Kalø Bay – ARCPaC Excursion, Wednesday 27 May 2026

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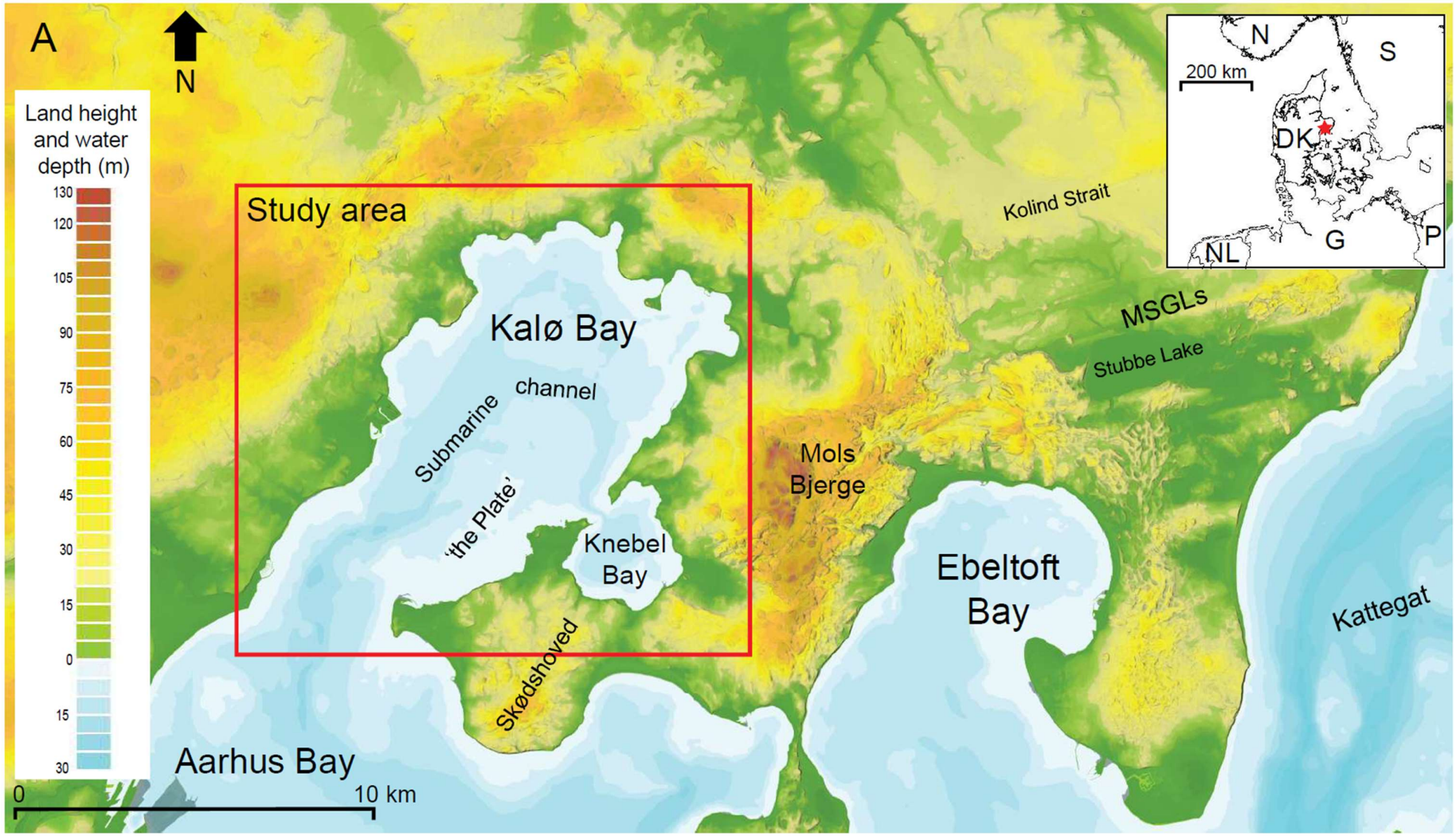
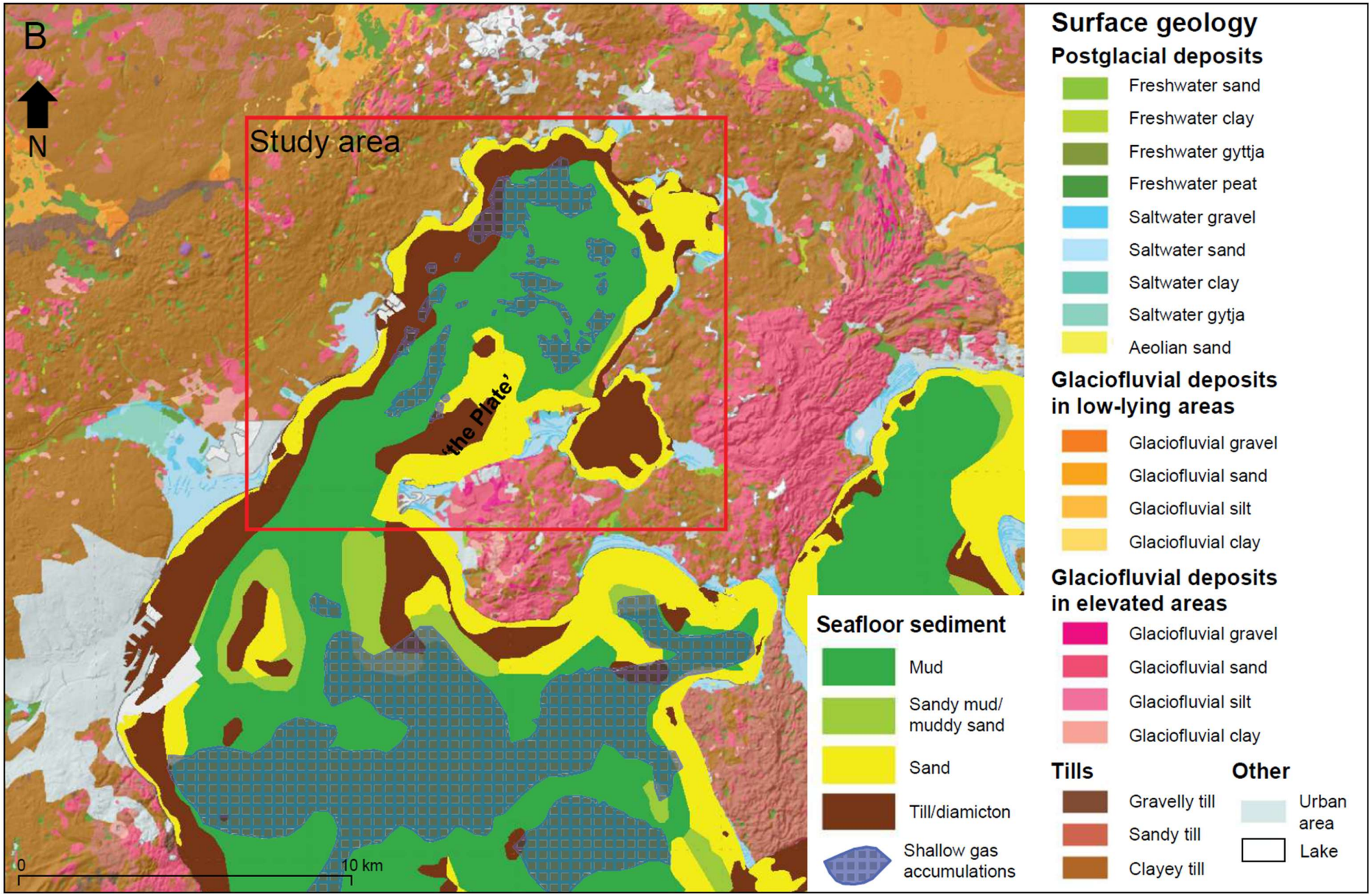
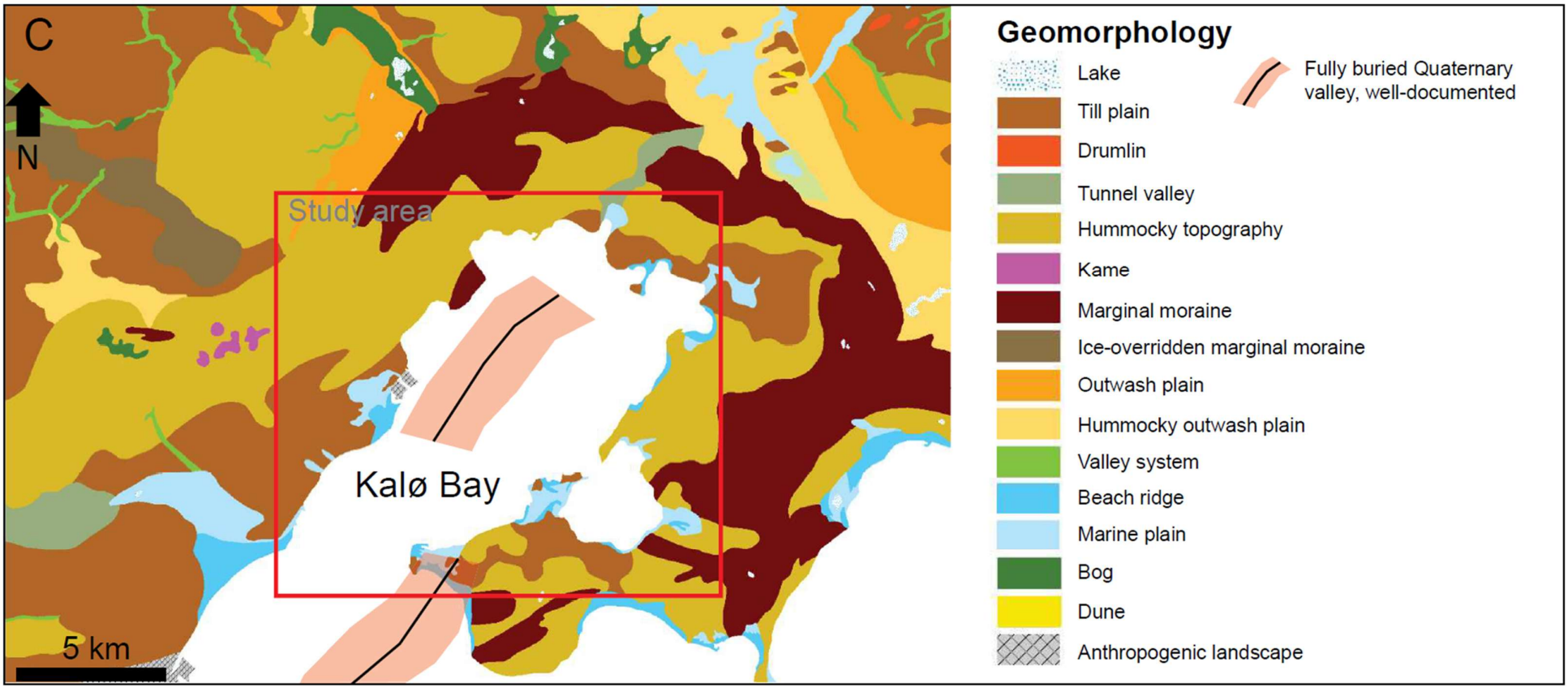
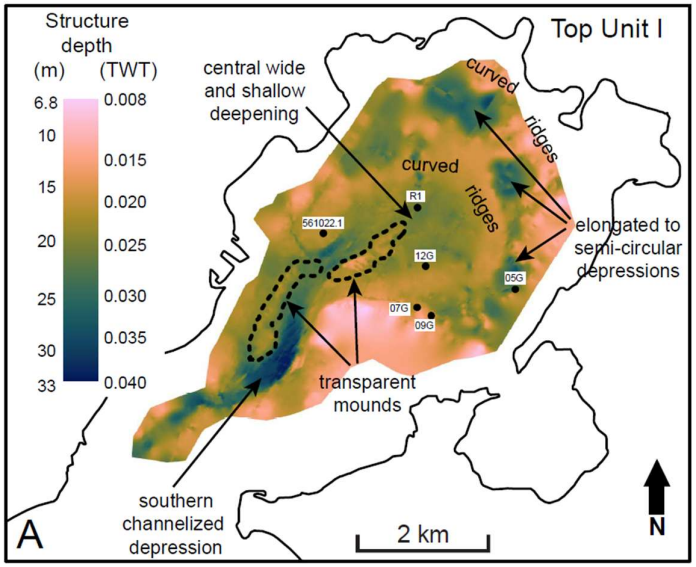
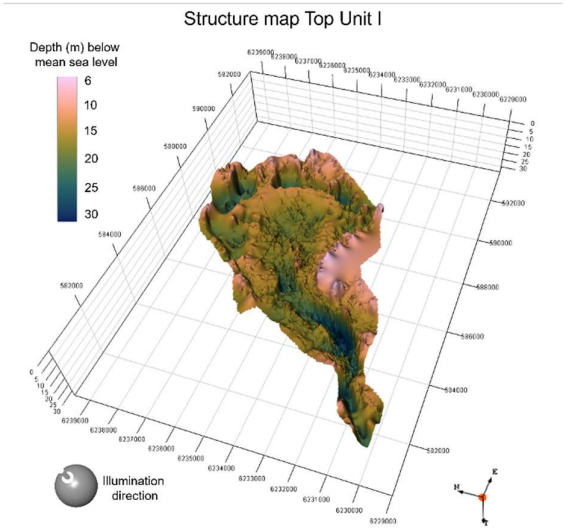
Figures from Andresen et al., Boreas, Vol. 55 (2), April 2026, https://doi.org/10.1111/bor.70047

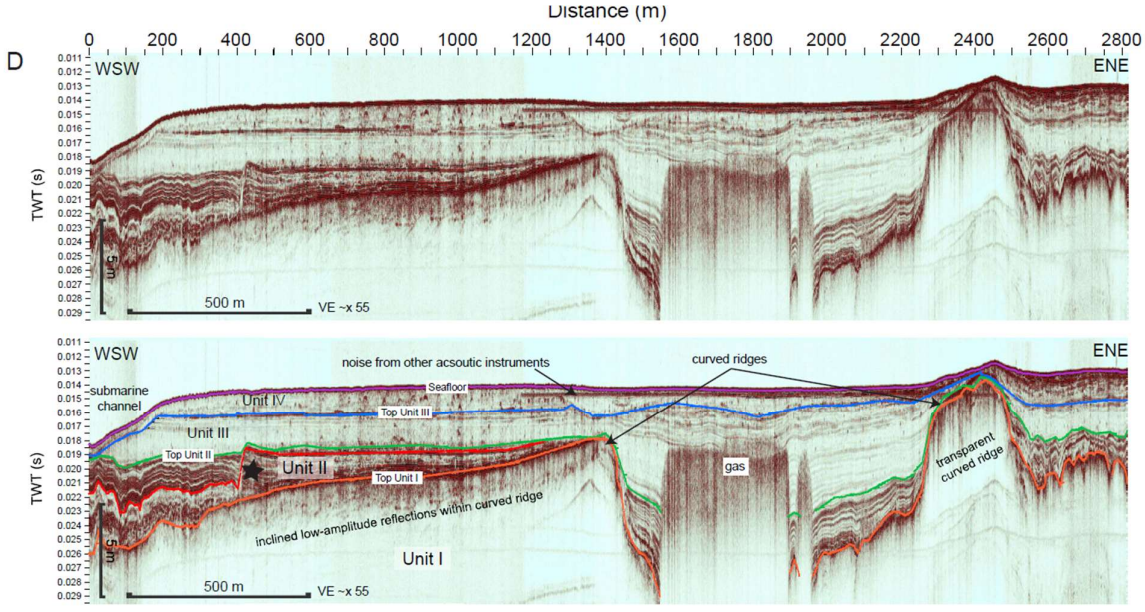


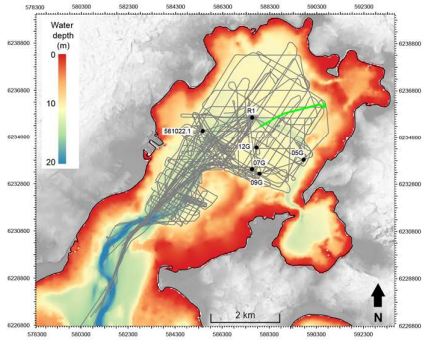

B
N
Study area
'the Plate'
0
10 km
Surface geology
Postglacial deposits
Freshwater sand
Freshwater clay
Freshwater gyttja
Freshwater peat
Saltwater gravel
Saltwater sand
Saltwater clay
Saltwater gytja
Aeolian sand
Glaciofluvial deposits in low-lying areas
Glaciofluvial gravel
Glaciofluvial sand
Glaciofluvial silt
Glaciofluvial clay
Glaciofluvial deposits in elevated areas
Glaciofluvial gravel
Glaciofluvial sand
Glaciofluvial silt
Glaciofluvial clay
Seafloor sediment
Mud
Sandy mud/ muddy sand
Sand
Till/diamicton
Shallow gas accumulations
Tills
Gravelly till
Sandy till
Clayey till
Other
Urban area
Lake

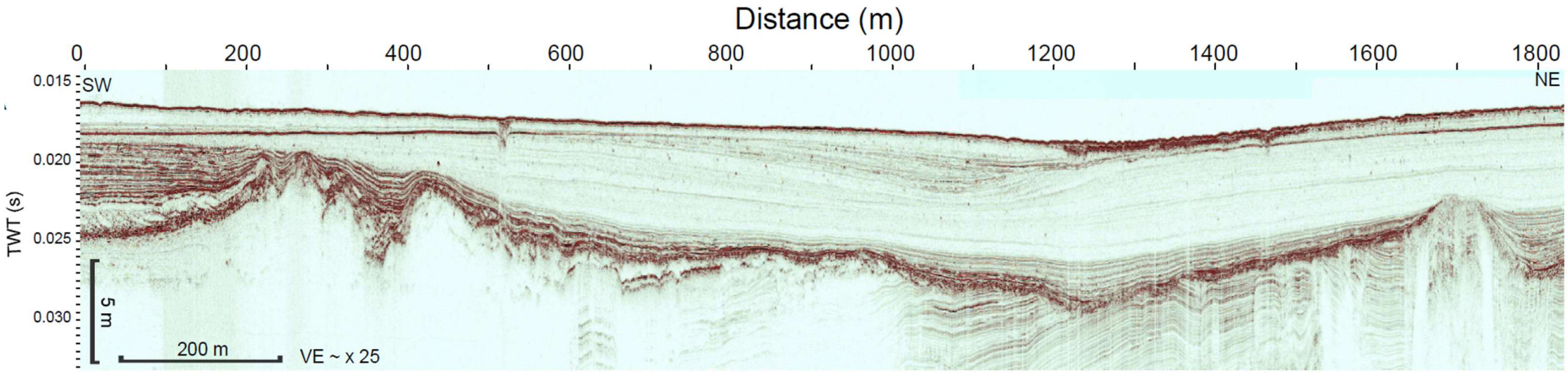

C
N
Study area
Kalø Bay
5 km
Geomorphology
Lake
Till plain
Drumlin
Tunnel valley
Hummocky topography
Kame
Marginal moraine
Ice-overridden marginal moraine
Outwash plain
Hummocky outwash plain
Valley system
Beach ridge
Marine plain
Bog
Dune
Anthropogenic landscape
Fully buried Quaternary valley, well-documented

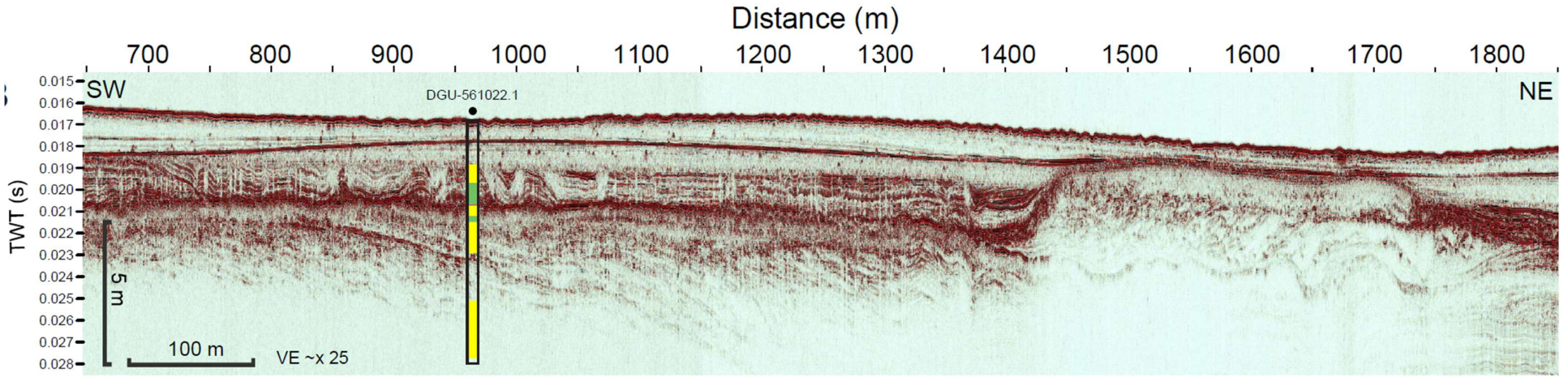

Structure depth
(m) (TWT)
6.8 0.008
10 0.015
15 0.020
20 0.025
25 0.030
30 0.035
33 0.040
Top Unit I
central wide and shallow deepening
curved ridges
curved ridges
elongated to semi-circular depressions
R1
561022.1
12G
05G
07G
09G
transparent mounds
southern channelized depression
A
2 km
N

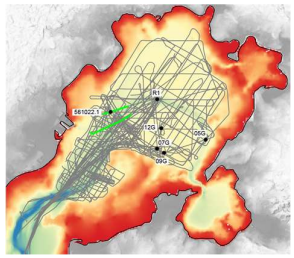

Structure map Top Unit I
Depth (m) below mean sea level
6
10
15
20
25
30
Illumination direction

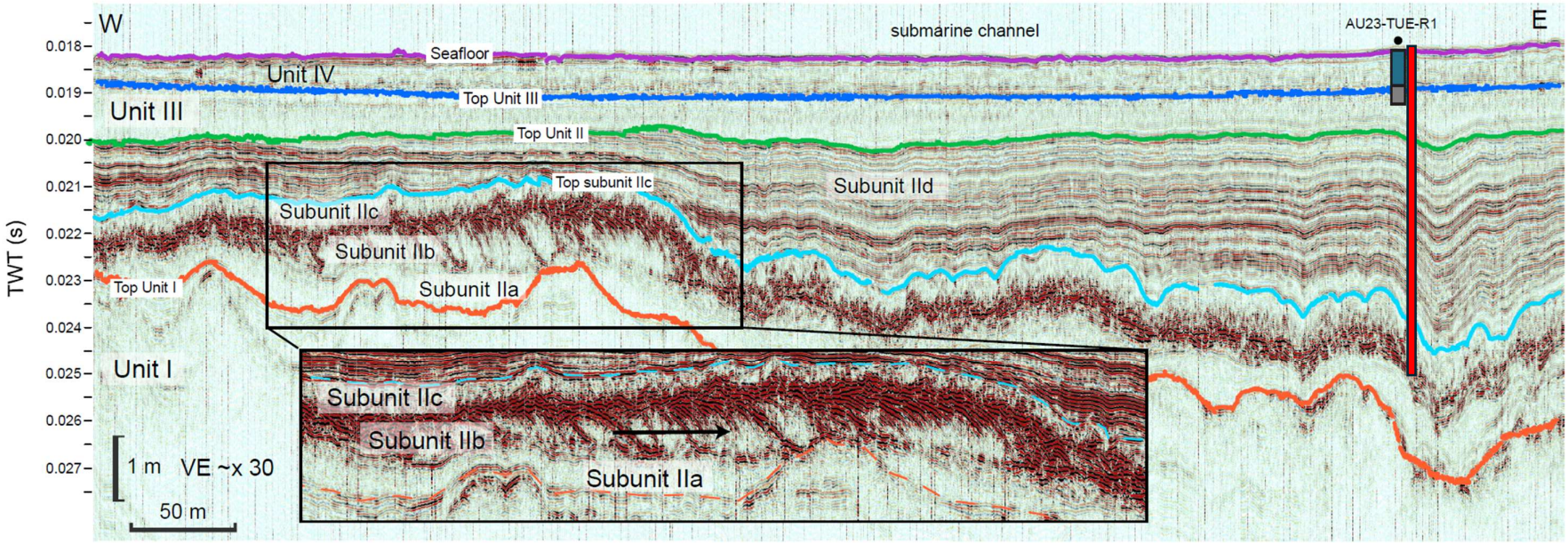

Distance (m)
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
D
WSW
ENE
TWT (s)
5 m
500 m
VE ~x 55
WSW
ENE
noise from other acoustic instruments
curved ridges
submarine channel
Seafloor
Unit IV
Top Unit III
Unit III
Top Unit II
Unit II
Top Unit I
gas
transparent curved ridge
inclined low-amplitude reflections within curved ridge
Unit I
5 m
500 m
VE ~x 55

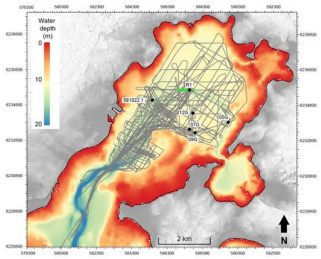

Water depth (m)
0
10
20
R1
561022.1
12G
05G
07G
09G
2 km
N


Distance (m)
0
200
400
600
800
1000
1200
1400
1600
1800
SW
NE
TWT (s)
0.015
0.020
0.025
0.030
5 m
200 m
VE ~ x 25


Distance (m)
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
SW
NE
DGU-561022.1
TWT (s)
0.015
0.016
0.017
0.018
0.019
0.020
0.021
0.022
0.023
0.024
0.025
0.026
0.027
0.028
5 m
100 m
VE ~x 25

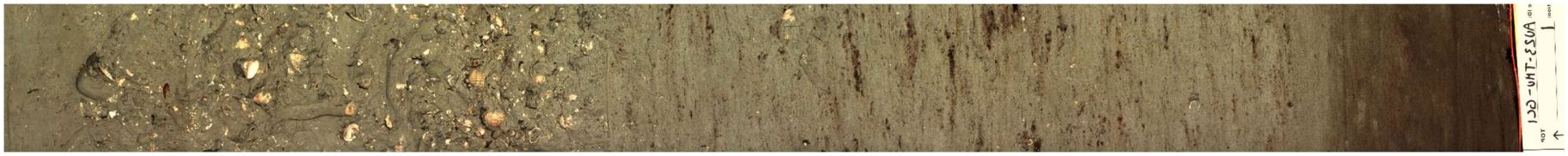


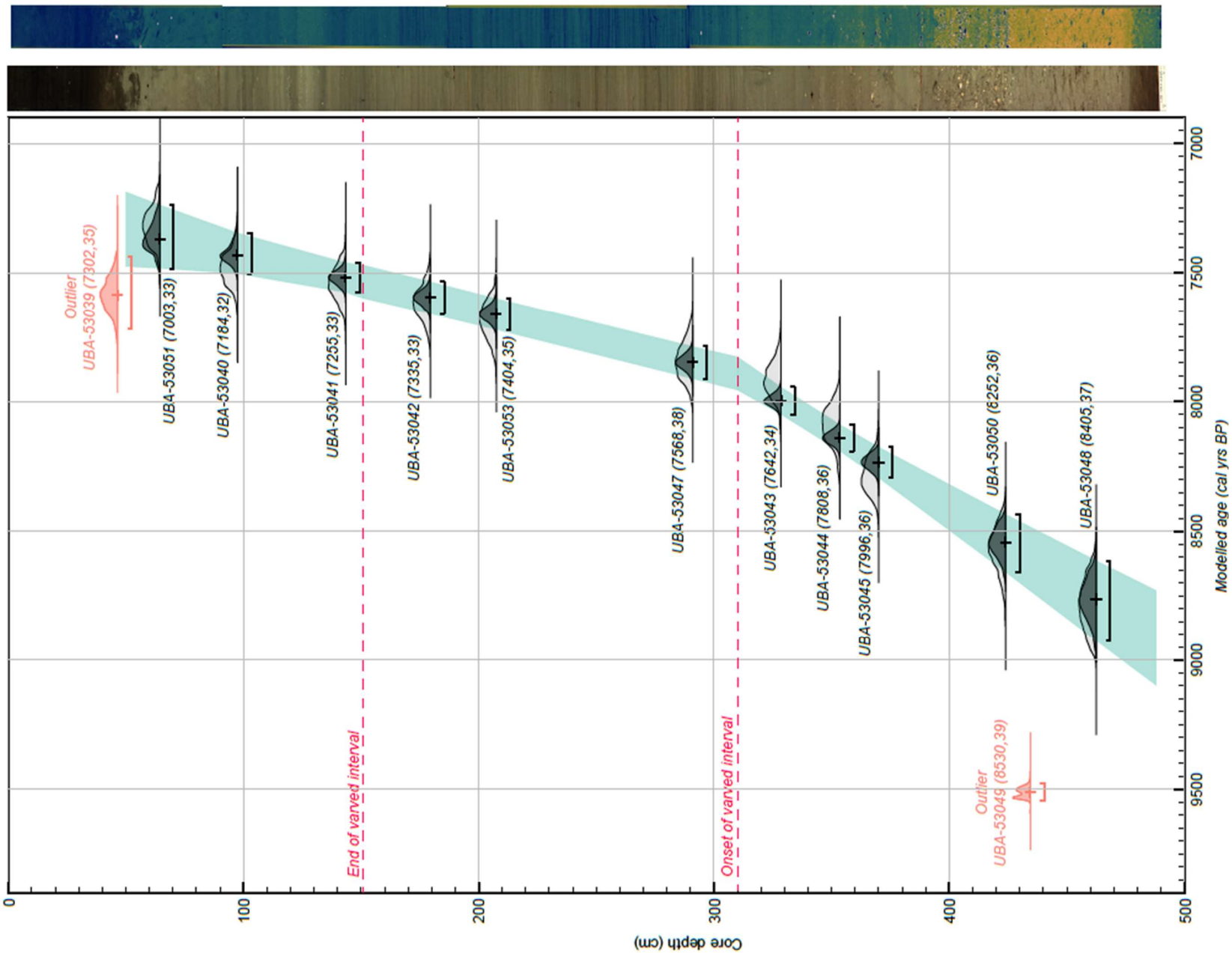


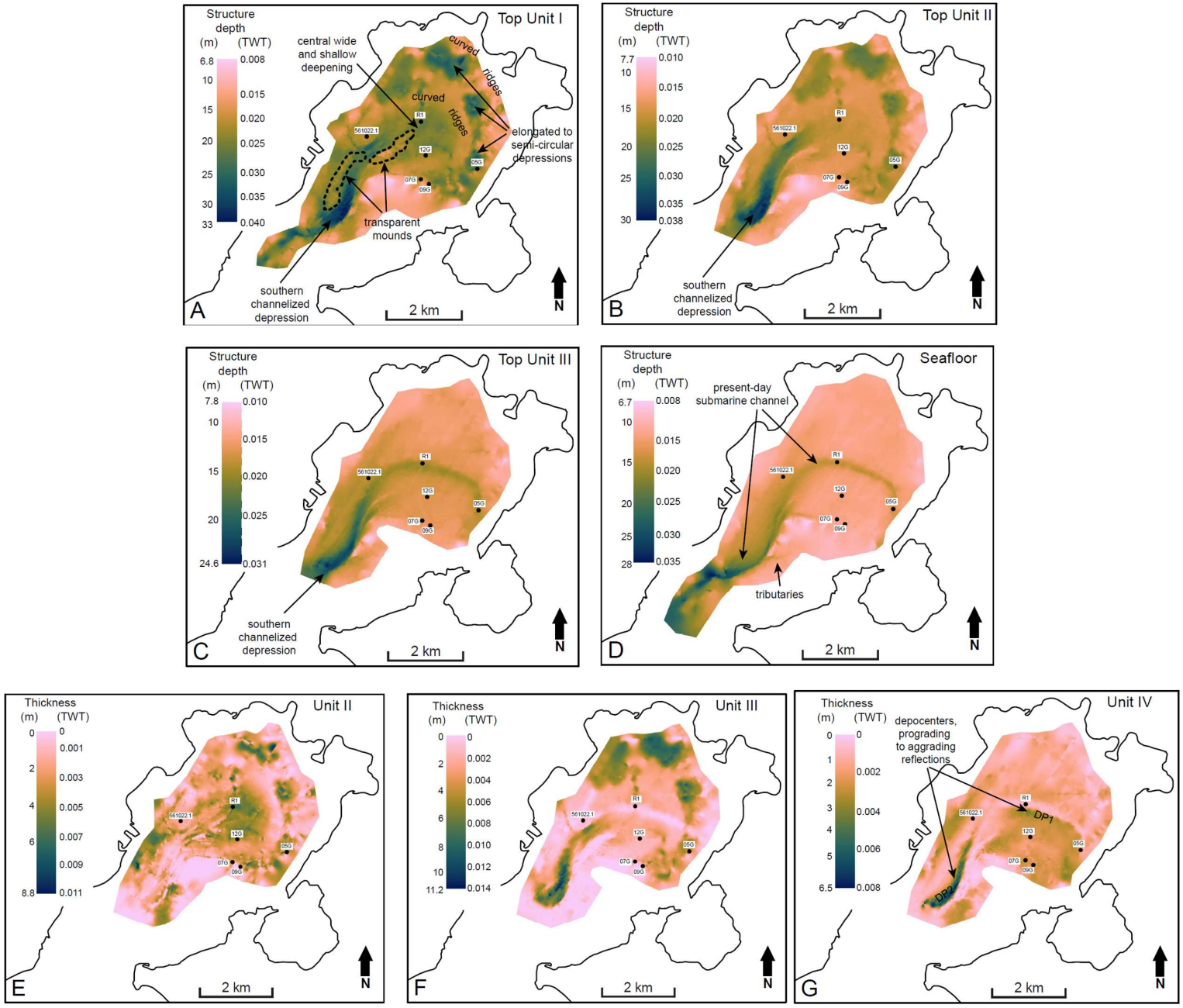


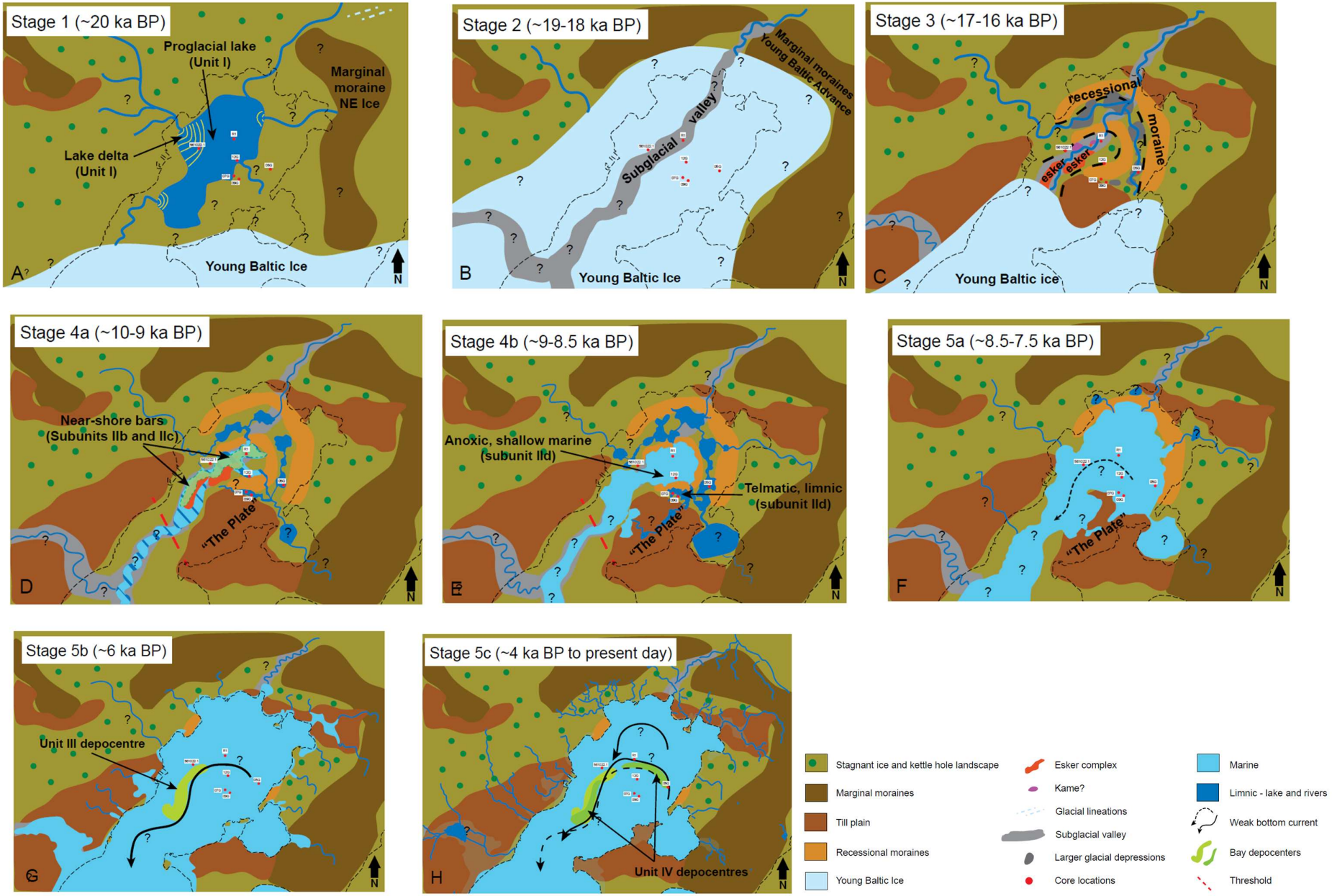
Basal section (3.9-4.9 m) of gravity core AU23-TUE-GC1 (red line in seismic profile above)

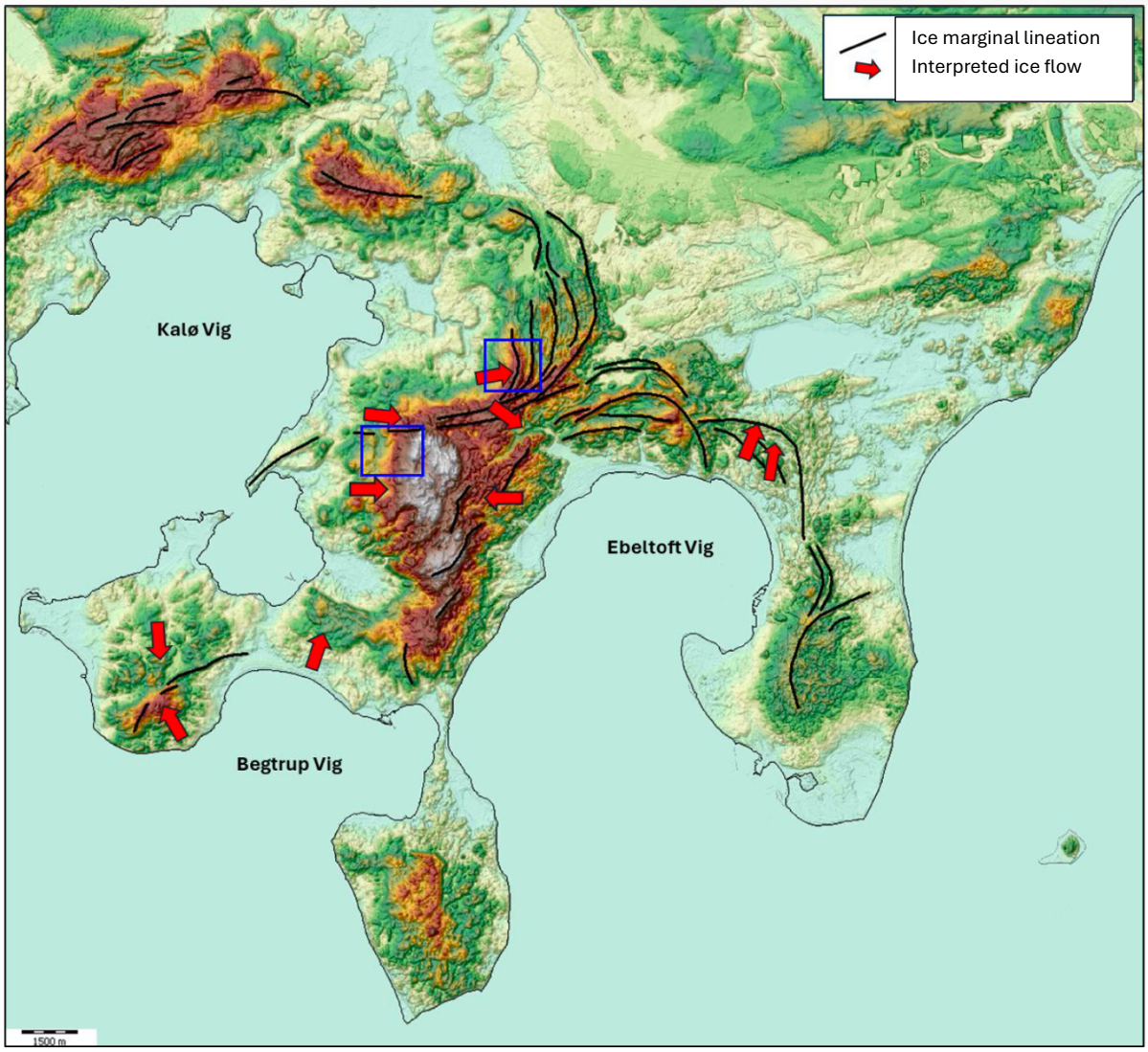
Shell layer dated to 8.5 cal. kyrs BP. Organic rich clay below dated to 8.6 cal. kyrs BP



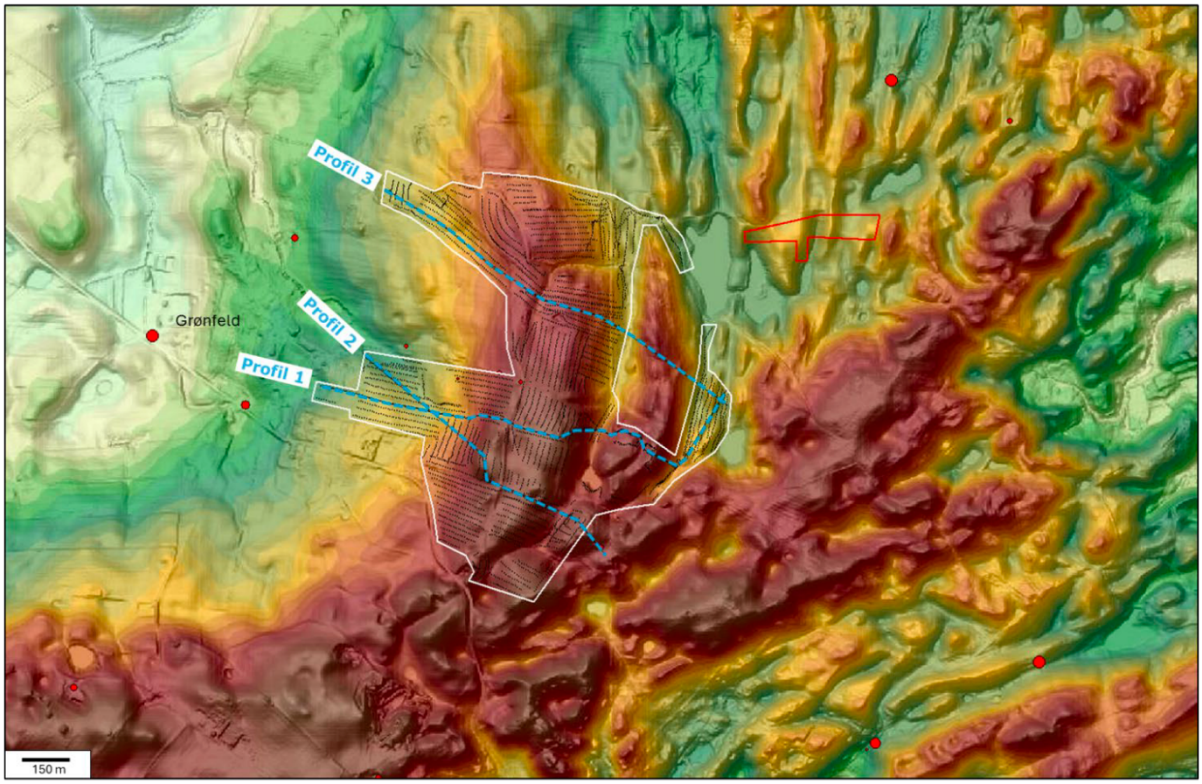

Outlier
UBA-53039 (7302,35)
UBA-53051 (7003,33)
UBA-53040 (7184,32)
UBA-53041 (7255,33)
UBA-53042 (7335,33)
UBA-53053 (7404,35)
UBA-53047 (7568,38)
UBA-53043 (7642,34)
UBA-53044 (7808,36)
UBA-53045 (7996,36)
UBA-53050 (6252,36)
UBA-53048 (8405,37)
Outlier
UBA-53049 (8530,39)
End of varved interval
Onset of varved interval
Core depth (cm)
Modelled age (cal yrs BP)
0
100
200
300
400
500
9500
9000
8500
8000
7500
7000


Structure depth (m) (TWT)
Top Unit I
central wide and shallow deepening
curved ridges
curved ridges
elongated to semi-circular depressions
transparent mounds
southern channelized depression
A
2 km
N
Top Unit II
southern channelized depression
B
Top Unit III
southern channelized depression
C
Seafloor
present-day submarine channel
tributaries
D
Thickness (m) (TWT)
Unit II
E
Unit III
F
Unit IV
depocenters, prograding to aggrading reflections
DP1
DP2
G
R1
561022.1
12G
05G
07G
09G

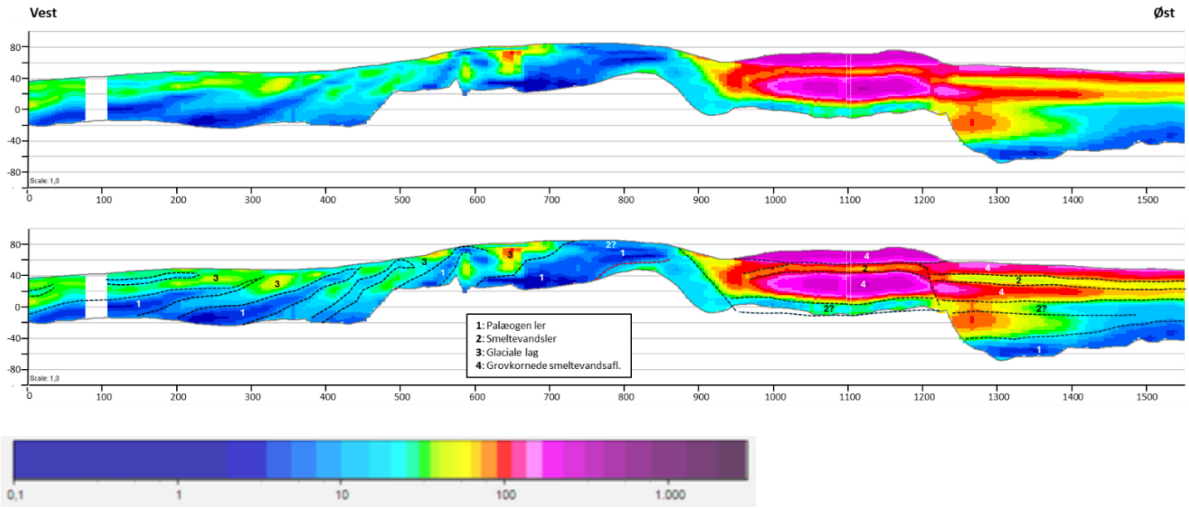

Stage 1 (~20 ka BP)
Proglacial lake (Unit I)
Marginal moraine NE Ice
Lake delta (Unit I)
Young Baltic Ice
A
Stage 2 (~19-18 ka BP)
Marginal moraines Young Baltic Advance
Subglacial valley
Young Baltic Ice
B
Stage 3 (~17-16 ka BP)
recessional moraine
esker
esker
Young Baltic ice
C
Stage 4a (~10-9 ka BP)
Near-shore bars (Subunits IIb and IIc)
"The Plate"
D
Stage 4b (~9-8.5 ka BP)
Anoxic, shallow marine (subunit IId)
Telmatic, limnic (subunit IId)
"The Plate"
E
Stage 5a (~8.5-7.5 ka BP)
"The Plate"
F
Stage 5b (~6 ka BP)
Unit III depocentre
G
Stage 5c (~4 ka BP to present day)
Unit IV depocentres
H
N
Stagnant ice and kettle hole landscape
Marginal moraines
Till plain
Recessional moraines
Young Baltic Ice
Esker complex
Kame?
Glacial lineations
Subglacial valley
Larger glacial depressions
Core locations
Marine
Limnic - lake and rivers
Weak bottom current
Bay depocenters
Threshold



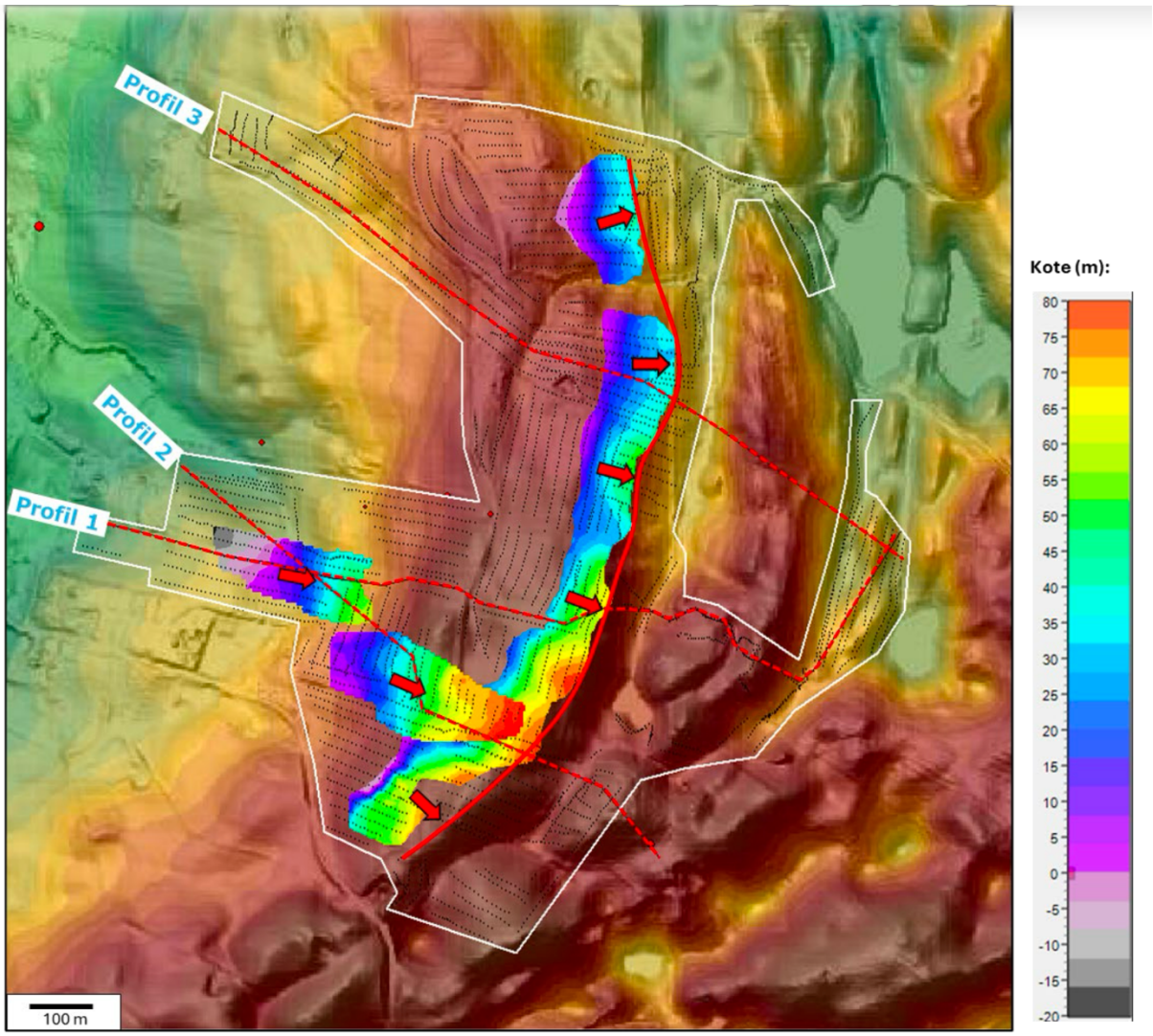
Above: Interpreted ice-marginal terrain signatures in the Mols Bjerge area. The northernmost blue box shows the location of the close-up area in the following figures. Source: Jørgensen (2024) NPMB report 47.



Above: Geophysical survey locations and location of profile line 1 (**below**).

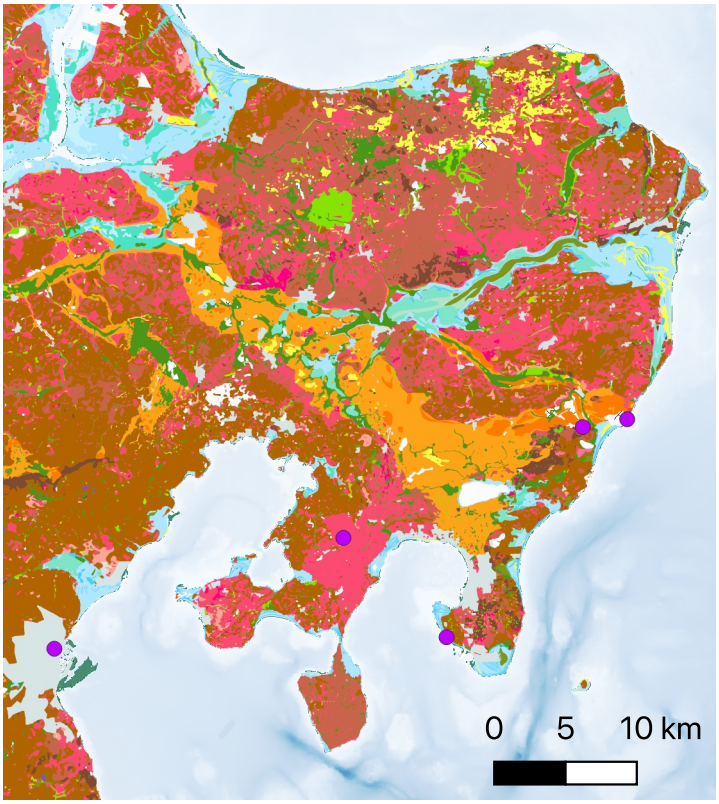


Above: Resistivity transect of Profile 1. Resistivity is visualized by color with unit ohm*m. The highest resistivities mark coarse outwash sediments (unit 4). Glacial tills are intermediate conductors due to clay content (unit 3), while meltwater clay (unit 2) and Paleogene clay (unit 1) are the best electrical conductors.
The section shows a glaciotectonic thrust fault system with compression from the west, where the Paleogene clay acted as a decollement surface. At the ice margin, an active and dynamic meltwater system deposited varying grain sizes in fans and basins.

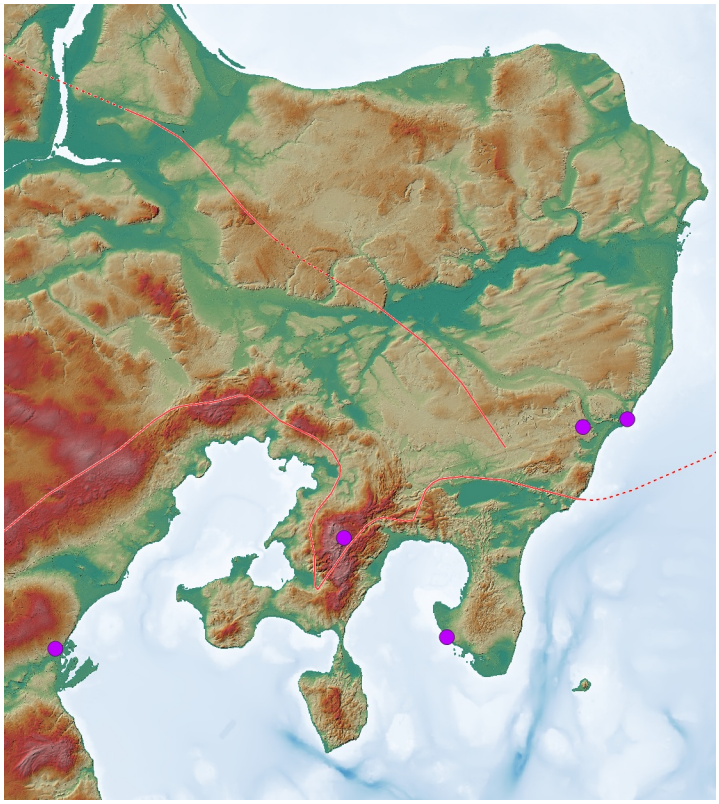


Above: Map view of thrust surface elevations [m] dipping towards WNW and indicative of ice margin geometry and stress patterns.

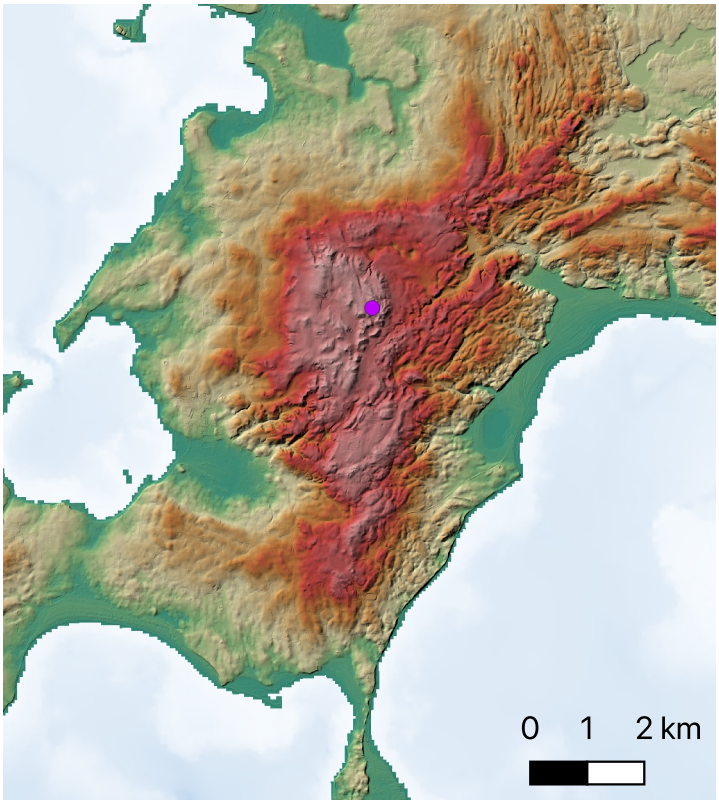
The Djursland peninsula with named points of interest marked. The southern tip of Djursland contains the Nationalpark Mols Bjerge. Hyphothesized ice margins marked with red lines.



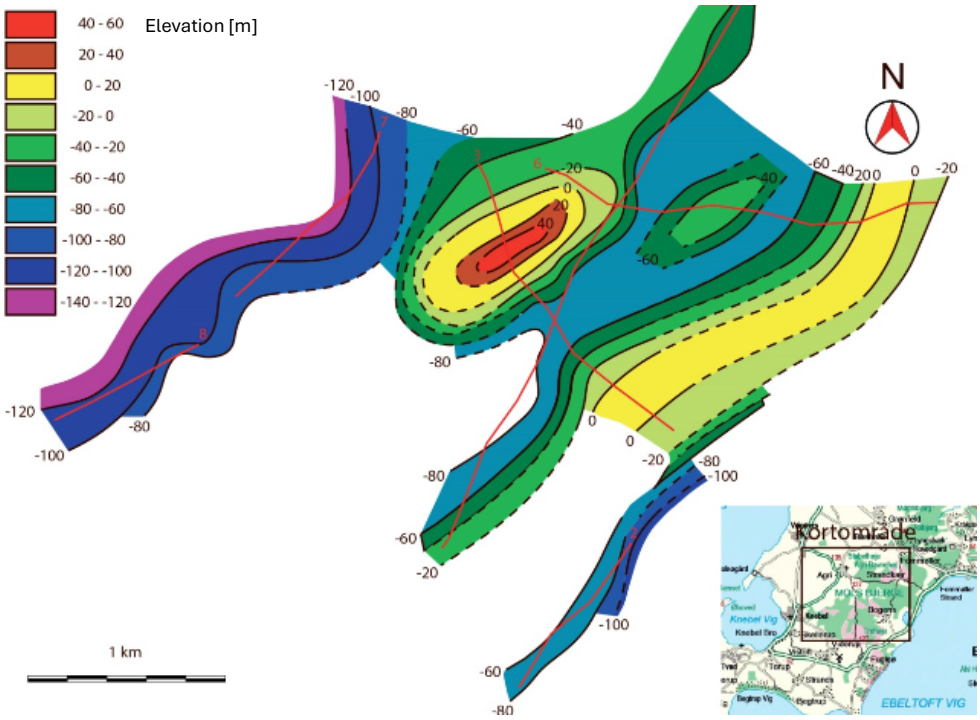
Surface geology of the area. Brown: clay till. Pink: Deformed meltwater deposits. Orange: Intact meltwater deposits. Yellow: Aeolian deposits. Light blue: Raised marine deposits. Green: Organic-rich freshwater deposits.



Digital elevation and bathymetry model with hill shading.



Digital elevation model closeup of central Mols Bjerge.



Above: The prequaternary Danian limestone forms the structural core of the high-elevation area. The figure shows interpolated surface elevation of the Danian limestone below Mols Bjerge. Source: Clausen et al. 2017 NPMB report nr. 19/2017.
Below: East/west transect of surface topography and top Danian limestone surface and accompanying map.