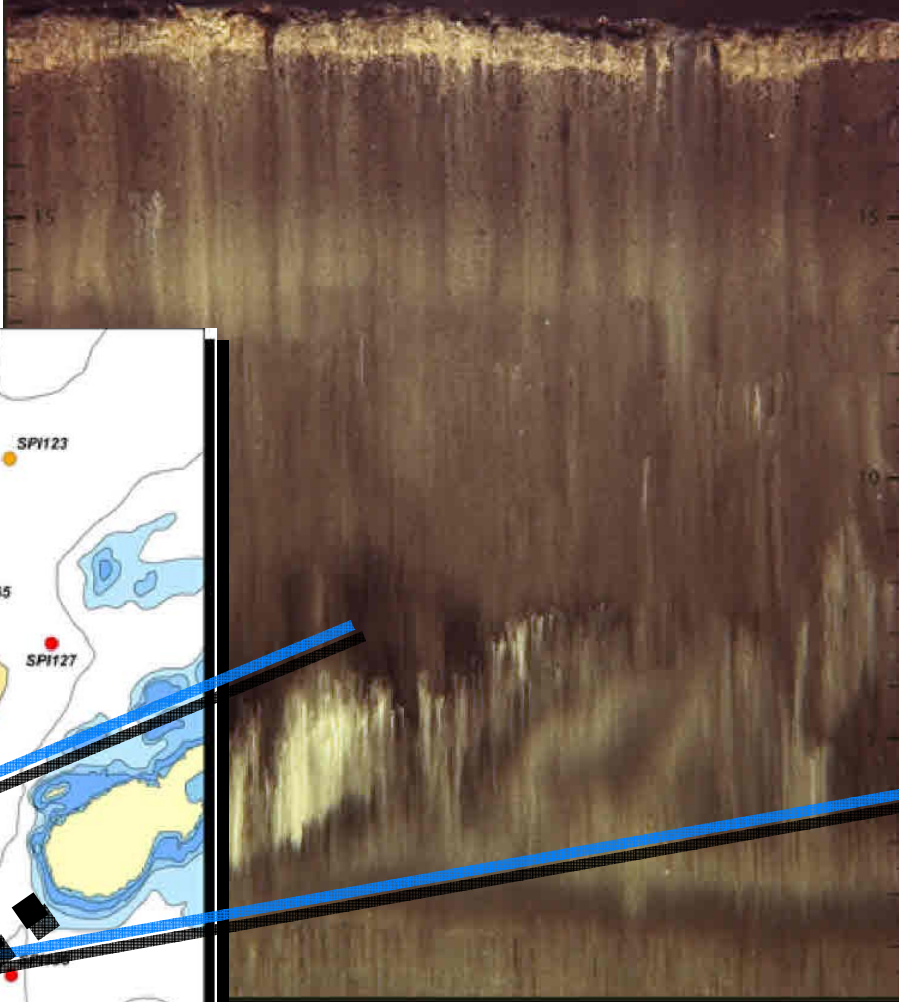
Dredging & capping

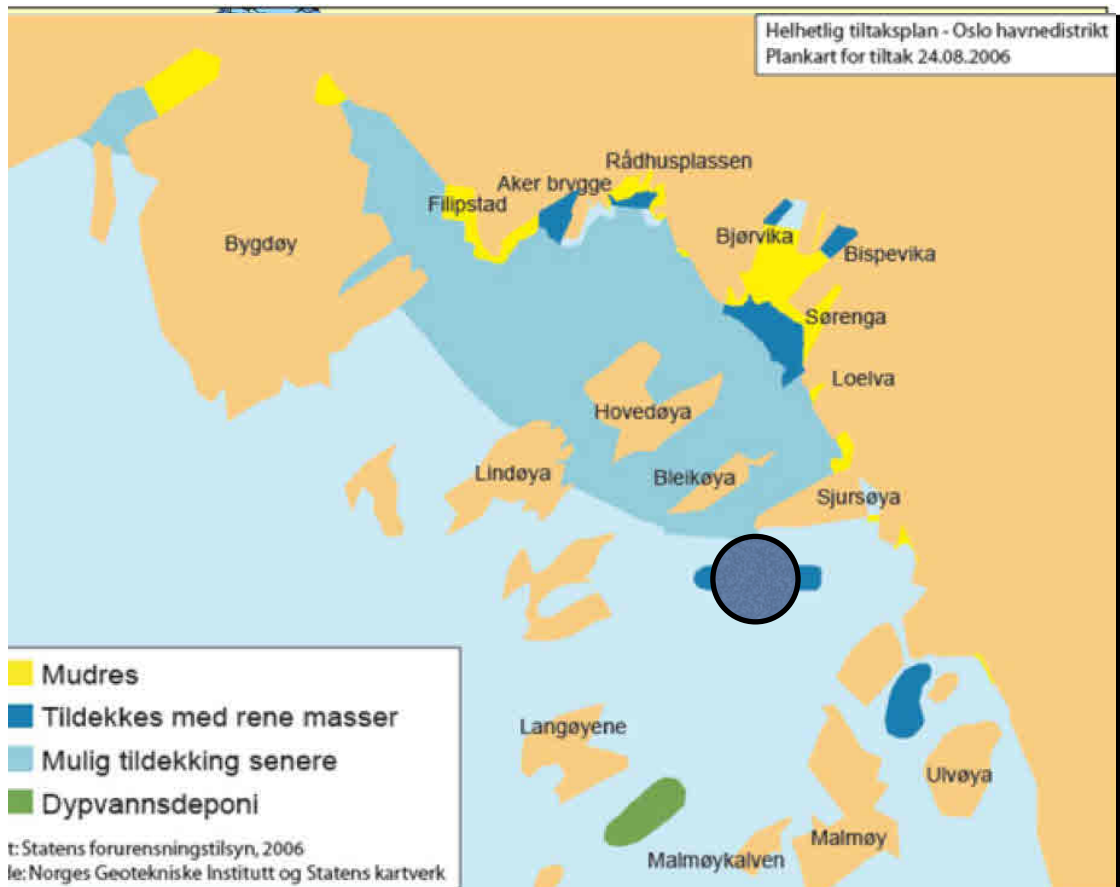
Deep water depos:



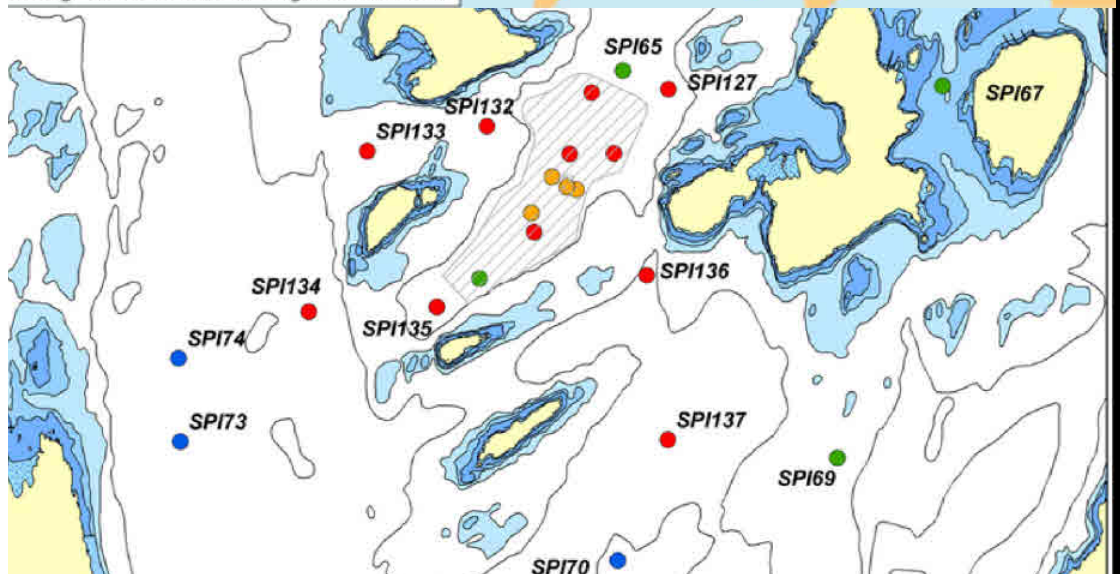
NGIA1

SPI134



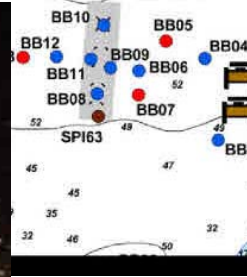


Dredging & capping



Before

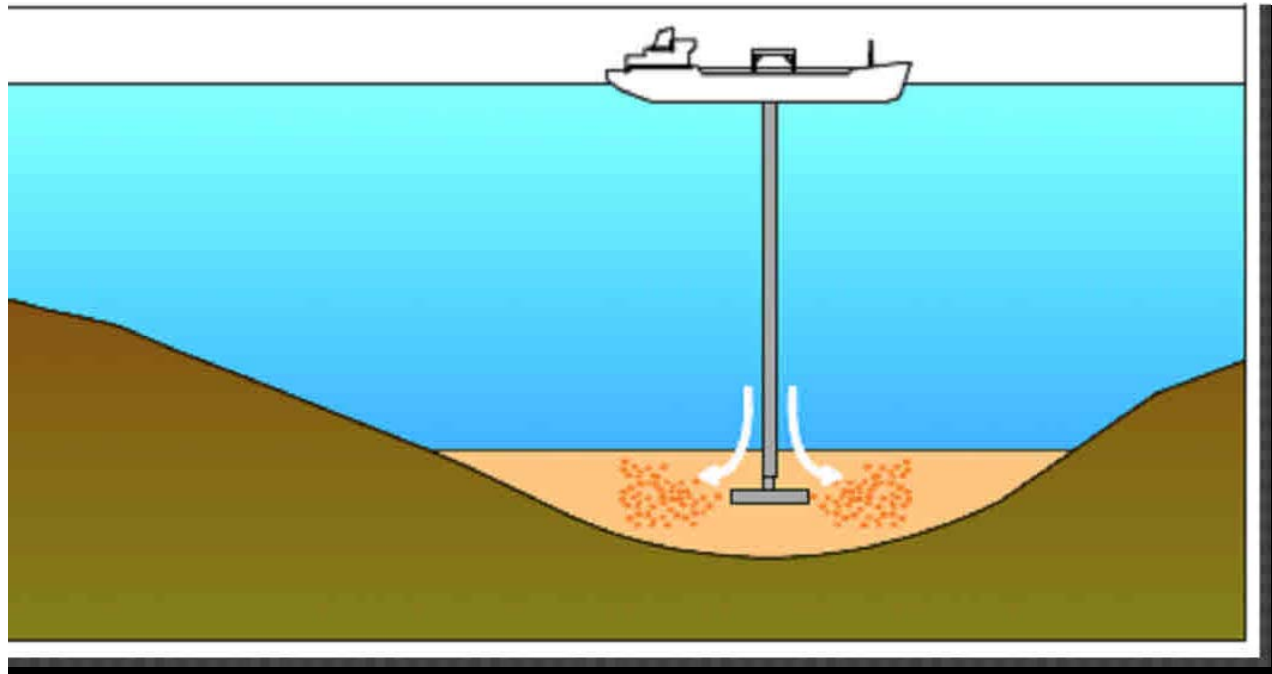
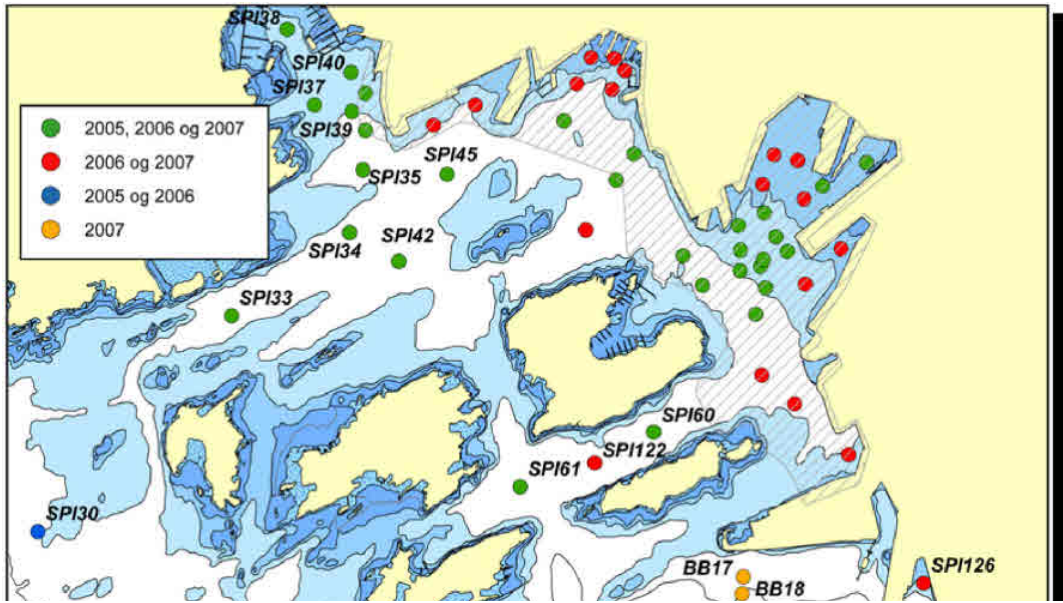
After



9 month

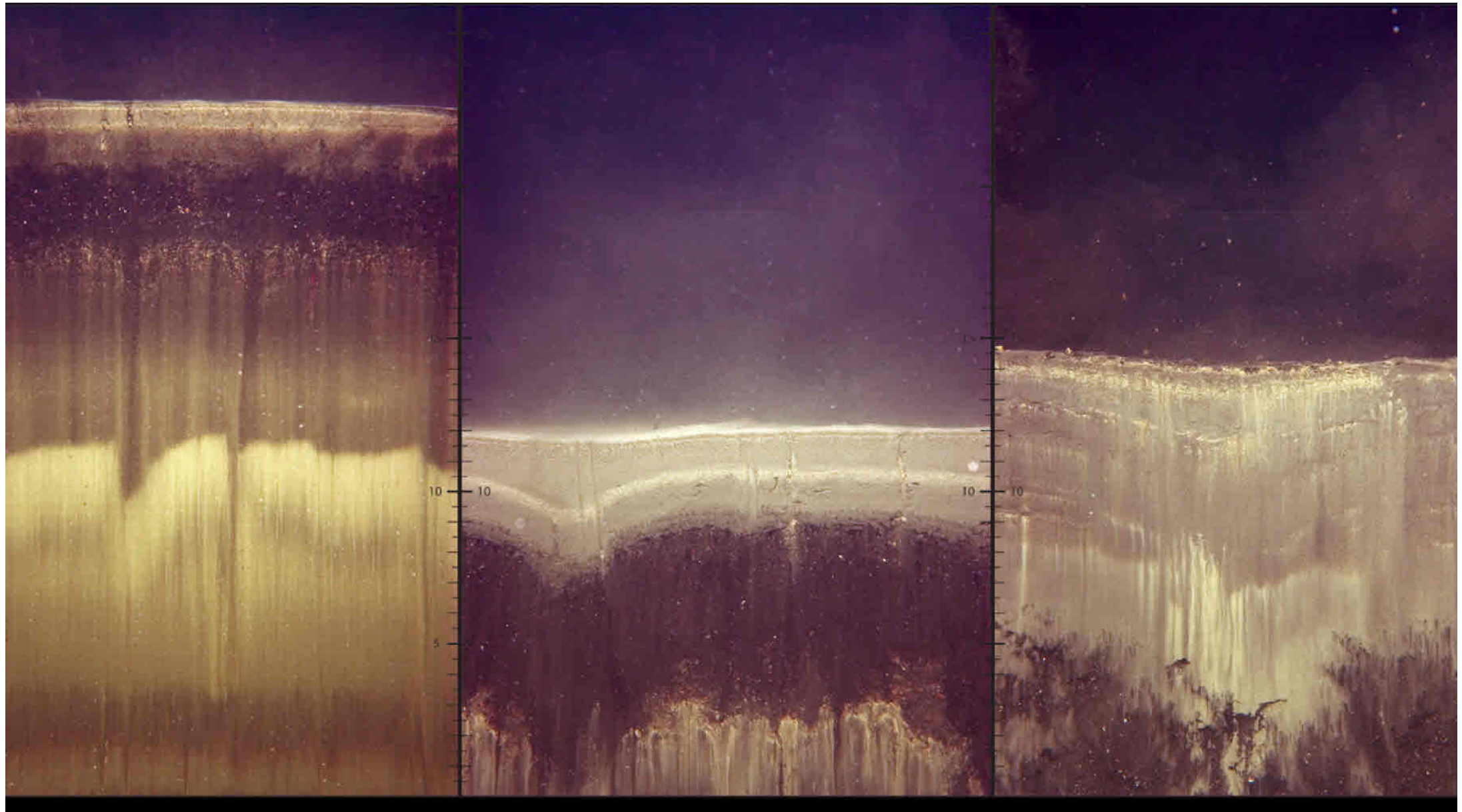
21 month





Deep water depos:





Before

After

5 month later

Ecological status in deeper areas of the studied area following variation in oxygen concentrations

Ecological status in capped areas in Bekkelagsbassengen' have improved

Sediment stability is improved by 'dm' thick layer of sand in the deep-water deposit area