

## **Assessing Impacts of CO<sub>2</sub> leakage on the ecosystem - An overview and early results from the RISCS project**

Jonathan Pearce

British Geological Survey  
and the RISCS project team



# 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 CO<sub>2</sub> 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 CO<sub>2</sub> seeps in northern Greece



Natural CO<sub>2</sub> seeps near Sicily used to investigate marine responses to CO<sub>2</sub> leaks



*Palaemon serratus*, one of several marine species whose response to elevated CO<sub>2</sub> is being investigated



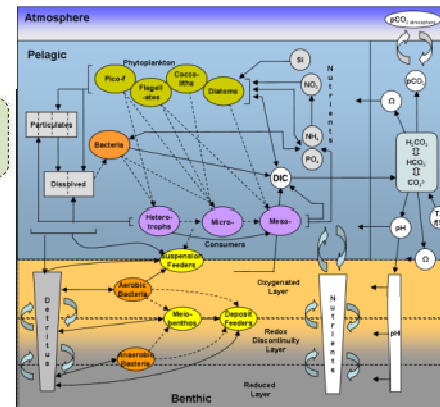
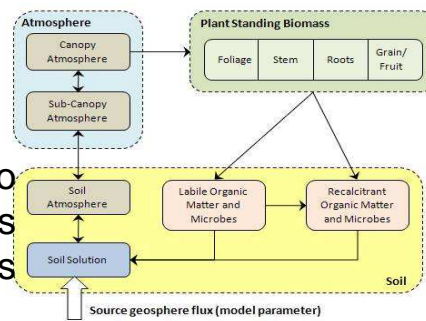
Monitoring CO<sub>2</sub> fluxes in experiments investigating impacts of CO<sub>2</sub> leaks on agricultural soils and crops

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



Mesocosm experiments investigating impacts of elevated CO<sub>2</sub> on benthic organisms. *Courtesy of Edwin Foekmar, IMARES*

Soil-plant model used to investigate plant responses to CO<sub>2</sub> leaks



Marine biogeochemical model for investigating marine responses to CO<sub>2</sub> 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](http://www.riscs-co2.eu)