DigiMon

ACT knowledge sharing workshop

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November 16-17, 2020

DigiMon

Digital Monitoring of CO_2 storage projects

ERA CO Fund ACT 2 project

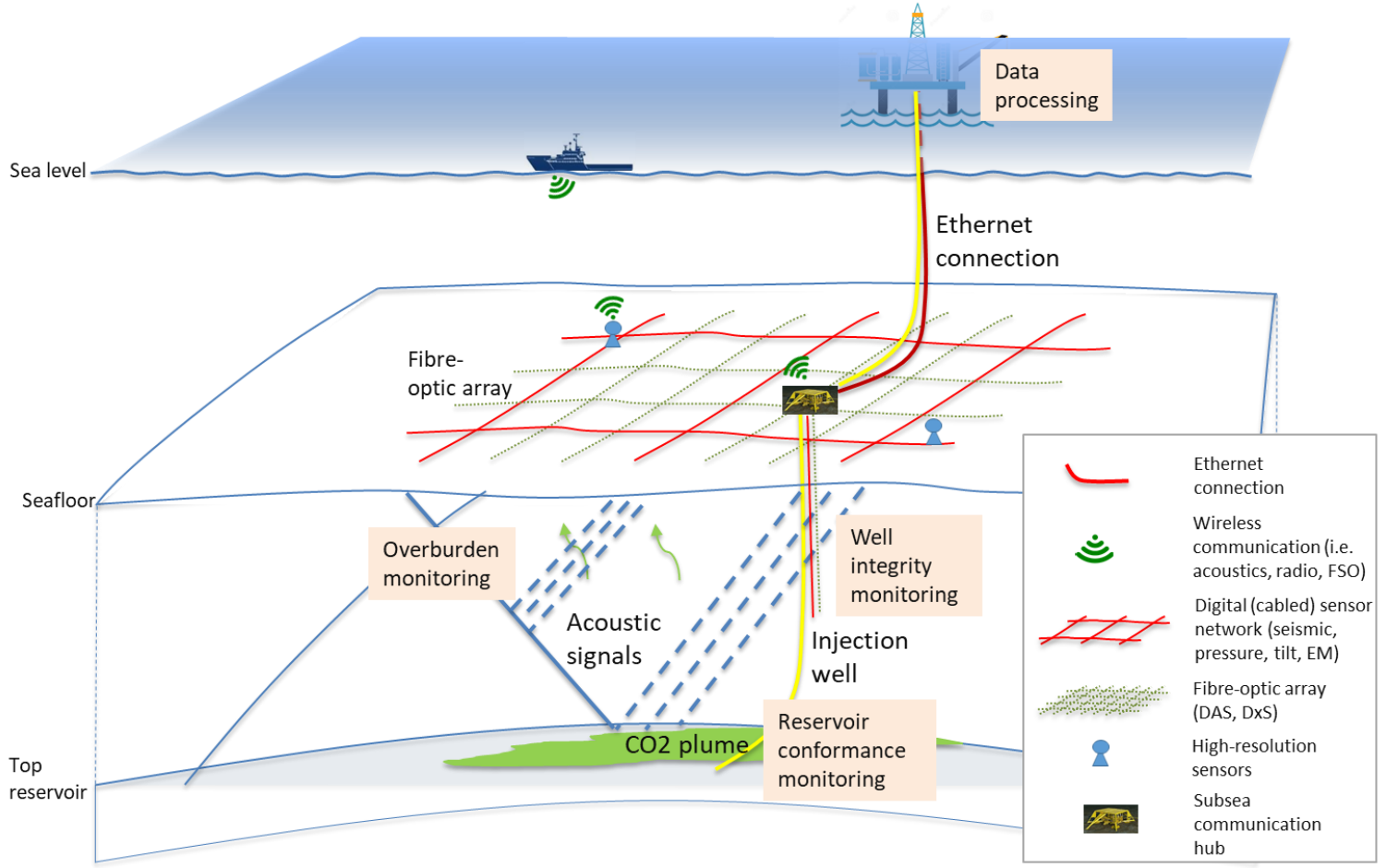
September 2019 – August 2022

6.5 MEURO (NORCE 10.5 MNOK)

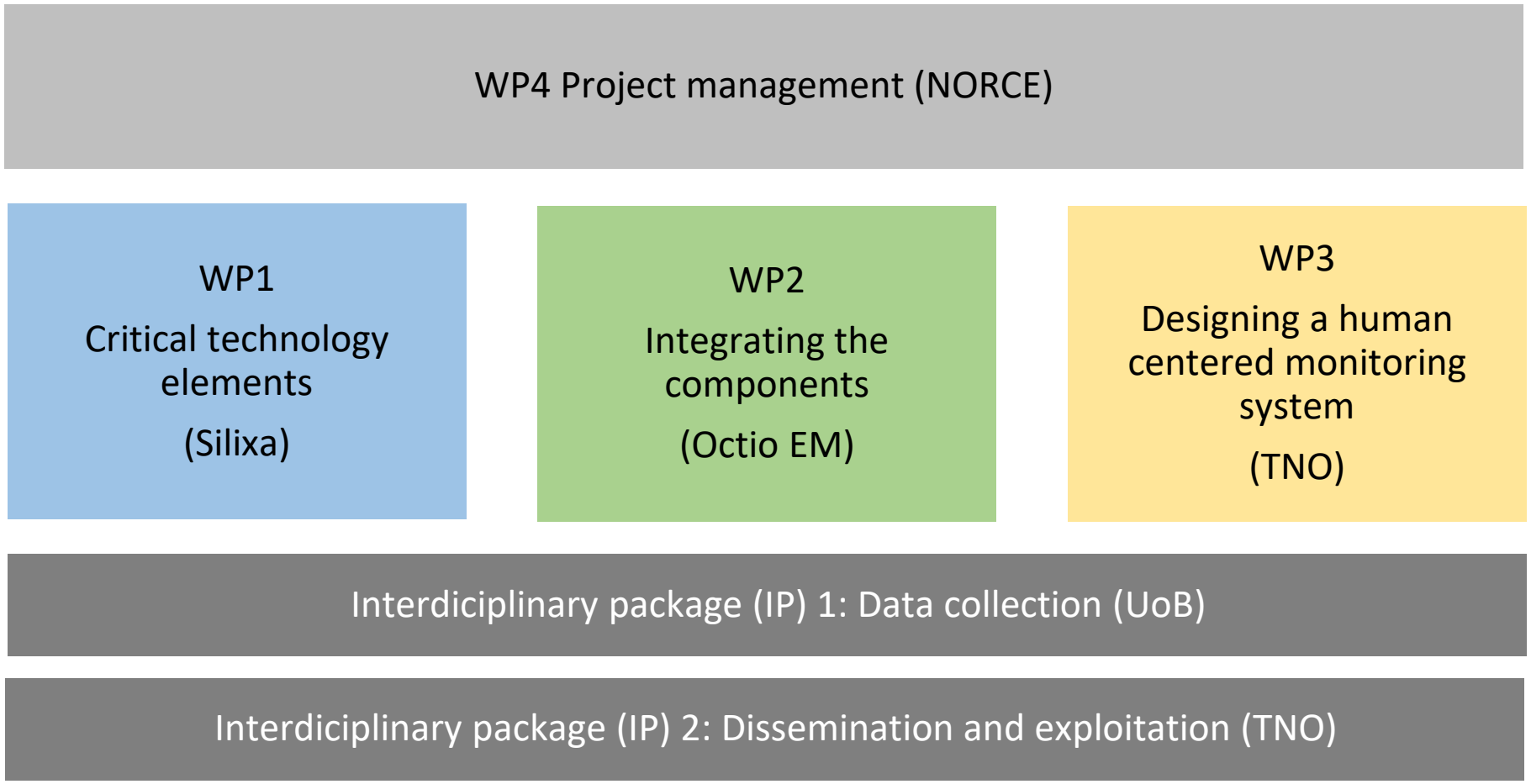
NORCE (project manager)		TNO	
OCTIO Environmental Monitoring		GEOTOMOGRAPHIE GmbH	
CRES Centre for renewable energy sources and saving		LLC Lawrence Livermore National Security	
UNIVERSITY OF BRISTOL		SILIXA ltd	
NTNU		EQUINOR Energy AS	
HELMHOLZ – Centre for Environmental Research (UFZ)		REPSOL – Norge AS	
SEDONA Development srl		UNIVERSITY OF OXFORD	

Early warning system for CO_2 storage

The overall objective of the DigiMon project is to "*accelerate the implementation of CCS by* ***developing and demonstrating*** *an affordable, flexible, societally embedded and smart Digital Monitoring early-warning system*", for monitoring any CO_2 storage reservoir and subsurface barrier system, receiving CO_2 from fossil fuel power plants, oil refineries, process plants and other industries.



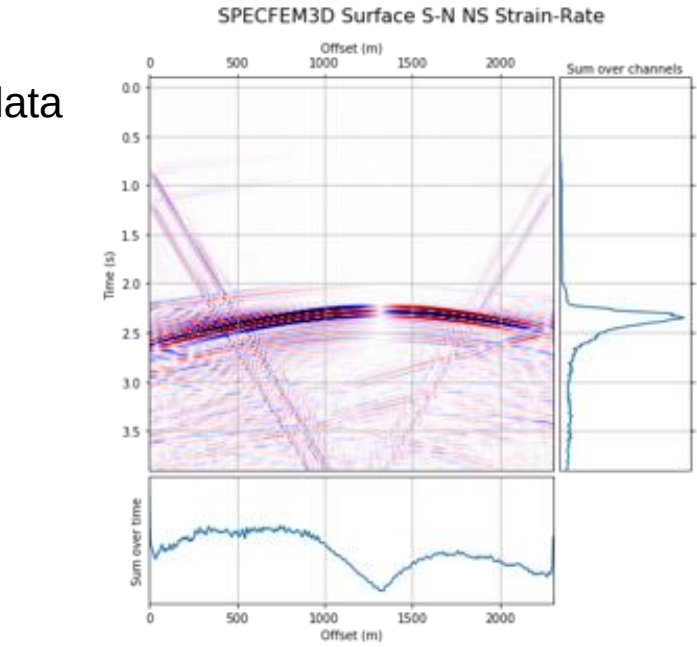
DigiMon work packages

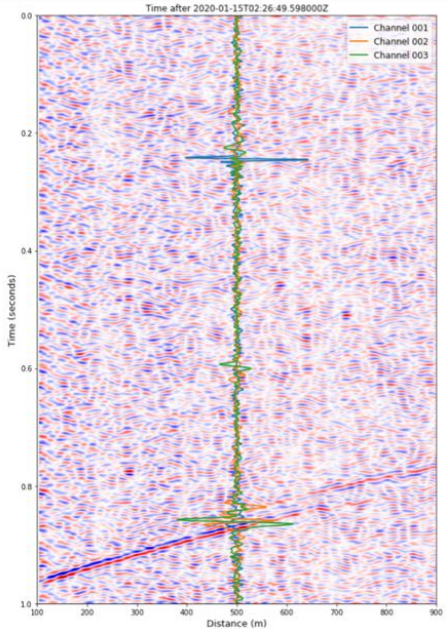


WP1 - Completed Activities

- Synthetic DAS datatset (D1.3)
  - Tested different finite difference, finite element modelling and ray-tracing for consistency
    - Achieve good agreement between synthetic DAS data generated using both SW4 and SPECFEM3D.
- Field dataset for microseismic (D1.1)
  - Jan 2020 Mike Kendall acquired DAS data at the Rutford Ice Stream in Antarctica
- DAS pre-processing workflow (D1.4)

Synthetic DAS data

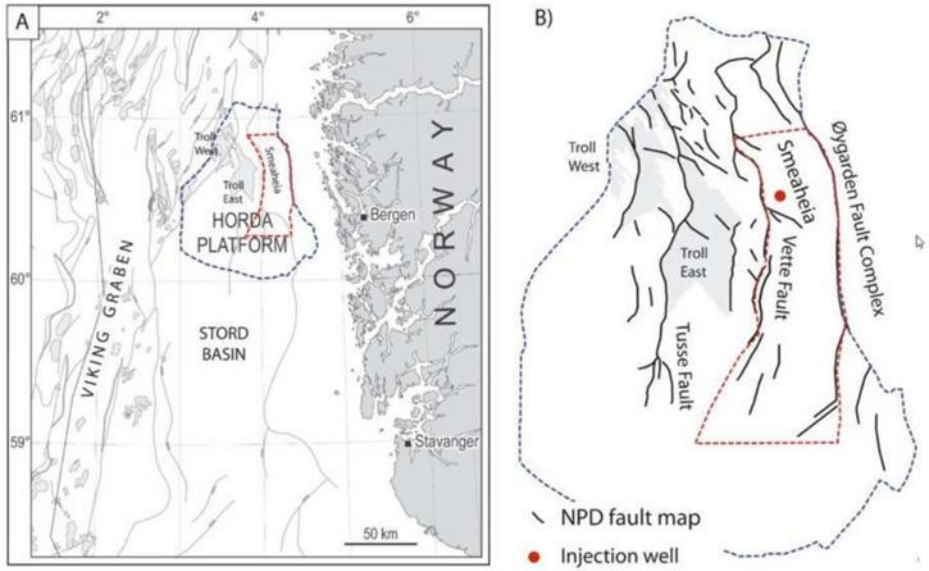




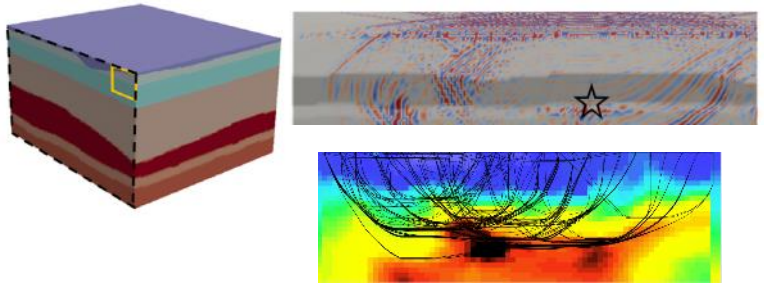
Microseismic event recorded on geophone & DAS

WP2 - Completed activities

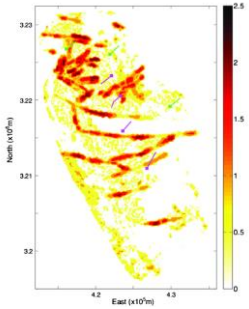
- Selection of site for forward modelling activities
  - The containment structure of the Smeaheia site is a fault block located east of the Troll gas field, north-west of Bergen; 1200 to 1500 m depth in the alpha structure
- Framework for modeling of the Digimon data components (D2.1 – 12/20)
  - Models for gravity and uplift have been completed; models for DAS and seismic have been id-ed
- The forward modelling framework will include:
  - Full seismic waveform modelling and Seismic ray-tracing for conventional seismic and DAS data
  - Geomechanical modelling and
  - Modelling of the gravity response



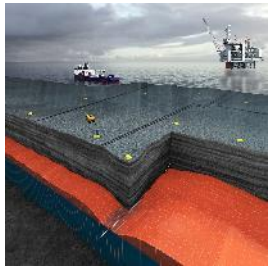
- Full seismic waveform modelling
- Seismic ray-tracing



- Geomechanical modelling



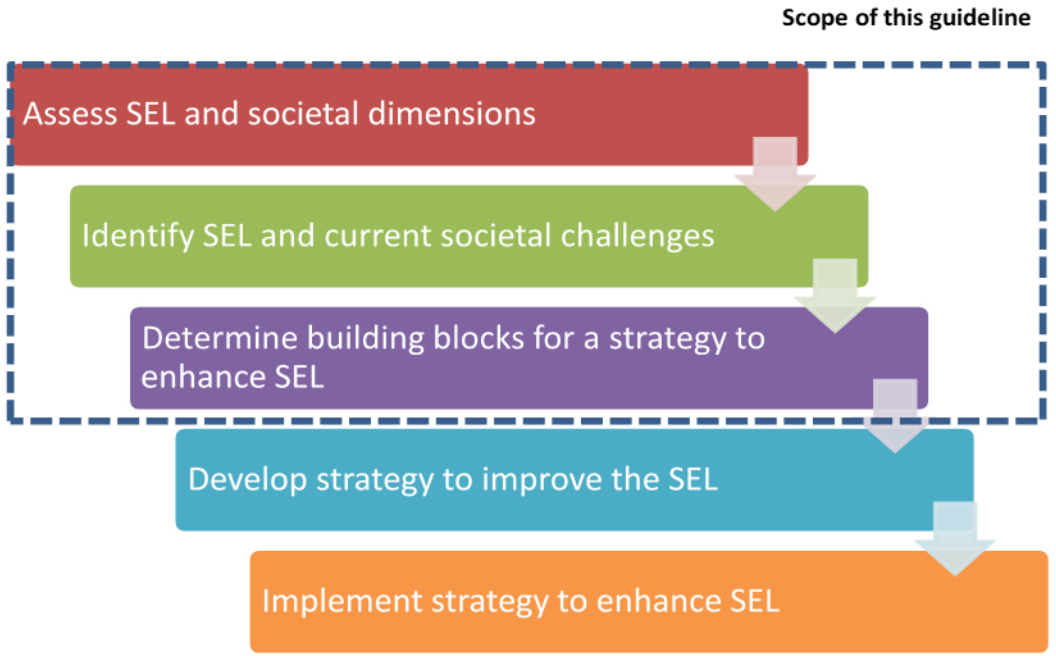
- Gravity modeling

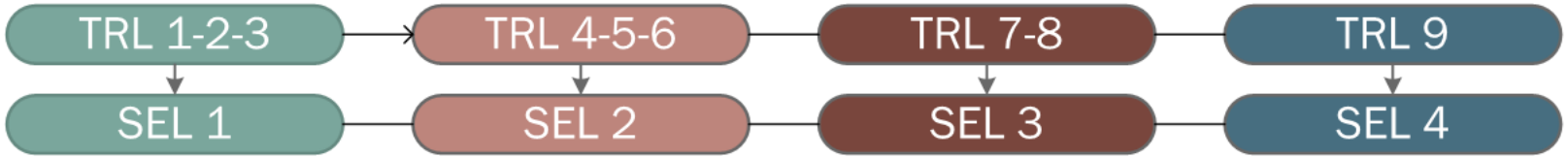


From Paap et al., 2018; Verdon et al. 2017; www.octio.com

WP3 – Completed activities

- Societal Embeddedness Level Assessment Guideline (D3.1)
  - The SEL methodology is an addition to the TRL methodology and assesses the societal embeddedness level of a technology.
  - There is a close link between the SEL methodology and TRL levels
- National assessments have been launched





Thank you for your attention!

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