

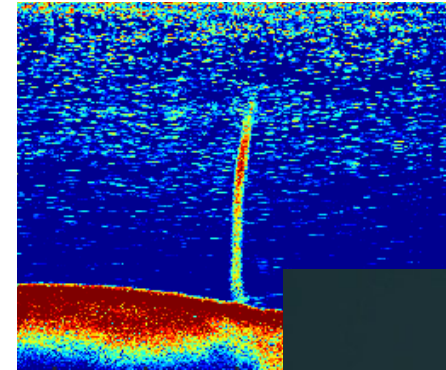


Lekkasjedeteksjon under havoverflaten  
– ny teknologi og digitalisering

Forum for framtidens oljevern, sept 2022, Svolvær

# Innhold

- Subsea lekkasjedeteksjon – samarbeid i industrien
- Lekkasjedeteksjonsbarrieren – hva ønsker man oppnå
- Nye teknologier for lekkasjedeteksjon vokser fram med digitalisering
  - Aktiv akustikk
  - Undervannsdroner
  - Fiberoptikk
- Dataprosessering og visualisering



# Lekkasjedeteksjon – hvordan jobber næringen sammen?

- Offshore Norge retningslinje 100: Anbefalte retningslinjer for deteksjon av akutte utslipp
  - Metodikk for å etablere og vedlikeholde barrieren deteksjonssystem
  - Avgrenset til deteksjon
  - Under revisjon, publisering høst 2022
- Arbeidsgruppe etablert for oppfølging av felles avvik etter tilsynskampanje Mdir/Ptil
  - Alle operatører invitert
  - Dialog med Mdir/Ptil
  - Møteserie med leverandører av (subsea) lekkasjedeteksjonssystem

# ***Sensitive, continuous, area coverage, reliable, robust***

## *Improve/ensure performance*

*Subsea sensors*

*Surface detection*

*Single phase mass balance*

## *New technology*

*Active acoustic*

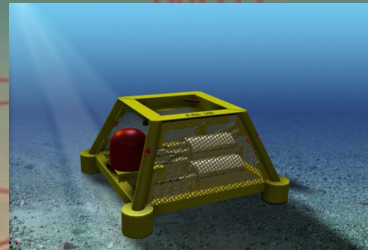
*Drones (UID)*

*Fibre optic leak detection*

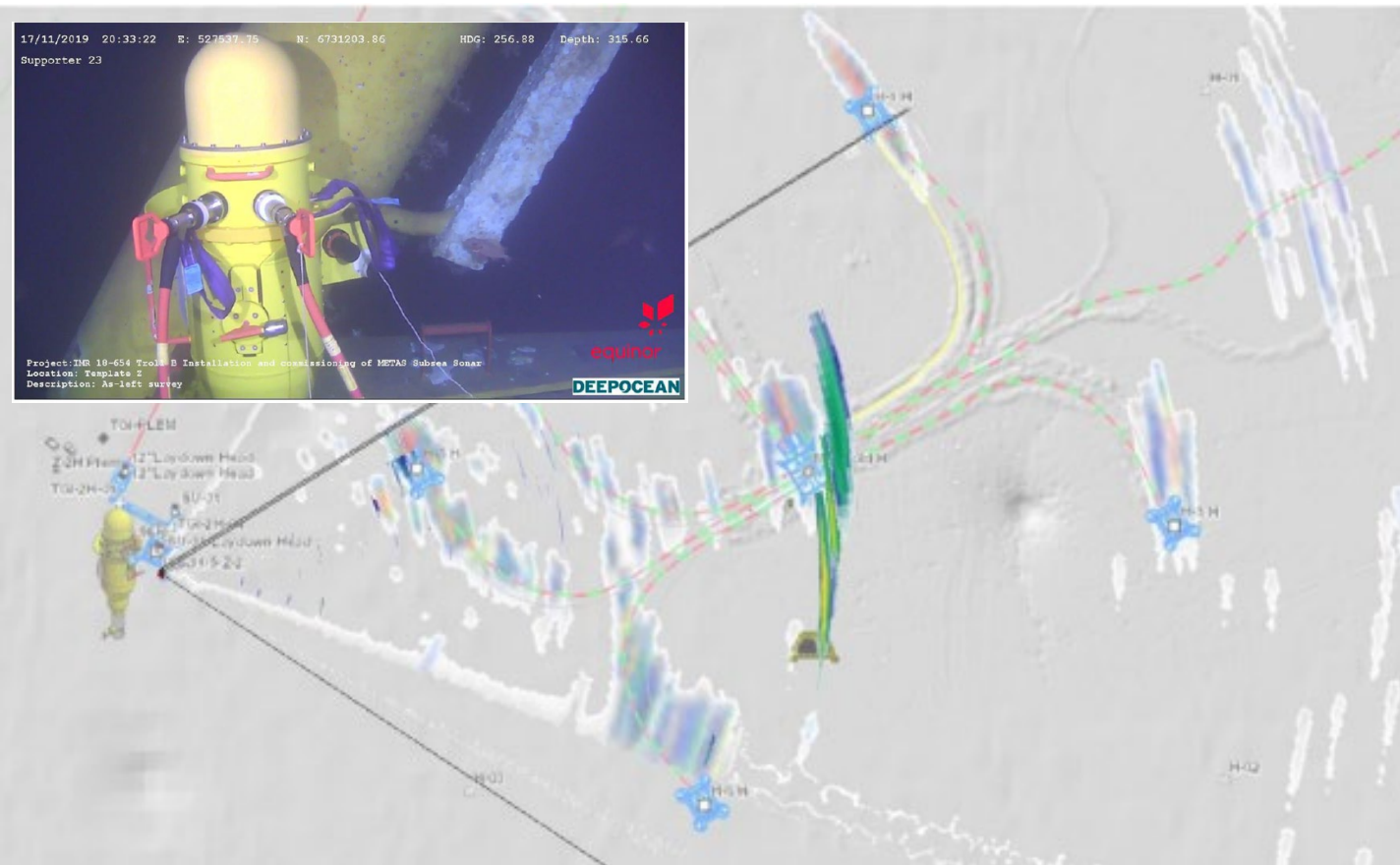
*Multi phase mass balance*

## *New ways of working*

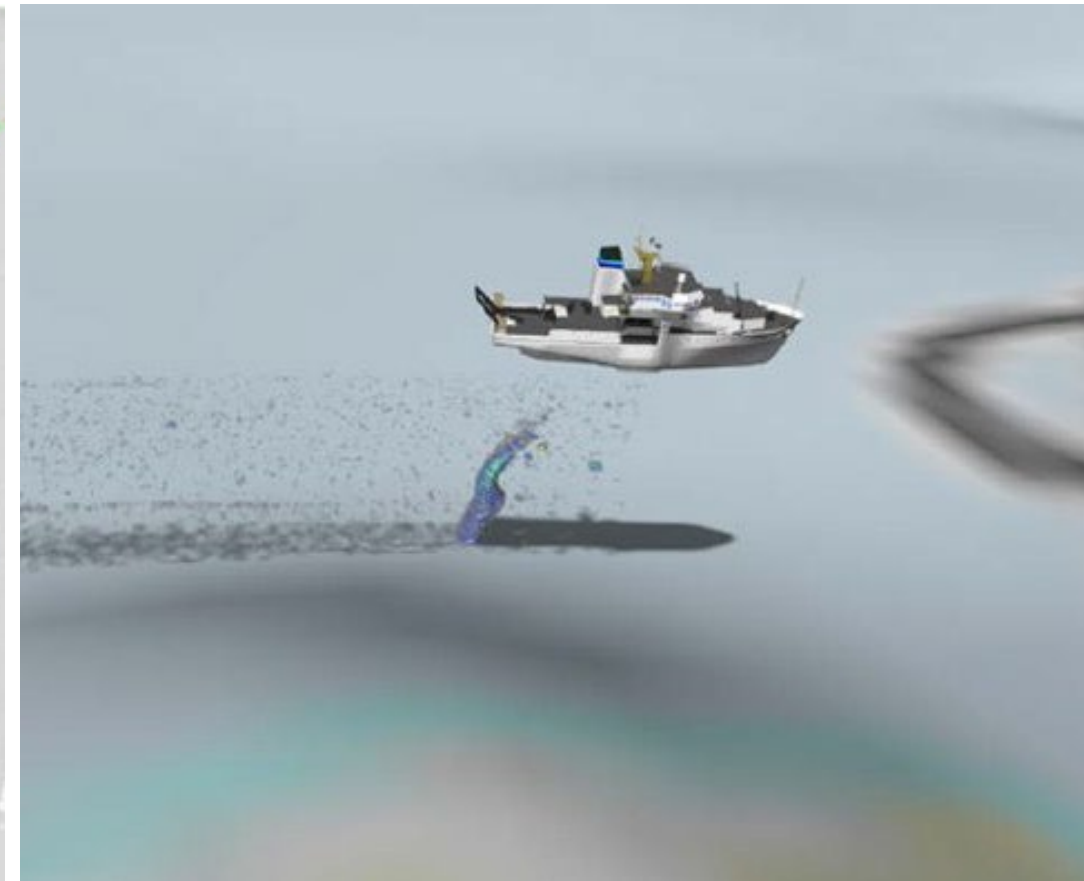
*Real-time offshore barrier map*



# Active acoustics - reflection of emitted sound pulses

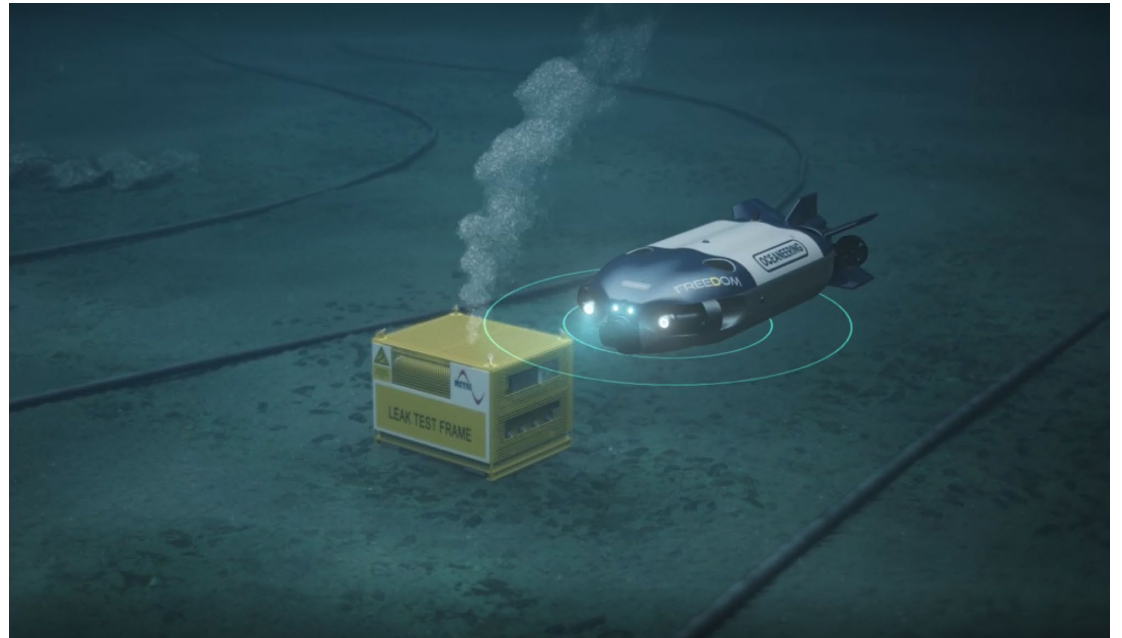
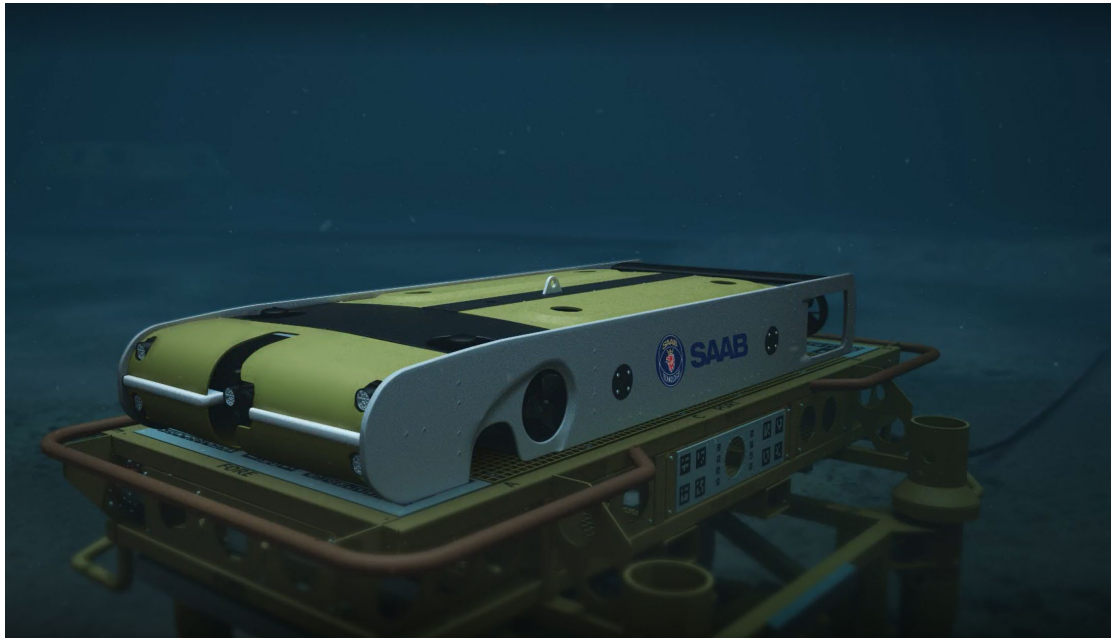


Tests with Metas subsea sonar at Troll B



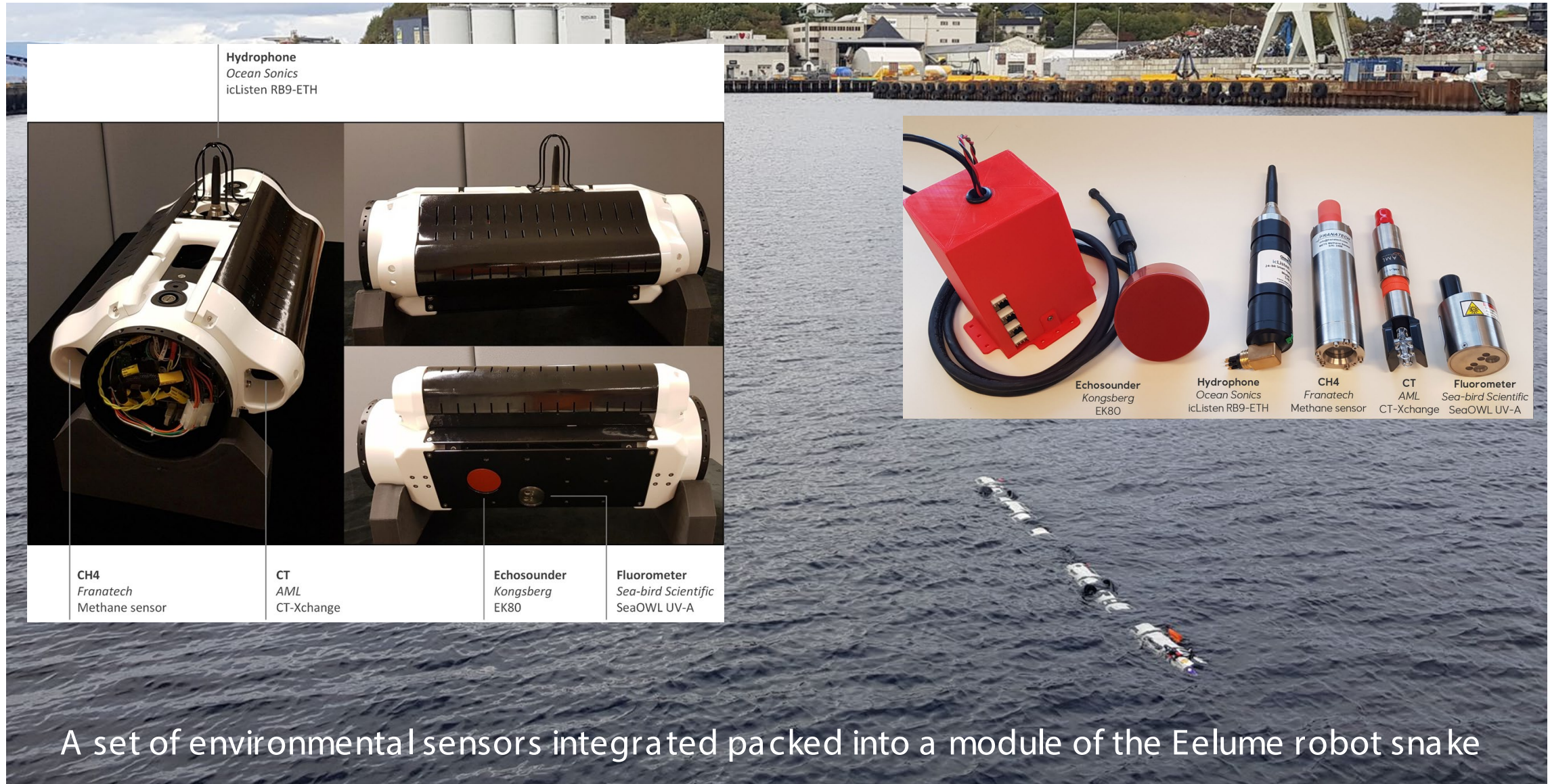
From surface vessels

# Undervannsdroner





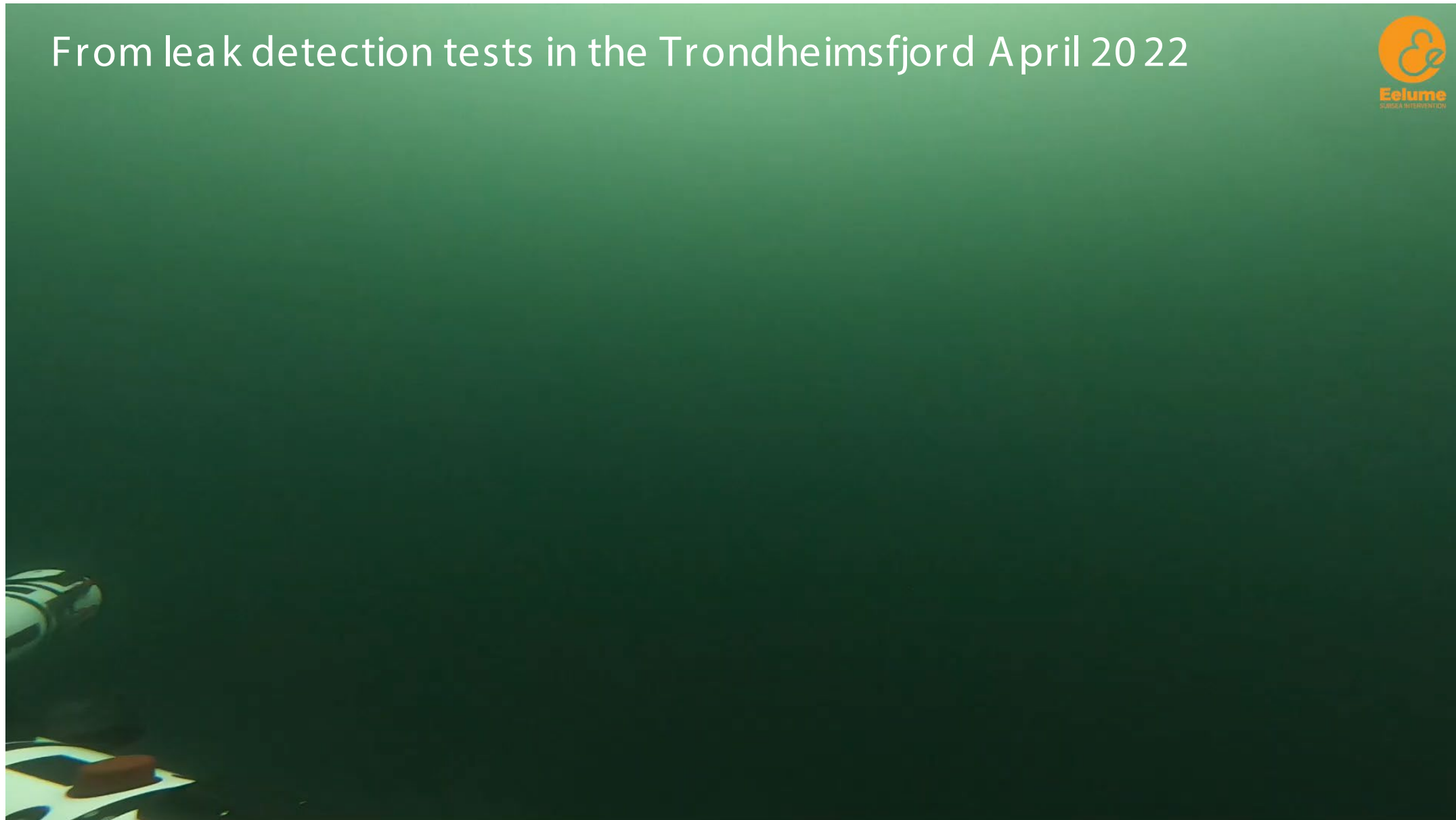
# Eelume module for environmental surveys and leak detection







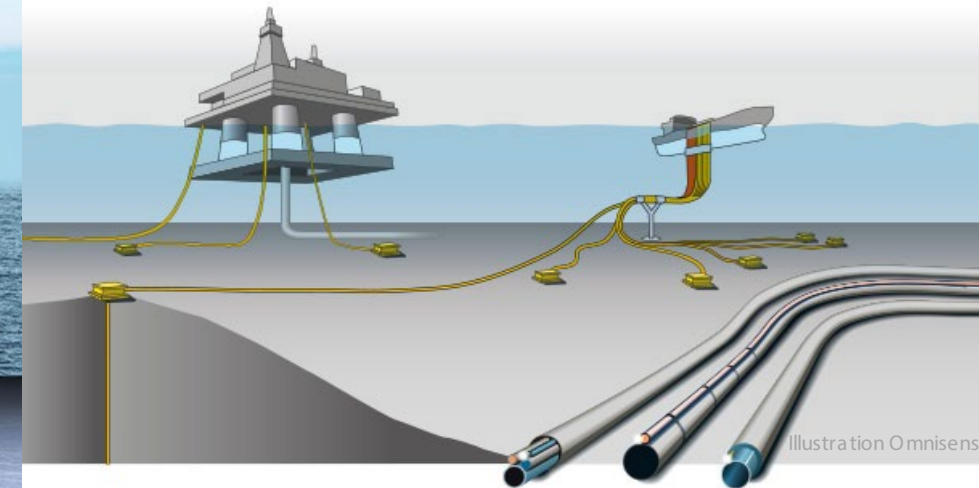
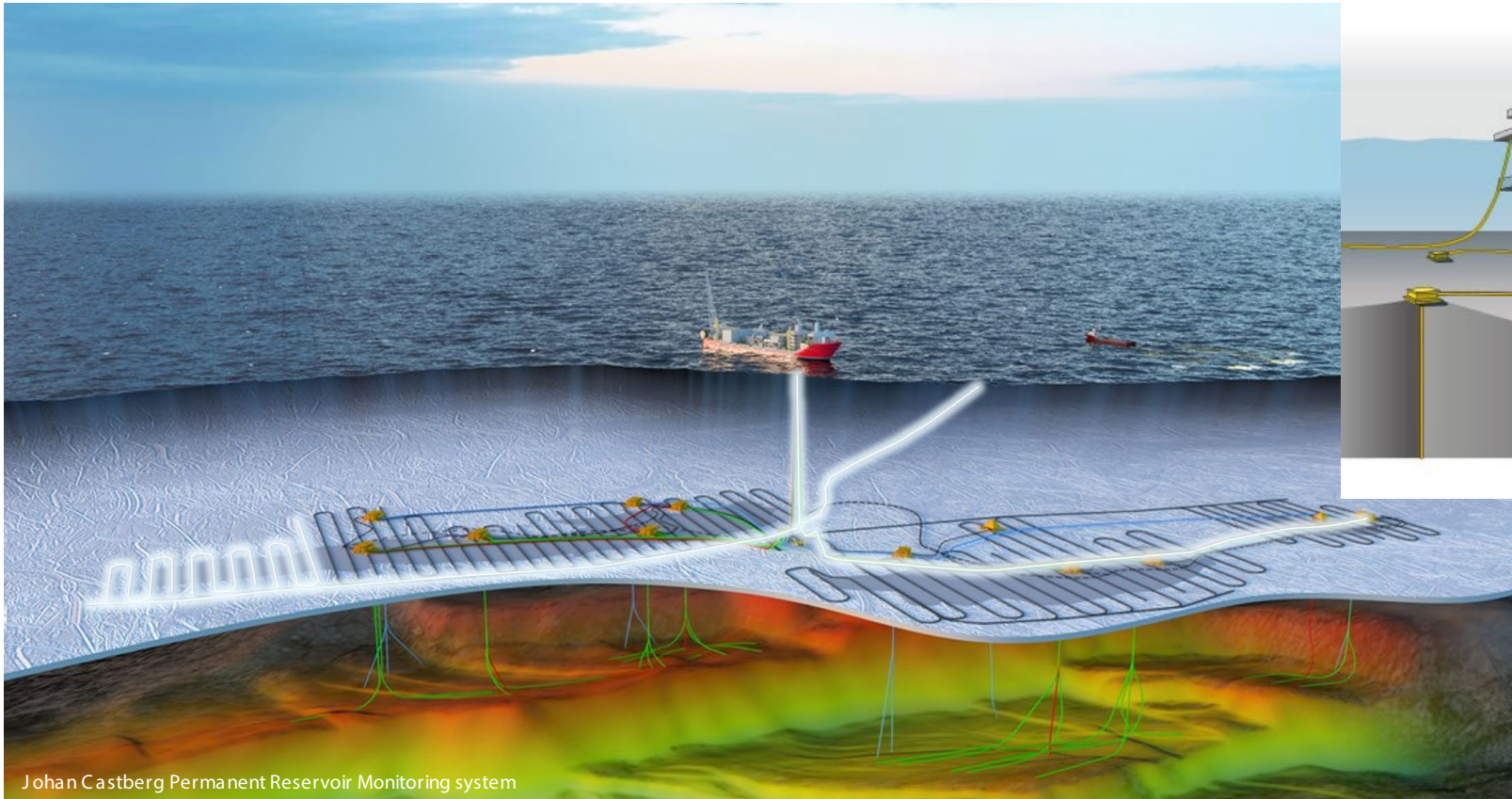
# From leak detection tests in the Trondheimsfjord April 20 22



# Leak detection by fibre optics

Two main principles for leak detection:

- DAS – Distributed Acoustic Sensing – sensing vibrations from a leakage
- DTS – Distributed Temperature Sensing – sensing temperature changes from a leakage



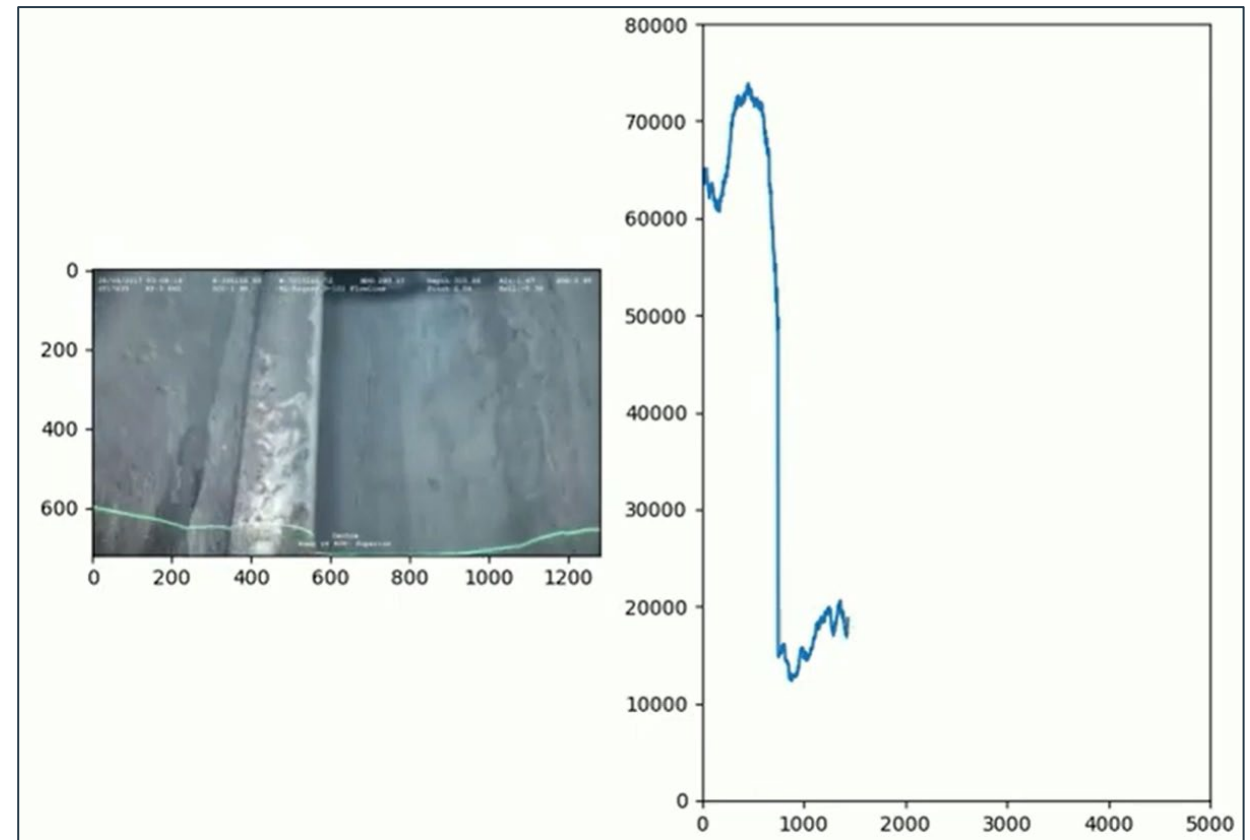
# Automatic data analysis to detect subsea leakages

Especially important for:

- Underwater video and photos
- Active acoustics

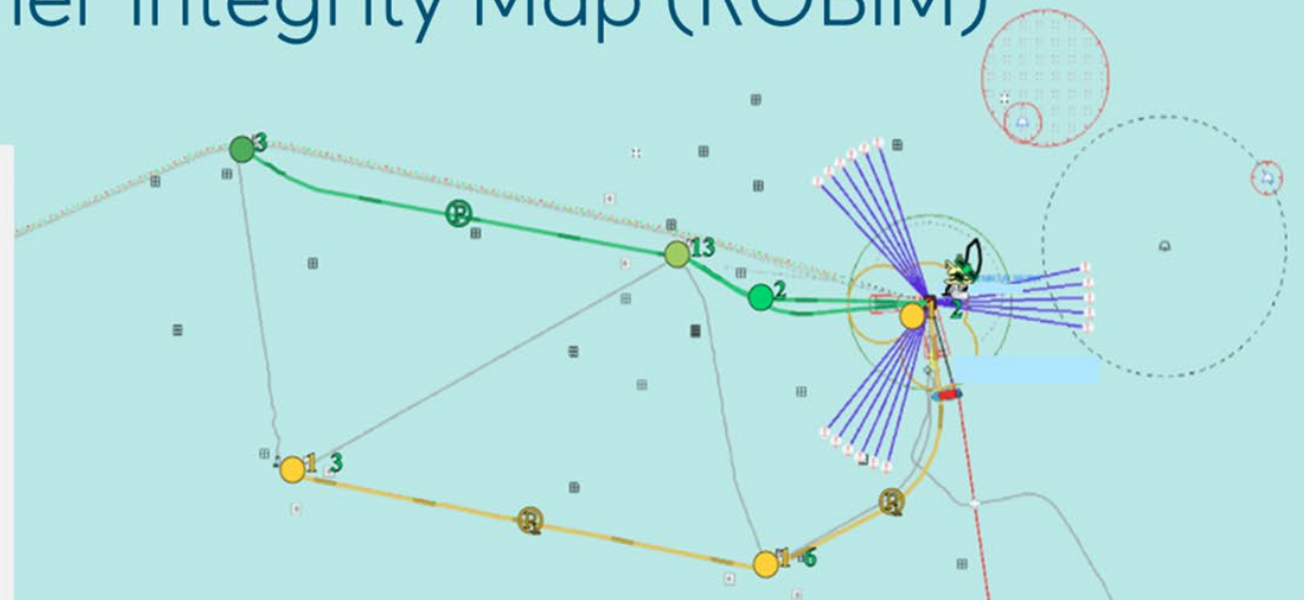
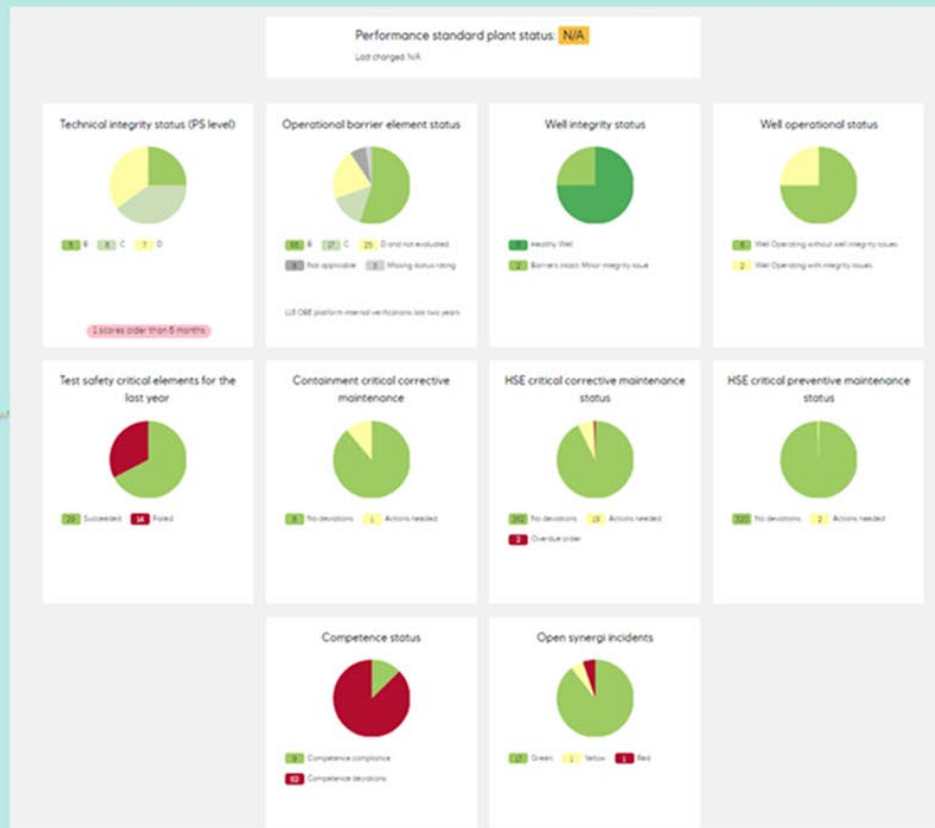
Both are technologies which produce huge amount of data.

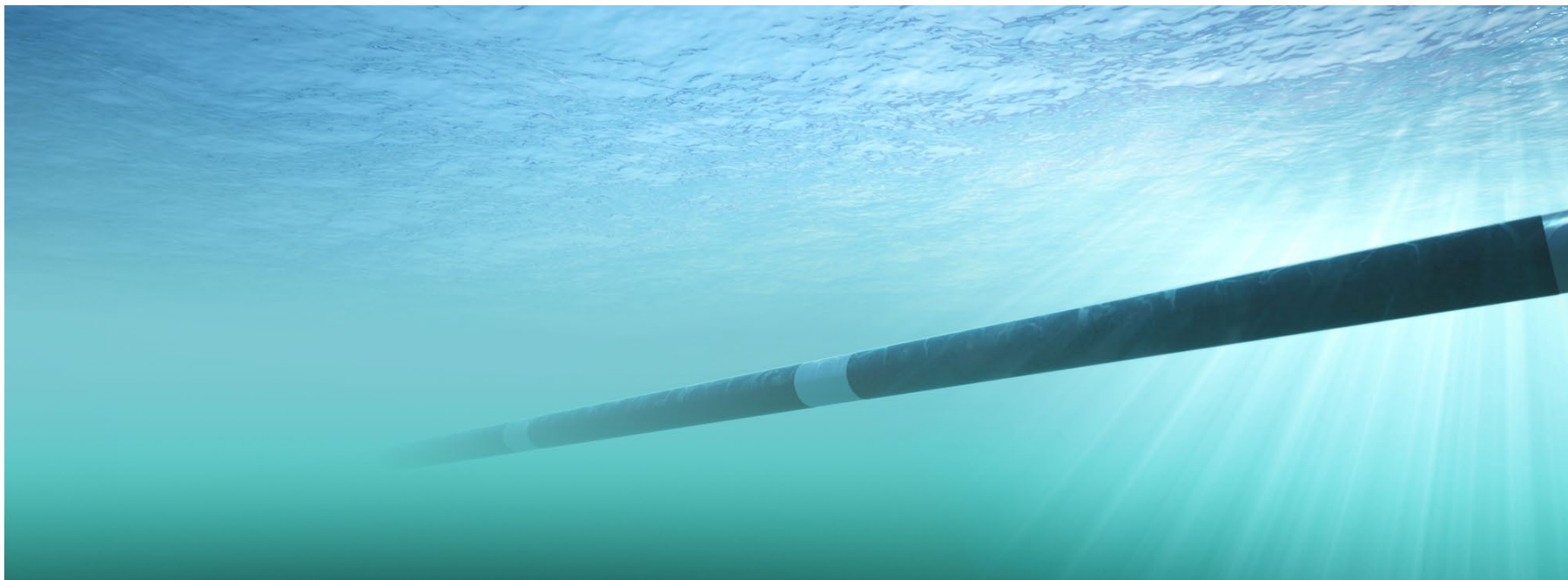
Automatic analysis essential for broad implementation



# Real-time Offshore Barrier Integrity Map (ROBIM)

Janne Lise Myrhaug , David Ralph





## Lekkasjedeteksjon under havoverflaten – ny teknologi og digitalisering

Anders Hermansen, overingeniør miljøteknologi

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