Impact of potential leakage from a sub-seabed CO_2 storage site on the marine environment at relevant hydrostatic pressure (CO2MARINE)

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Rationale

- Carbon Capture and Storage (CCS) is a key technology for the reduction of CO_2.
- EU supports selected portfolio of demonstration projects to promote the implementation of sub-seabed CCS in Europe (e.g. ROAD, GOLDENEYE, ECO2).
- In Poland, sequestration of CO_2 under the sea floor in depleted oil reservoirs in the southern Baltic Sea (B3 field) is considered a reasonable mitigation option (Fig.1).

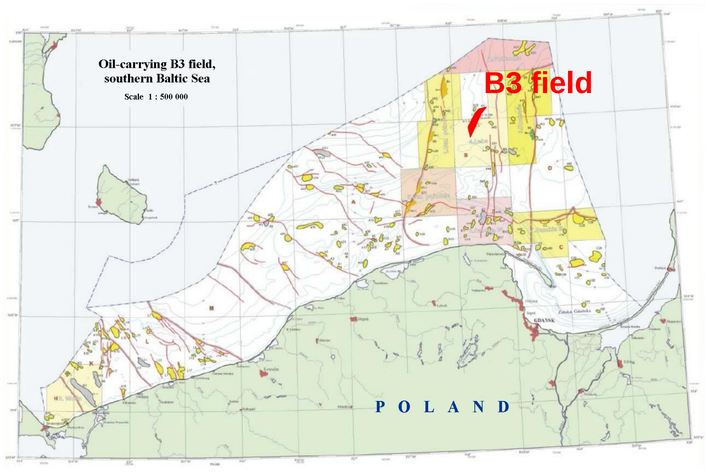
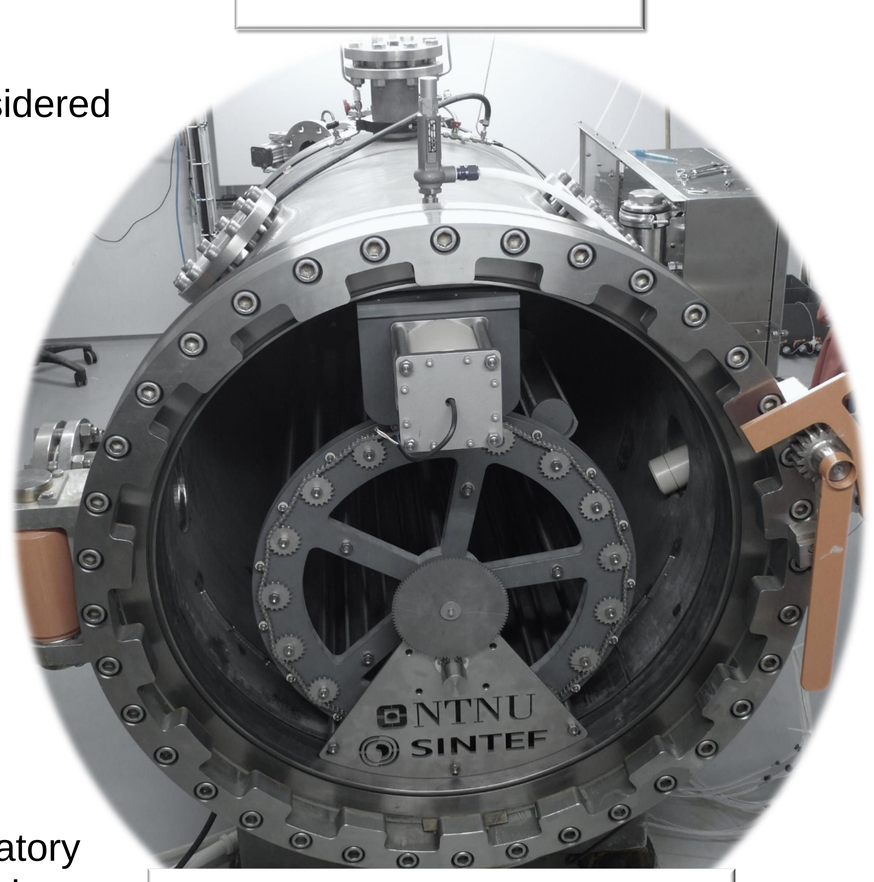


Fig. 1. Potential CO_2-storage site in the Baltic Sea

Objectives

- To assess the impact of CO_2 on chemical processes in marine sediments, sea water and benthic biota at relevant hydrostatic pressure to simulate natural conditions at a potential CO_2 storage site in the Baltic Sea.

Karl-Erik TiTank



Specifications:
Volume: 1.4 m^3
Pressure: 1-30 bar
Flow-through rate: 1 L min^{-1}
Recirculation rate: 10 L min^{-1}
50 sample containers accessible through a decompression chamber

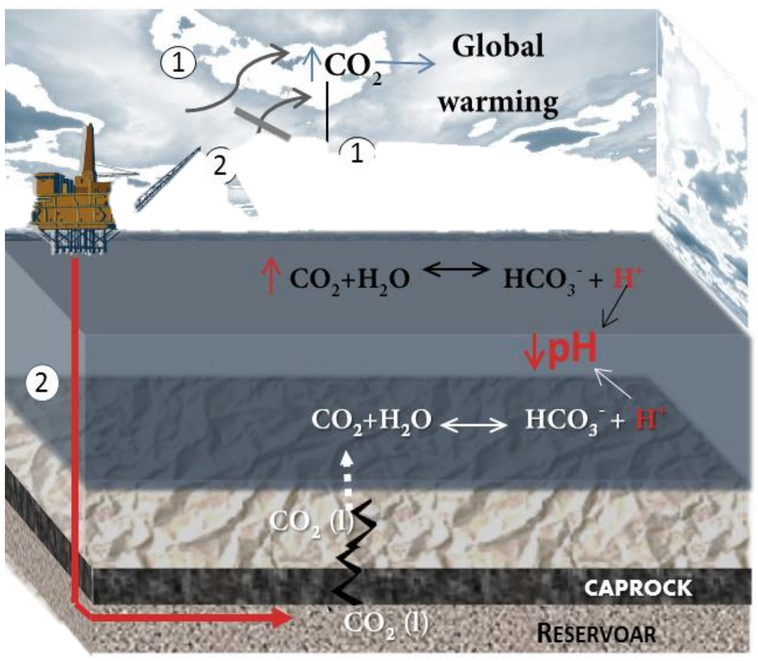


Fig. 2. Schematic presentation of 1: Ocean acidification at global scale and 2: Carbon capture and storage (CCS) in geological structure and potential leaks from storage site of CO_2

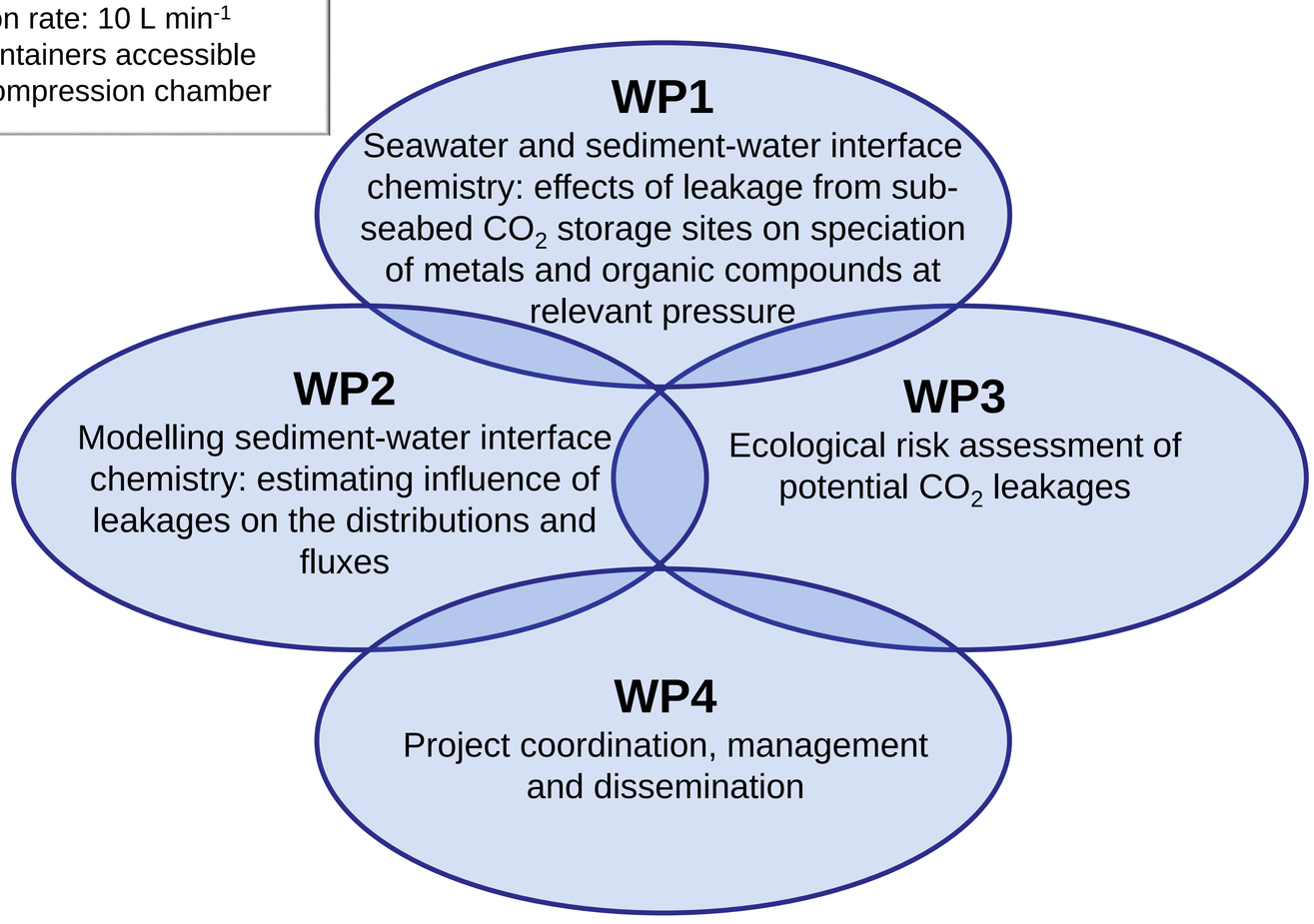
Methods and approach

The project plans a series of 3-month laboratory experiments in the unique titanium hyperbaric tank (Karl Erik TiTank) at SINTEF/NTNU Sealab in Trondheim, Norway.

Surface sediments and two macrobenthic faunal species, the clam *Macoma balthica* and ragworm *Hediste diversicolor*, from the Baltic Sea will be exposed to different CO_2 concentrations at a hydrostatic pressure 9 bar (water depth 80 m) to mimic natural conditions at the sea floor.

Fig. 3. Test species: *Hediste diversicolor* and *Macoma balthica*

Project structure



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