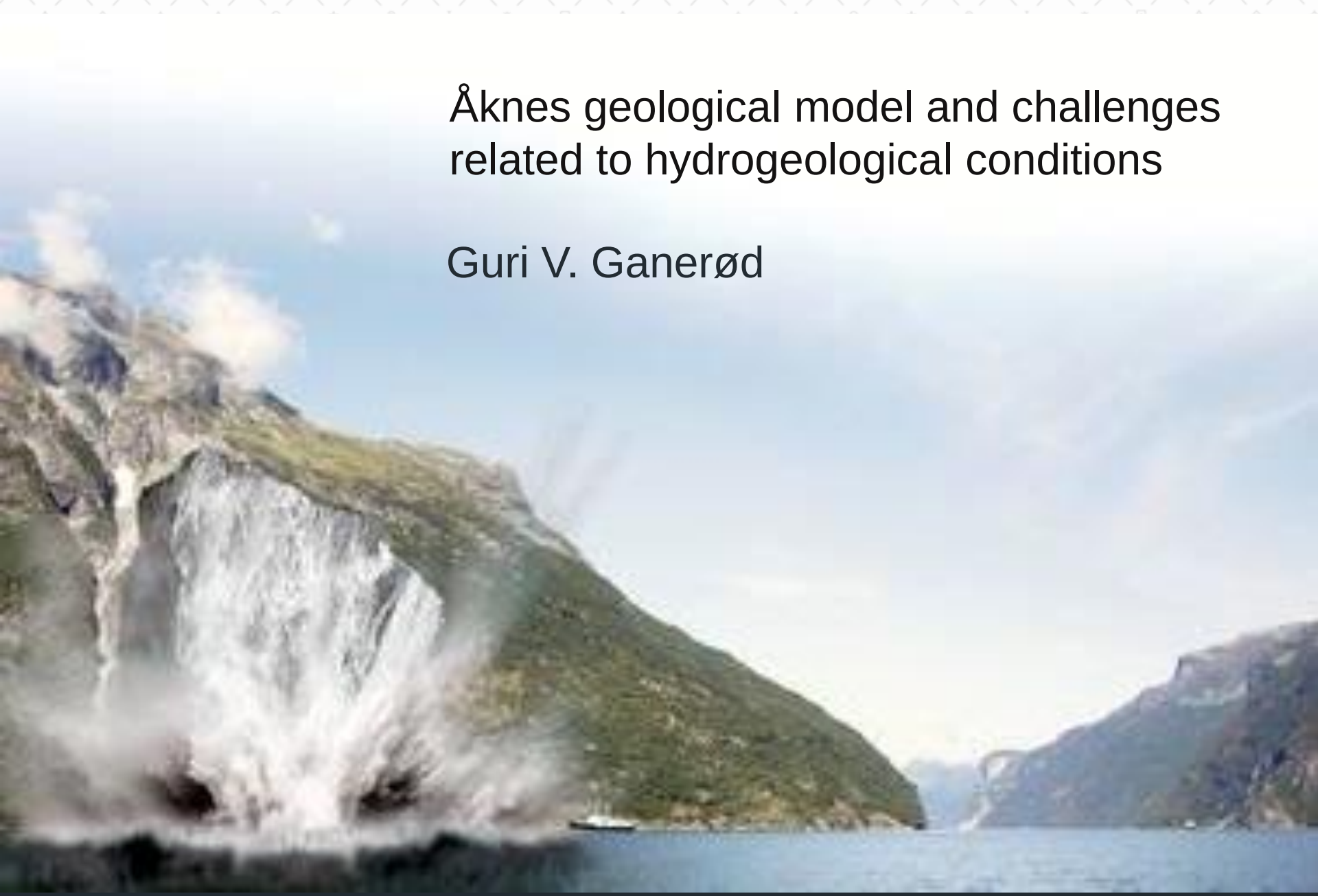
Åknes geological model and challenges related to hydrogeological conditions

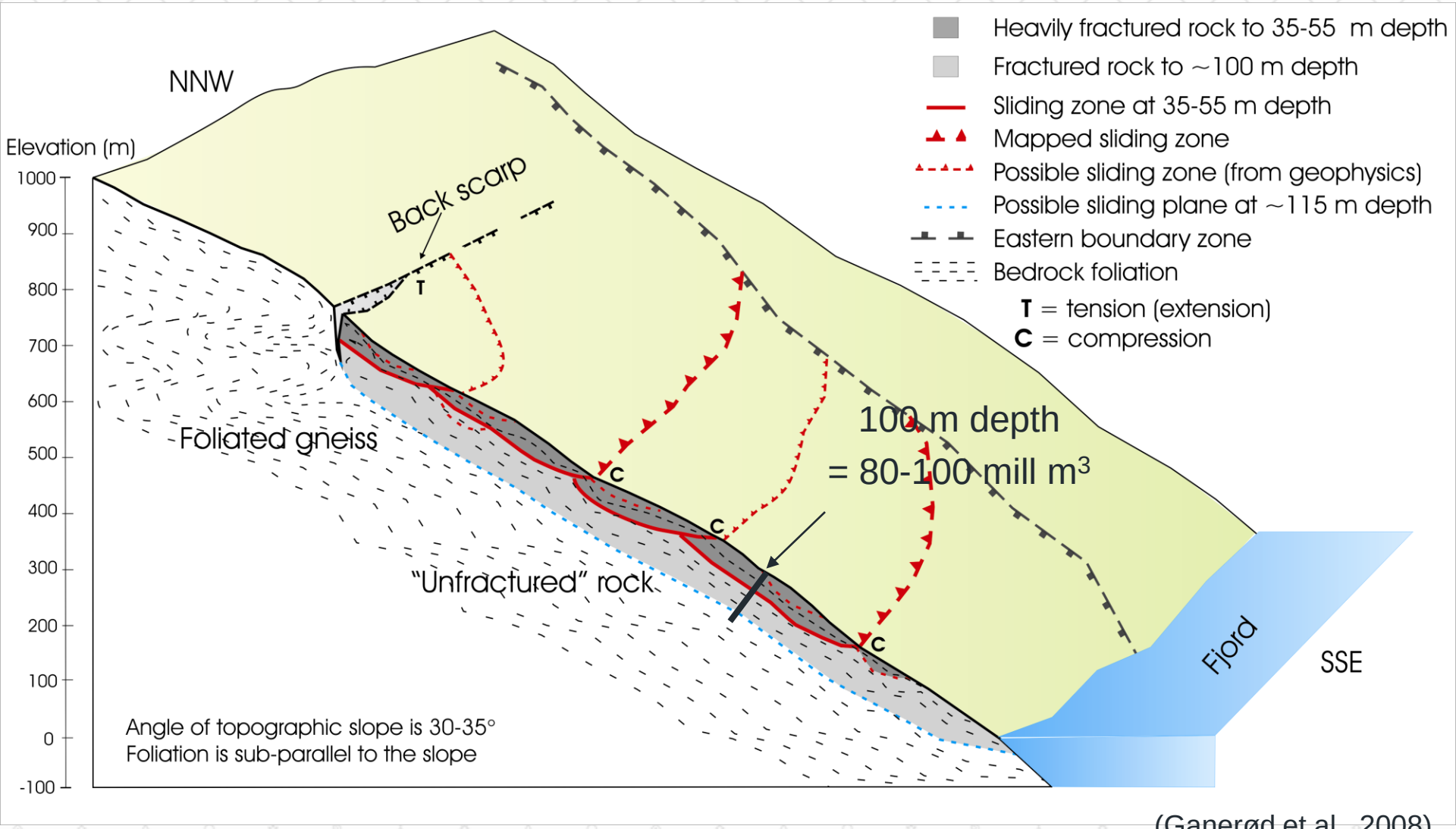
Guri V. Ganerød



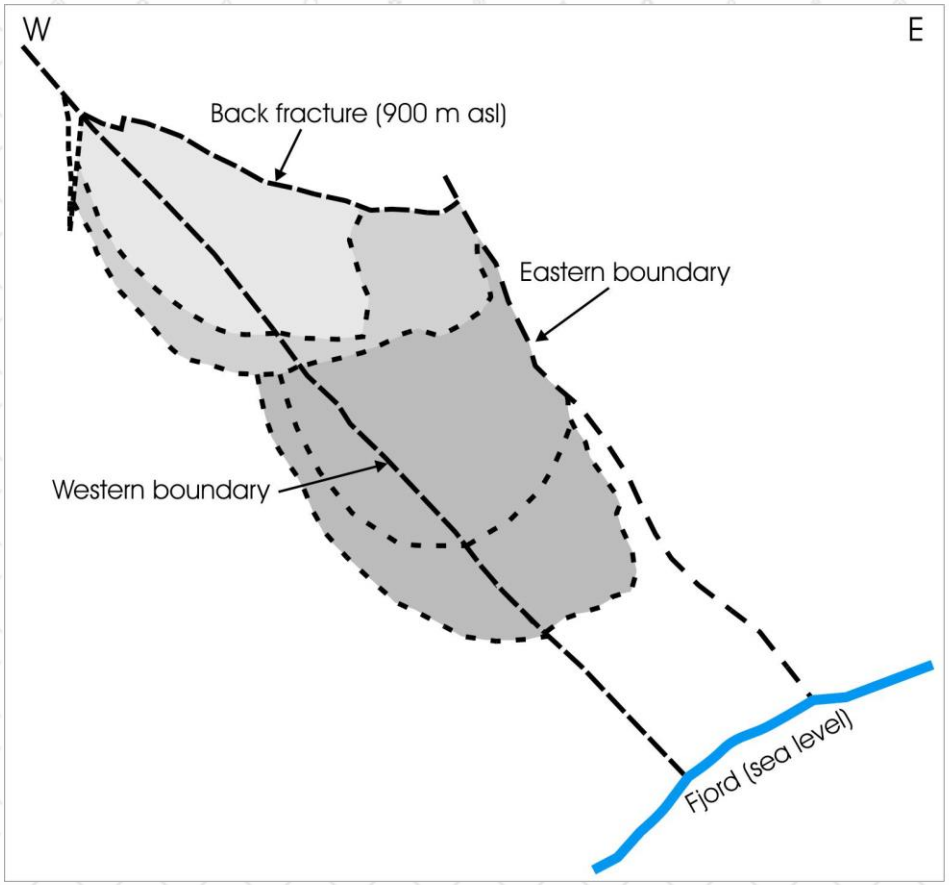
Bergens Tidende
26.10.20089

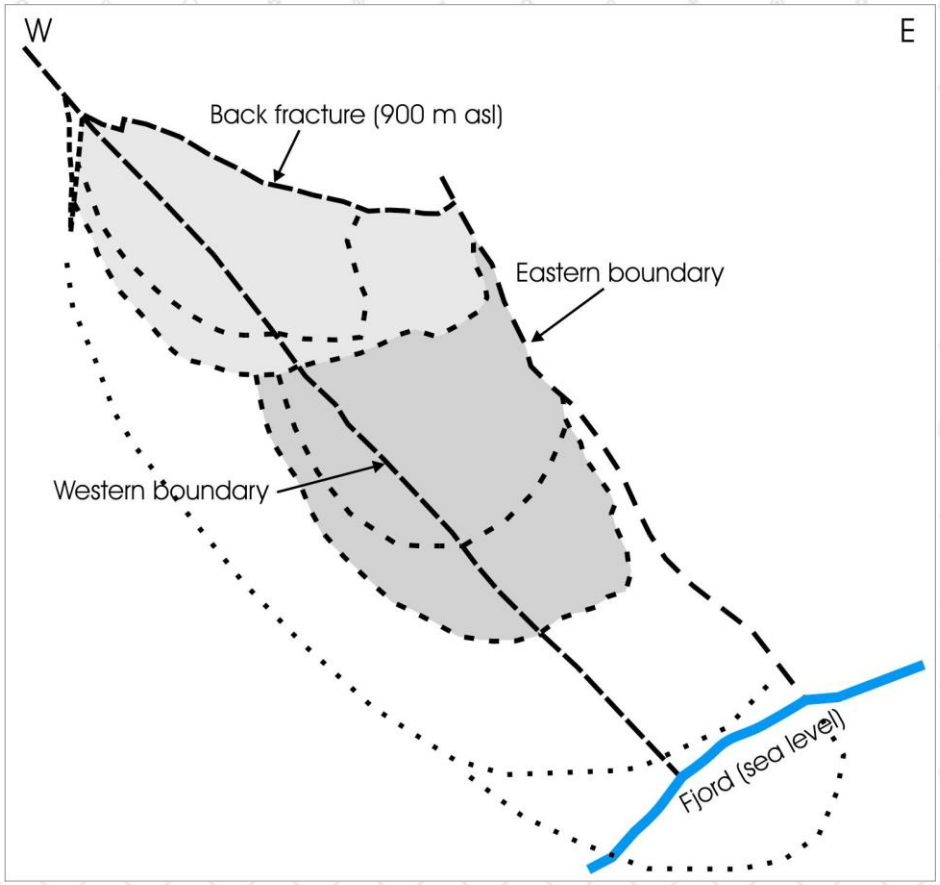
NORGES GEOLOGISKE UNDERSØKELSE
- NGU -

Geological model



(Ganerød et al., 2008)





(Nordvik et al., 2009)

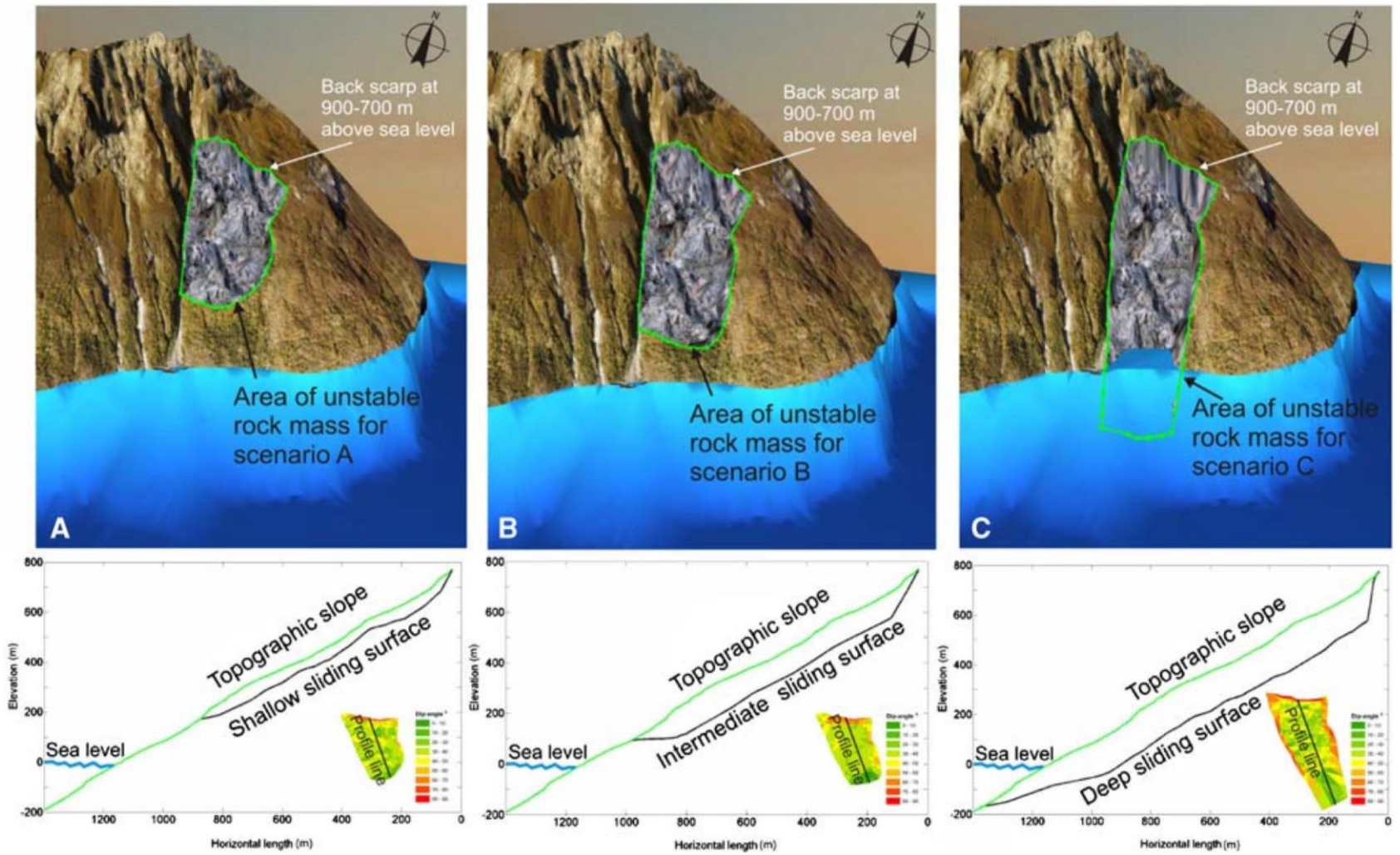
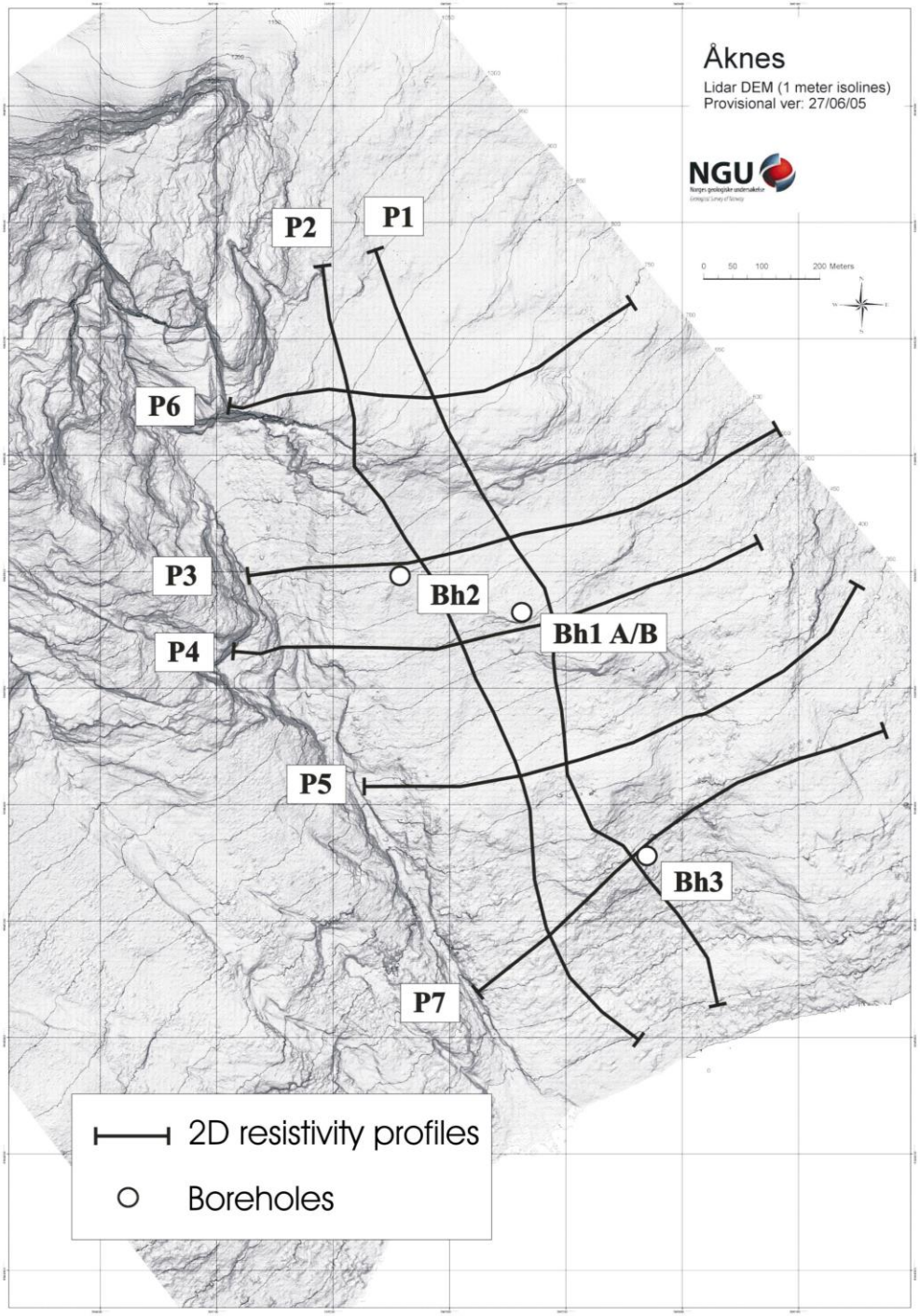
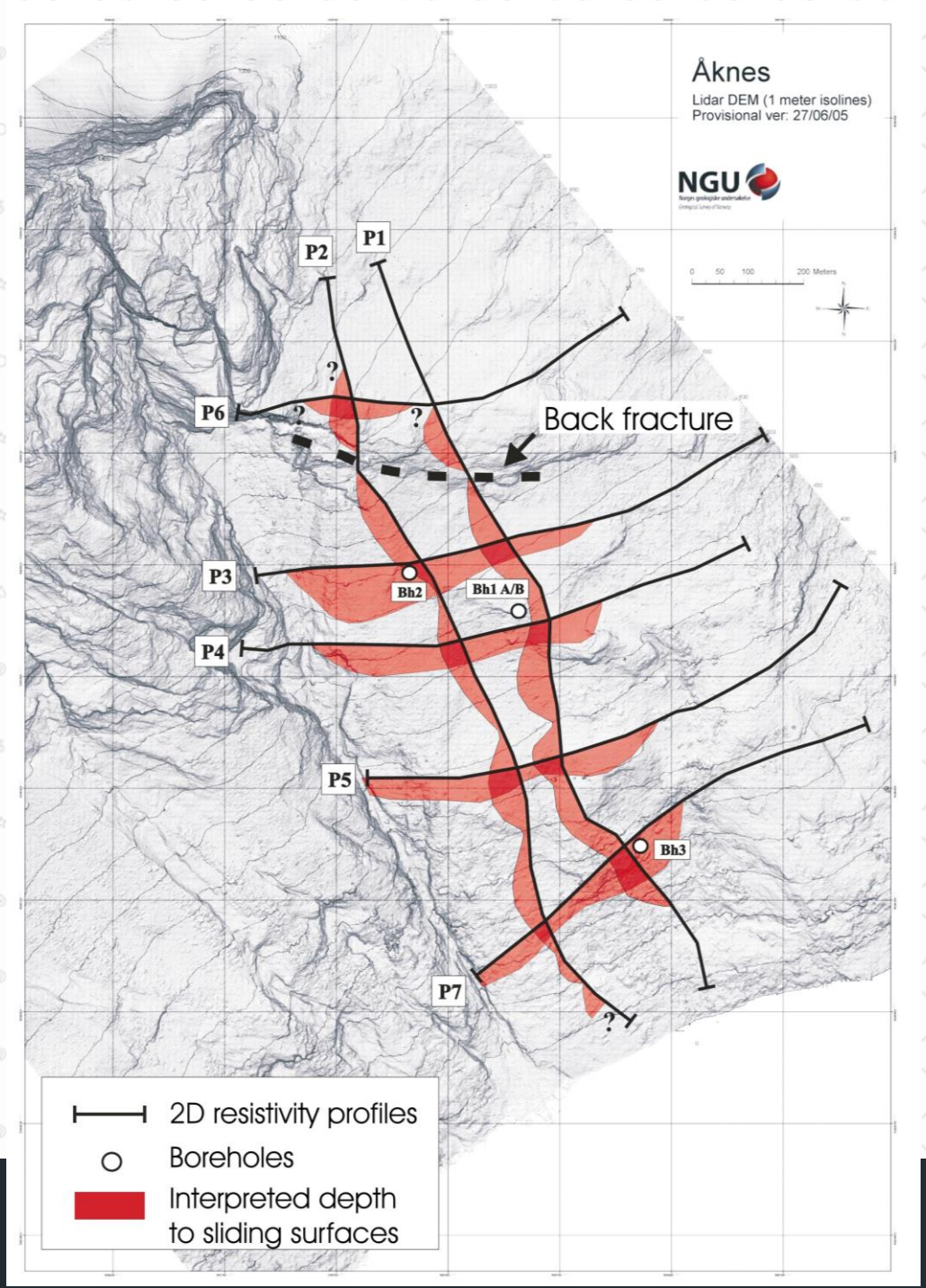


Fig. 8 **a** Extent of unstable area for Scenario A (510,000 m^2) with a basal sliding surface (BSS) at a depth of 40–55 m **b** Extent of unstable area for Scenario B (575,000 m^2) with a BSS at 105–115 m depth. **c** Extent of unstable area for Scenario C (742,000 m^2) with a depth to BSS of 150–190 m

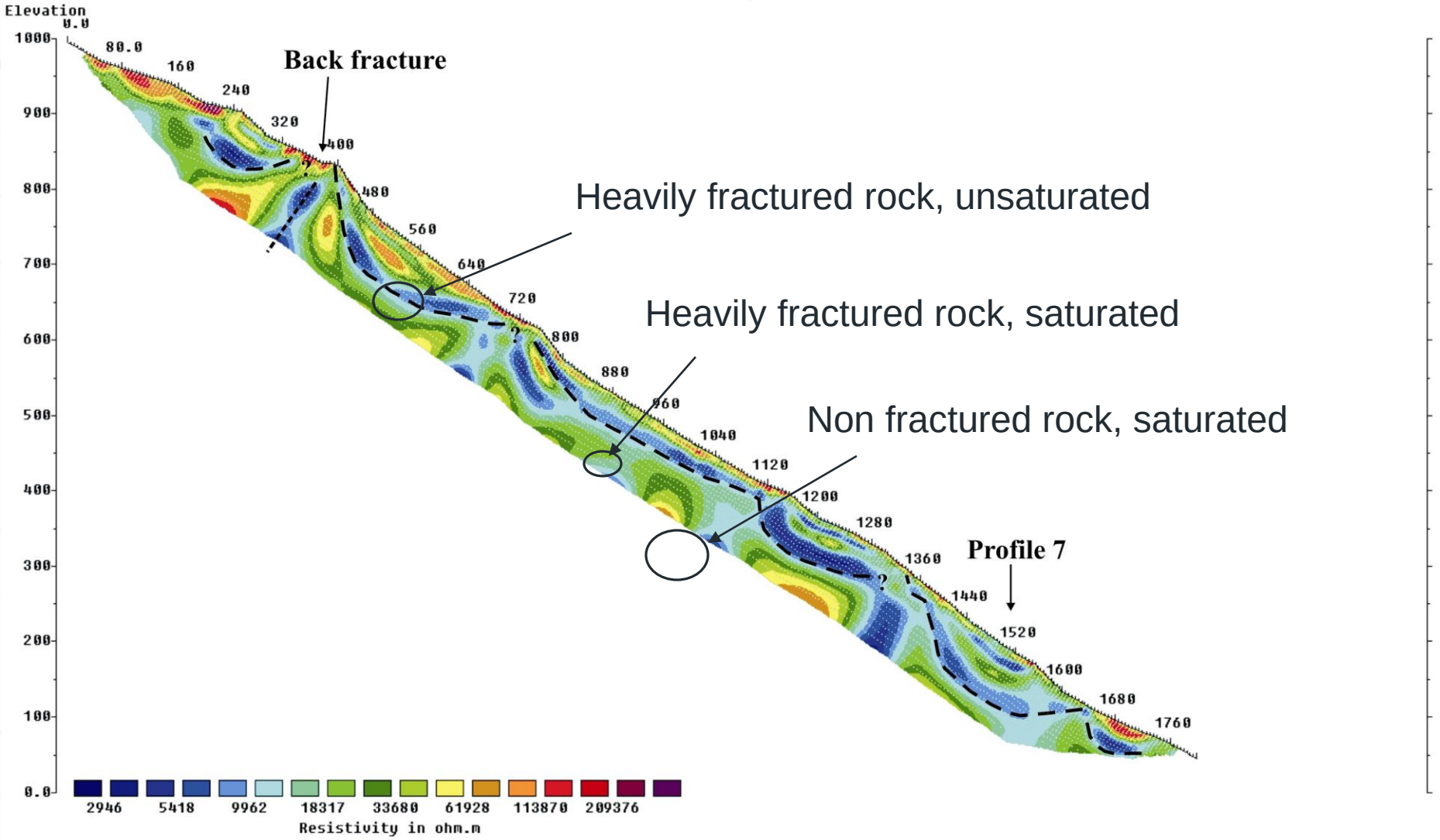
(Nordvik et al., 2009)


Åknes
Lidar DEM (1 meter isolines)
Provisional ver: 27/06/05
NGU
0 50 100 200 Meters
P1
P2
P3
P4
P5
P6
P7
Bh1 A/B
Bh2
Bh3
2D resistivity profiles
Boreholes


Åknes
Lidar DEM (1 meter isolines)
Provisional ver: 27/06/05
NGU
0 50 100 200 Meters
P1
P2
P3
P4
P5
P6
P7
?
?
?
?
Back fracture
Bh2
Bh1 A/B
Bh3
2D resistivity profiles
Boreholes
Interpreted depth to sliding surfaces

2D Resistivity Profile 2

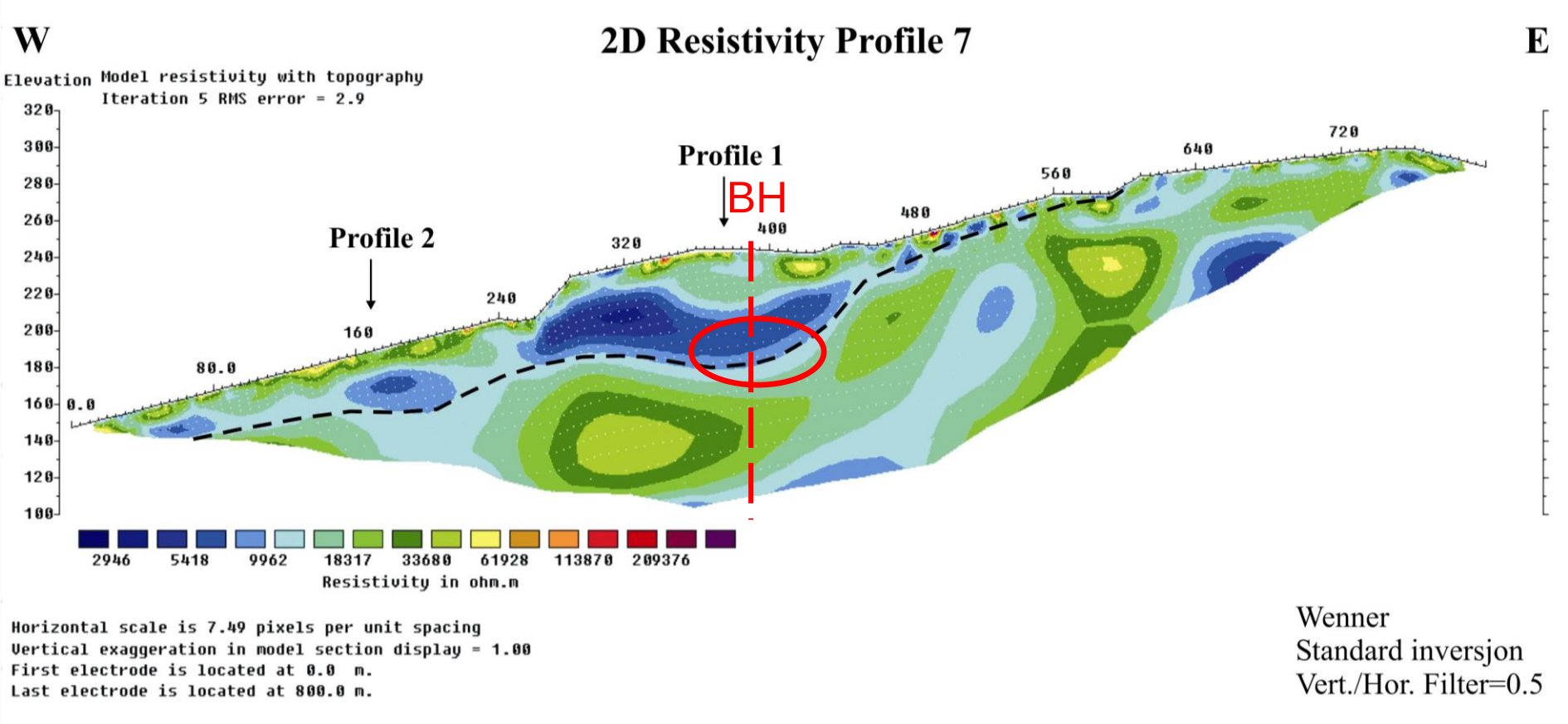
N S



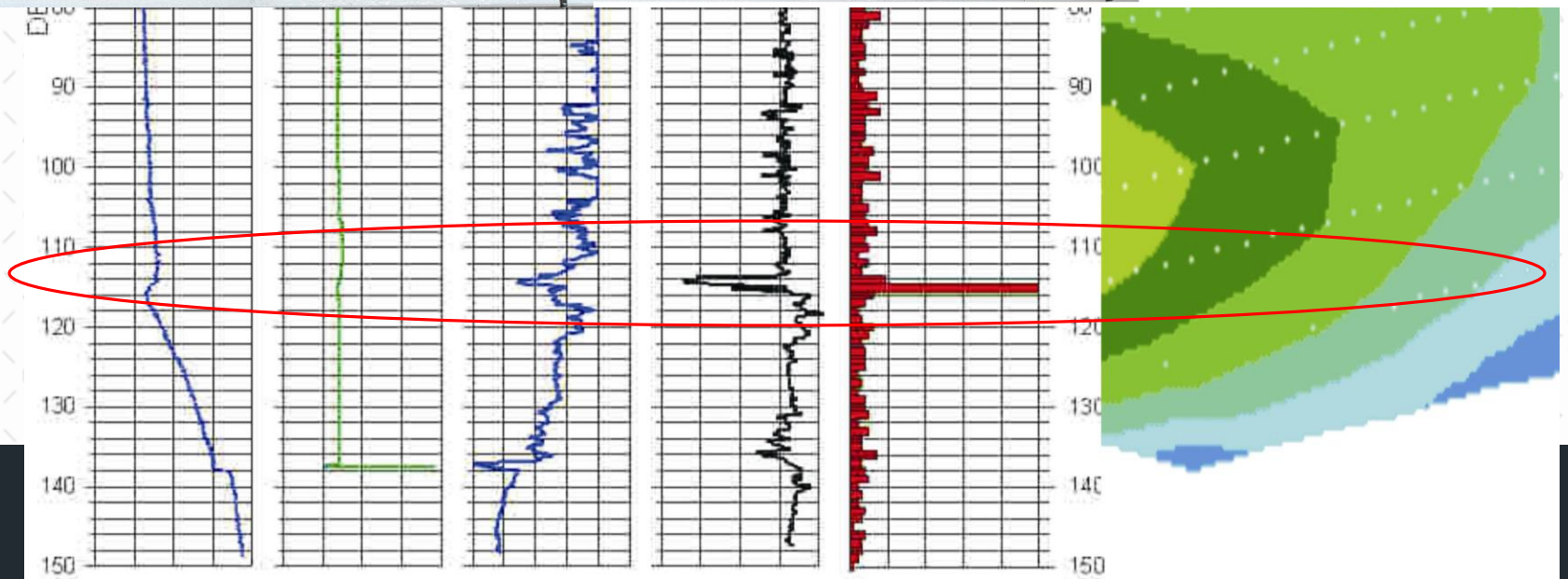
Horizontal scale is 3.33 pixels per unit spacing
Vertical exaggeration in model section display = 1.00
First electrode is located at 0.0 m.
Last electrode is located at 1800.0 m.

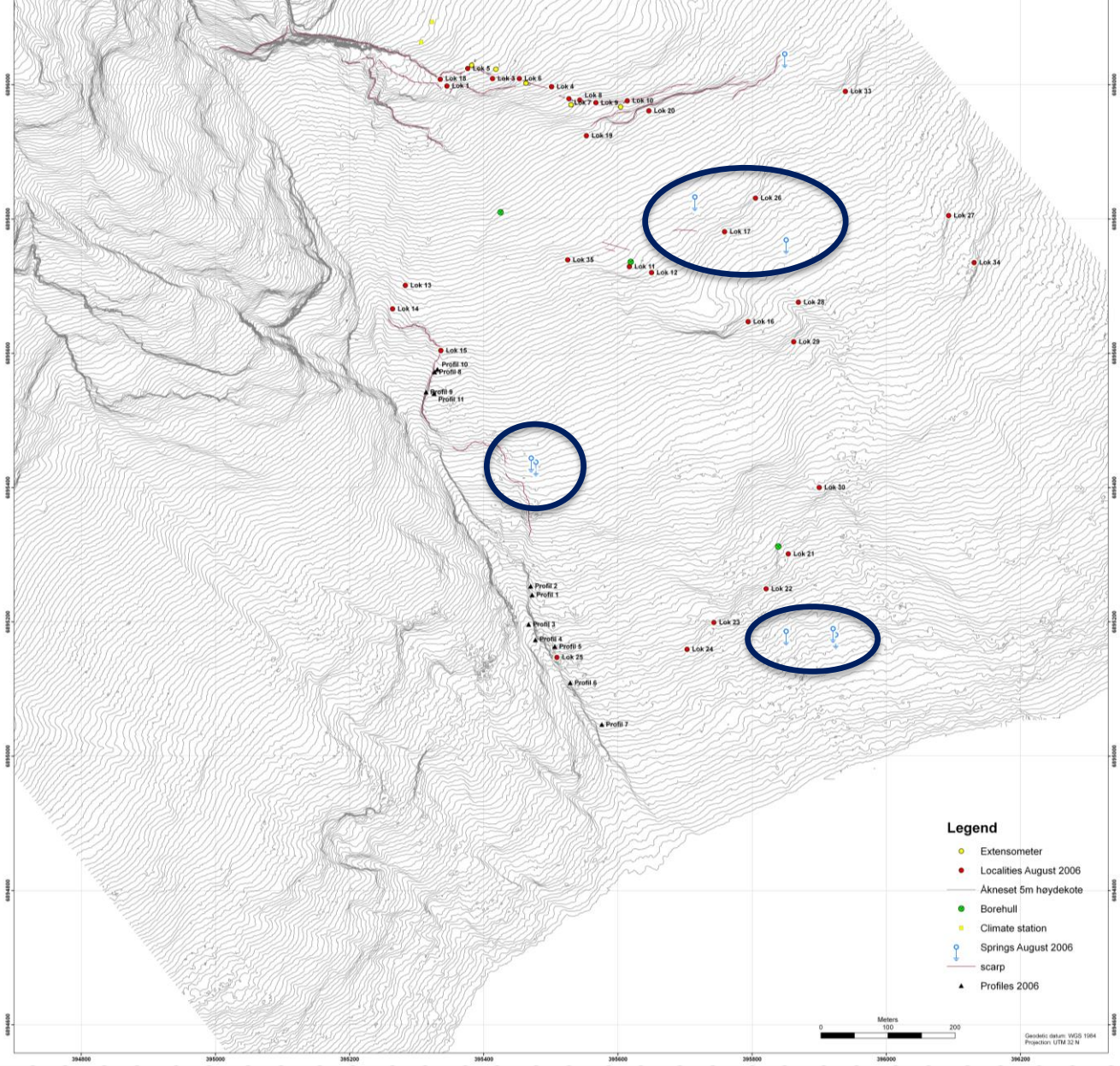
Dipol/Dipol
Standard inversion
Vert./Hor. Filter=0.5

Profile 7


W
2D Resistivity Profile 7
E
Elevation
Model resistivity with topography
Iteration 5 RMS error = 2.9
320
300
280
260
240
220
200
180
160
140
120
100
0.0
80.0
160
240
320
400
480
560
640
720
Profile 1
BH
Profile 2
2946
5418
9962
18317
33680
61928
113870
209376
Resistivity in ohm.m
Horizontal scale is 7.49 pixels per unit spacing
Vertical exaggeration in model section display = 1.00
First electrode is located at 0.0 m.
Last electrode is located at 800.0 m.
Wenner
Standard inversjon
Vert./Hor. Filter=0.5


KH-01-N
112-119 m
KH-01-N
112-119 m
KH-01-N
112-119 m
A
B
C
F
E
D
KH-01-N
112-119 m
KH-01-N
112-119 m
KH-01-N
112-119 m


90
100
110
120
130
140
150
90
100
110
120
130
140
150


Lok 5
Lok 18
Lok 3
Lok 6
Lok 1
Lok 4
Lok 8
Lok 7
Lok 9
Lok 10
Lok 20
Lok 19
Lok 33
Lok 26
Lok 27
Lok 17
Lok 35
Lok 11
Lok 12
Lok 34
Lok 13
Lok 14
Lok 28
Lok 16
Lok 29
Lok 15
Profil 10
Profil 8
Profil 9
Profil 11
Lok 30
Lok 21
Profil 2
Profil 1
Lok 22
Profil 3
Lok 23
Profil 4
Profil 5
Lok 24
Lok 25
Profil 6
Profil 7
Legend
Extensometer
Localities August 2006
Åkneset 5m høydekote
Borehull
Climate station
Springs August 2006
scarp
Profiles 2006
Meters
0
100
200
Geodetic datum: WGS 1984
Projection: UTM 32 N
394800
395000
395200
395400
395600
395800
396000
396200


Digitalisering og økt tilgang til data om undergrunnen kan spare samfunnet for store summer knyttet til for eksempel bygging av tunneler eller parkeringshus.
UNDERGRUNNSPROGRAMMET
2016-2018

Jernbaneverket

Statens vegvesen

Norges vassdrags- og energidirektorat

NVE

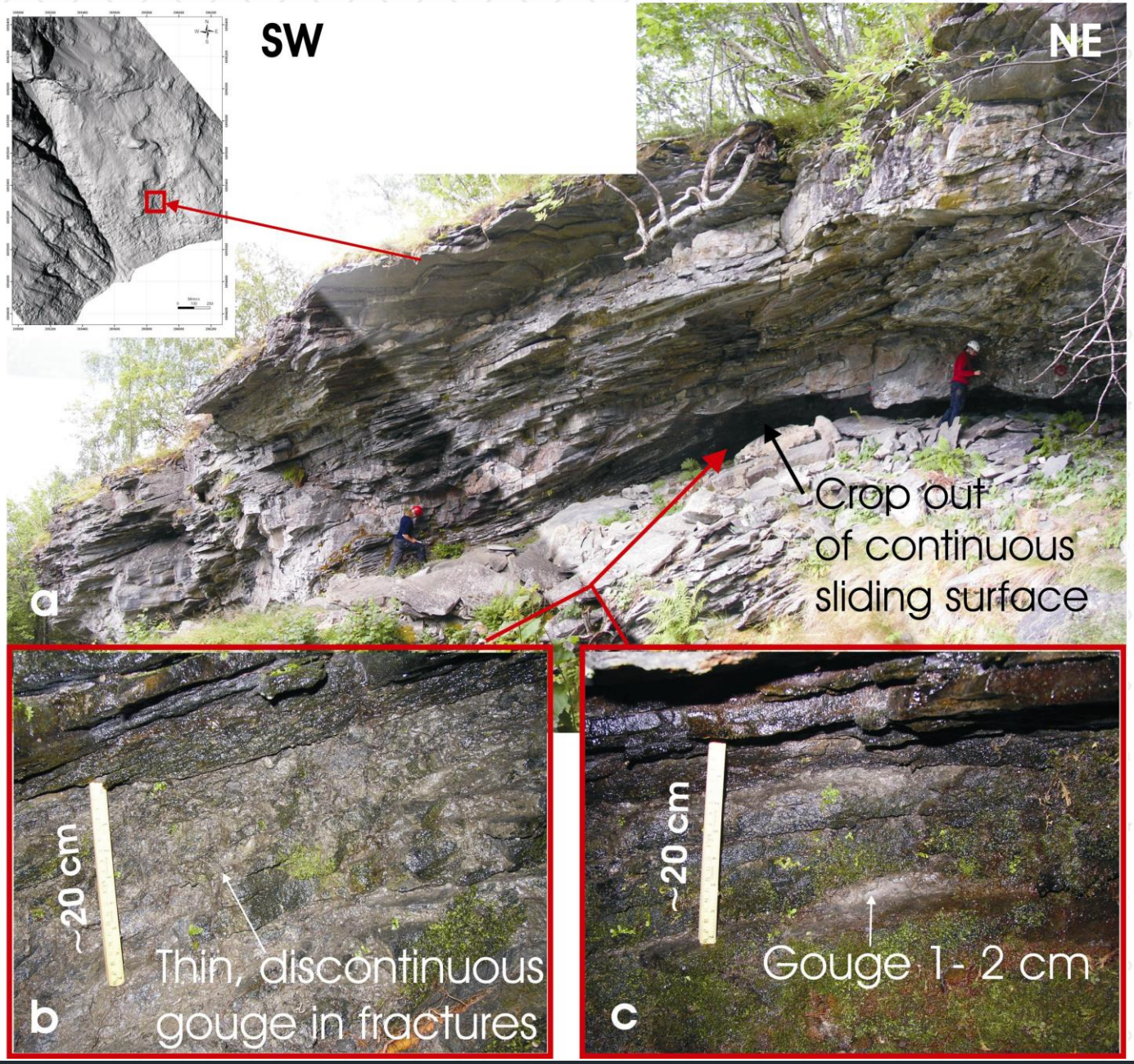
STATSBYGG

NORGES GEOLOGISKE UNDERSØKELSE

NGU

Foto: NVE

Thank you for your attention


SW
NE
Crop out
of continuous
sliding surface
a
~20 cm
Thin, discontinuous
gouge in fractures
b
~20 cm
Gouge 1- 2 cm
c


KH-01-N
35-42 m
KH-01-N
35-42 m
KH-01-N
35-42 m
A
B
C
F
E
D
KH-01-N
35-42 m
KH-01-N
35-42 m
KH-01-N
35-42 m


KH-01-N
112-119 m
KH-01-N
112-119 m
KH-01-N
112-119 m
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KH-01-N
112-119 m
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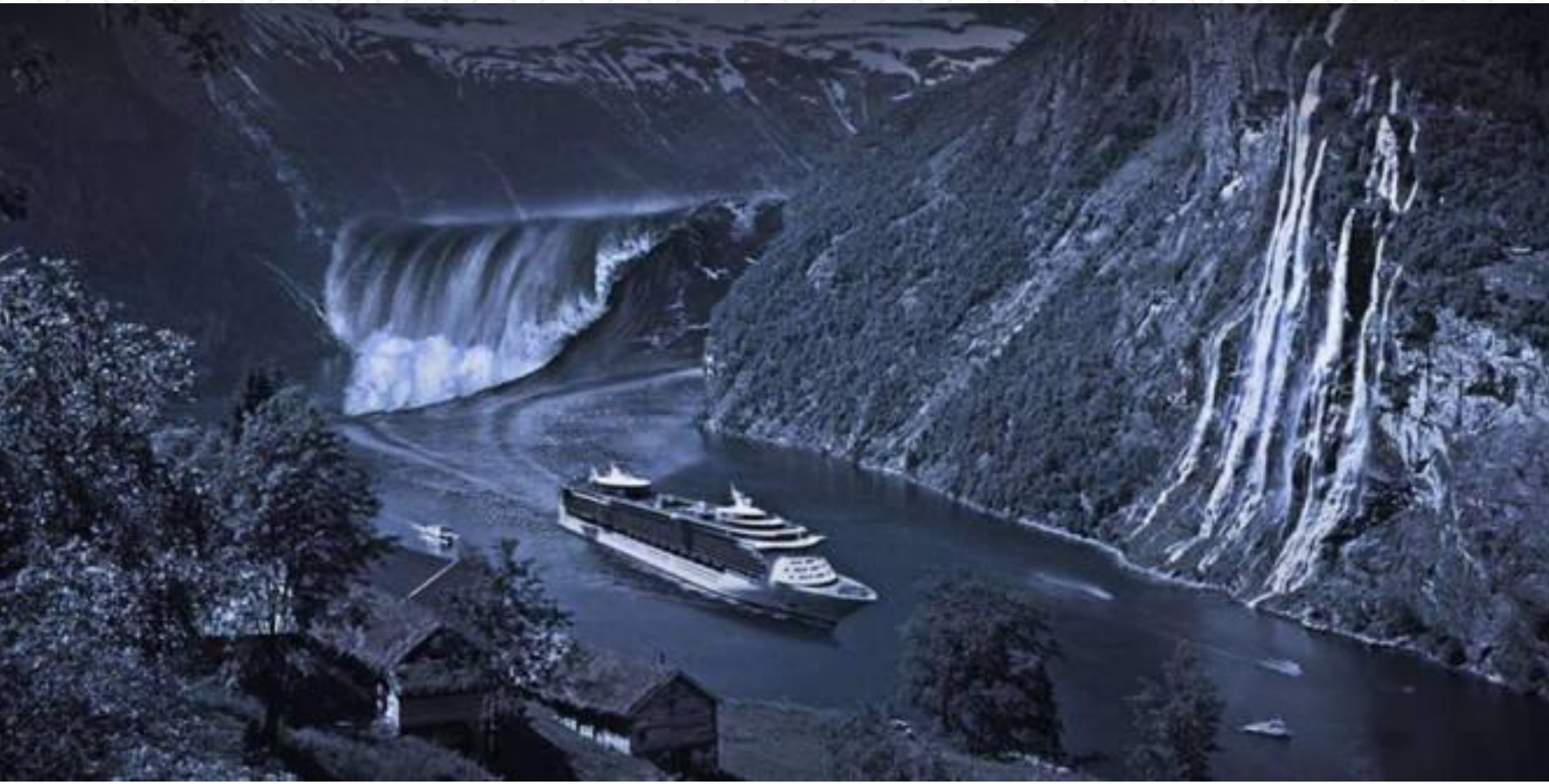
112-119 m



Geiranger - www.klartale.no