



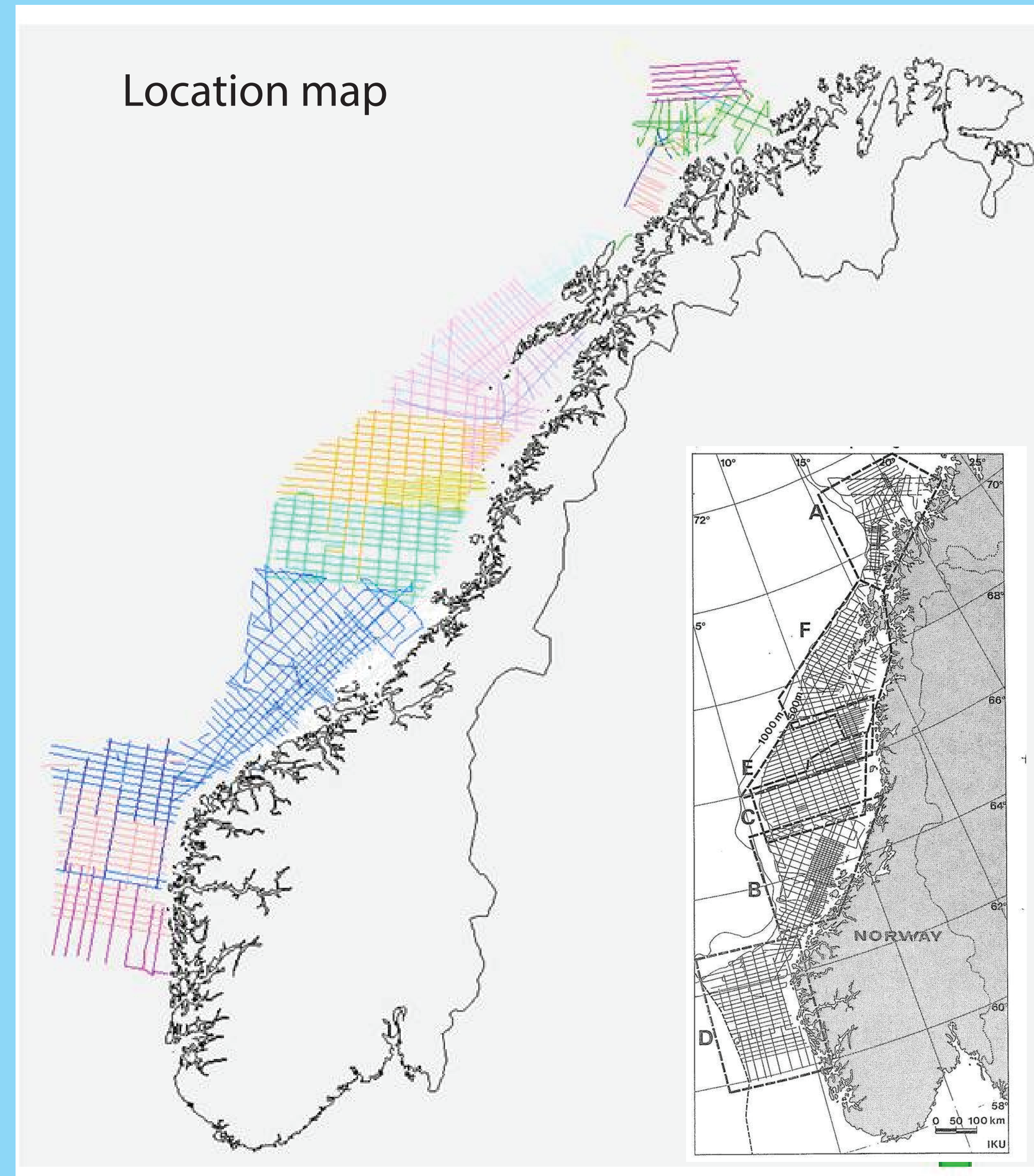
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The SPARDIG project - Transforming analogue sparker records from the Norwegian continental shelf into SEG-Y format

First results

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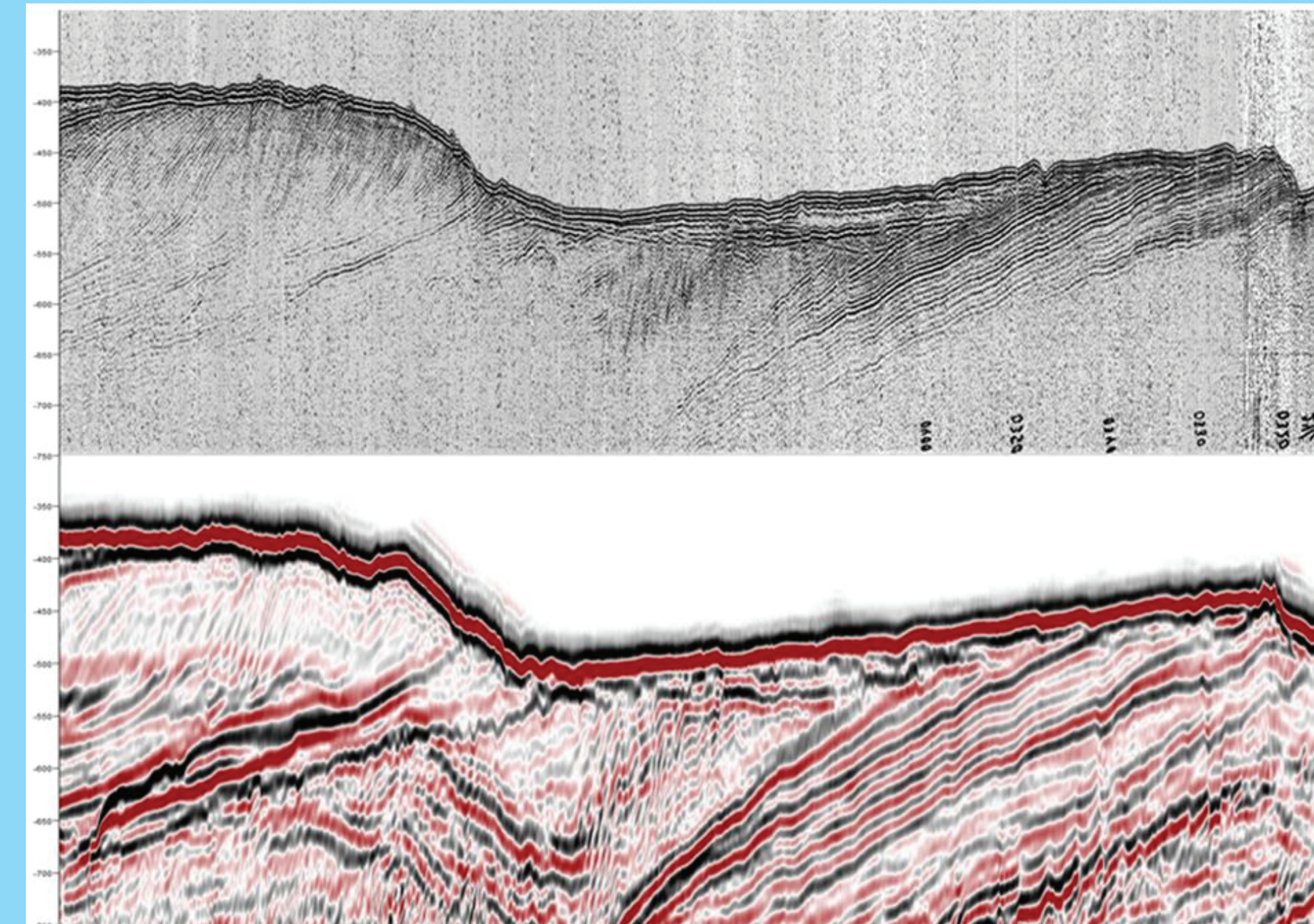


THE DATA

- Sparker lines from the Norwegian continental shelf, 1970-1982
- Acquired by IKU (Sintef Petroleum Research)
- Responsibility transferred to NGU in 1998
- Data were sold in 6 packages
- Mainly Decca Main Chain navigation

THE SPARDIG PROJECT: SEG-Y CONVERSION

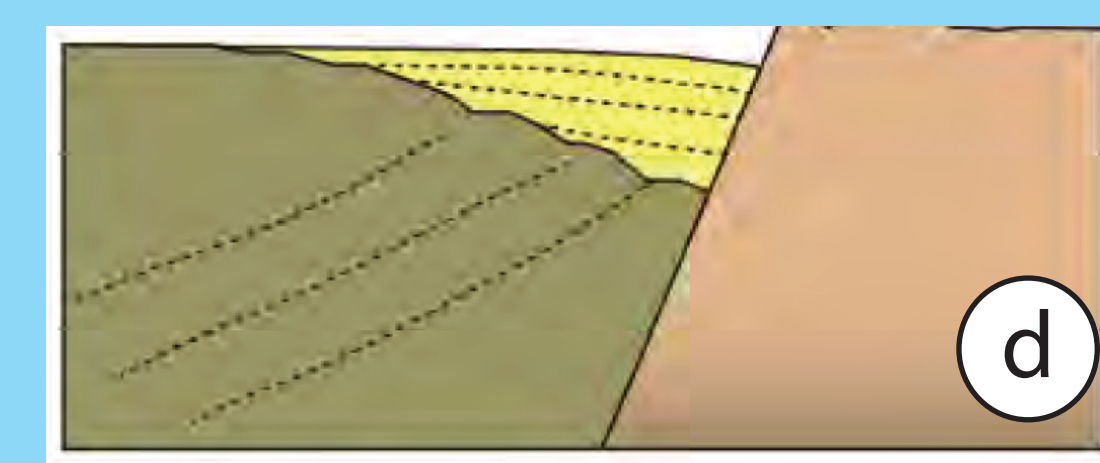
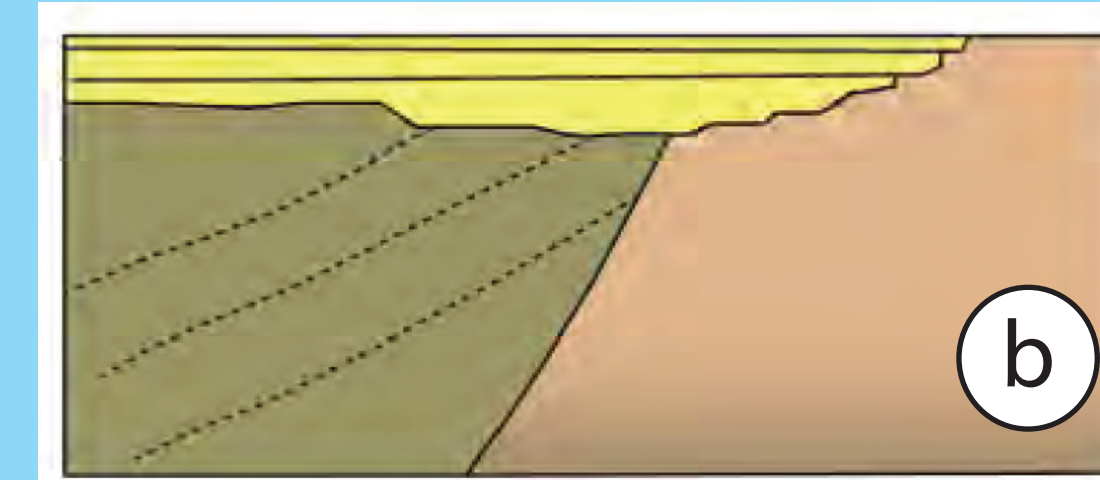
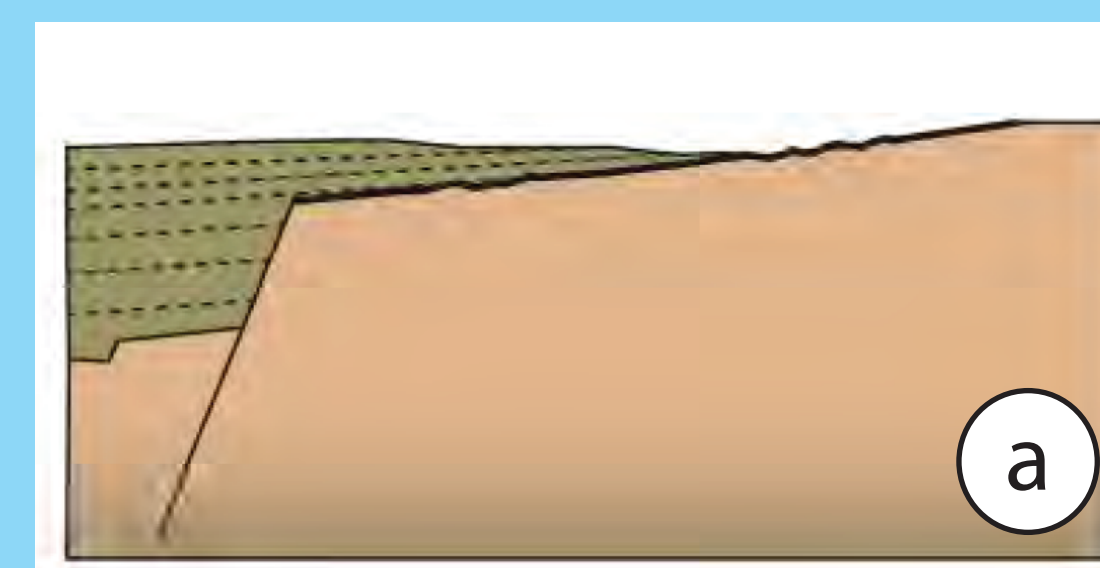
- Supported by NGU, AkerBP (Det Norske), Lundin Norway, Seabed Project
- IPGS converted 374 rolls of analogue lines, representing 31 261 km (+3 500 000 traces)
- Workflow: scanning at 600dpi, conversion into SEG-Y with SeisTrans software (Caldera), introduction of navigation into headers, QC
- SEG-Y files delivered to the Norwegian Discos National Repository



COMPARISON OF IKU SPARKER AND 2D SEISMIC

IKU sparker lines have commonly a higher resolution than 2D image, but the penetration is limited. Sparker and conventional data image the subsurface differently, but the data sets are supplementary to each other.

On figure left, the NW-SE sparker line B73-153 off mid Norway shown together with the parallel 2D line MND84NHR01 (ca. 500m apart) imaged in the same scale. Note the thin Quaternary overburden best imaged on the sparker line.



TYPES OF CONTACT RELATIONSHIPS BETWEEN SEDIMENTS AND CRYSTALLINE BASEMENT (BSC)

The different contact relationships have different implications with respect to saprolite preservation as well as for possible Quaternary movements on inherited faults.

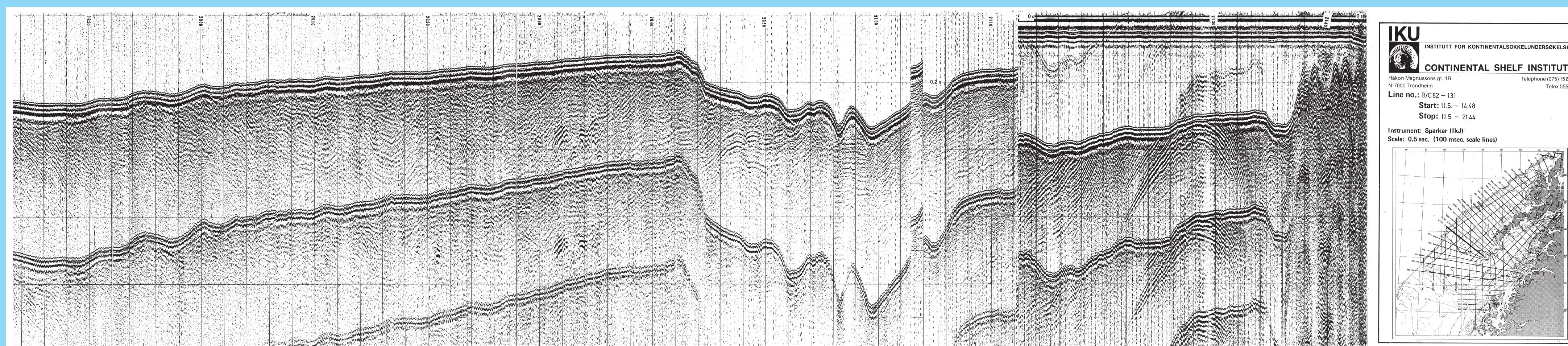
- a) basement surface conformably overlain or onlapped at a very low angle by pre-Cretaceous sedimentary rocks
- b) erosion into old fault scarps; overlying sediments represent Mesozoic or draping Quaternary deposits
- c) fault scarp at the seafloor without draping sediments. The scarp morphology may result from differential (glacial) erosion, or from relatively young faulting events
- d) Fault scarp with Quaternary basin and/or warped seafloor morphology.

Exposure of weathered basement at the seafloor and juxtaposition of basement and sediments across inherited faults were observed up to several kilometers along strike.

These relationships provide important links to the deeper structure and stratigraphy of the Mid-Norwegian margin.

A suite of triangular Quaternary basins observed along the basement-sediment contact in the Møre area highlights the need to investigate further the possibility of Quaternary fault reactivation.

Yellow: Quaternary sediments. Green: mainly Mesozoic sediments. Brown: continental crystalline crust



TOP:

Original image

LEFT:

Seismic display of SEG-Y file

CONCLUSION

The SPARDIG project secured a national treasure for future investigations. This type of high-resolution regional grid will probably never be collected again. The SEG-Y transformed sparker together with available 2D seismic data and high resolution bathymetric data sets will have a large potential for improved geological regional mapping of the upper layers of the seabed, and the study of possible Quaternary fault reactivation.

REFERENCES

- Chand et al. 2016 - Transforming analogue sparker records from the Norwegian continental shelf into SEG-Y format. Technical report, Spardig project, 2016.038, http://www.ngu.no/upload/Publikasjoner/Rapporter/2016/2016_038.pdf.
- Miles et al., 2007 - Resurrecting vintage paper seismic records. Mar Geophys Res 28, 319-329, DOI:10.1007/s11001-007-9034-5.