Assurance offshore monitoring, a cross-disciplinary approach

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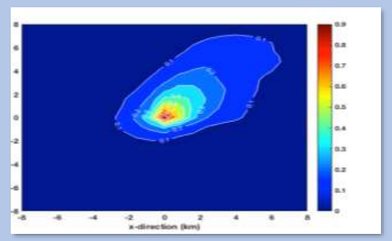
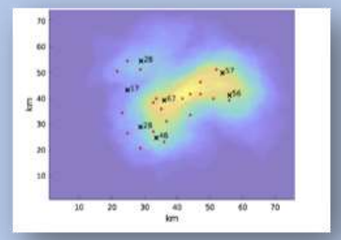
Introduction

We outline the approach chosen in an ongoing project, ACTOM , aiming to develop procedures for design and execution of appropriate, rigorous and cost-effective monitoring of offshore geological carbon storage (OGCS), aligning industrial, societal and regulative expectations with technological capabilities and limitations. An interdisciplinary consortium applies methods to critically assess secure offshore CO2 storage as this technology becomes i

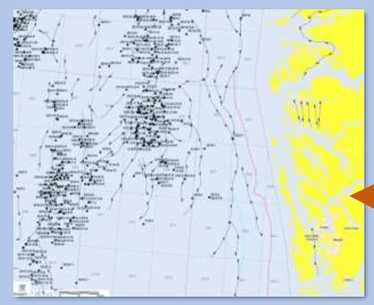
ACTOM is developing a web-based toolbox which will enable the derivation of optimal environmental monitoring strategies for CCS in the marine subseabed, reducing costs.
The toolbox should:
•enable operators to combine different monitoring technologies to design adequate and efficient monitoring programs
•enable regulators and operators to communicate to the effectiveness of proposed monitoring strategies, in line with Marine Spatial Planning.



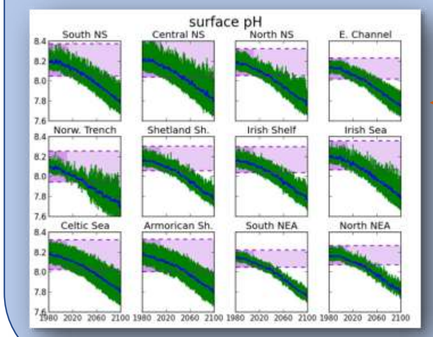
•Ali et al. 2015
•Blackford et al. 2020



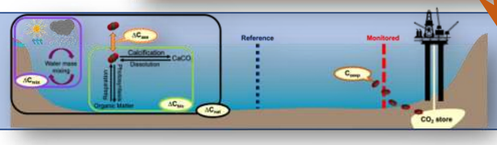
•Fixed installations
  • Hvidevold et al. 2015, 2016,
  •Oleynik et al. 2020,
•Moving platforms
  •Alendal, 2017



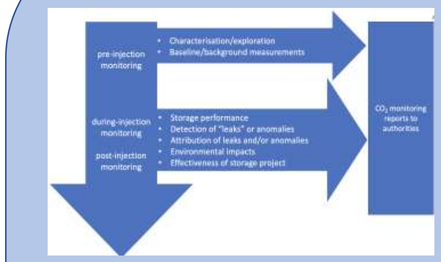
Potential Seep locations



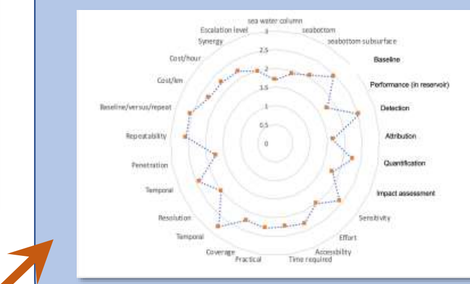
Environmental Statistics



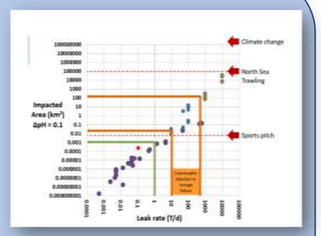
•Rate of Change method (*Blackford et al. 2017*)
•Stochiometric methods: Cseep method (*Botnen et al. 2015*)
•ML methods: time series classification through machine learning (*Gundersen et al. 2020*)



•Globally the guidelines and regulations are based on the principles of
  •best available practice
  •best available technology
•recognition of the fact that monitoring needs to be site-specific
•**We find no conflict between regulation requirements and technical capabilities for marine monitoring in CCS projects. .**



- Gathered a comprehensive inventory of geophysical and marine monitoring technologies.
•Developed a framework for assessing different technologies w.r.t. capabilities, costs & regulations, building on, among others, previous work by IEAGHG and STEMM-CCS.
•So far, monitoring technology exists for all project phases, surfaces, and monitoring aspects.



•Blackford et al 2020

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