



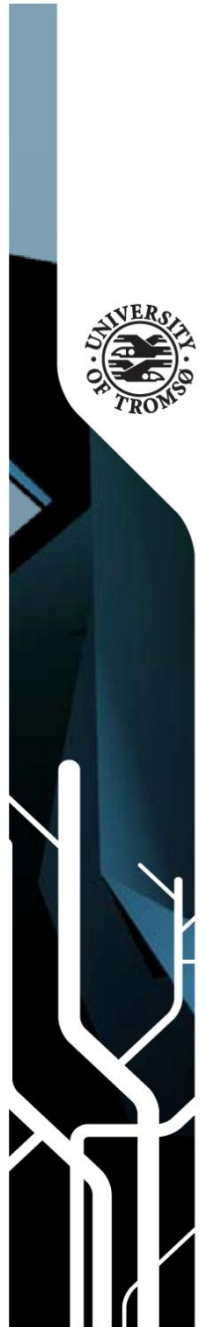
**Submarine landslides offshore Norway – a  
summary of observations and implications for  
initial deformation and flow dynamics**

Jan Sverre Laberg

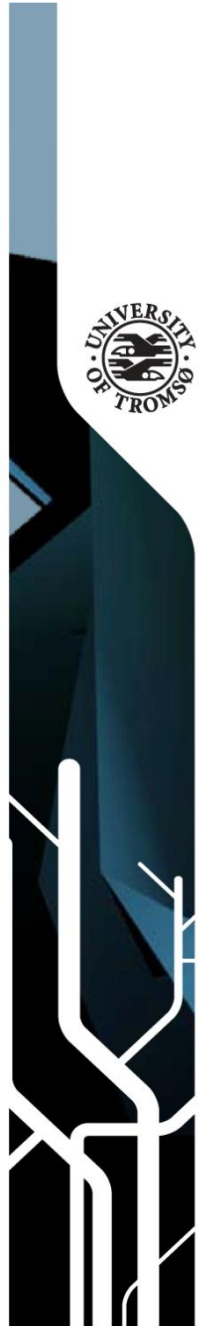
Dept. of Geology, University of Tromsø, Tromsø, Norway

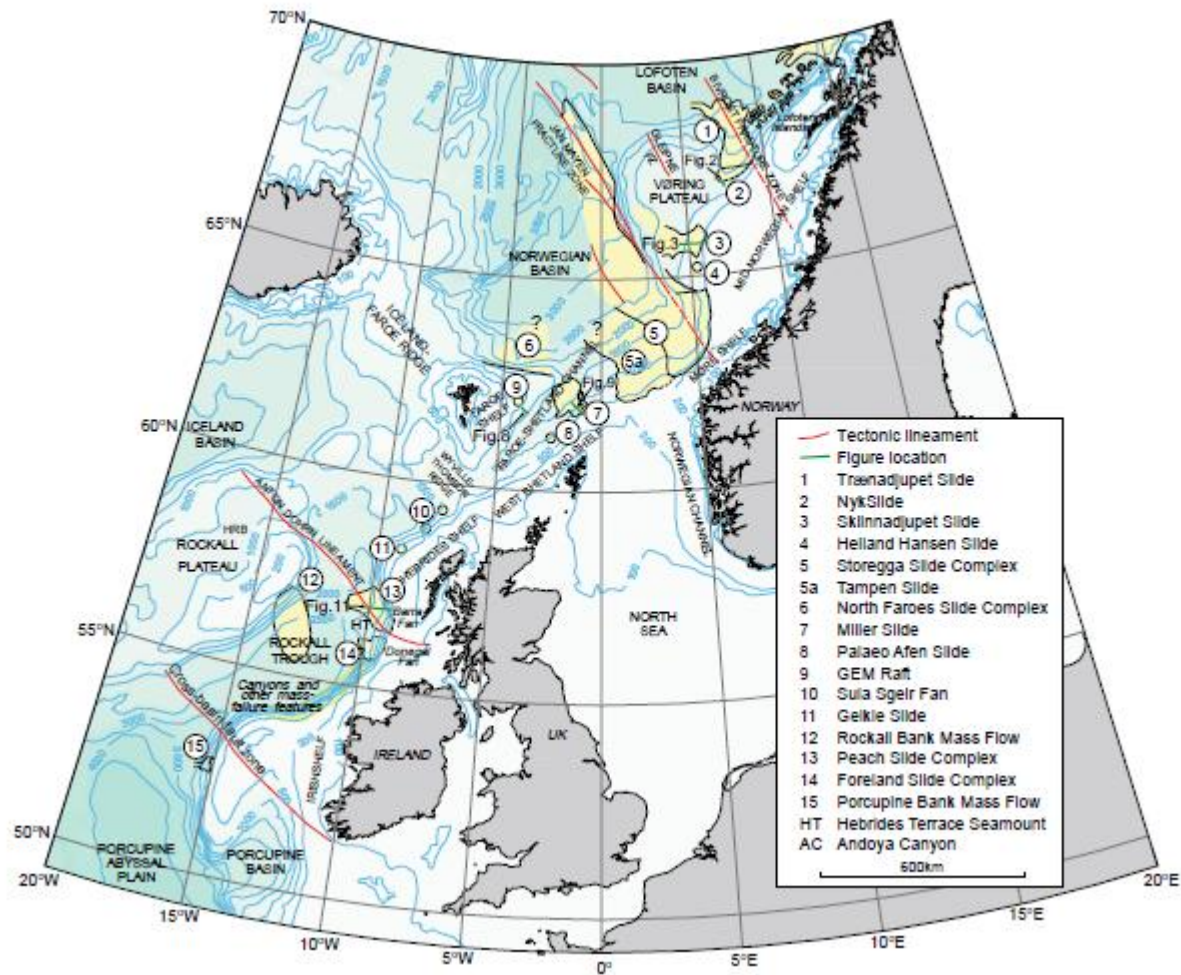
# Outline

- Submarine landslides offshore Norway – where and when?
- Which sediments failed?
- Morphological characteristics of the slide scar and the slide deposits
- Summary

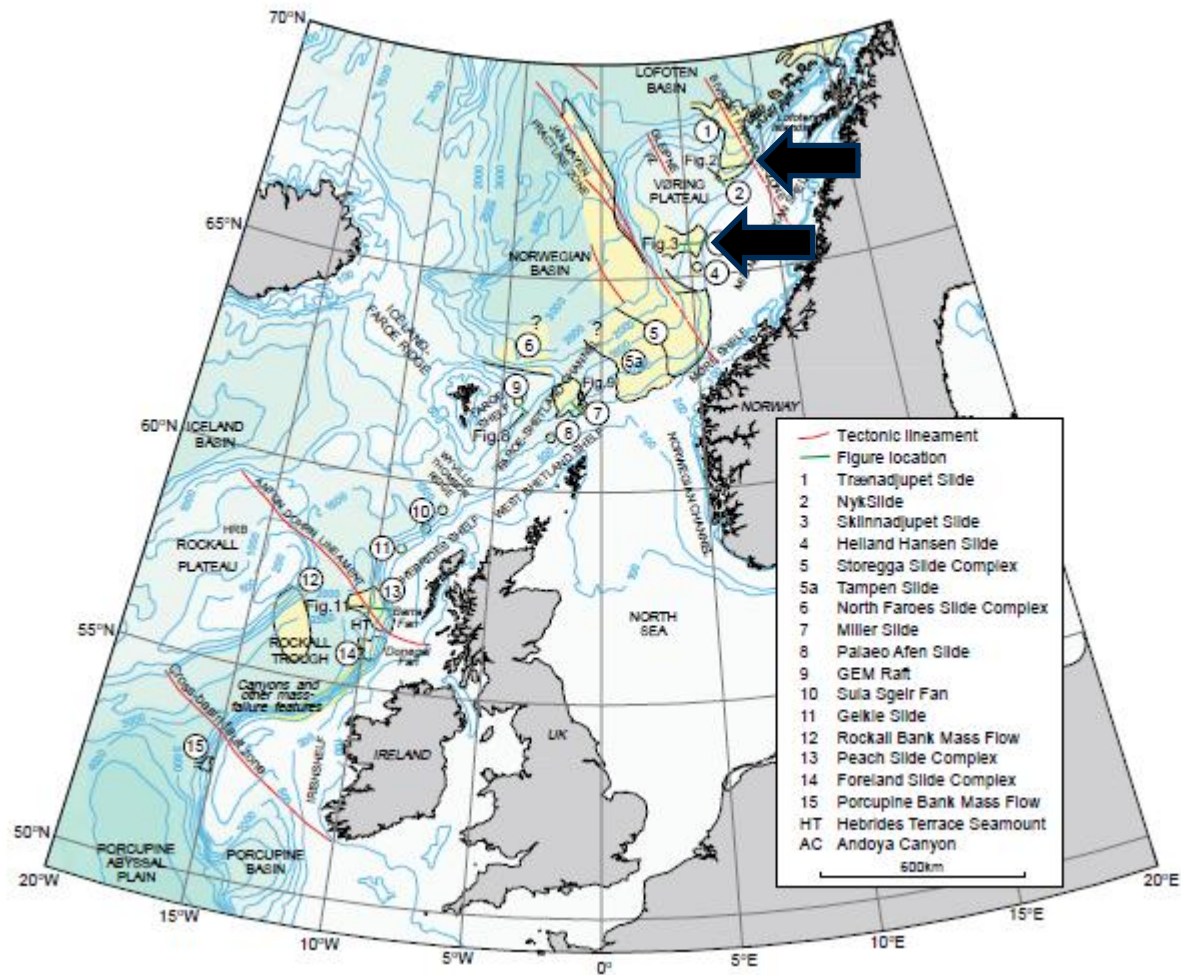


# Submarine landslides offshore Norway – where and when?

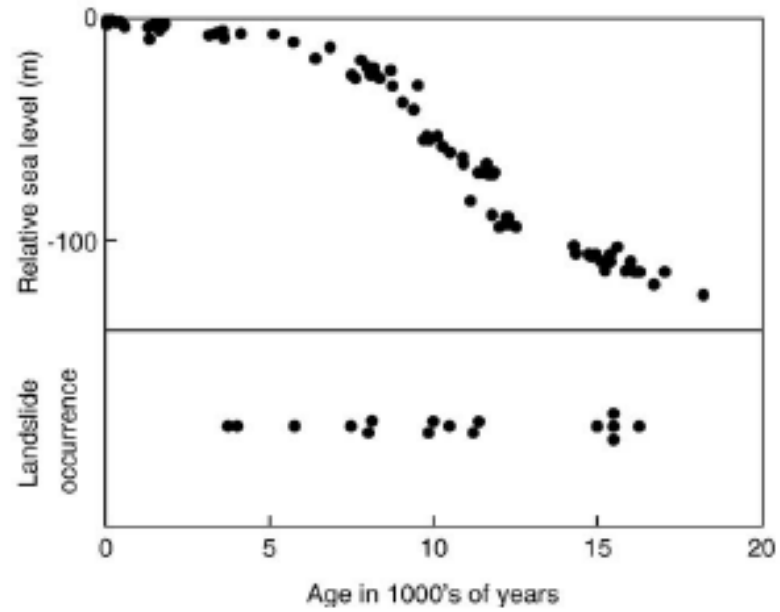




Evans et al. (2005)



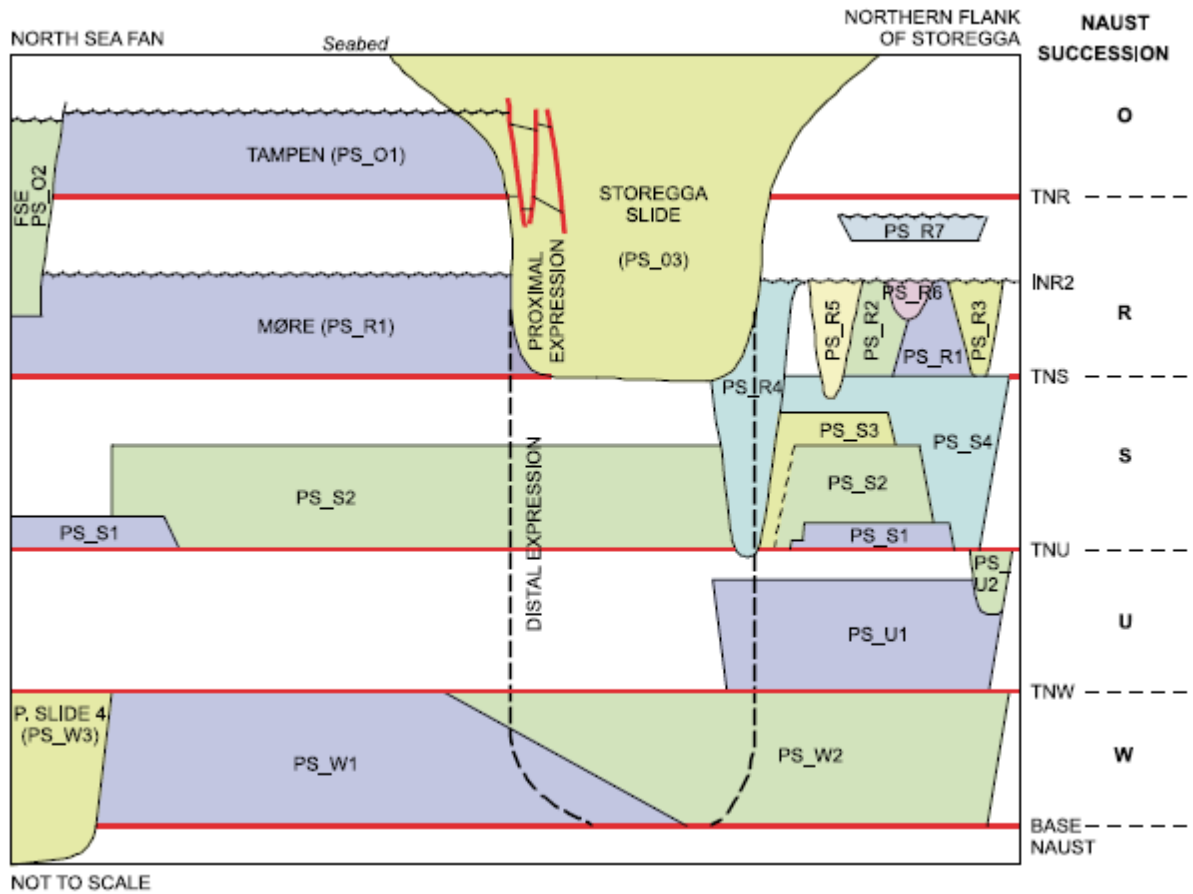
Evans et al. (2005)



Lee (2009)







Evans et al. (2005)



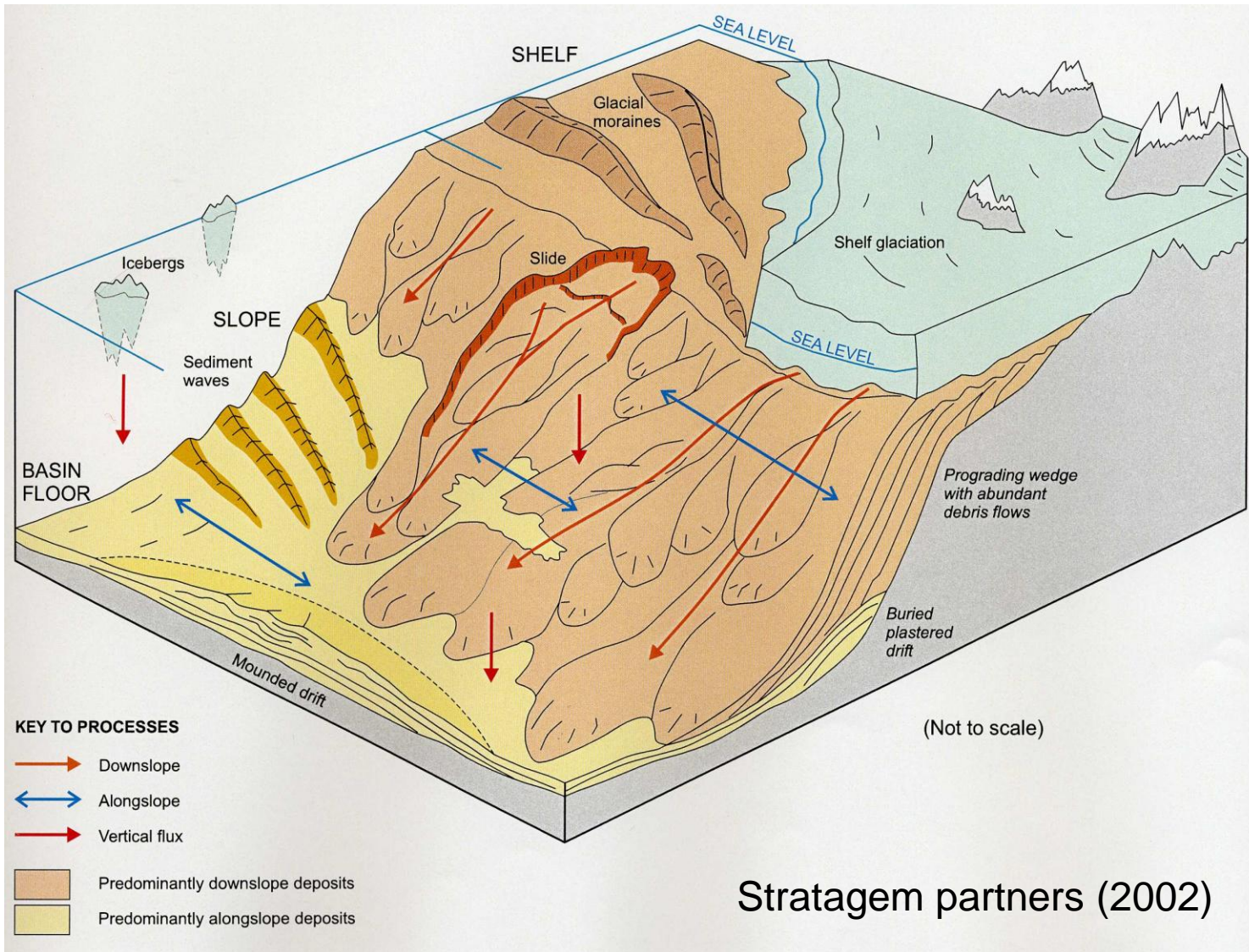
*Submarine landslides offshore Norway have a wide geographic and stratigraphic distribution*

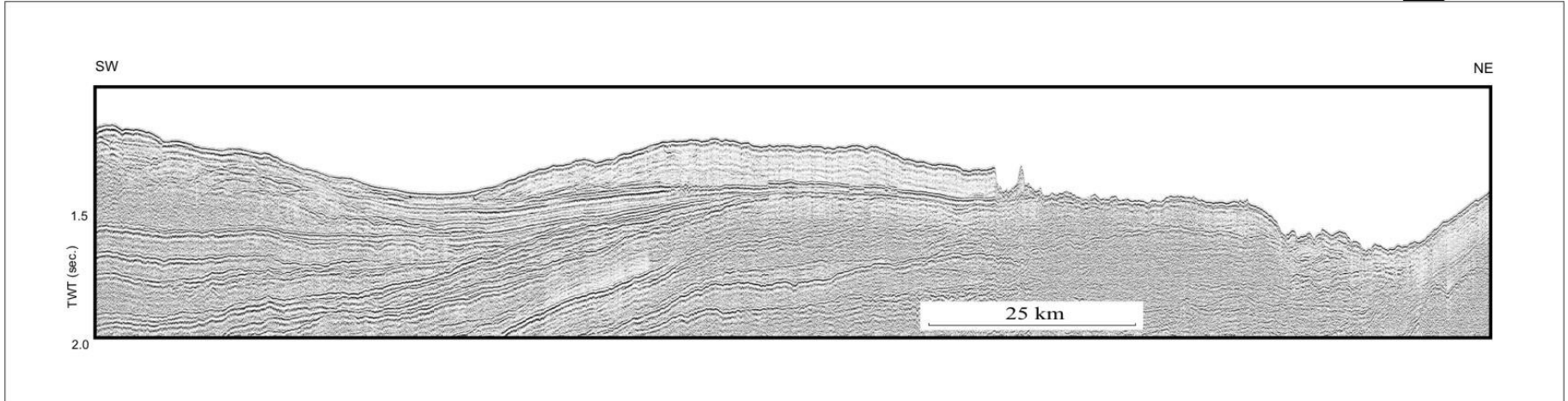


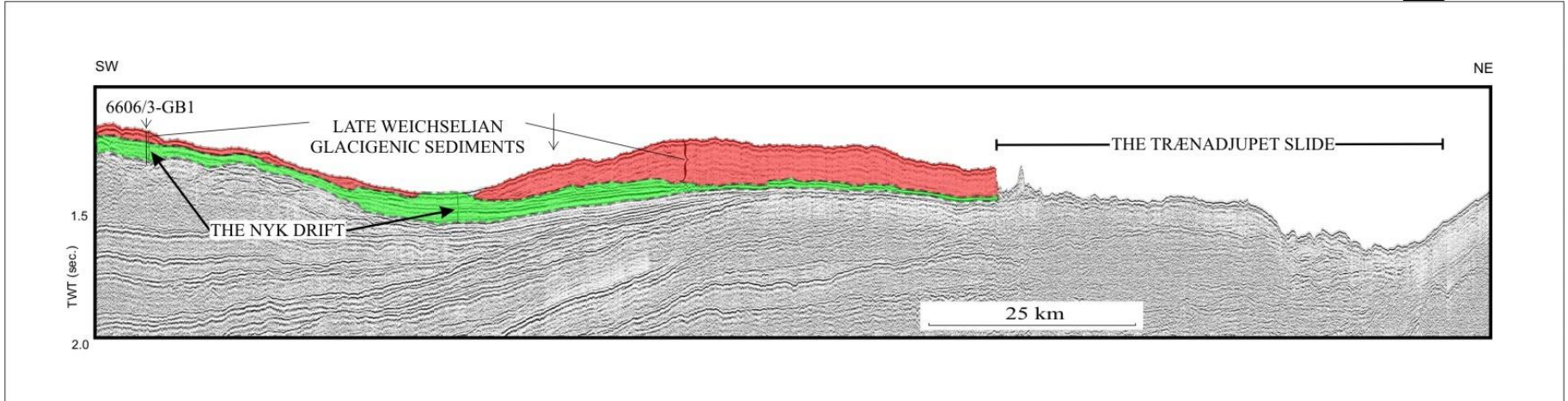


# Which sediments failed?













LATE WEICHSELIAN GLACIGENIC  
SEDIMENTS



THE NYK CONTOURITE DRIFT  
SEDIMENTS

SHEAR  
BANDS

- *In most cases both glacial and contouritic sediments affected*
- *The contourites were the weak layers that originally failed (strain softening behaviour)*
- *The properties of the contourites that controls the stability of the continental slope – these layers may be located ~10 - ~100 m below the sea floor*

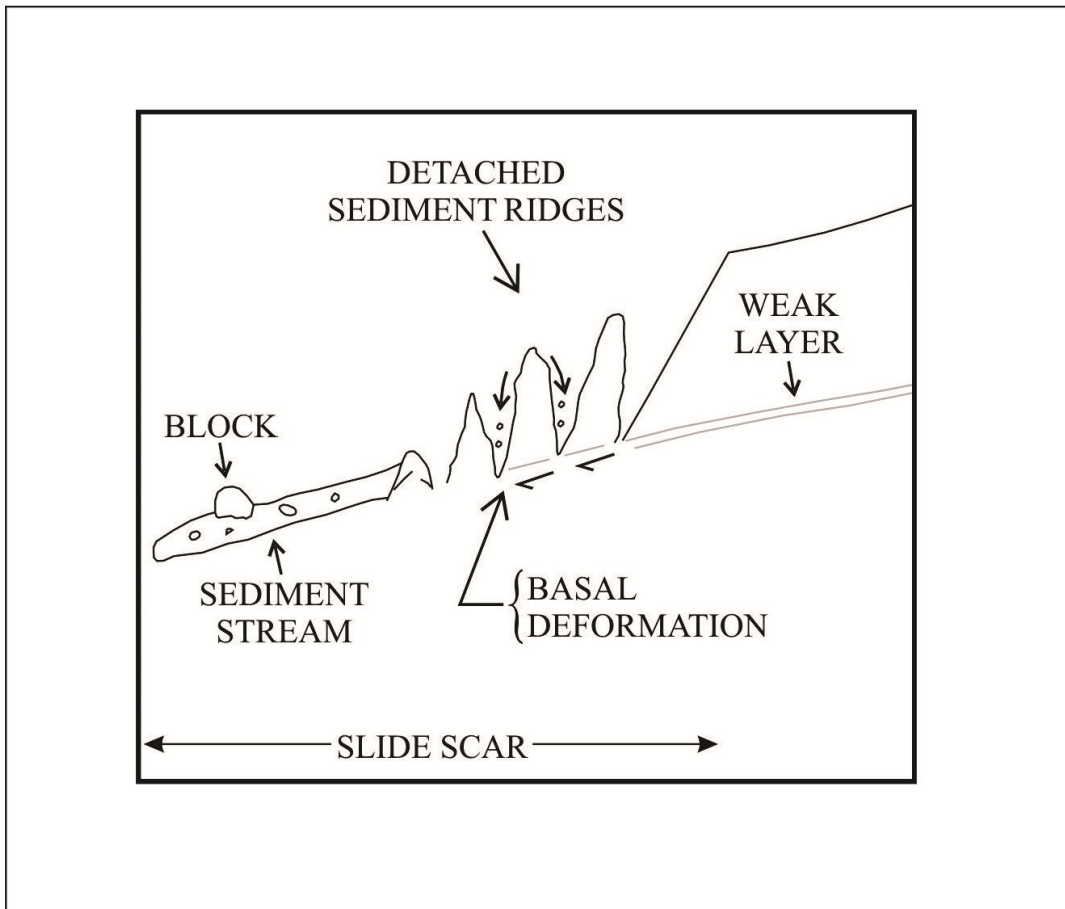


# Morphological characteristics of the slide scar and the slide deposits

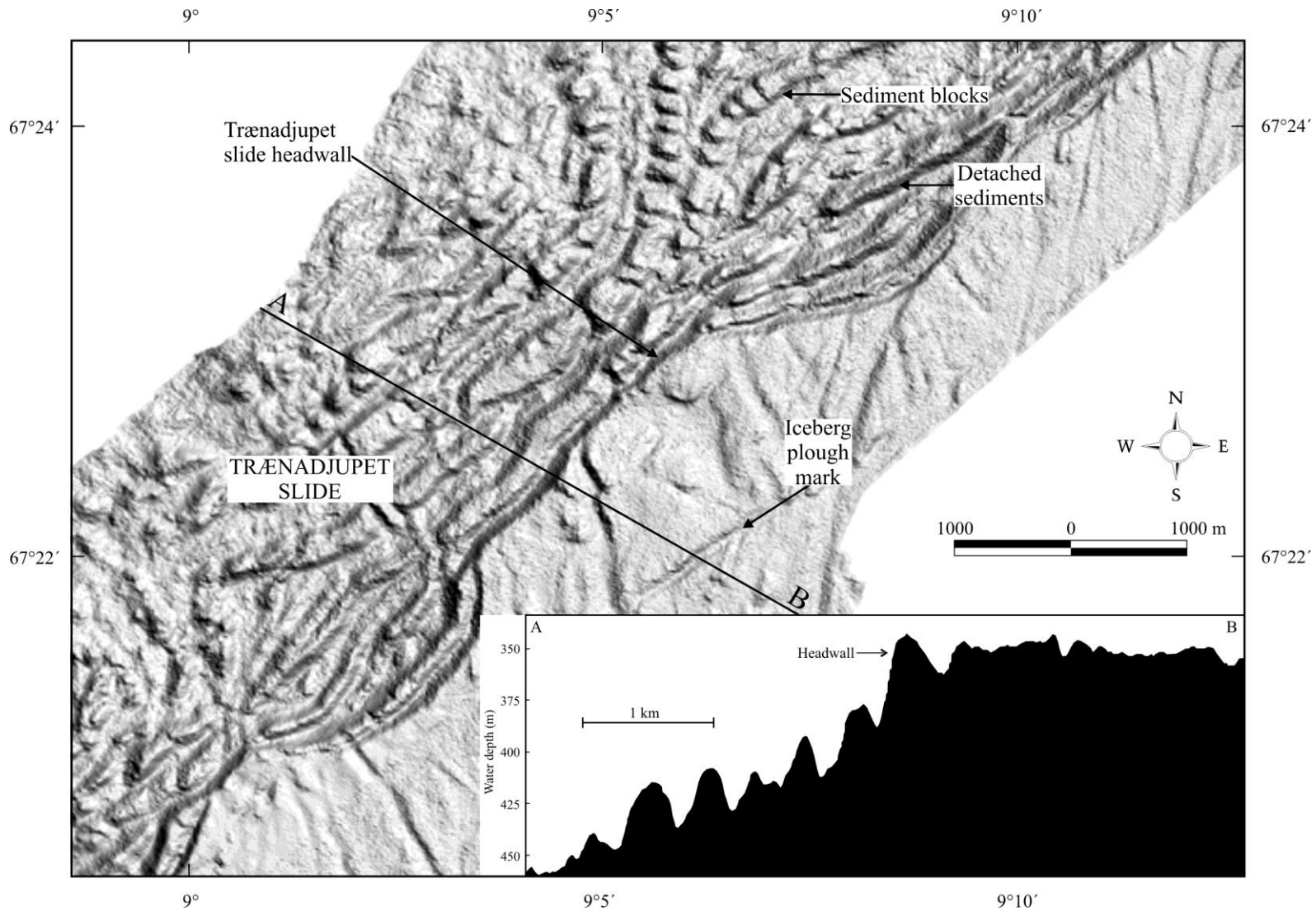




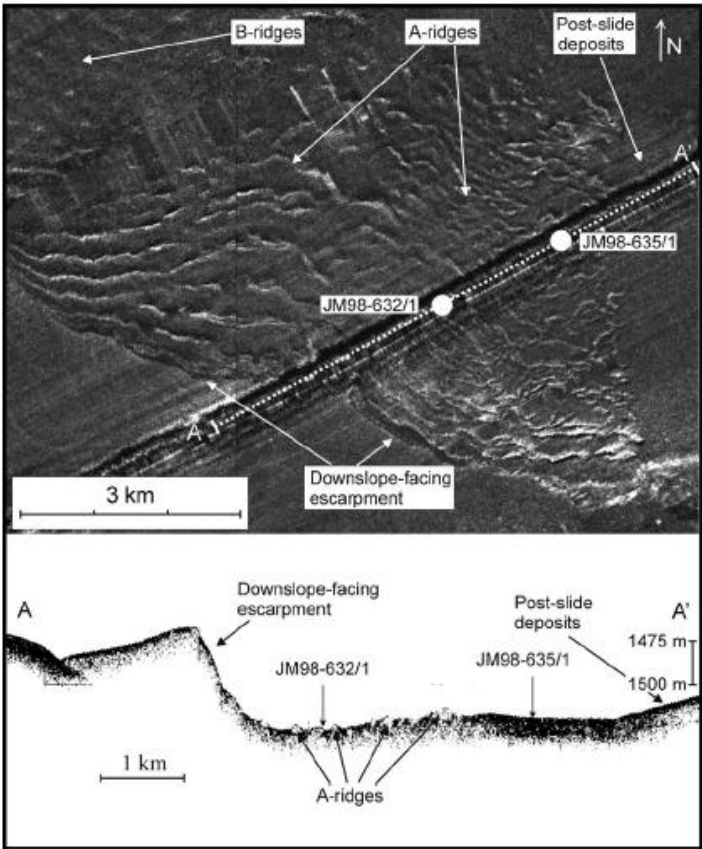
## Sediment evacuation area



# Sediment evacuation area



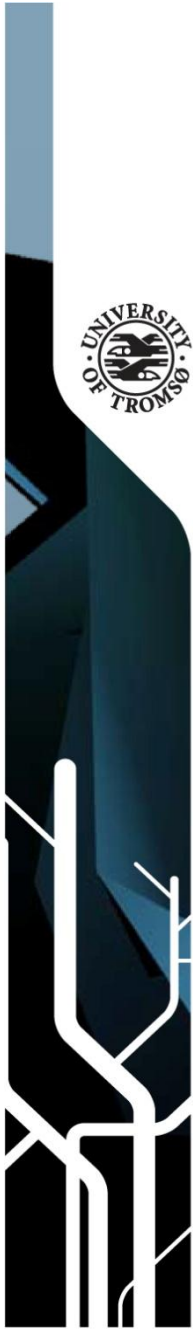
# Sediment evacuation area



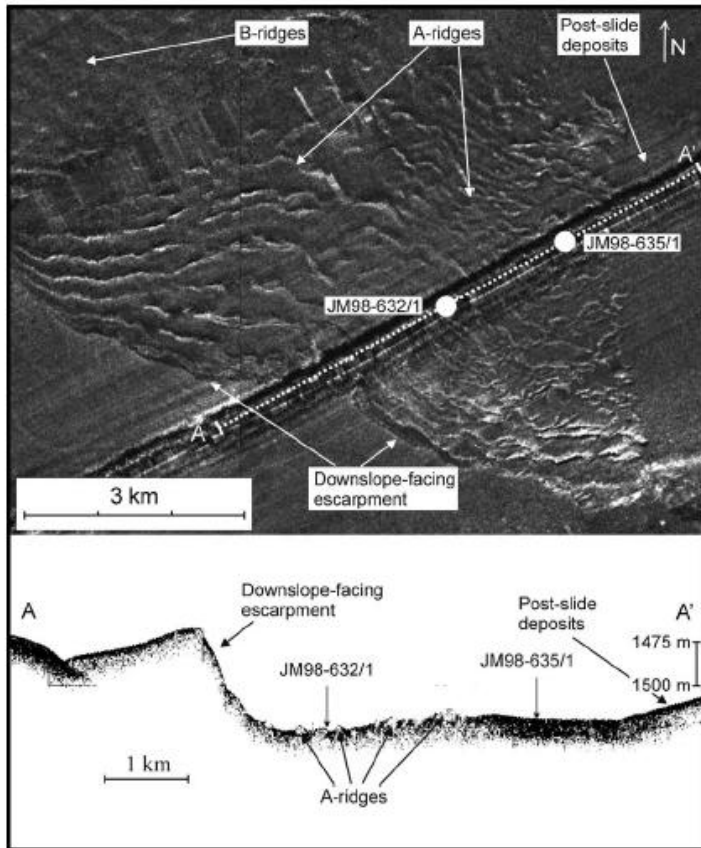
«Extentional»

Lindberg et al. (2004)

«Compressional»

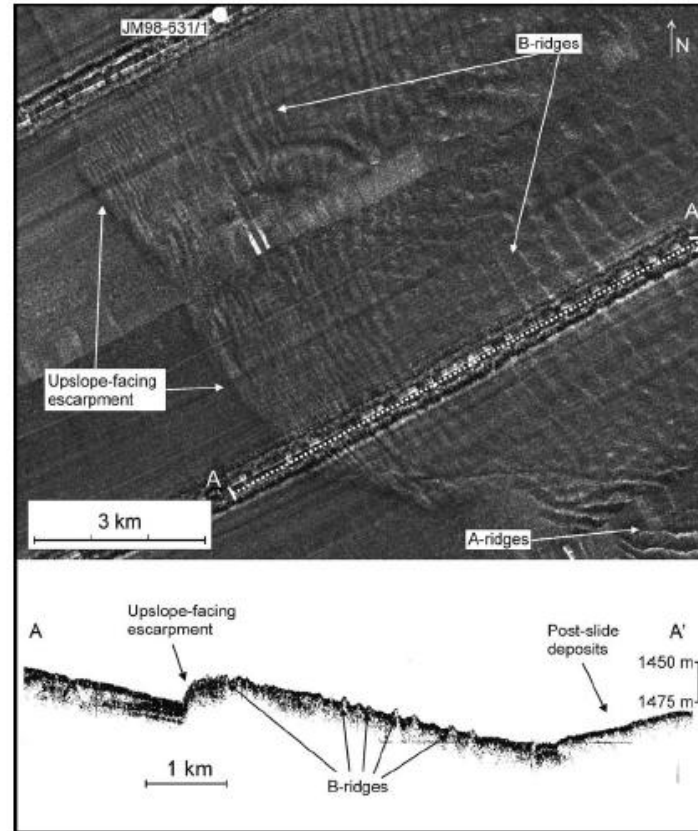


# Sediment evacuation area



«Extentional ridges»

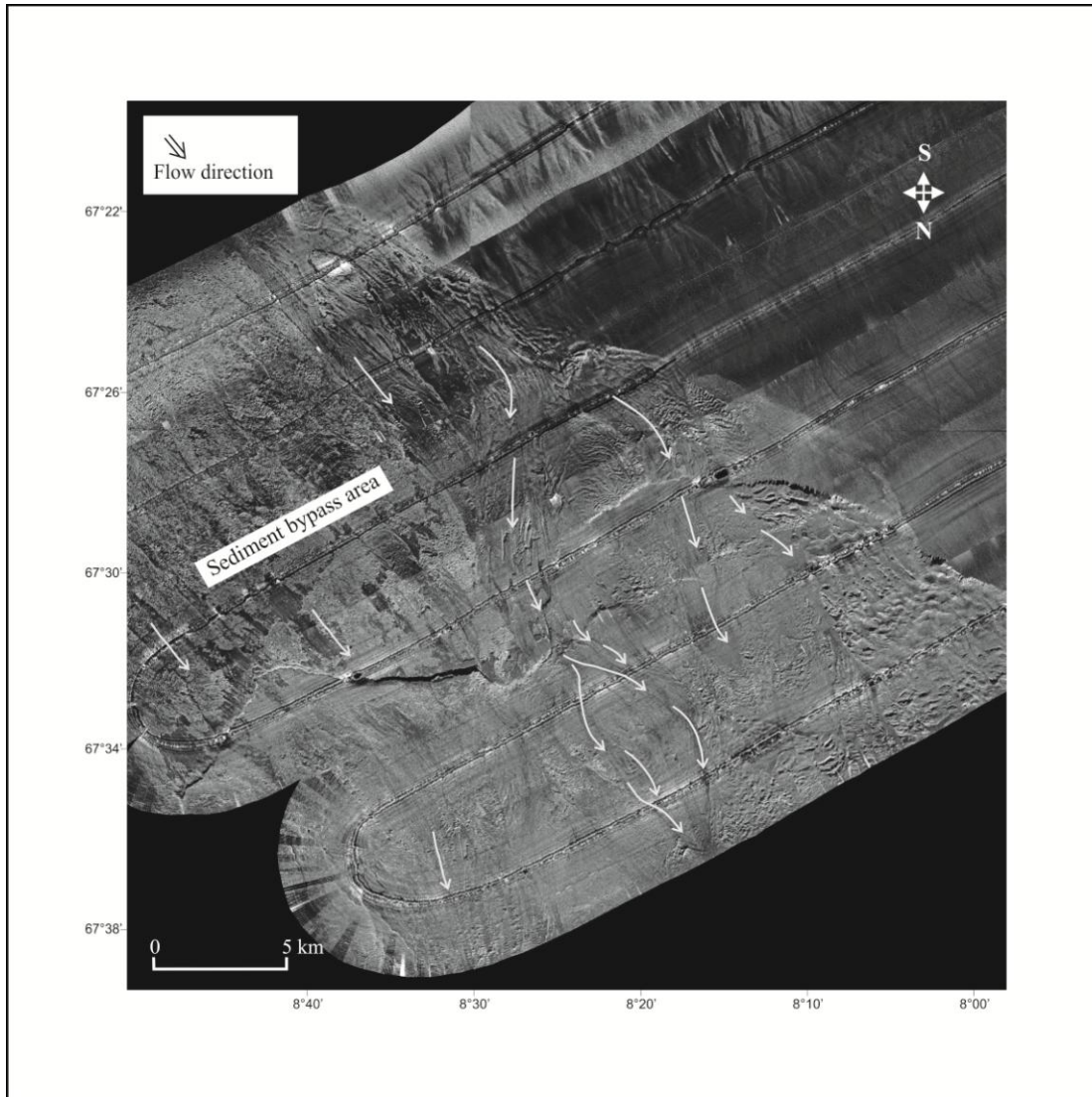
Lindberg et al. (2004)



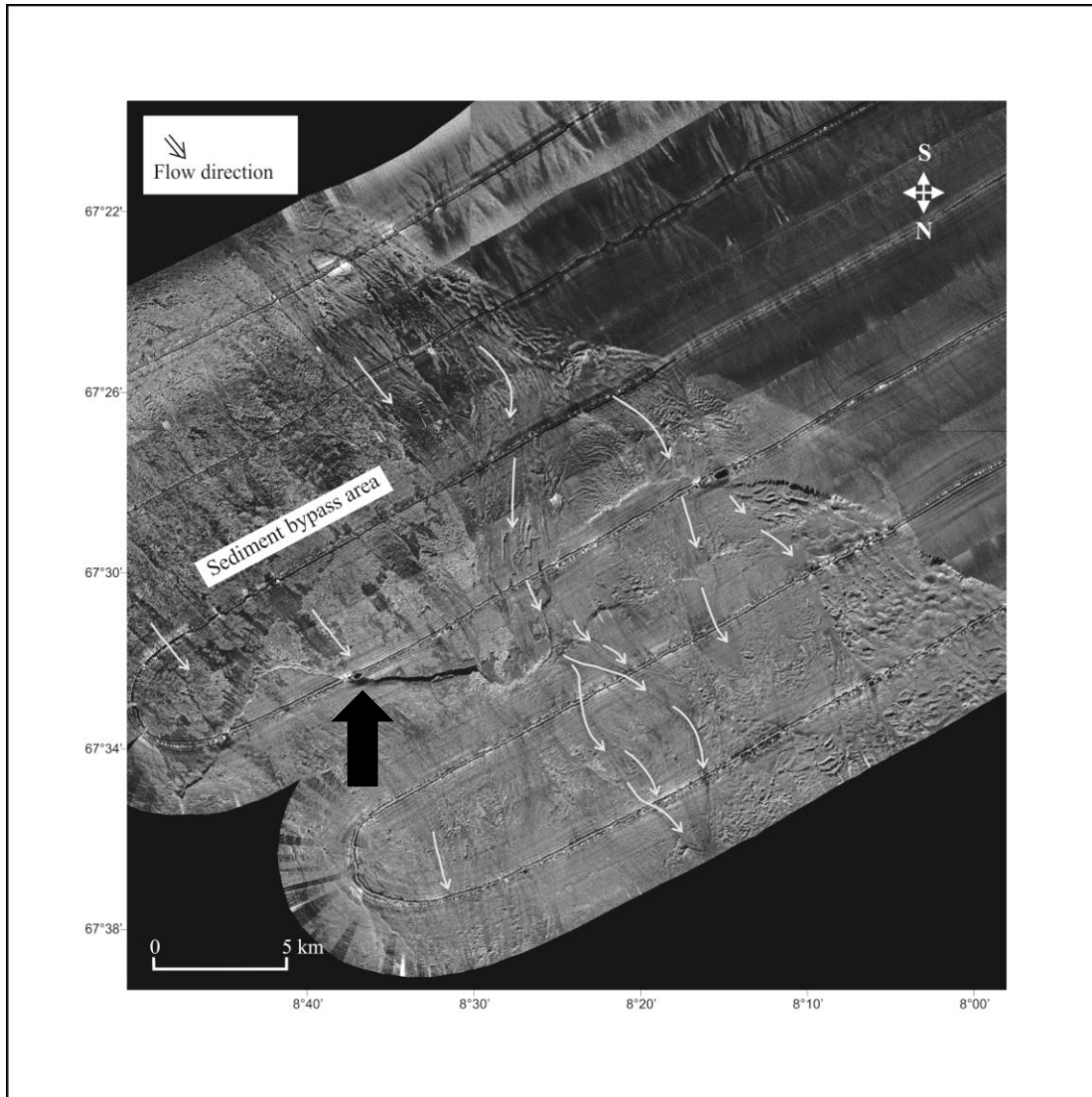
«Compressional ridges»



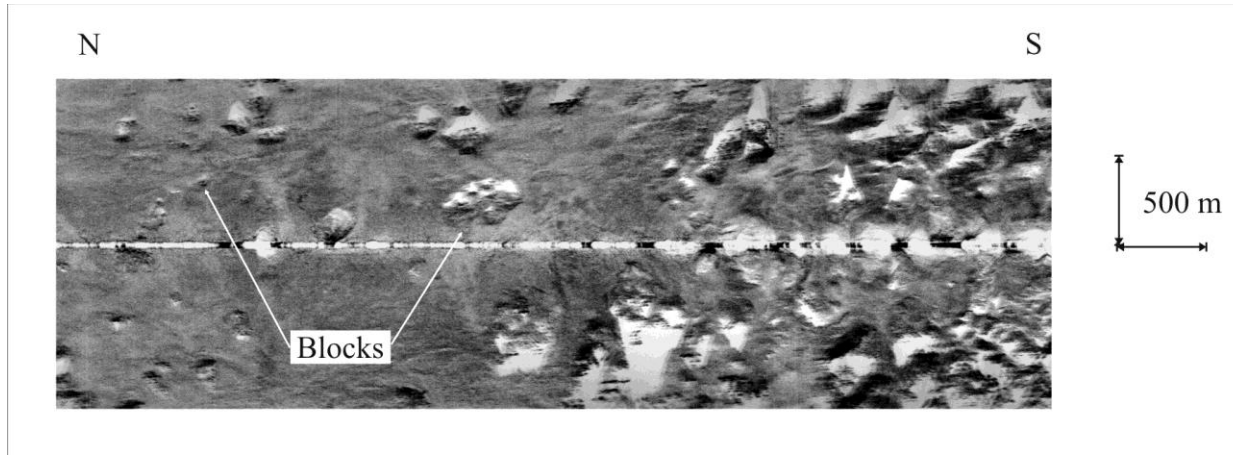
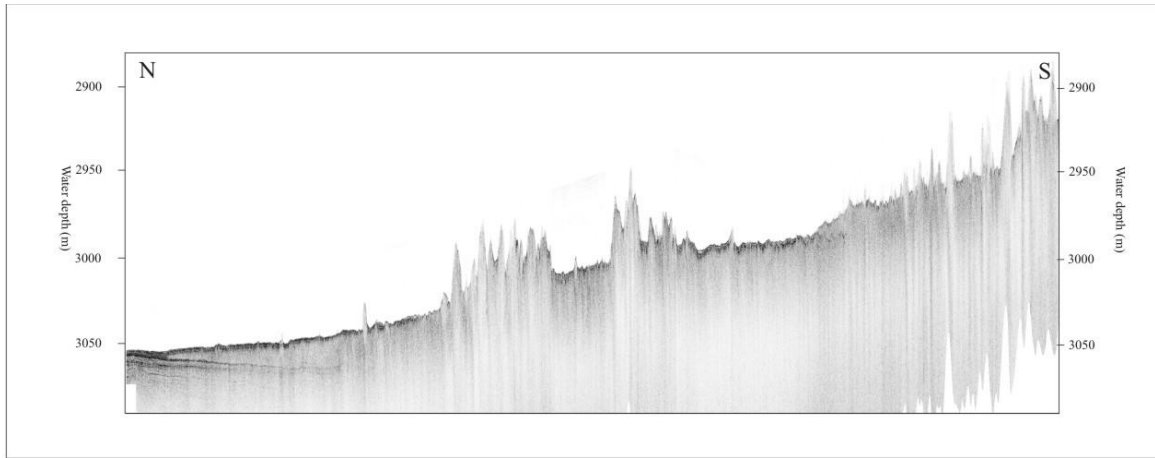
# Sediment evacuation/bypass area



# Sediment evacuation/bypass area

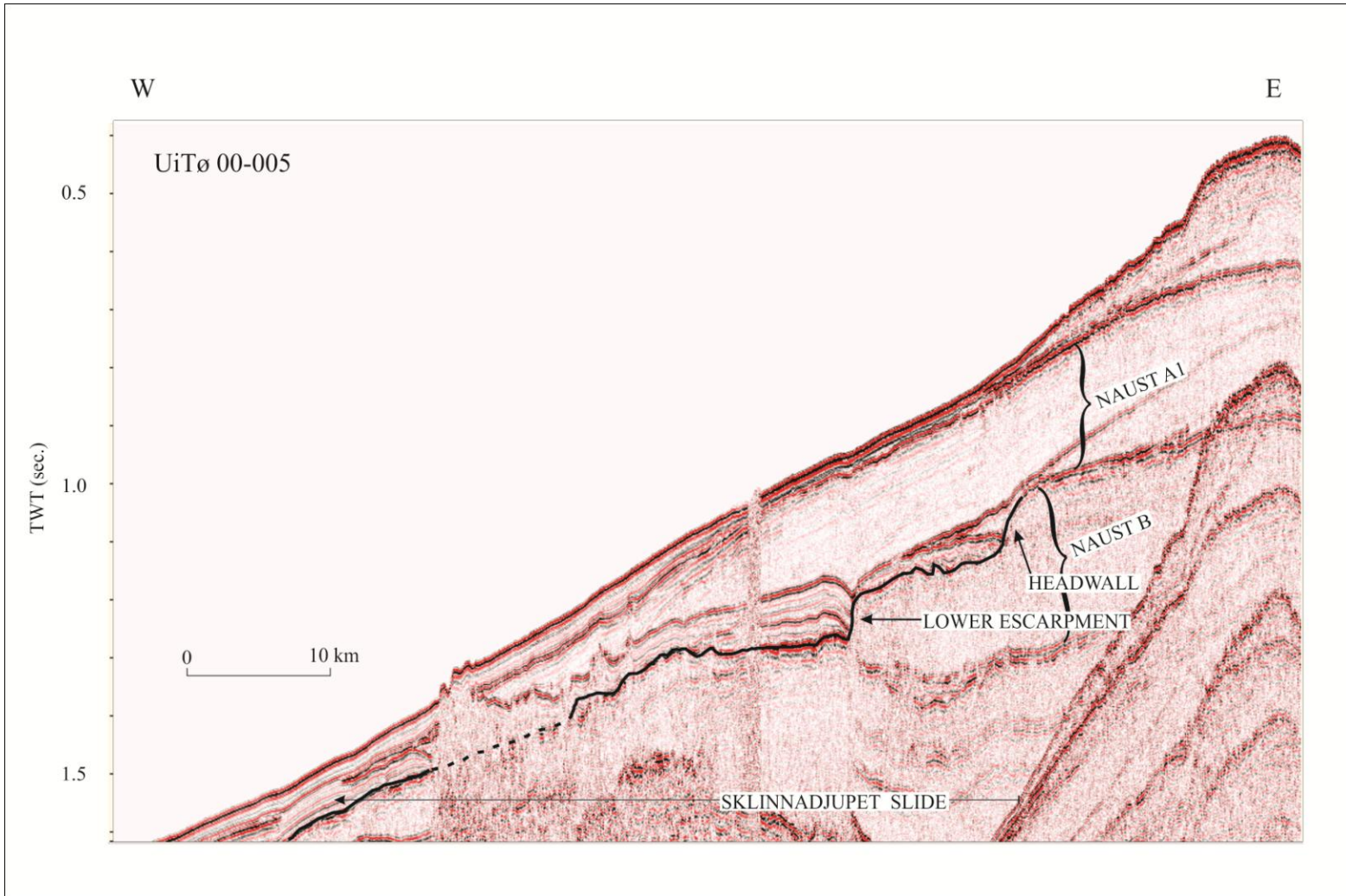


# Area of sediment deposition

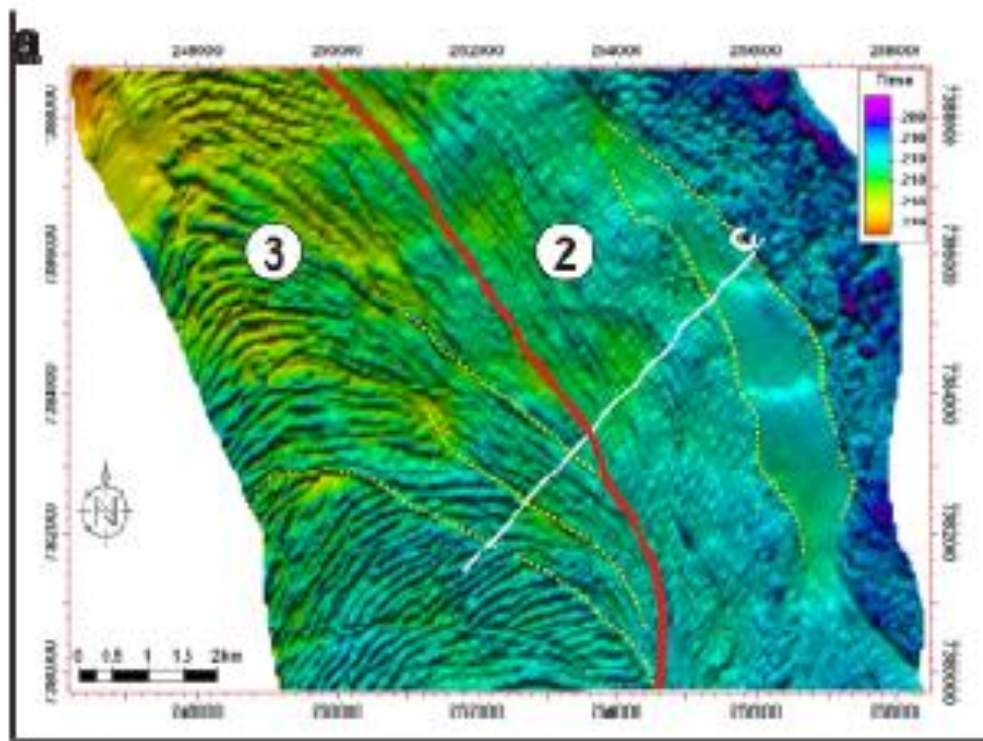




# Sediment evacuation area



# Area of sediment deposition



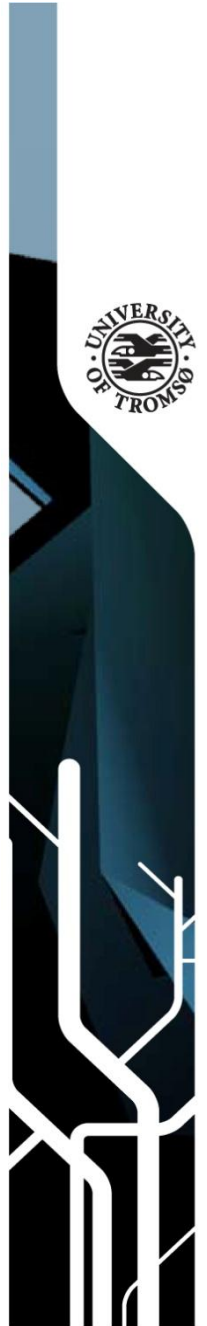
Johansen (2010)



# Summary



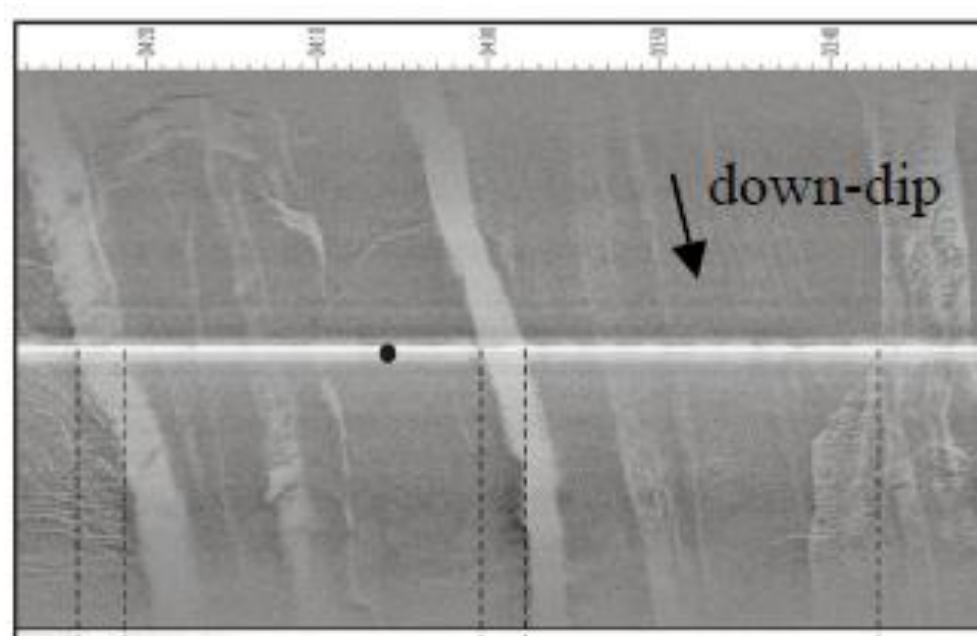
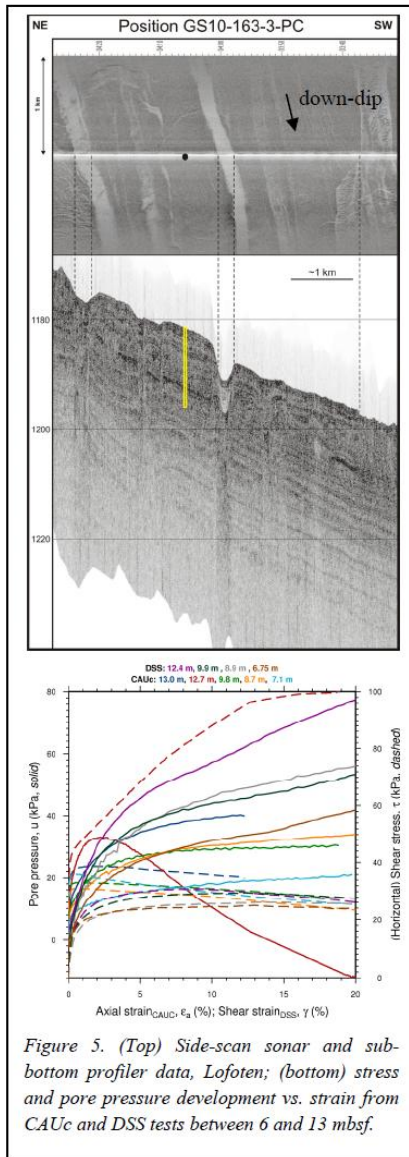
- *A very complex slide scar morphology that relates to the variations in sediment composition and physical properties*
- *The run-out, even on slopes of low gradient is extremely long*
- *In areas of buried slide scars as well as slide deposits; large variations in sediment composition and properties is to be expected over very short distances*



# Outlook



# Lofoten



Vanneste et al. (2011)