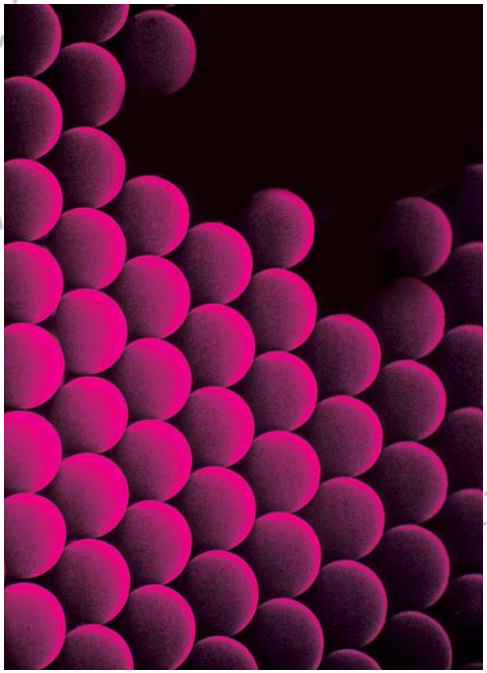
Norwegian University of Science and Technology

NTNU key figures (2010)



52 departments in **7** faculties
NTNU University Library
NTNU Museum of Natural History and Archaeology

10 587 student applications with NTNU as first choice
18 432 registered students, **6726** admitted in 2010
2 785 degrees awarded
260 doctoral degrees awarded (32 % women)
80% of Norway's M.Sc. degrees in Engineering are awarded by NTNU

4 935 person-years
3 075 employed in education and research; **596** full professors
Budget: **EUR 640 mill.**
590 000 m² owned and rented premises

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NTNU's six Strategic Research Areas

- **Energy and petroleum – resources and environment** – because energy use has to be sustainable and efficient

- **Medical Technology** – because health is one of our greatest challenges
- **Materials Science** – because materials are the basis for new technology
- **Marine and maritime research – because the ocean offers large quantities of unused resources and unexploited opportunities**
- **Information and communication technology** – because man has to communicate
- **Globalisation** – because the world is becoming a global village

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Brief statistics of petroleum education at Norwegian University of Science anTechnology

- NTNU established a petroleum department in 1973
- first class graduated in 1974 (crash course)
- around 2000 graduated sivilingeniørs and M.Sc.'s during 1974-2012
- 150 graduated Ph.D.´s during 1977-2012
- around 100 M.Sc.'s graduate per year
- around 10 Ph.D.´s graduate per year
- currently around 120 full-time teachers, staff, researchers
- currently around 400 students enrolled at B.Sc. and M.Sc. levels in Petroleum

Department of Petroleum Engineering and Applied Geophysics NTNU

Department Head: Jon Kleppe
Deputy Department Head: Martin Landrø
Administrative Head: Sylvi Vefsnmo

Staff

Technical/Administrative

Anne Lise Brekken
Solveig Johnsen
Tone Sanne
Turid Uvsløkk
Sylvi Vefsnmo
Madelein Wold

Knut Backe
Gunnar Bjerkan
Terje Bjerkan
Haakon Myhren
Roger Overaa
Lars Sandvik
Åge Sivertsen
Erlend Våtevik

Professors

Drilling

J. Eck-Olsen[3]
E. Fjær[2]
T. B. Gjersvik[2]
F. Godhavn[2]
R. Holt
A. Rødland
S. Sangesland
P. Skalle

Production

H. Asheim
M. Golan
J.Gudmundsson
H. Herfjord[1]

Reservoir

S. Dale[2]
R. Bratvold[2]
T. van Golf-Racht[1]
V. Hepsø[2]
O. S. Hustad[2]
L. Høier[2]
T. Aa. Jelmert
J. I. Jensen
J. Kleppe
H. Langeland
J. Å. Stensen[2]
O. Torsæter
C. H. Whitson

Applied Geophysics

P. Avseth[2]
L. Amundsen[2]
B. Arntsen
A. Bauer[2]
J. Ebbing[2]
P. A. Bjørkum[2]
K. Hokstad[2]
S. Johansen
M. Landrø
O. B. Lile[1]
C. Puigdefabregas[2]
P. Ringrose[2]
J. S. Rønning[2]
A.Stovas
E. Tjåland
B. Ursin

1) emeritus
2) Prof. II (20%)
3) Industrial lecturer

60 Post docs's and Ph.D candidates within exploration and production

Key academic research programs

- ROSE – The Rock-Seismic Program
- 4D Seismic – Reservoir Simulation Program
- Improved Oil Recovery Program
- Subsea Program
- New Drilling Methods Program
- Smart Fields/Integrated Operations Program
- Heavy Oil Recovery Program
- Drilling and Wells for Better Recovery
- CO_2 Sequestration Program

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Industry-supported geological field courses in the M.Sc. program

Geological field courses

Through a close cooperation with Statoil, BP and Shell, several specialized field courses have been developed over the past few years. The courses take place at Svalbard, in England, in the Pyrenees and in Oman.

Svalex Statoil

PetrOX bp

Pyrex Statoil

Omanex

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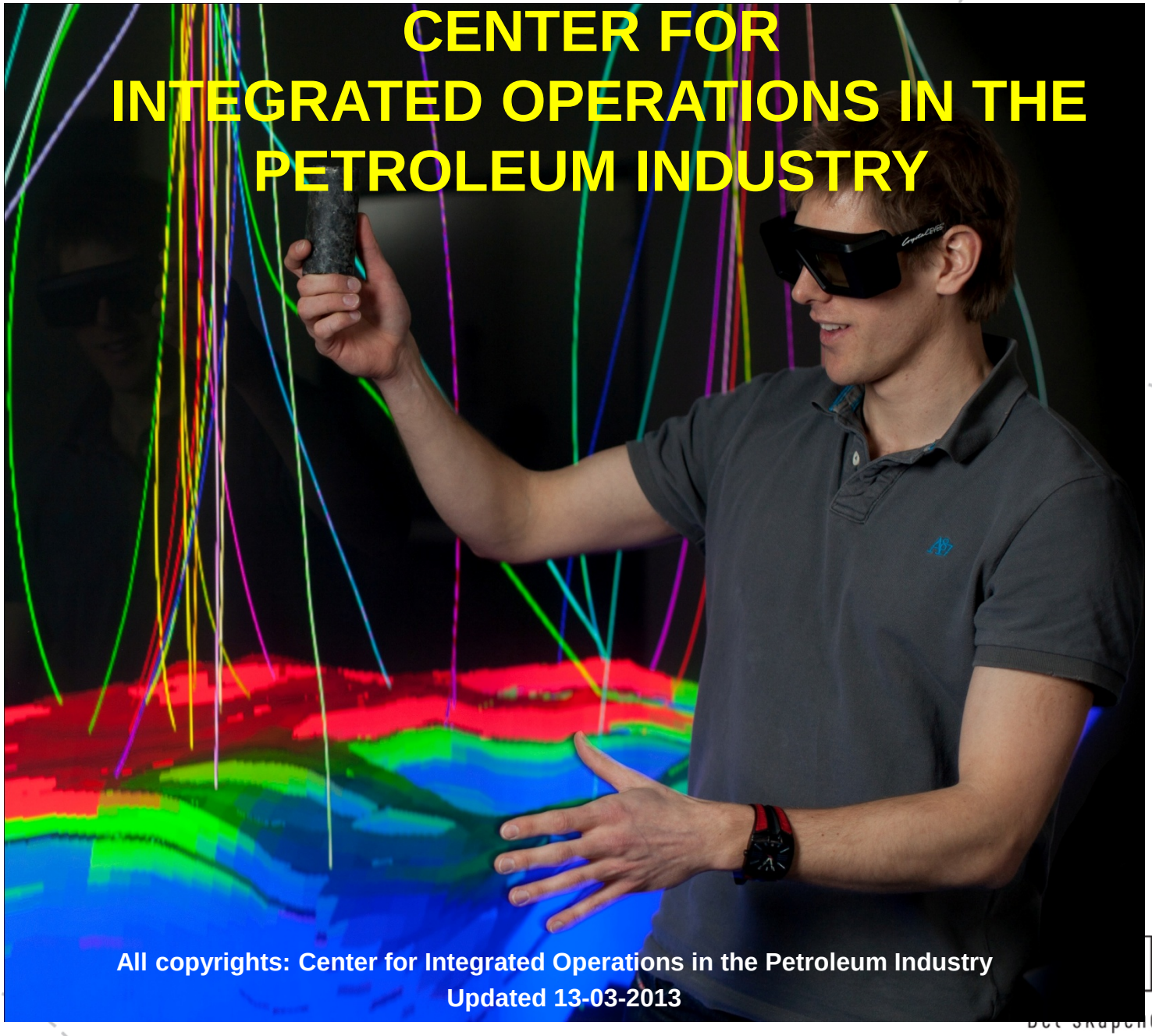
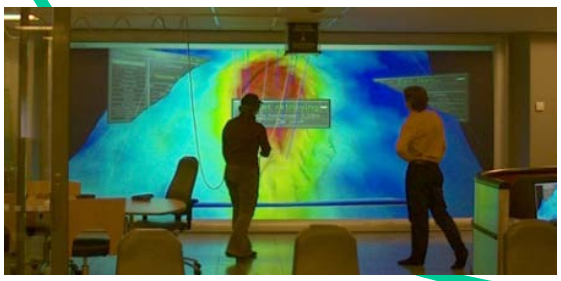


Integrated planning and execution

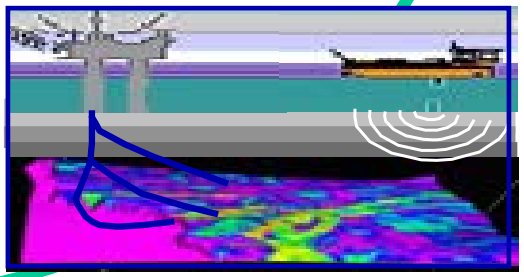
Decision processes across disciplines and organizational boundaries

Smarter Decisions
through
Integrated operations

Data acquisition
Communication



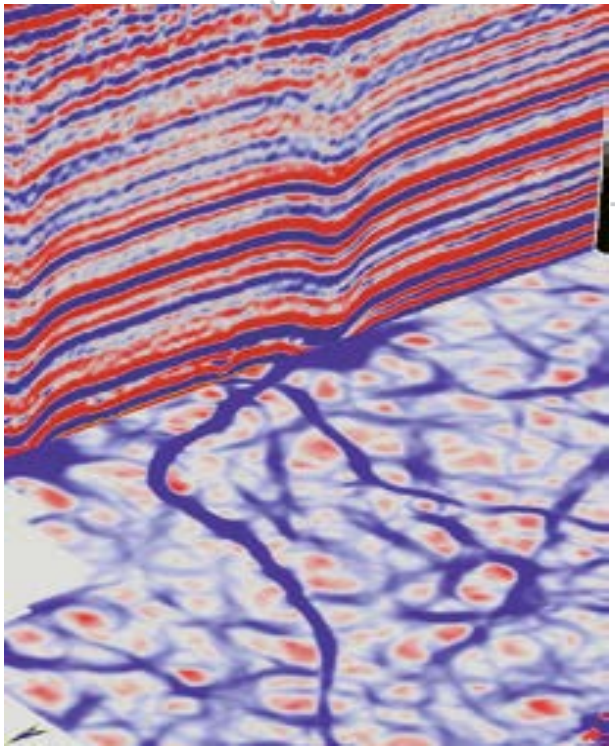
Visualization
Communication



Data processing, modeling, prediction
Decision support

Background Seismic Interpretation

- ✓ Close to 1000 candidates have been educated in seismic interpretation at NTNU
- ✓ More that fifty students attend this years basic seismic interpretation courses
- ✓ For a large number of Master and PhD students seismic interpretation is an important part of their thesis work
- ✓ IPT is member and has access to Diskos database



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Seismic Interpretation school

Co-operation between IPT and industry

- ✓ To give good and updated education we are dependent on co-operation with the industry
- ✓ Today we have excellent co-operation with many companies within seismic interpretation. We want to develop and expand this co-operation
- ✓ In the future we will organize our industry co-operation within *seismic interpreation education* in a consortium

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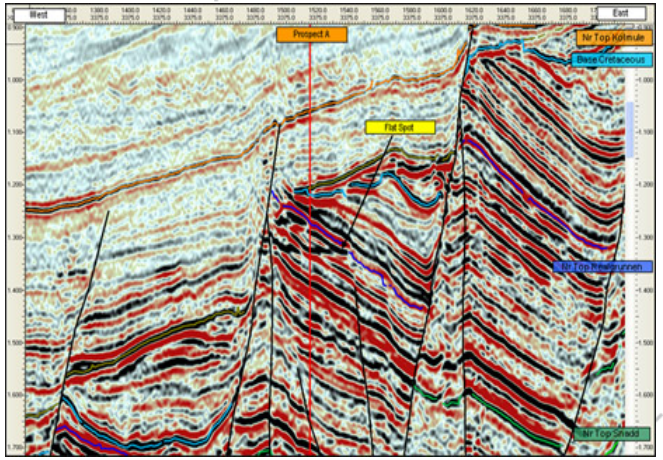
Seismic Interpretation school



Industry consortium in seismic interpretation education at NTNU

- ✓Seismic interpretation education at NTNU is organized through a consortium
- ✓Members from oil companies and service companies
- ✓The consortium build a data base of interpreted seismic data examples and case studies
- ✓ Seismic data base is open to members
- ✓The consortium gives courses to members
- ✓Also includes one to one co-operation between institute and company
- ✓The consortium arranges a yearly consortium meeting/conference

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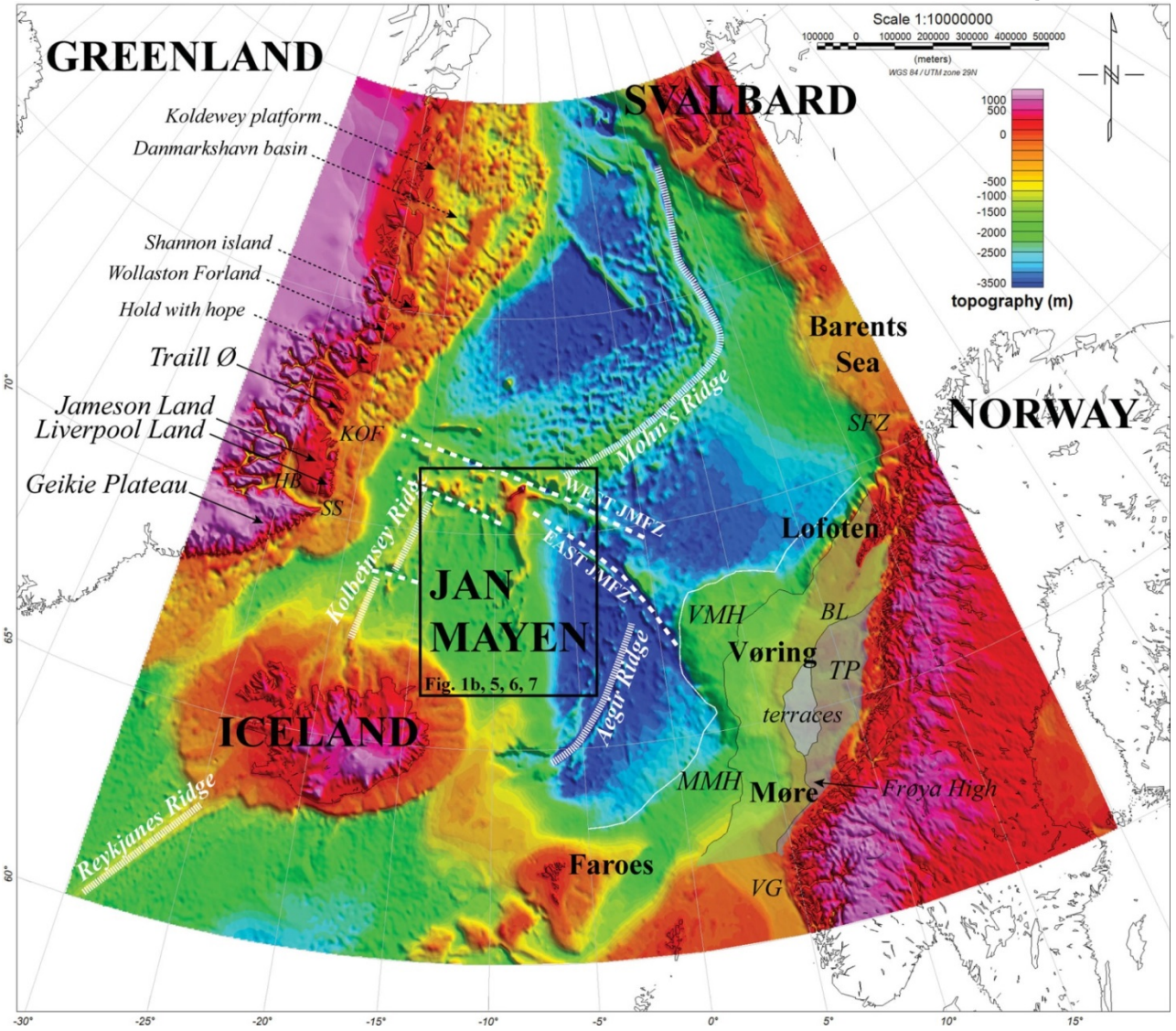
Nature and Distribution of Continental- and Oceanic Crust between Iceland and Jan Mayen

Background

- The detailed nature and distribution of continental- and oceanic crust between Iceland and Jan Mayen is not known.
- Improved mapping of this area is key to a better understanding of geodynamic processes and evolution of the North Atlantic margins.
- The results will also have important implications for HC exploration.



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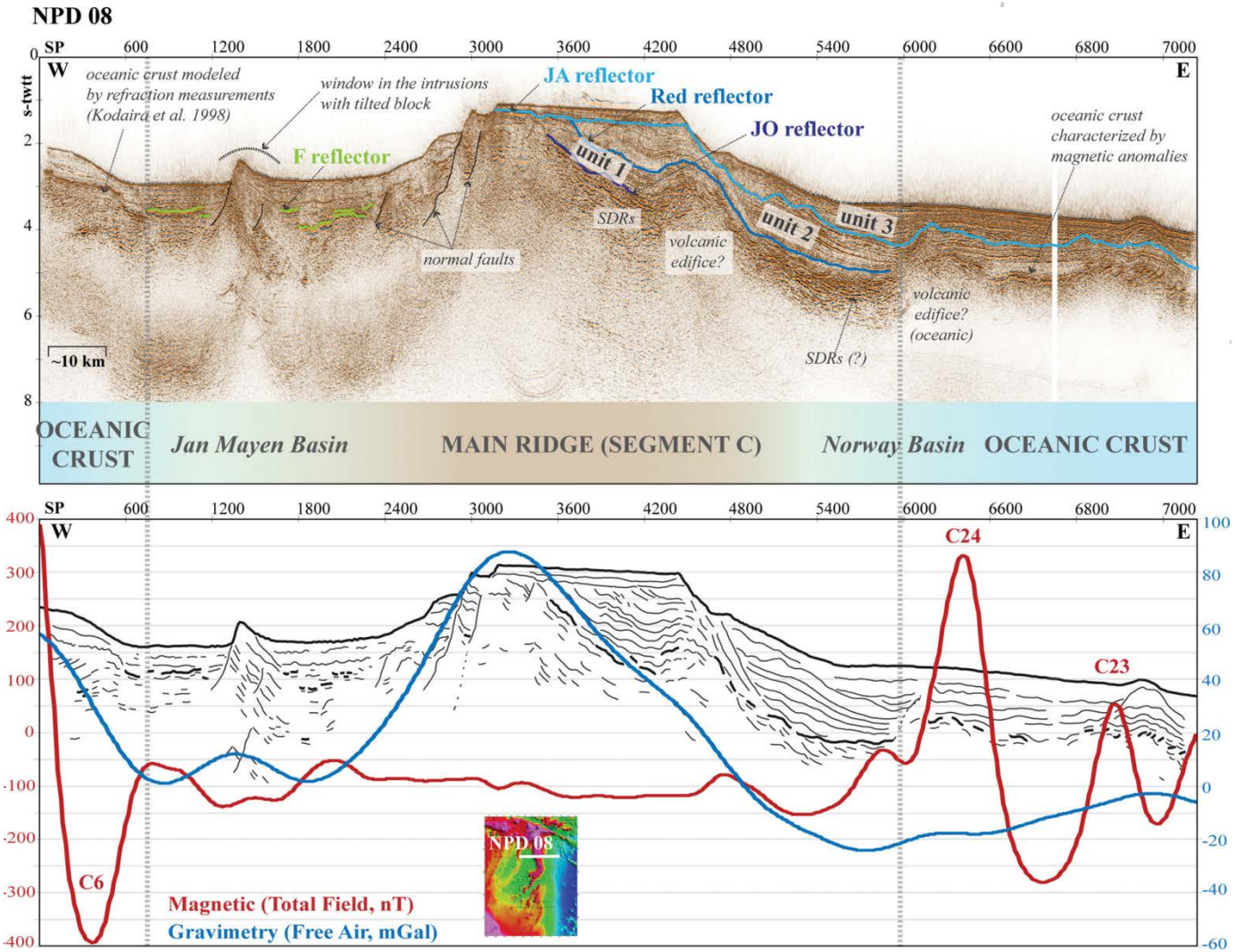

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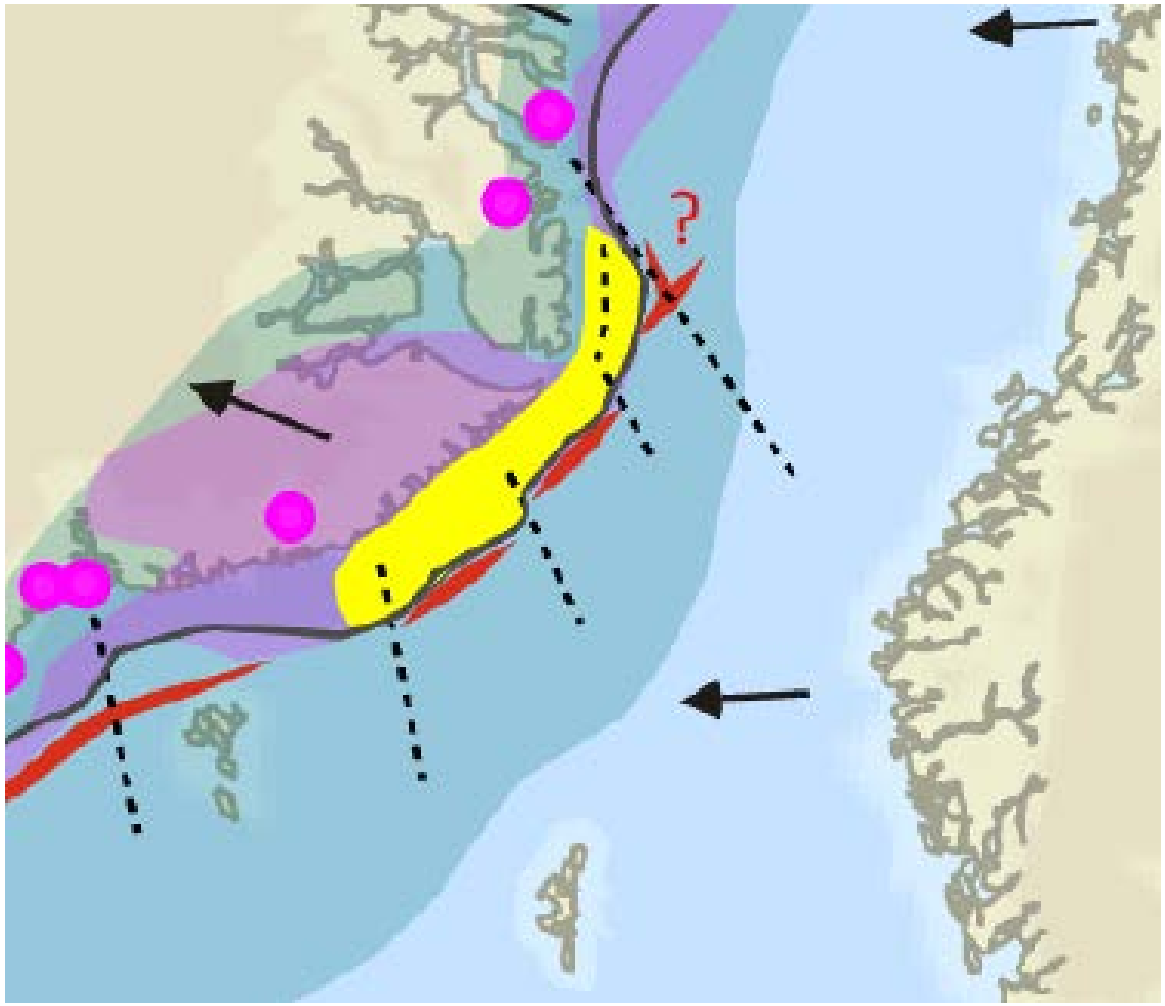

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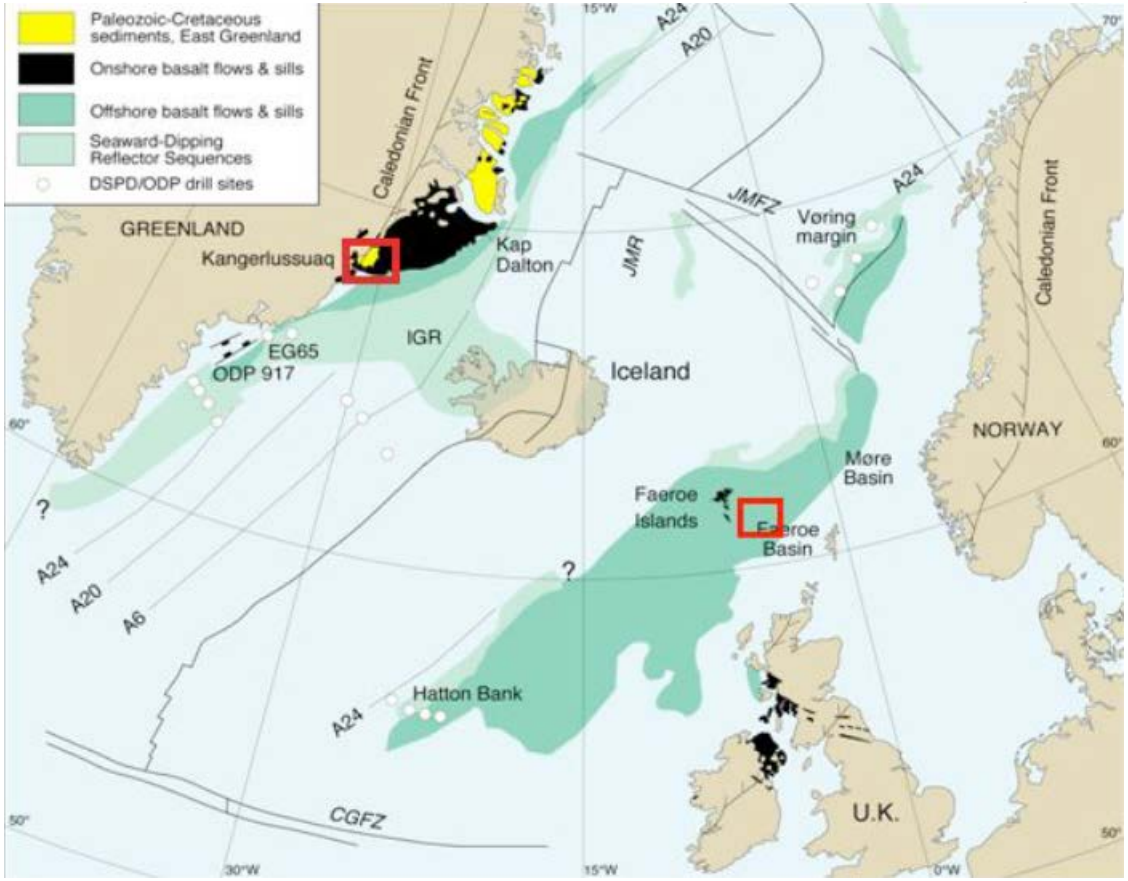

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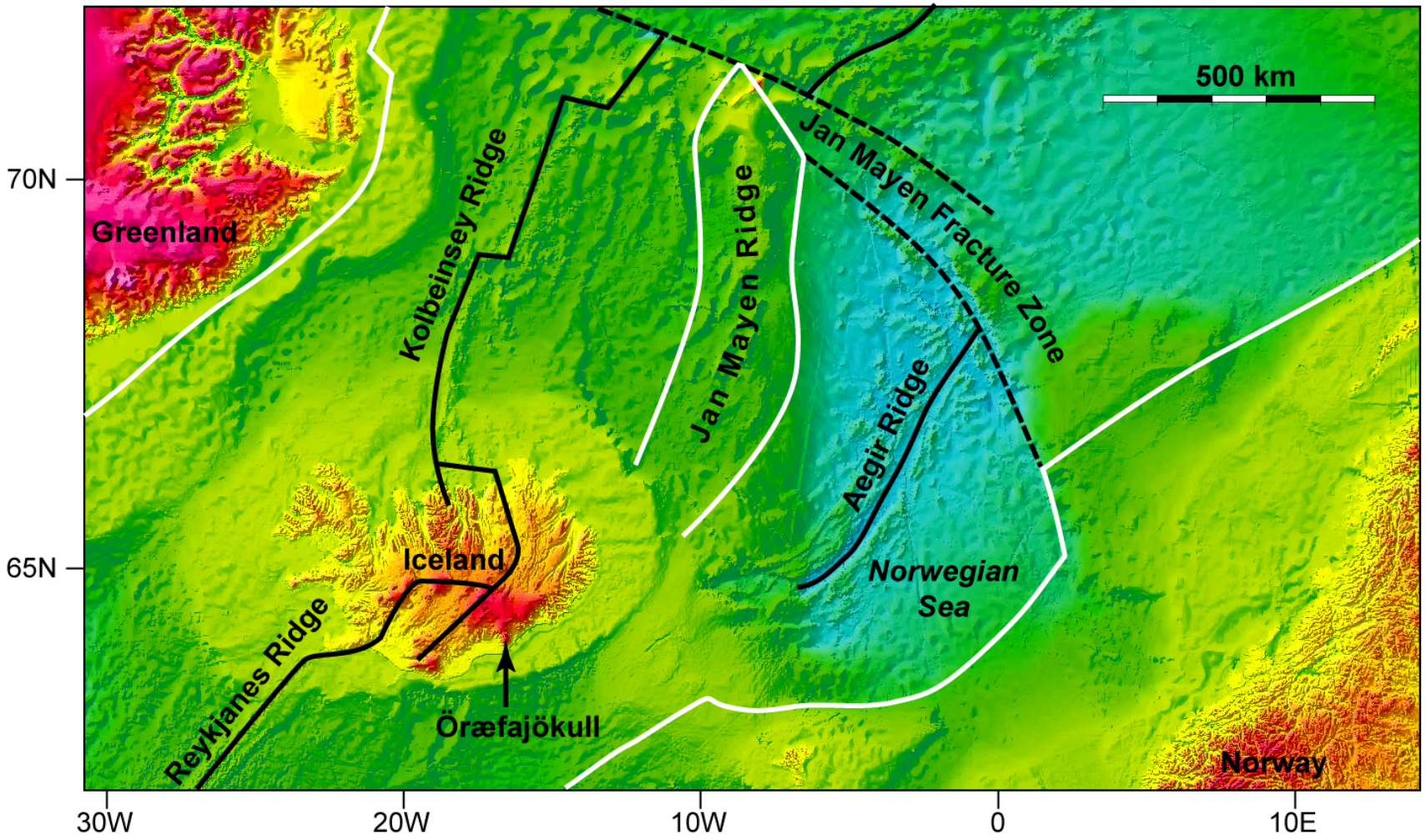
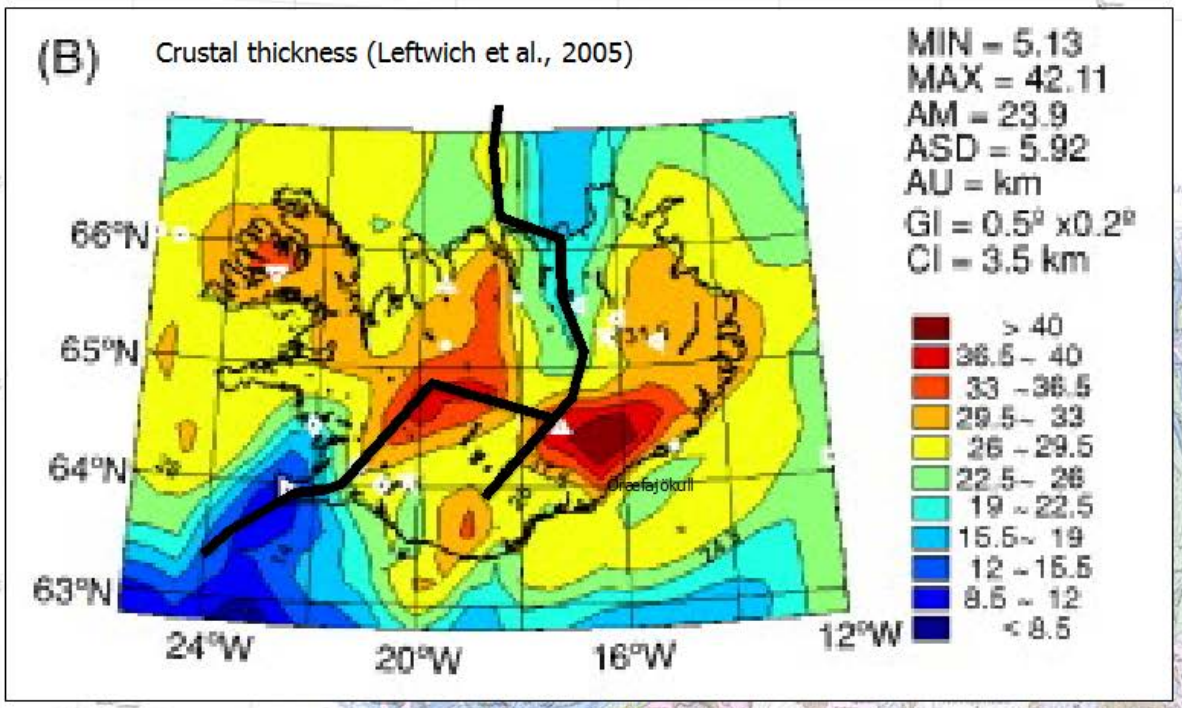

500 km
70N
65N
Greenland
Kolbeinsey Ridge
Jan Mayen Ridge
Jan Mayen Fracture Zone
Aegir Ridge
Iceland
Norwegian Sea
Reykjanes Ridge
Öræfajökull
Norway
30W
20W
10W
0
10E



★ Drill site criteria:
- Thick underlying crust in vicinity of Öræfajökull
- Minimum volcanic cover (oldest lavas exposed)
- Low heatflow (< 90 mW/m2, ≈ < 45 ° C/km)
- Close to main road/infrastructure

Project Goals – Data Acquisition

- **Regional mapping of the nature and distribution of continental- and oceanic crust between Iceland and Jan Mayen**
- **Acquisition of deep seimic sections and MCSEM- and MMT data between Island and Jan Mayen**
- **Tie-in between marine- and onshore geophysical data**
  - Possible acquisition of new geophysical data onshore (depending on existing onshore database)
- **Tie-in of geophysical and geological data onshore and offshore**
  - Possible drilling of research wells along acquired data lines onshore and offshore (depending on results of geophysical/geological studies)

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