SHARP Storage

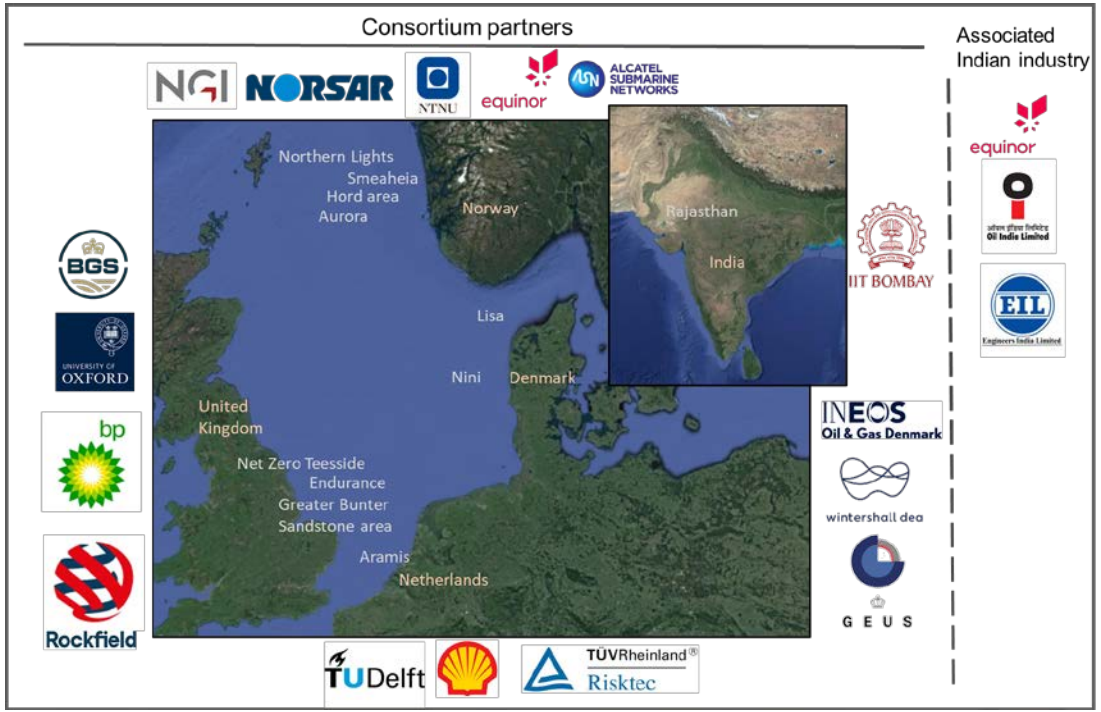
Stress history and reservoir pressure for improved quantification of CO_2 storage containment risks

Rotterdam, June 9th, 2022

Dr. Elin Skurtveit, project coordinator

SHARP Consortium

- **Norway:** NGI, Equinor, Norsar, NTNU, Alcatel (ASN)
- **UK:** U.Oxford, Rockfield, BGS, BP
- **Denmark:** GEUS, INEOS, WintershallDea
- **Netherlands:** TU Delft, Risktec, Shell
- **India:** IIT Bombay, Equinor, EIL, Oil India, Shell



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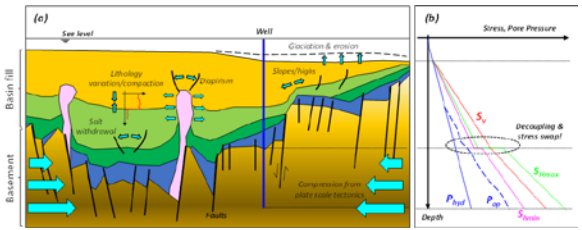
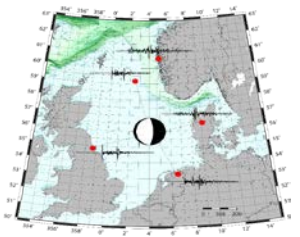
SHARP main aim

The overall aim is to increase the accuracy of subsurface CO_2 storage containment risk management through the improvement and integration of subsurface stress models, rock mechanical failure and seismicity observations





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Background for SHARP project

To reach climate goals, gigatonne-per-year scale CO_2 injection is critical

Uncertainties related to the geomechanical response of CO_2 injection is high

There is potential to improve the risk assessment integrating stress field observations, rock failure models and seismicity data

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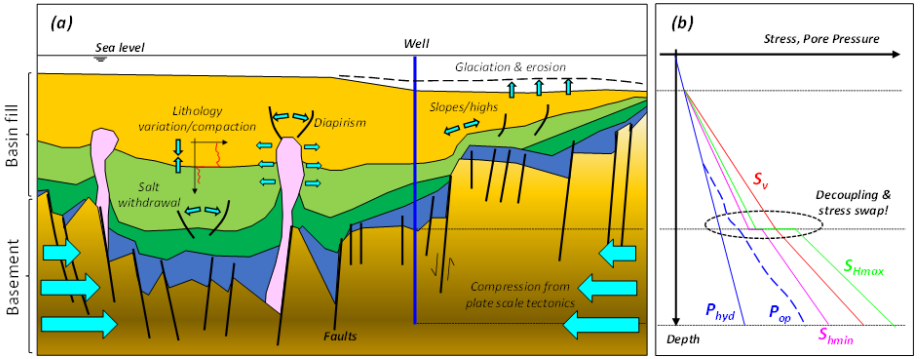
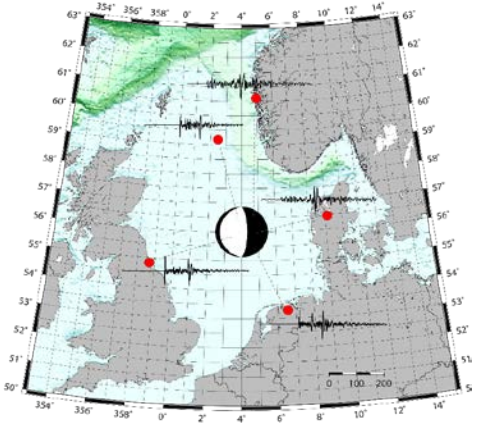
Objective

- Basin- and site-scale geomechanical models for the North Sea
- New integrated earthquake catalogues and stress maps
- Characterize deformation, failure, flow and seismic properties





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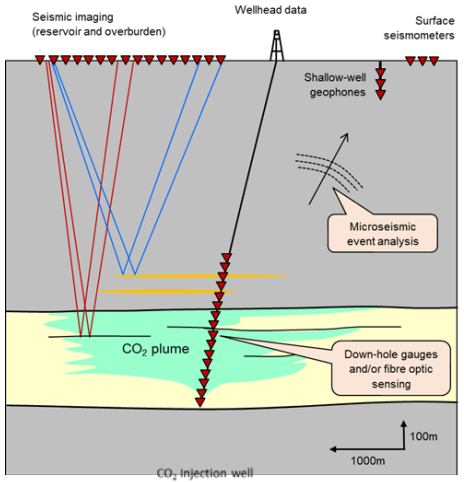
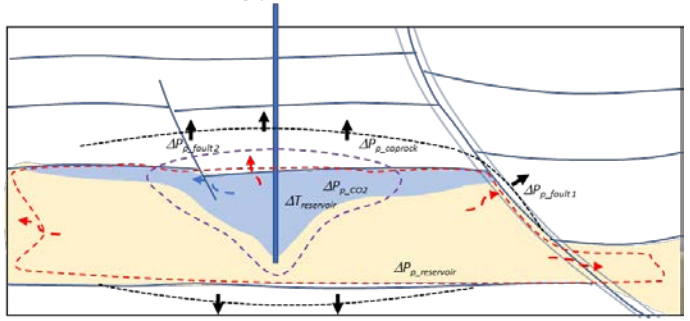
Objective

- Cost-effective strategies for monitoring induced seismicity “right time-right place”
- Improve sub-surface risk management
- Communicate technology development on containment risk to industry and regulators





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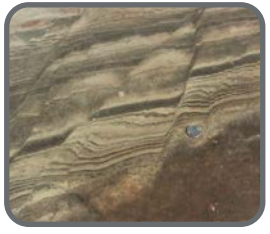
Case studies for value demonstration

UK: Greater Bunter Sandstone

Salt tectonics and stress



Norway: Horda area Aurora and Smeaheia

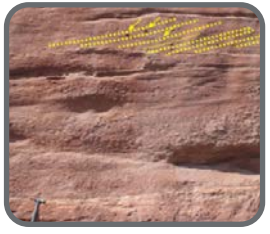
Mature area for data integration

Denmark: Lisa and Nini field

Seismic hazard and monitoring

Netherlands: Aramis

Risk assessment of depleted fields



India: Rajasthan

Developing new CCS project

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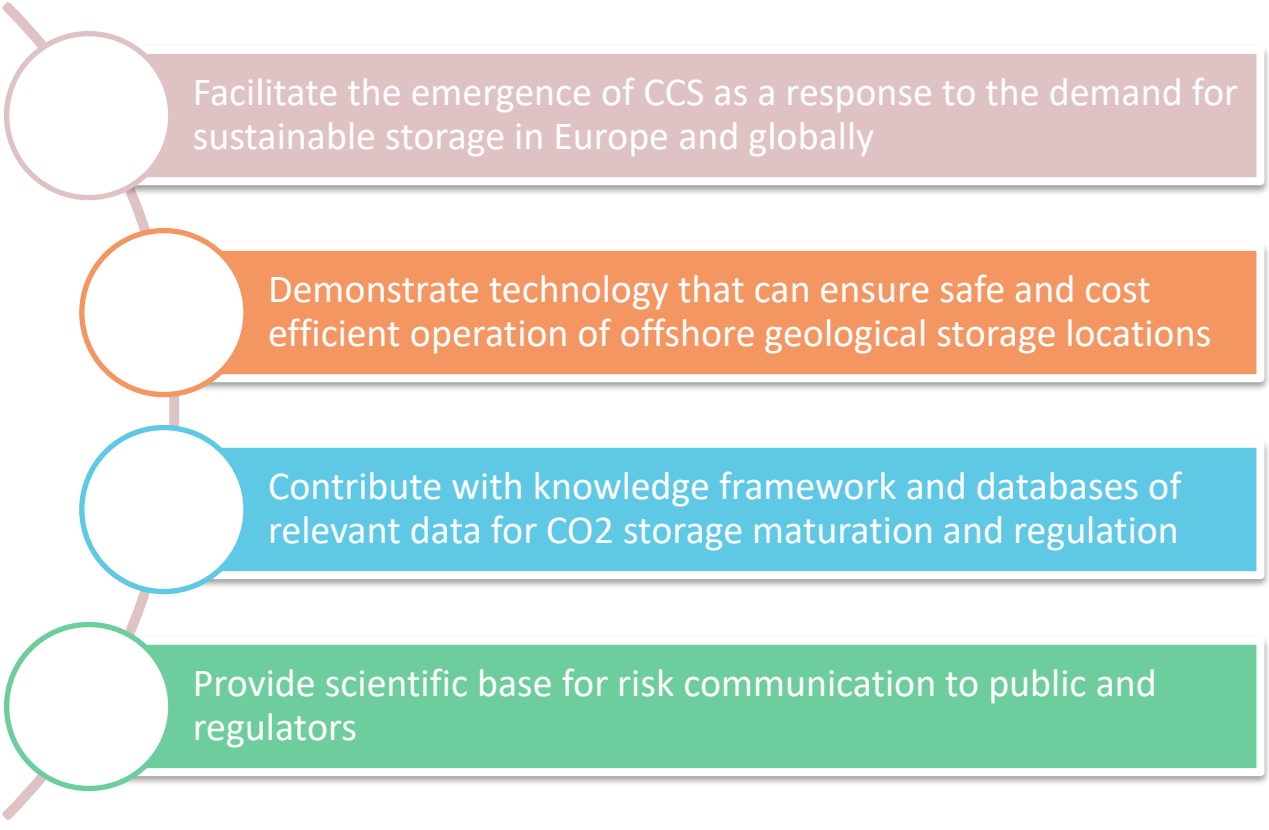
Impact



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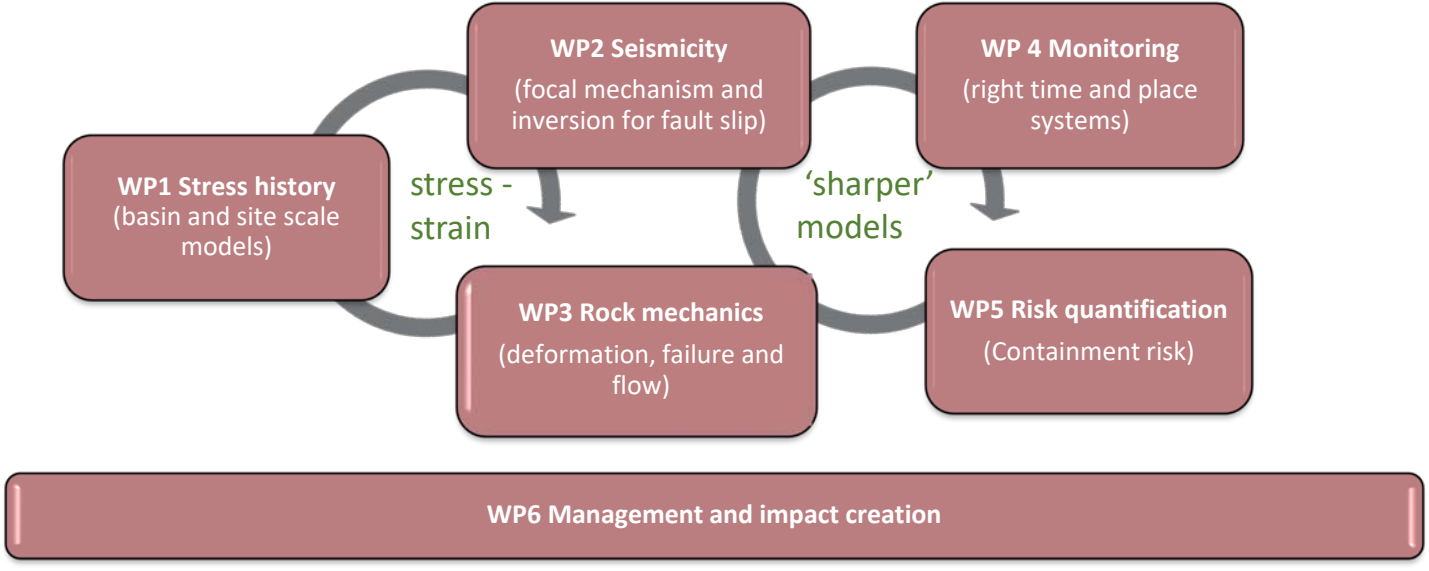
SHARP WP structure



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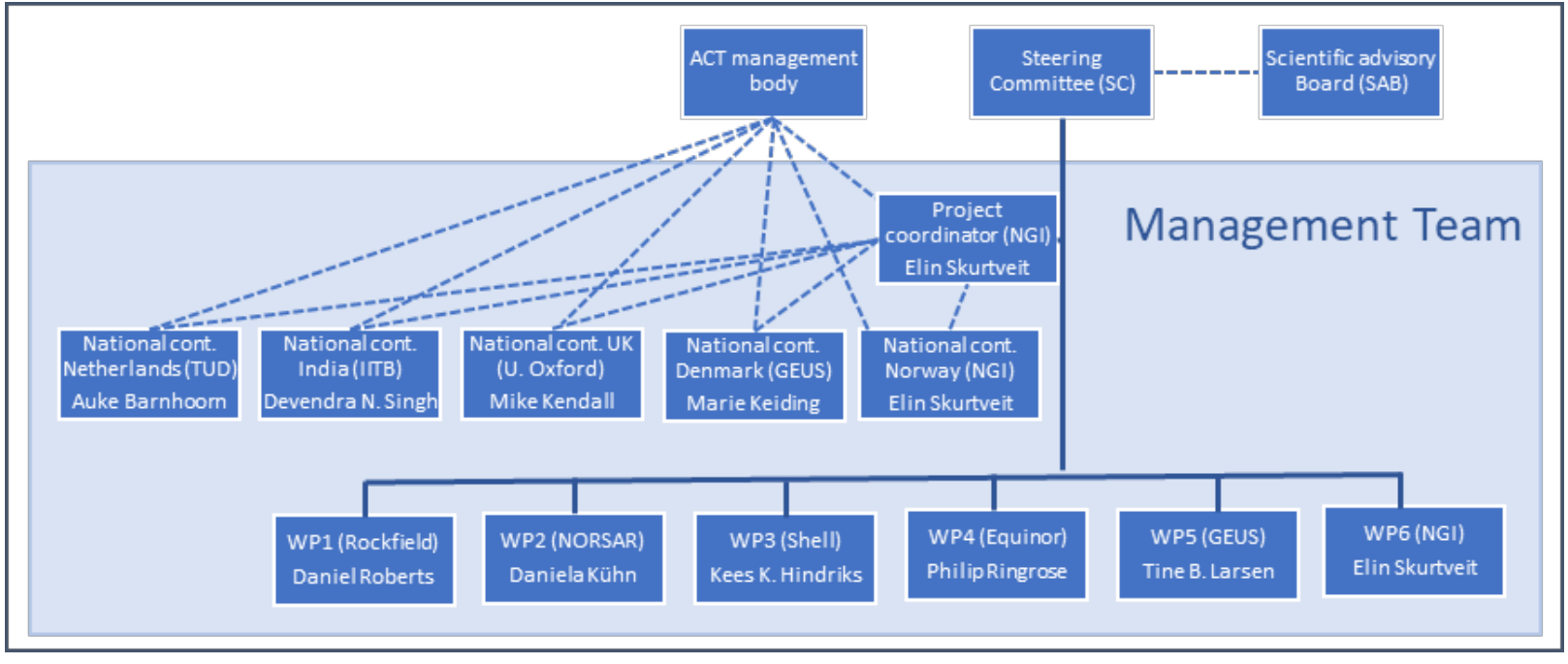
SHARP management structure



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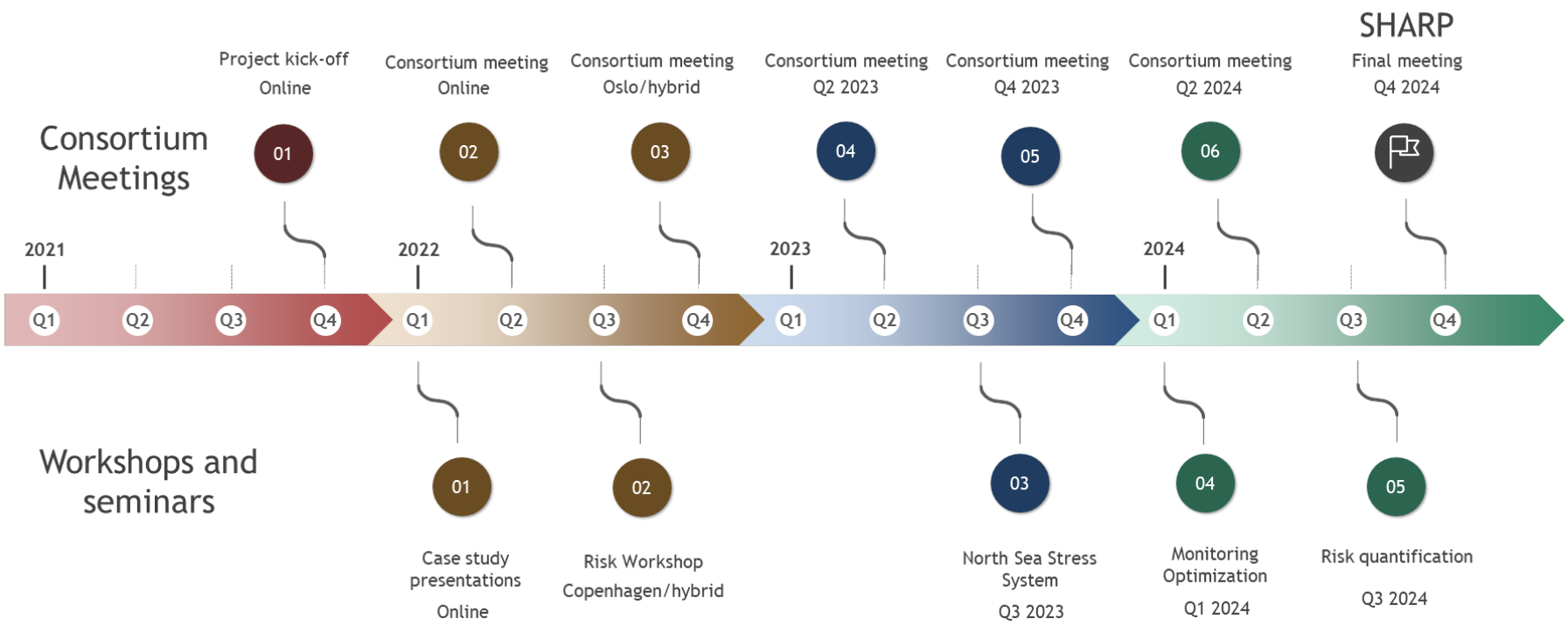
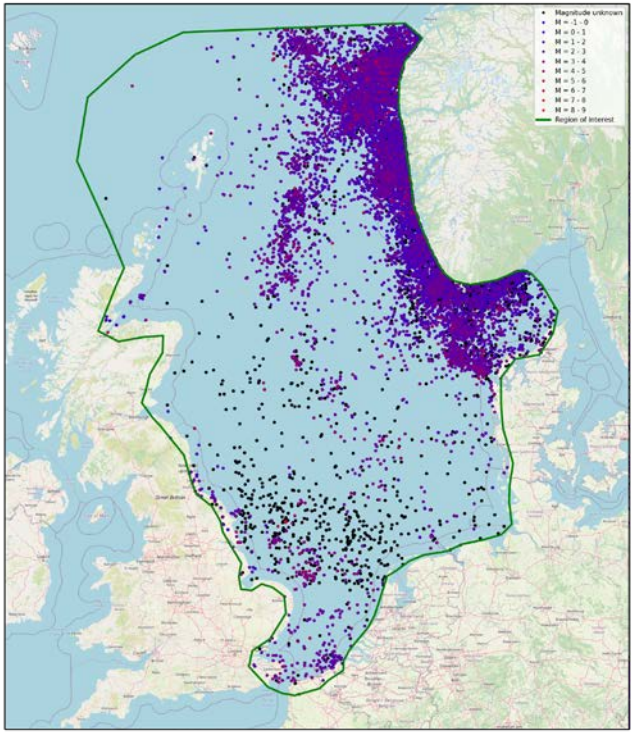
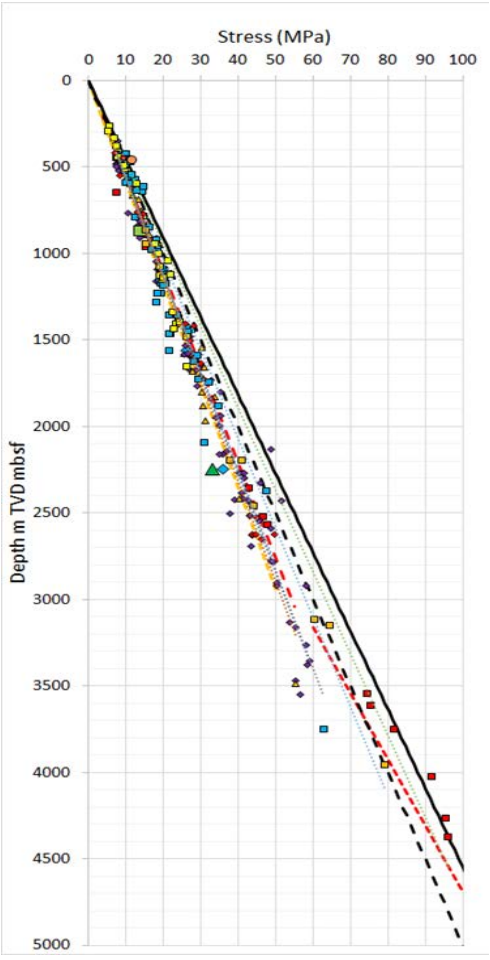
SHARP Storage events



Work in progress highlights:

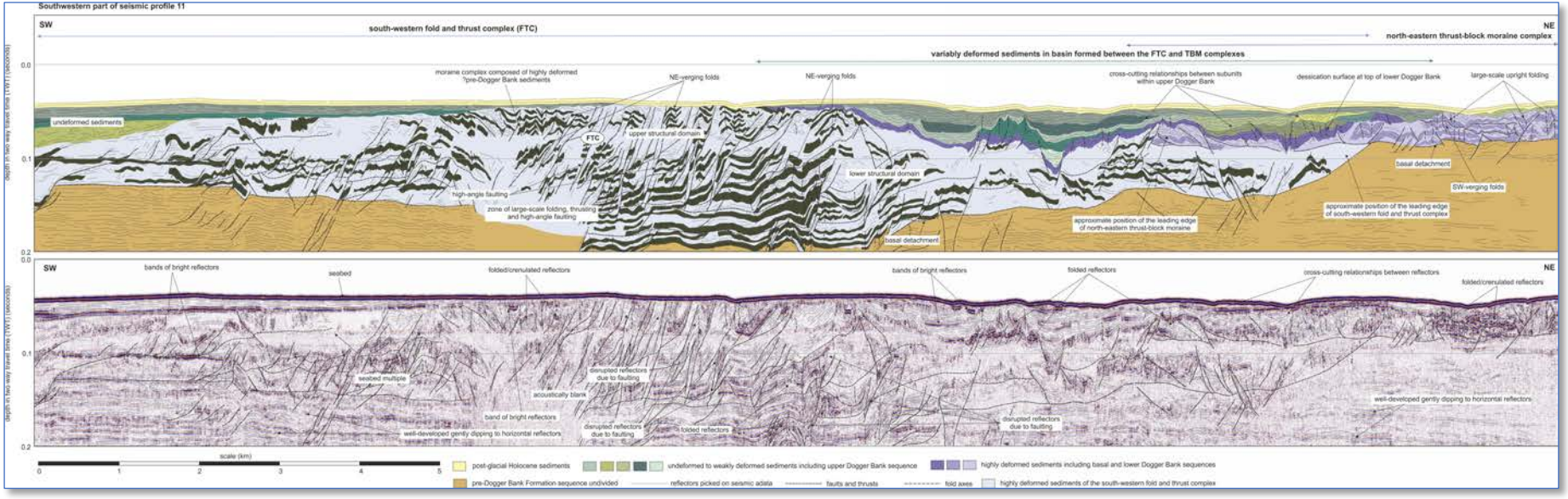


North Sea Earthquake Catalogue



Stress measurements from wells

Work in progress highlights:



Examples of a geological cross-section and interpreted 2D seismic data for the western part of Dogger Bank showing the complex folding and thrusting within the shallow subsurface (Phillips et al., 2022)

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Define effects of glaciation on stress state

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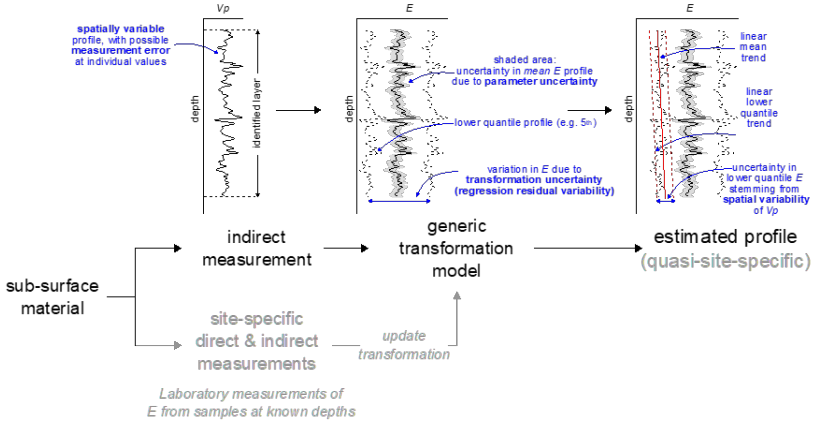
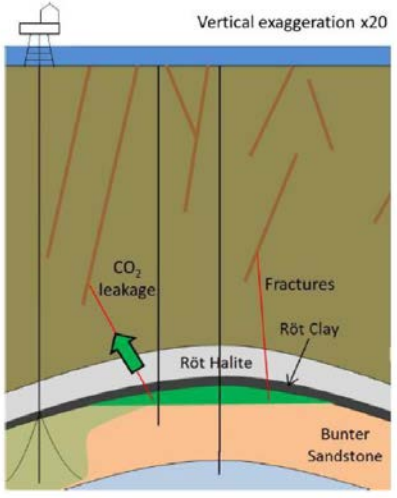
Methodologies for risk quantification – Two Deliverables in place





Deliverable 5.1: Guideline for uncertainty quantification of rock mechanical properties

Deliverable 5.2: Methodology for quantitative modelling of CO_2 storage containment risks

To be available on website : https://sharp-storage-act.eu/dissimination-and-results/

More about SHARP:

- Check out or webpage: https://sharp-storage-act.eu/
- Follow us on Twitter: **@sharp_co2**

- RISK workshop at GEUS, September 28-29 (in-person event)
  - https://sharp-storage-act.eu/uncategorized/first-announcement-of-sharp-risk-workshop-save-the-dates/

- Come talk to us at our poster-stand in Lyon 

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