

Assessing Impacts of CO₂ leakage on the ecosystem - An overview and early results from the RISCS project

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Assessing potential impacts of leakage

- Appropriate site selection, characterisation, risk assessment and monitoring will significantly reduce the risk of leakage.
- Operators, regulators and public need confidence that if leakage did occur, the potential impacts are understood. This will help improve monitoring, mitigation and remediation strategies.
 - RISCS is using both offshore and onshore, field- and lab-scale experiments, sites of natural CO₂ seepage and modelling approaches to understand the potential impacts.
- A major output will be a detailed Guide for Impact Appraisal.
- We have defined reference environments for European storage
 - Aim to ensure that all relevant processes influencing potential impacts / safety are represented to some degree across one or more of the environments
- We have defined a range of credible leakage scenarios to:
 - Communicate kinds of leakage and impacts that need to be considered
 - Provide a basis for discussing impacts in a structured fashion (Guide)
 - Focus experimental and modelling work
 - **Scenarios are hypothetical situations, not predictions**



Damaged pasture from natural CO₂ seeps in northern Greece



Natural CO₂ seeps near Sicily used to investigate marine responses to CO₂ leaks



Palaemon serratus, one of several marine species whose response to elevated CO₂ is being investigated



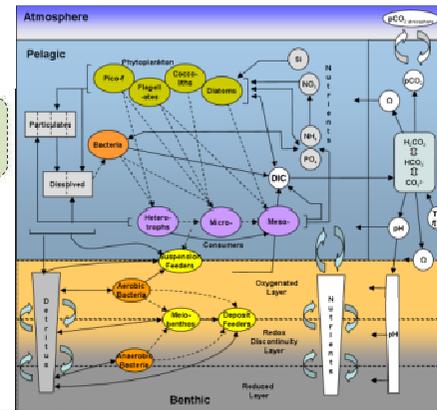
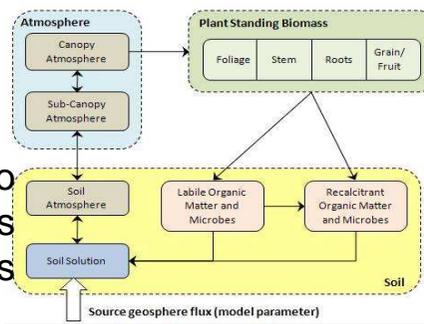
Monitoring CO₂ fluxes in experiments investigating impacts of CO₂ leaks on agricultural soils and crops

Investigating impacts of potential leaks from storage sites to inform risk assessments



Mesocosm experiments investigating impacts of elevated CO₂ on benthic organisms. *Courtesy of Edwin Foekmar, IMARES*

Soil-plant model used to investigate plant responses to CO₂ leaks



Marine biogeochemical model for investigating marine responses to CO₂ leaks

RISCS and SiteChar links

RISCS

- Addresses data needs for EIAs
- Defines thresholds and performance indicators for environmental impacts
- Contributes data to support monitoring plan development
- Defines reference environments that could be applied in environmental site characterisation
- Defines credible leakage scenarios to support risk assessment

SiteChar

- Develop and test site characterisation workflow including surface environmental characterisation
- Tests storage permitting including assessment and mitigation of leakage risks
- Develop monitoring plans and demonstration of baseline monitoring
- Develops and applies risk assessments

Project Partners



www.riscs-co2.eu