Temporal changes in the sediment pollution of the Gulf of Finland

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SEDGOF
Sediments of the Gulf of Finland

„Assessment for ecosystem-based management of marine environment on the basis of sea bottom and sediments of the Gulf of Finland" (SedGoF) [2014-2016]

Partners:

Estonian Geological Survey

TalTech Department of Geology

Tallinn University Institute of Ecology

TalTech Department of Marine Systems

Geological Survey of Norway

TAL TECH

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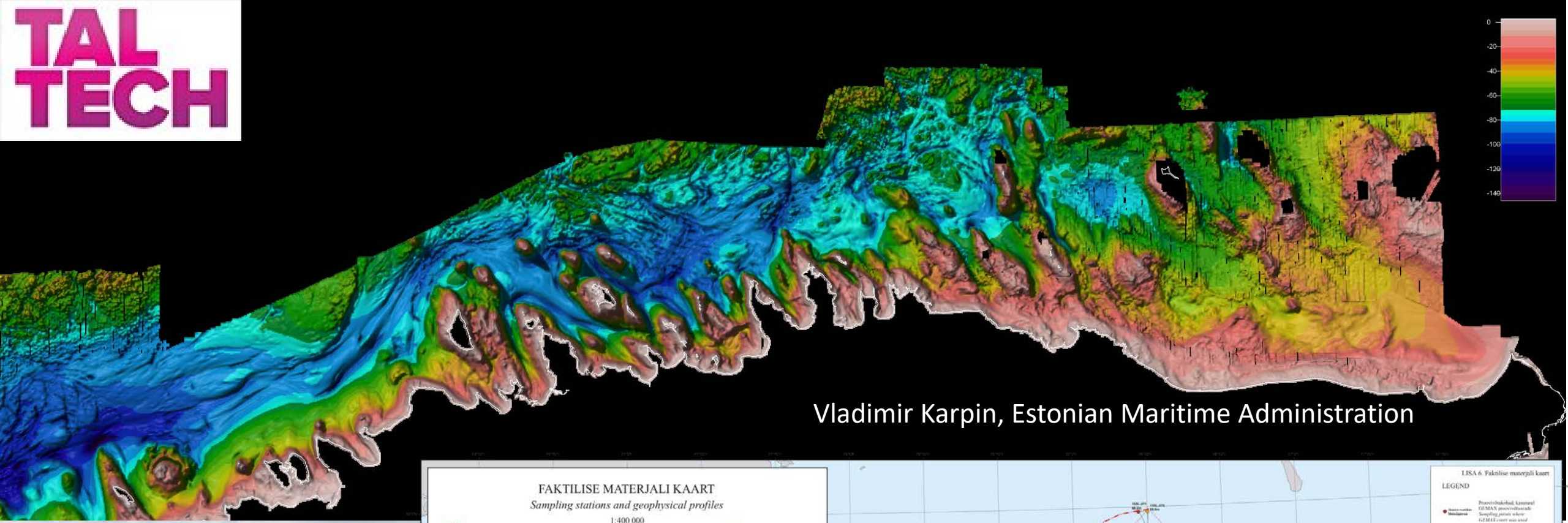
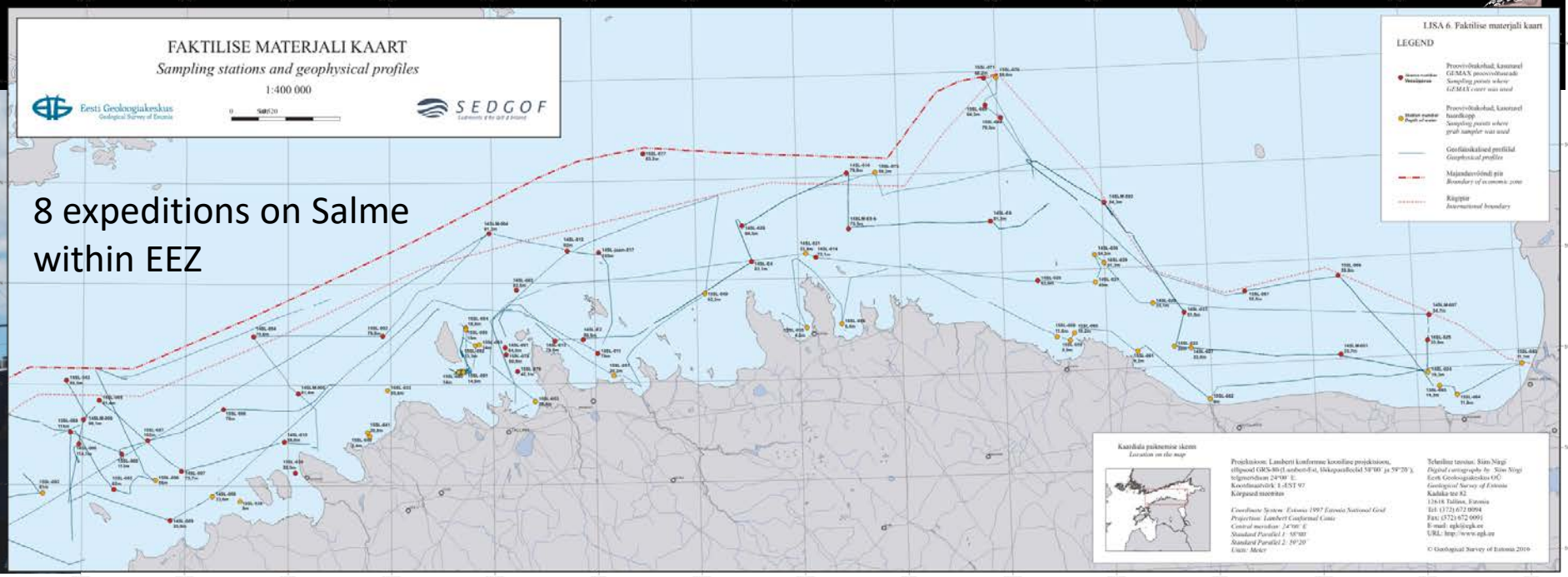
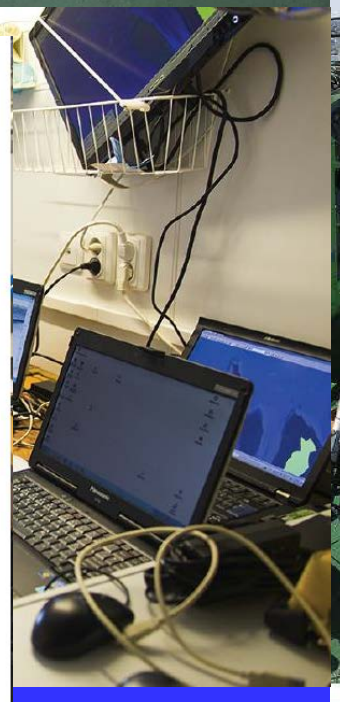


Vladimir Karpin, Estonian Maritime Administration



8 expeditions on Salme within EEZ

Acoustic survey lines were run including: continuous sub-bottom profiling, reflection seismic, side scan sonar and multibeam echo sounding.



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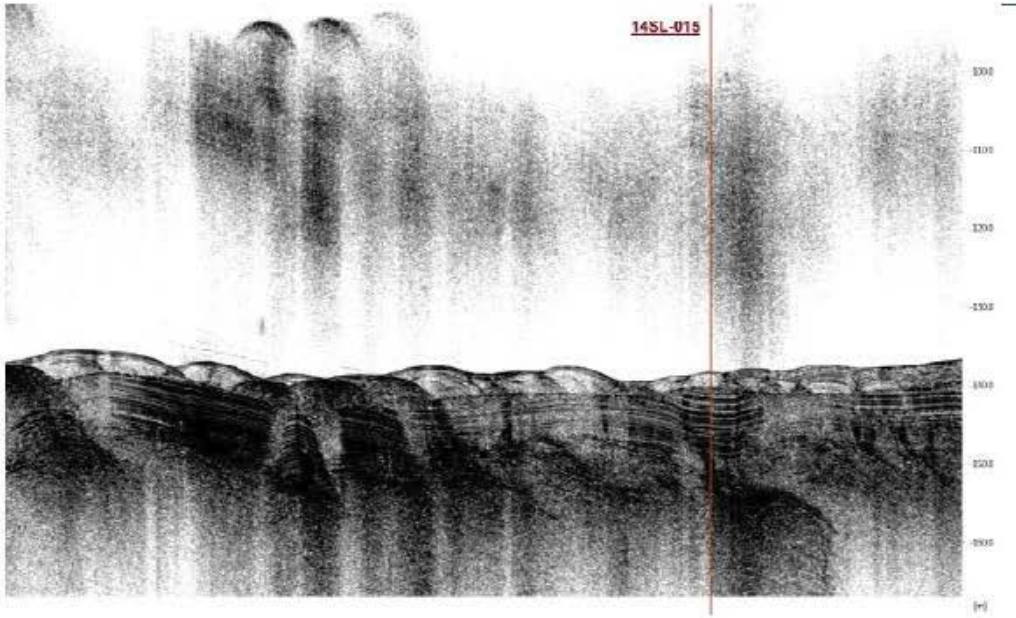

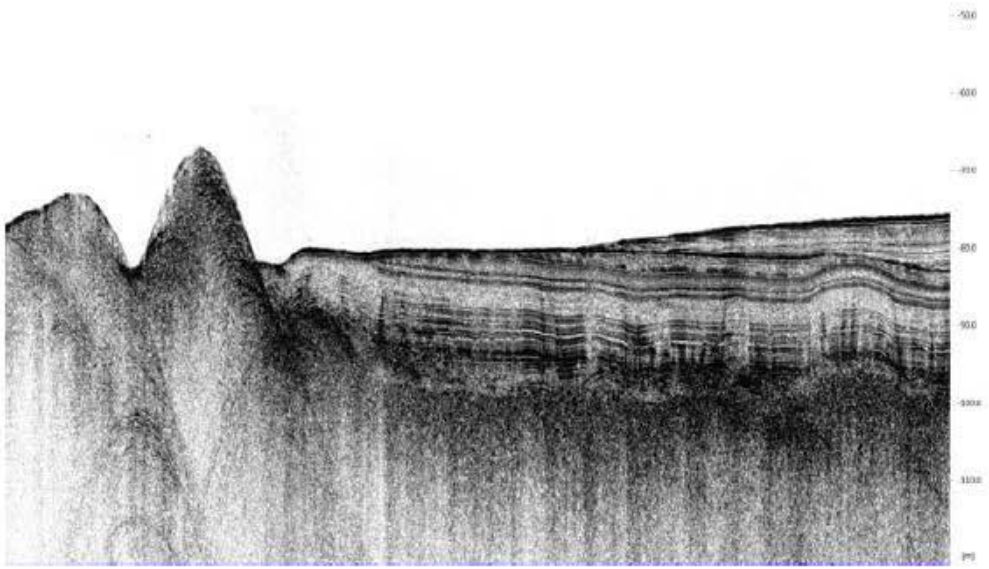

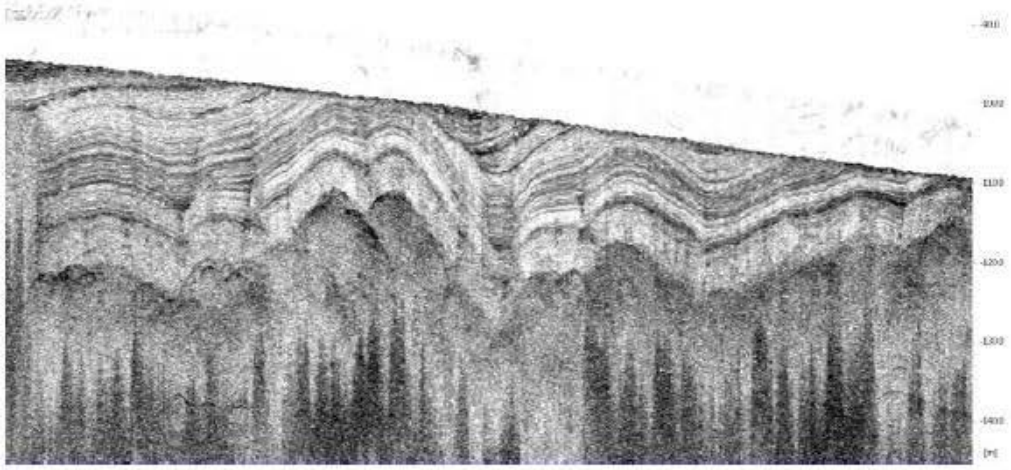

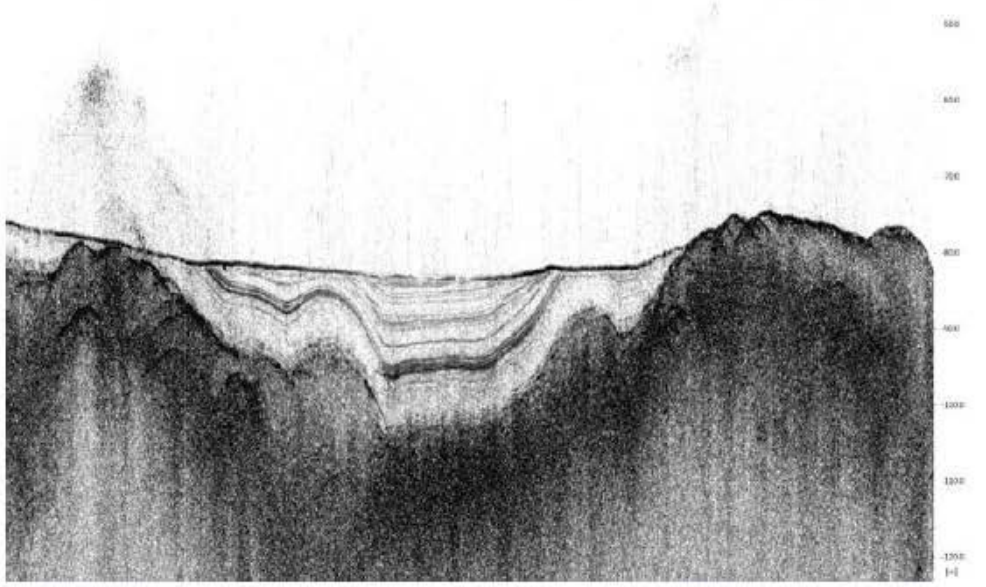

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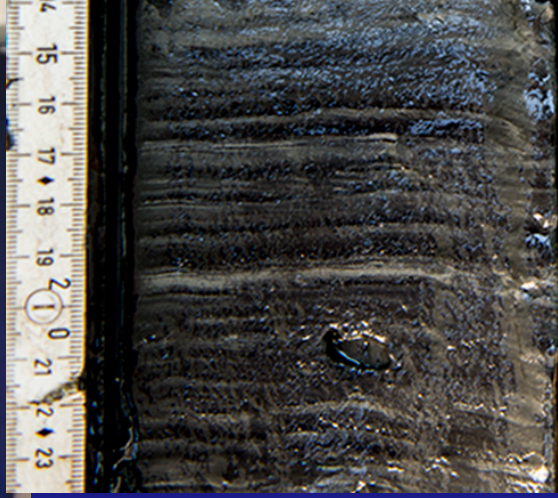

Gemax type sediment sampler (60 cm lenght, 9 cm diameter, double tubes)

Fe-Mn concretions

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Sediment cores and surface sediment analysed for:

grain size, Corg, N, Ptotal, Porg, C/N ratio

macroelements: SiO_2, Al_2O_3, CaO, MgO, Fe_2O_3, K_2O, Na_2O, TiO_2 etc [XRF]

microelements: As, Cd, Cr, Cu, Hg, Mn, Mo, Ni, Pb, U, Zn, V, Co, Sr, Sn, Ba, Th etc [ICP-MS]

sediment dating: ^{210}Pb, ^{137}Cs

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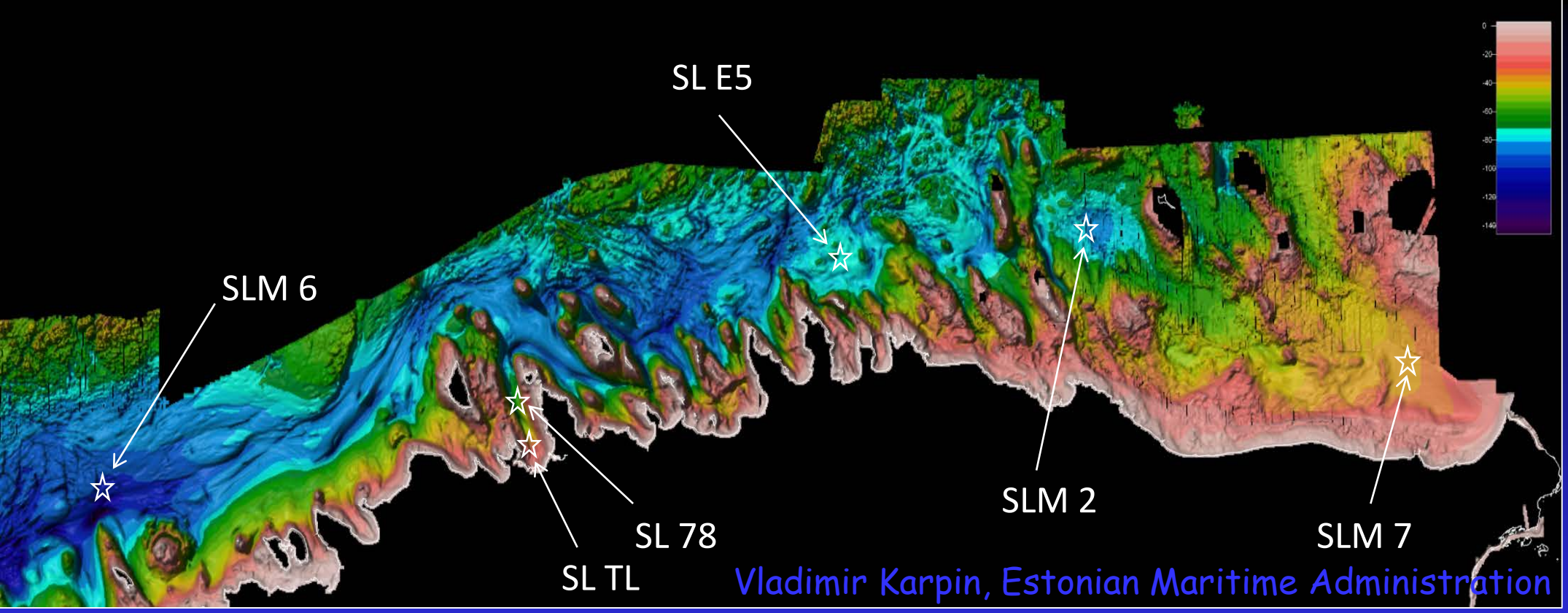

6 short sediment cores were studied:

SLM 2 – north from the Kunda town, water depth 84 m
SLM 6 – north from the Osmussaar island, water depth 101 m
SLM 7 – north from the Sillamäe town, water depth 35 m
SL E5 – north from the Loksa town, water depth 75 m
SL 78 – in the Tallinn Bay, water depth 61 m
SL TL – in the Tallinn Bay, water depth 24 m

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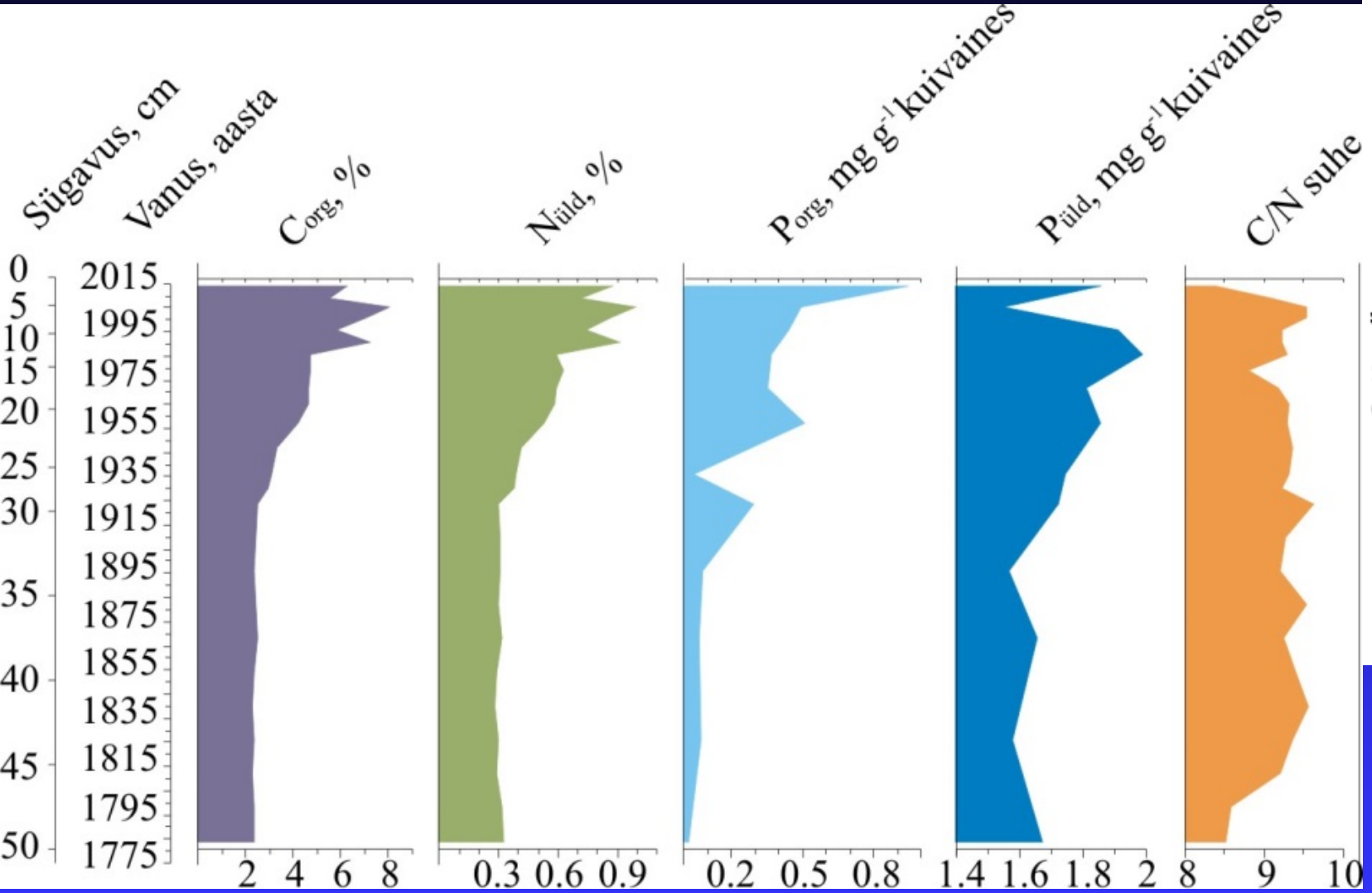
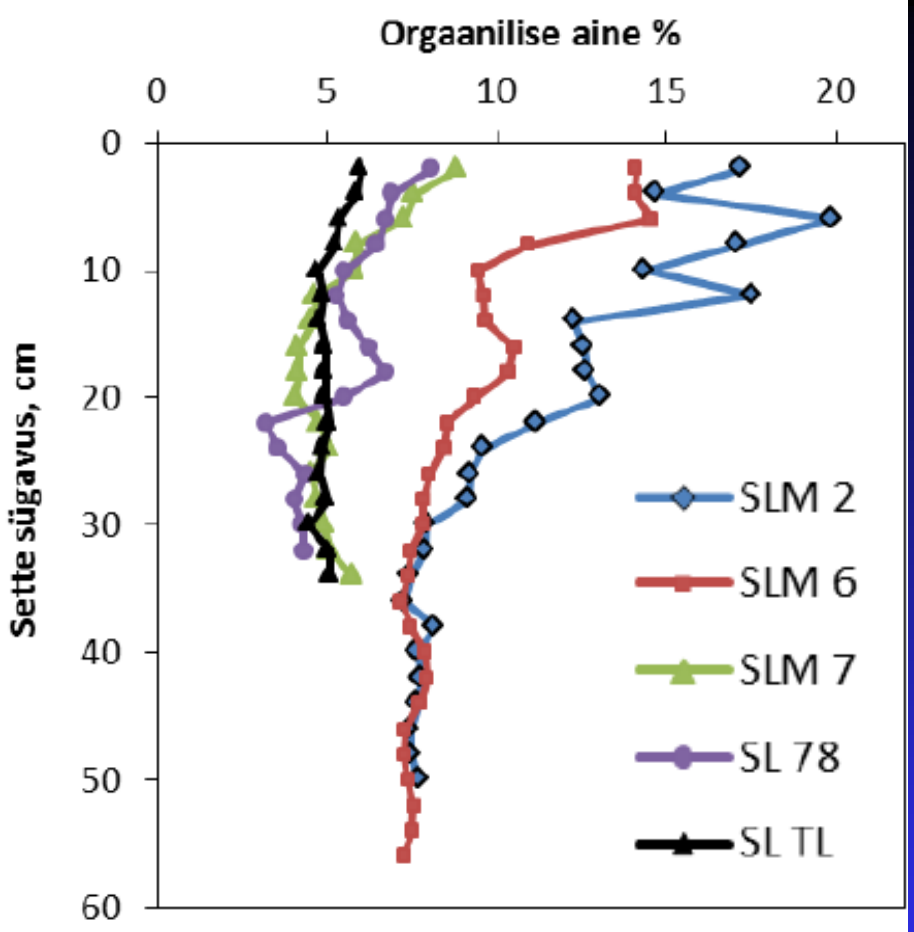
SLM-2 water depth 84 m (N from Kunda)





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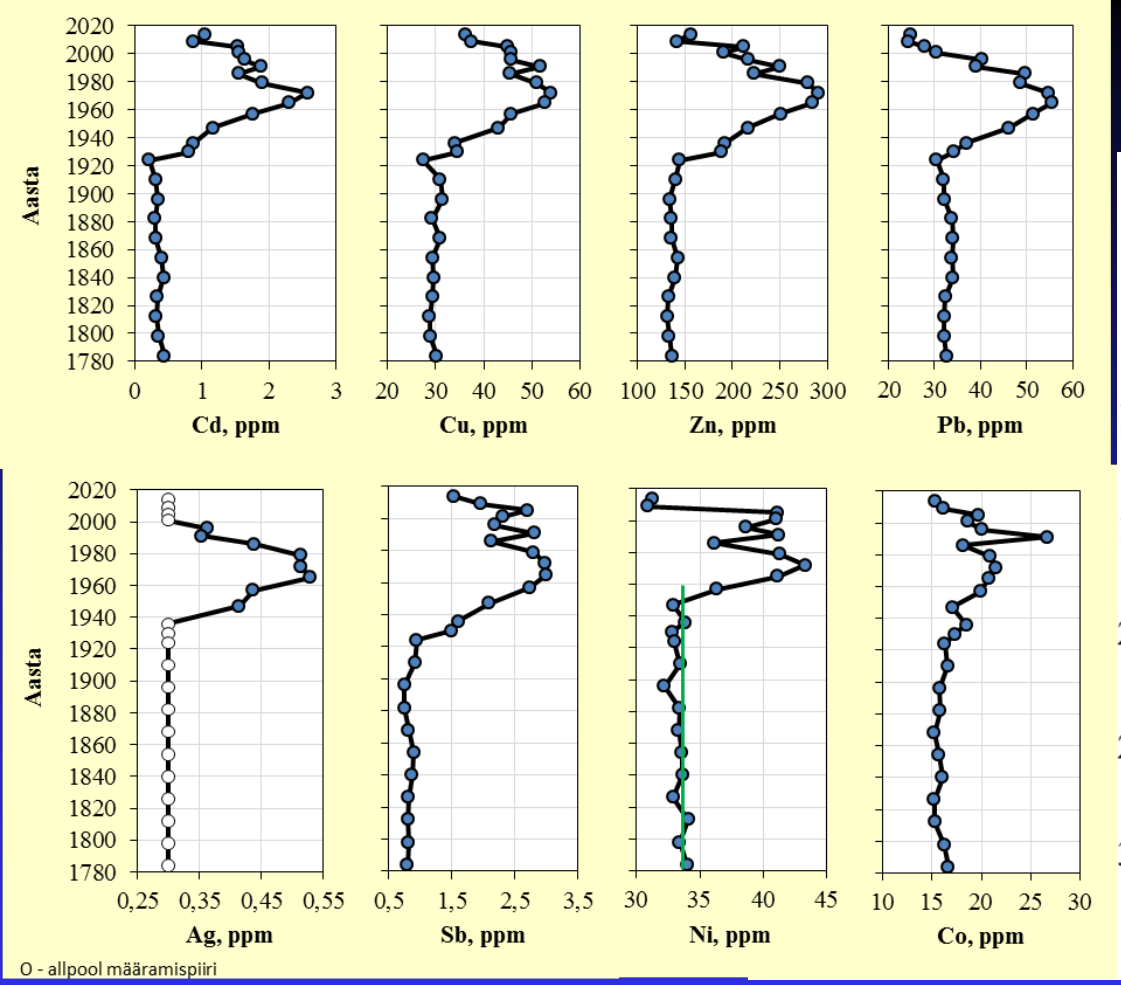
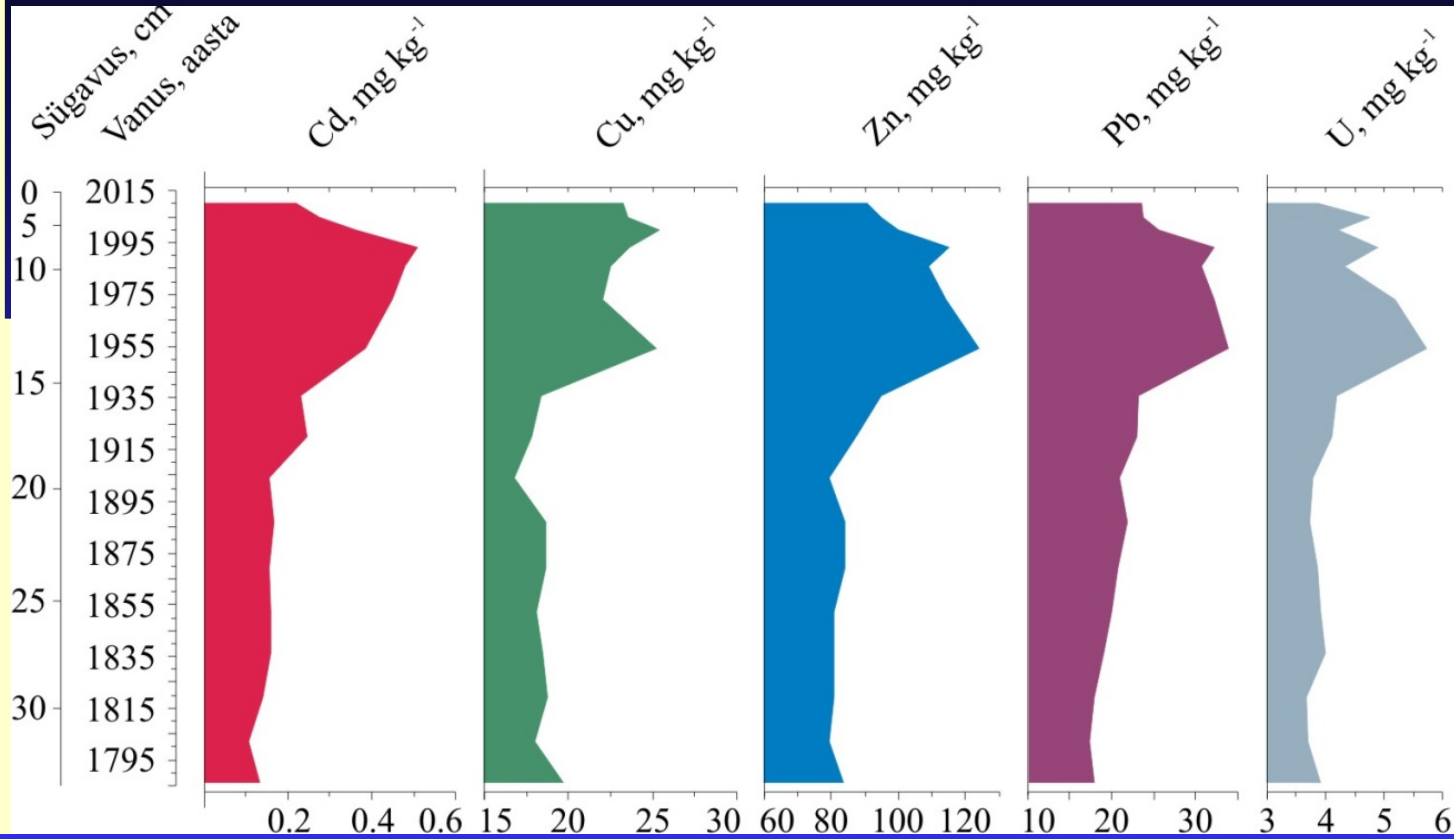
SLM-7 water depth 35 m (N from Sillamäe)





SLM-2 water depth 84 m (N from Kunda)

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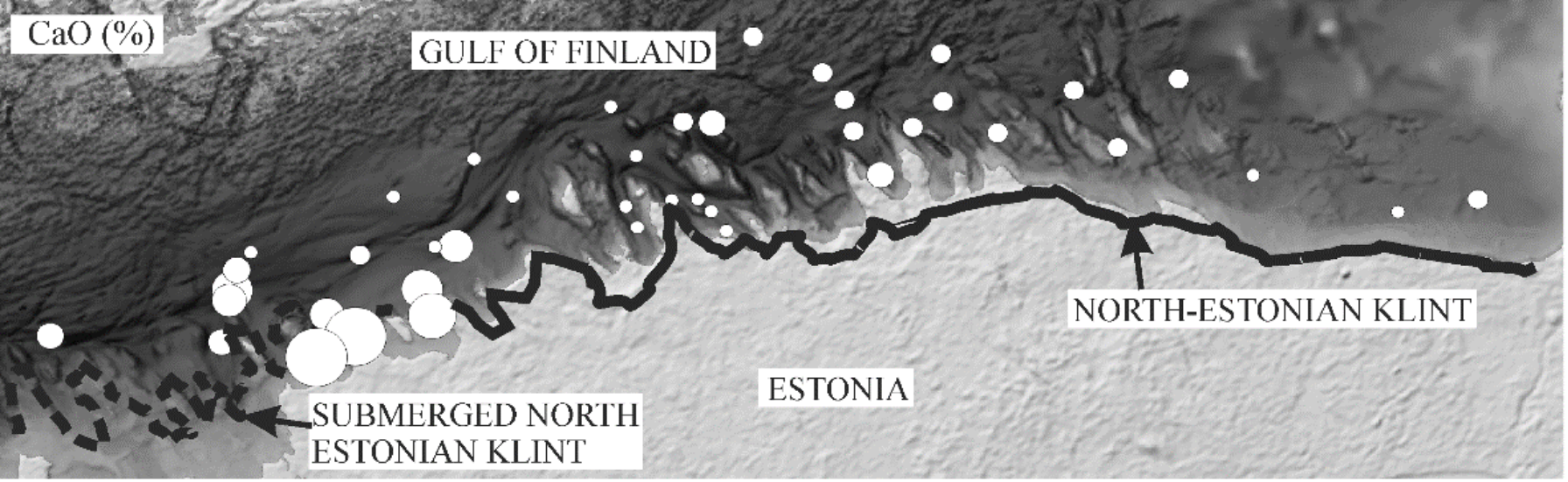
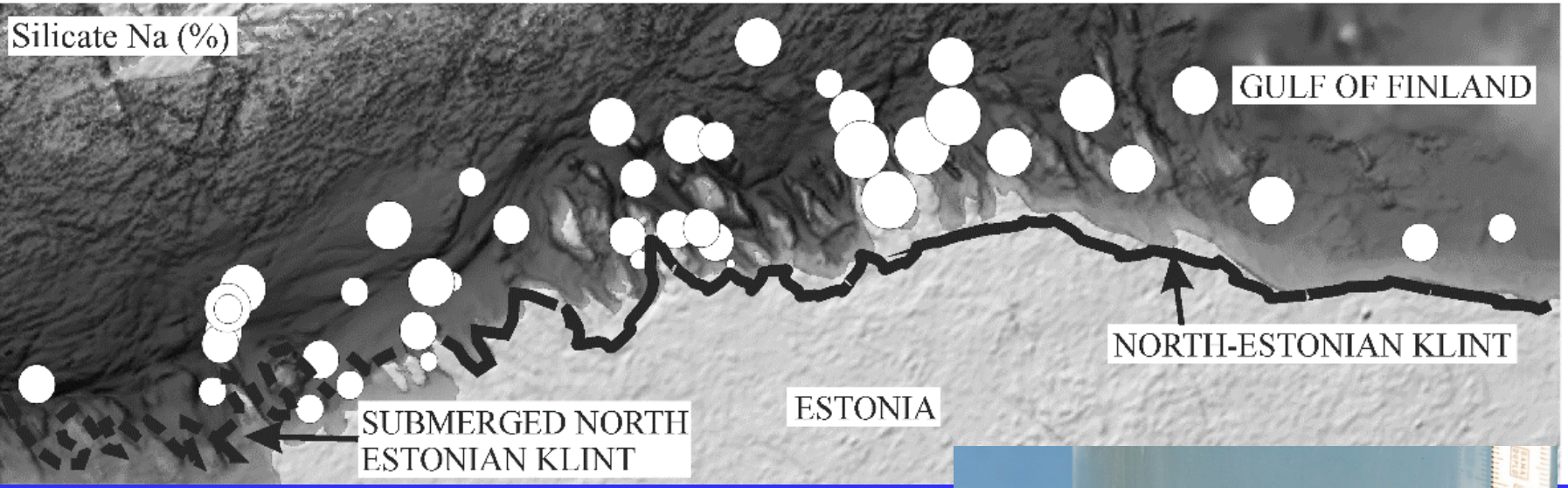
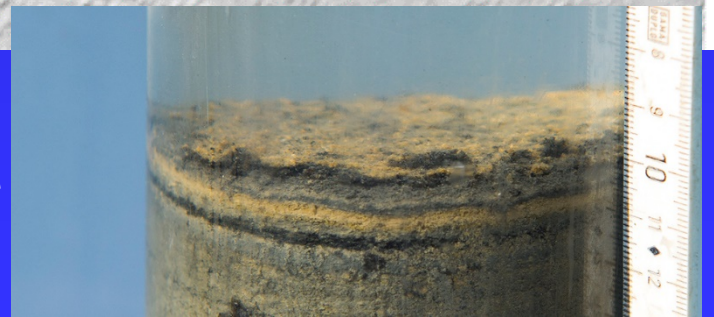




Surface sediment 0-3 cm



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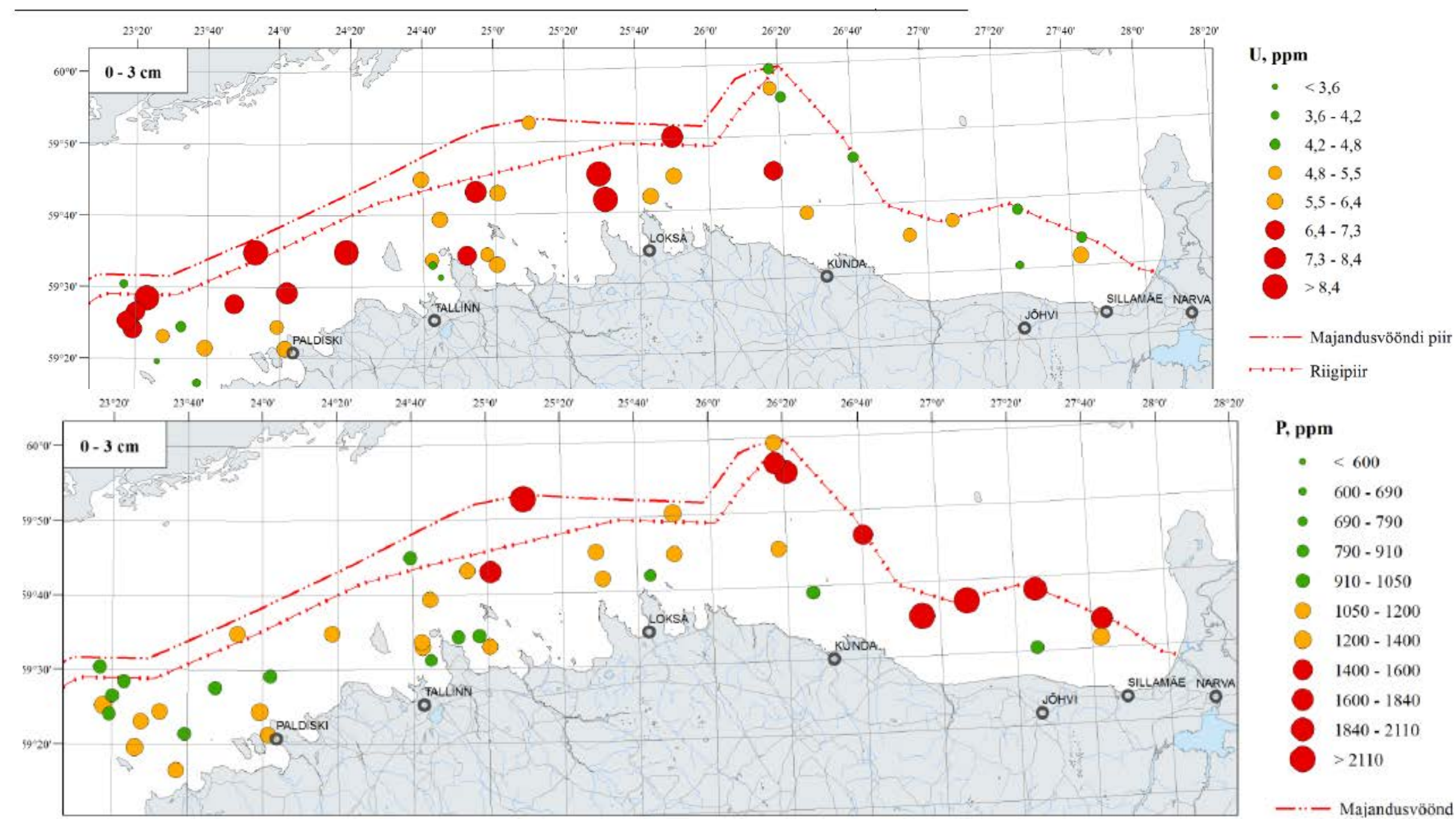
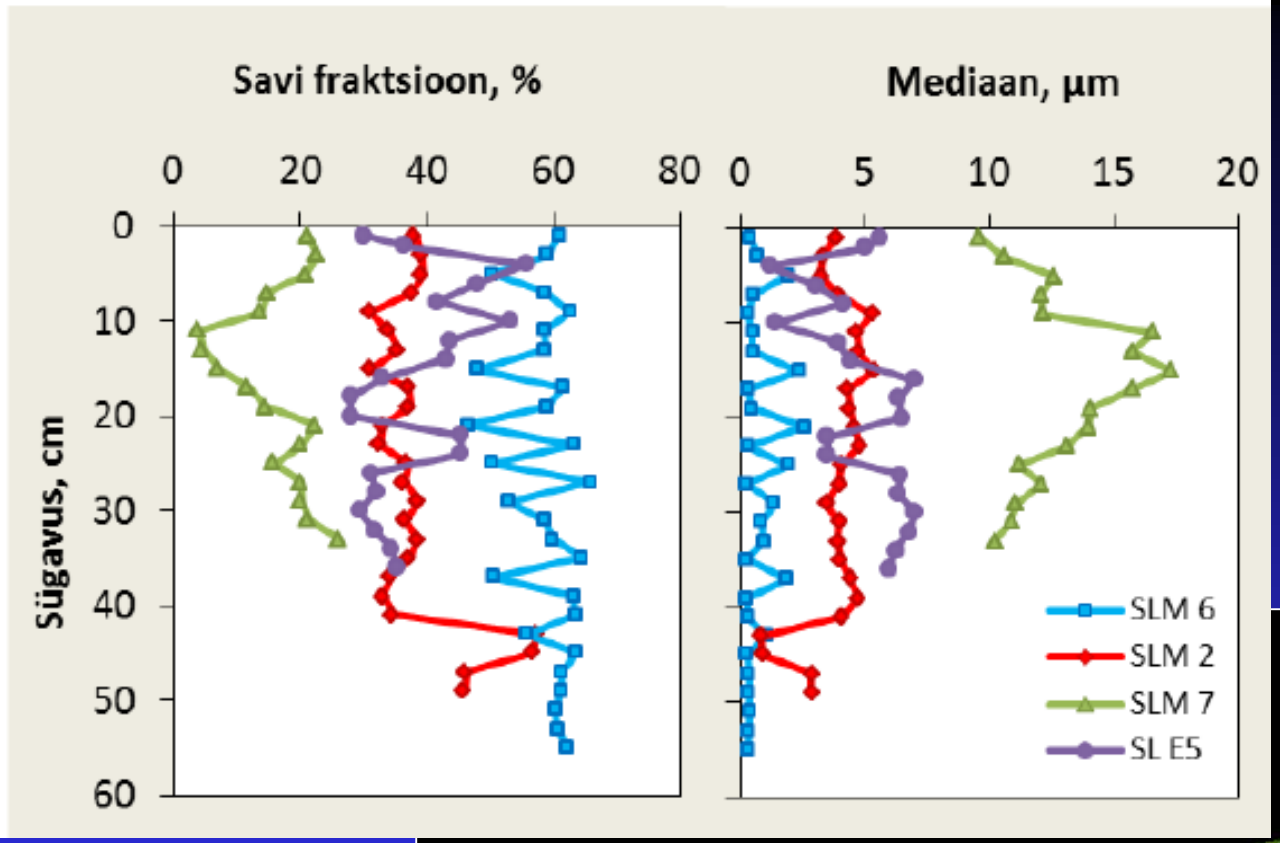
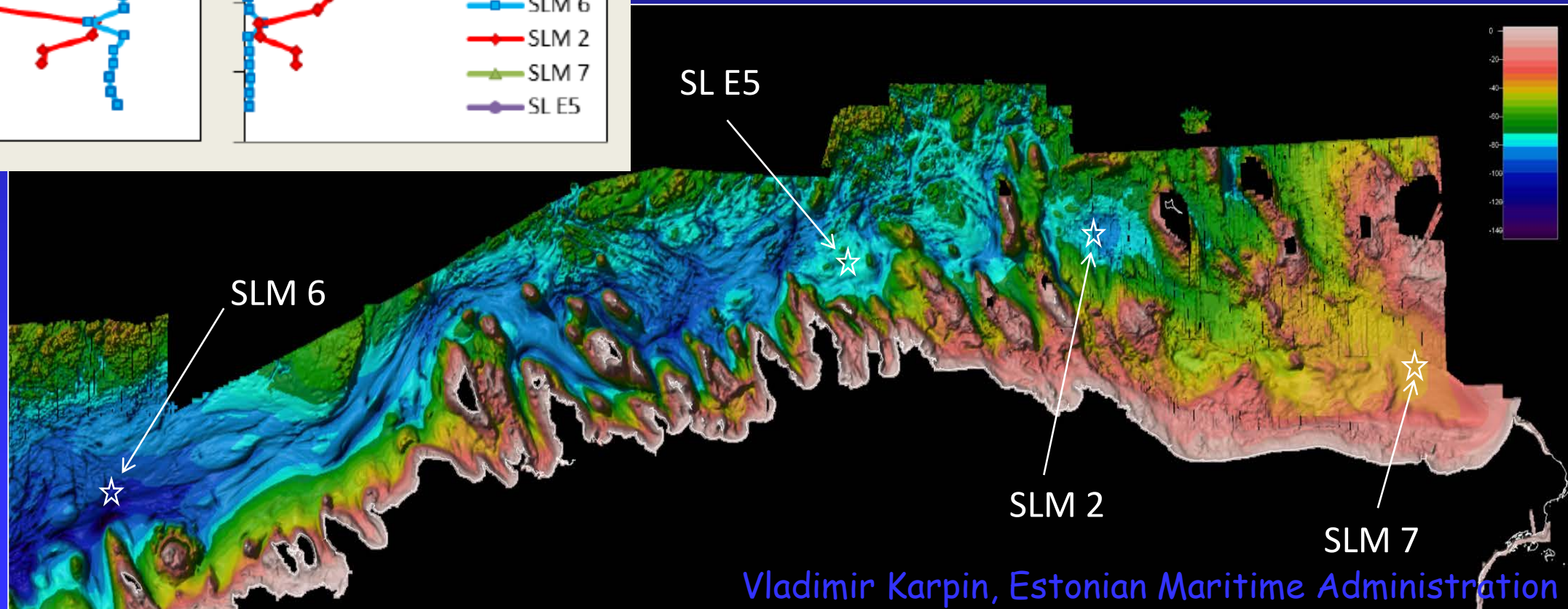

0 - 3 cm
U, ppm
< 3,6
3,6 - 4,2
4,2 - 4,8
4,8 - 5,5
5,5 - 6,4
6,4 - 7,3
7,3 - 8,4
> 8,4
Majandusvööndi piir
Riigipiir
LOKSA
KUNDA
TALLINN
PALDISKI
JÕHVI
SILLAMÄE
NARVA
0 - 3 cm
P, ppm
< 600
600 - 690
690 - 790
790 - 910
910 - 1050
1050 - 1200
1200 - 1400
1400 - 1600
1600 - 1840
1840 - 2110
> 2110
Majandusvöönd





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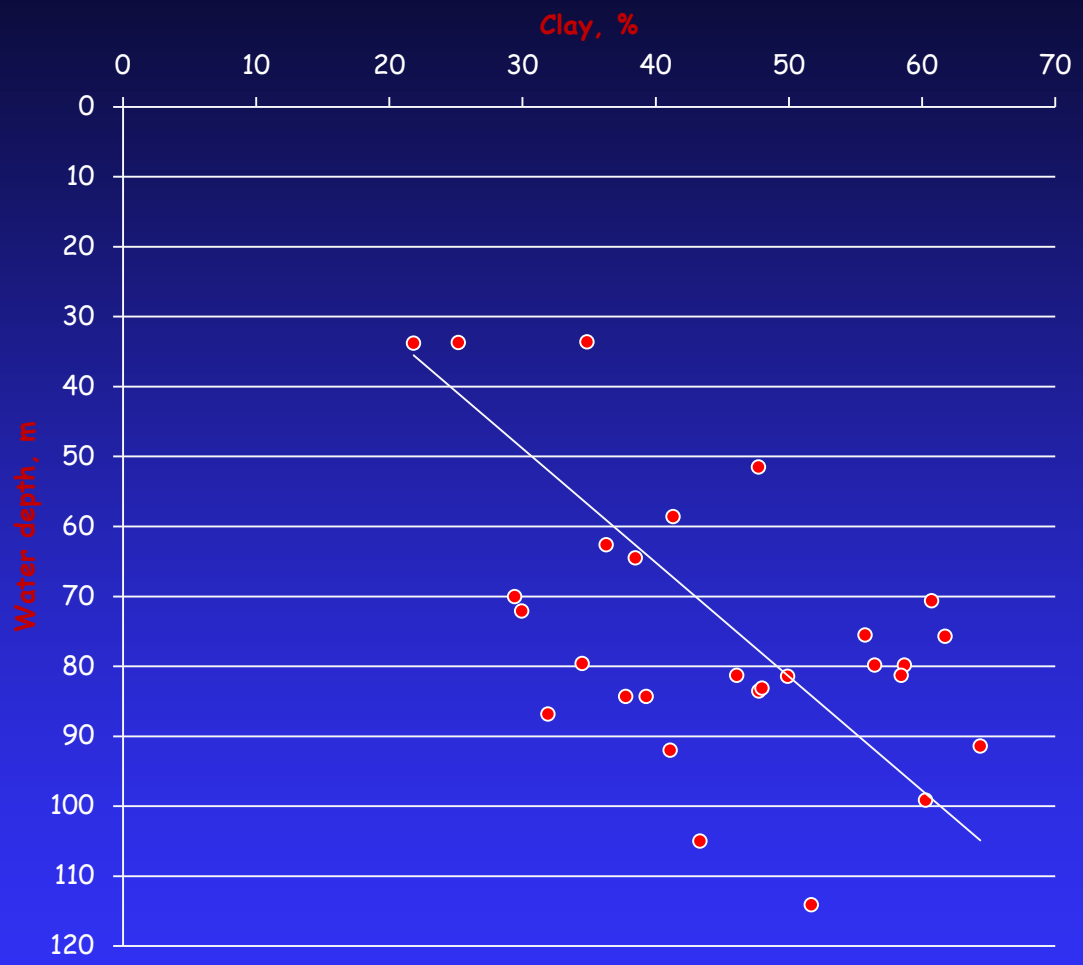
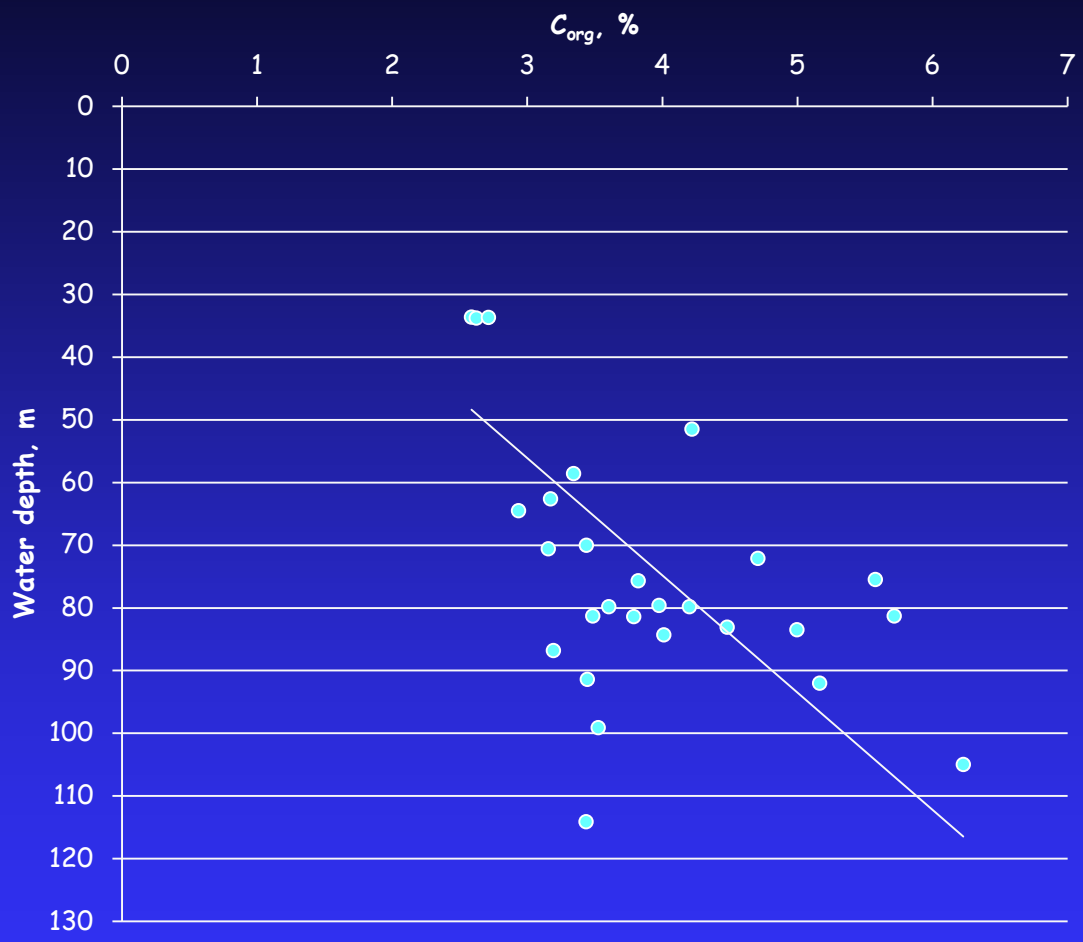
Water depth vs Clay fraction



Water depth vs C_{org} content



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HELCOM (Eutrophication in the Baltic Sea..., 2009)

5 rank classification
EQR (ecological quality ratio to natural reference conditions)

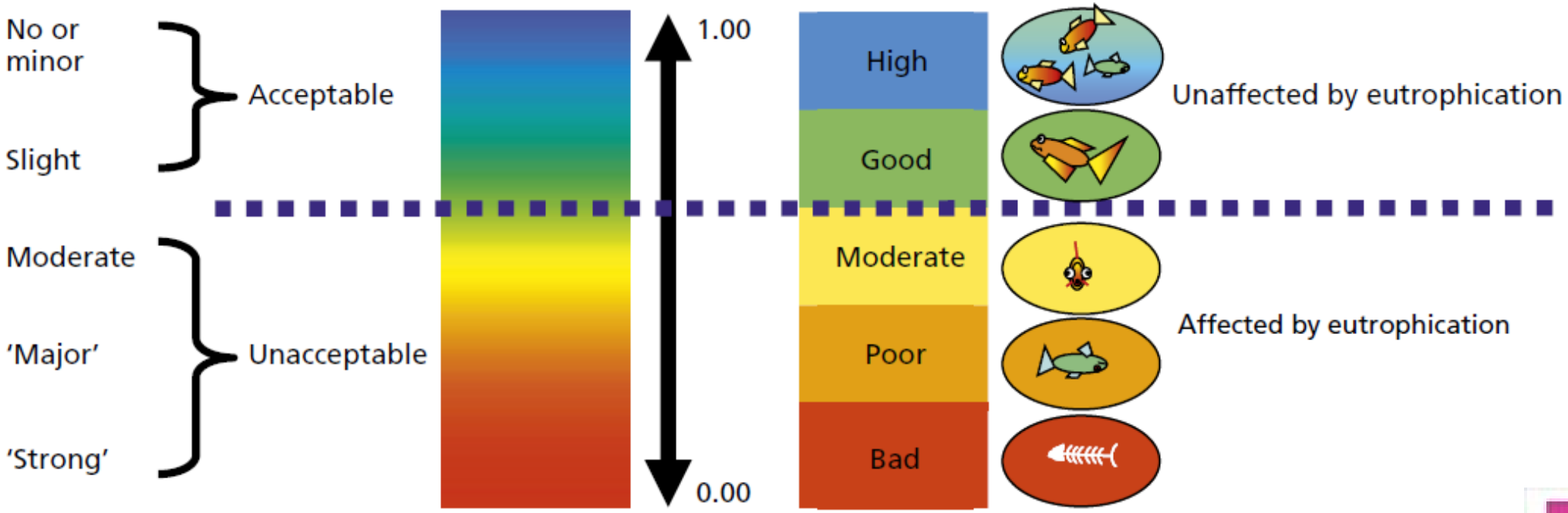

Figure A1. Overview of the EQR concept and its use for classifying water bodies affected by eutrophication. Based on Anon. (2000, 2005). Fish by courtesy of P. Pollard, SEPA.

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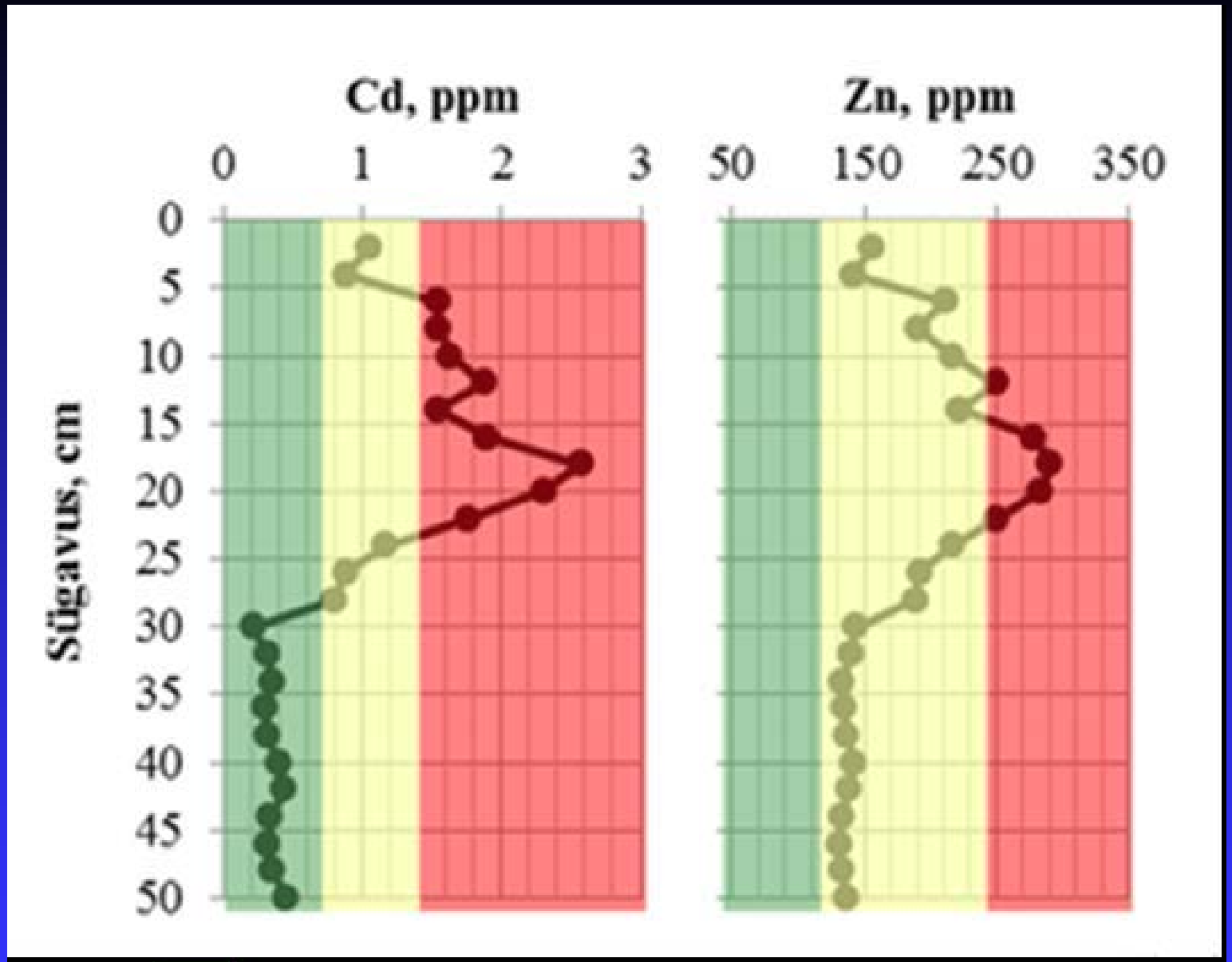
Cd, ppm
0
1
2
3
Zn, ppm
50
150
250
350
Sügavus, cm
0
5
10
15
20
25
30
35
40
45
50
high
moderate
bad