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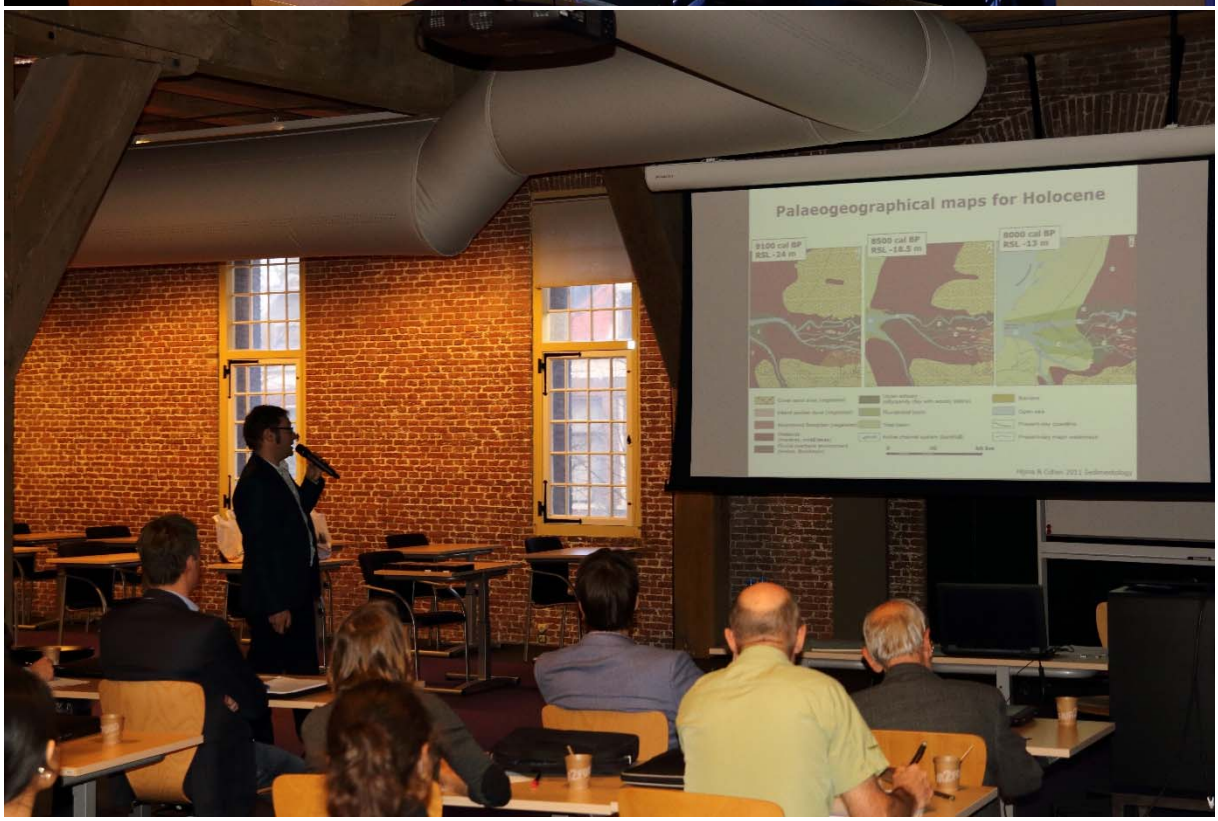
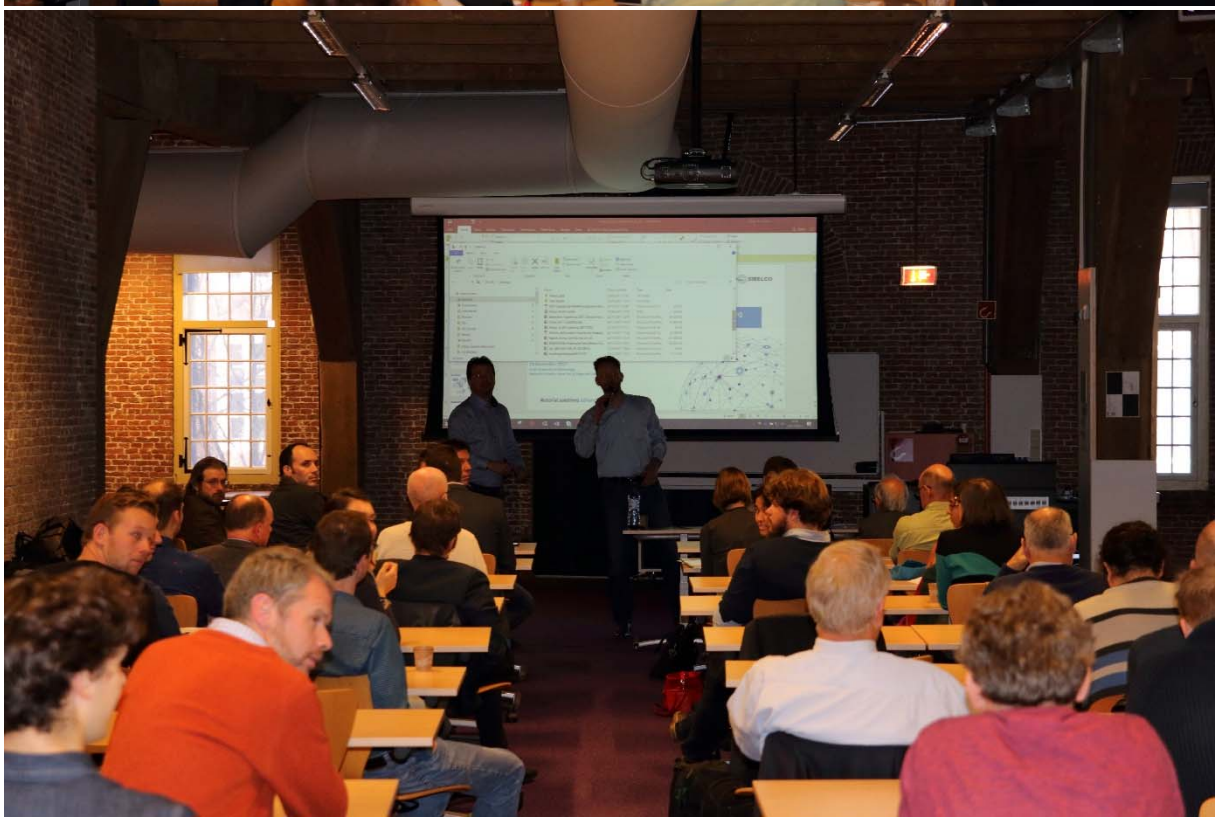
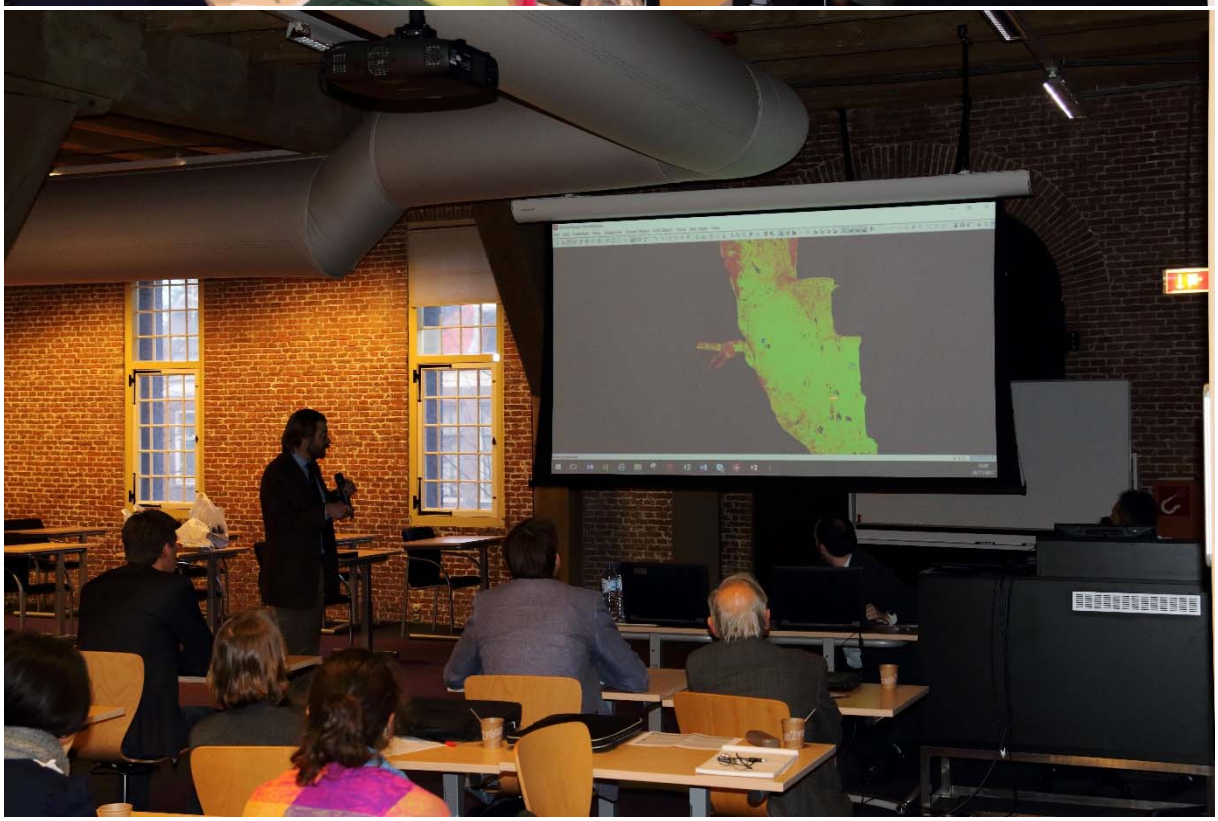

Palaeogeographical maps for Holocene
9100 cal BP
RSL -24 m
8500 cal BP
RSL -18.5 m
8000 cal BP
RSL -13 m



Optimal extraction requires a geotechnical pit design
A geotechnical pit design requires:
Design of retaining structures and support
Design of an in pit water management system.
Continuous monitoring (storing mining) of deformation, stresses and hydrogeology in order to verify or update the design.
Proactive geotechnical management.
Optimal extraction



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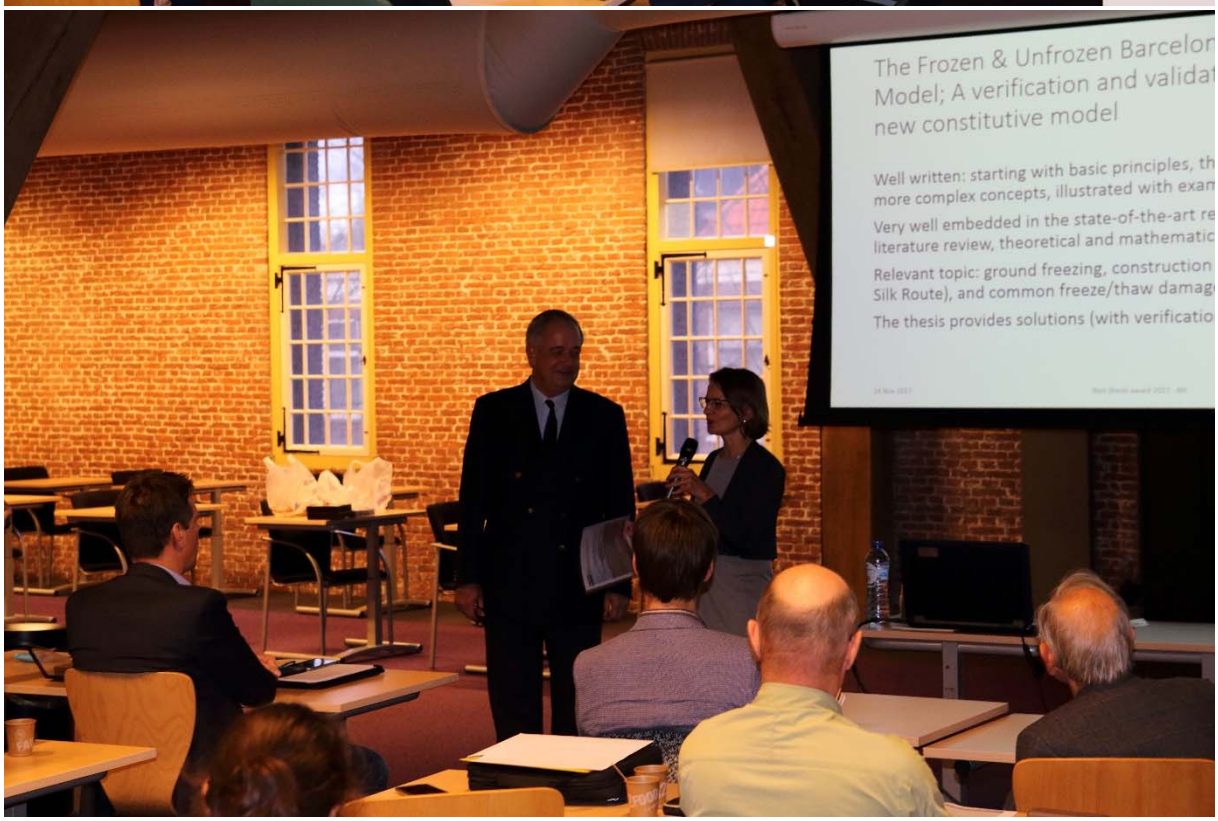
The Frozen & Unfrozen Barcelon
Model; A verification and validat
new constitutive model
Well written: starting with basic principles, th
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Very well embedded in the state-of-the-art re
literature review, theoretical and mathematic
Relevant topic: ground freezing, construction
Silk Route), and common freeze/thaw damag
The thesis provides solutions (with verificatio

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AaNDoS
the monitoring toolkit
Holistic deformation monitoring
- the NEAT Gotthard/Ceneri project
Martin Berliges
www.aandos.com

GeoControl
Ground movement 2000 - 2050
Daling > 60 cm
Daling 40 - 60 cm
Daling 30 - 40 cm
Daling 20 - 30 cm
Daling 10 - 20 cm
Daling 2 - 10 cm
Daling kx 2 cm
Geen verandering
Stijging kx 2 cm
Stijging > 2 cm
Down
Up
0
80 km
Rijkswaterstaat, NAM