CARBON DIOXIDE CAPTURE AND STORAGE AND ENVIRONMENTAL ASSESSMENT – JOINT PARTICIPANTS NETWORK (CCSEA-JPN)

CCSEA-JPN
Carbon dioxide Capture and Storage Environmental Assessment Joint Participants Network

OBJECTIVES

The Carbon dioxide Capture and Storage Environmental Assessment - Joint Participants Network (CCSEA-JPN) is a research network for leading scientists and engineers in the area of environmental issues of offshore CO_2 geological storage and ocean sequestration. The network was launched under the initiative of the Department of Ocean Technology, Policy and Environment in the University of Tokyo in Japan in 2012. CCSEA-JPN is aimed at investigating the impacts of the unintentional CO_2 leakage and migration on marine and local environment, advancing technologies to project and monitor CO_2 leakage, helping establish legislations, and securing public acceptance for CCS. Through these activities, CCSEA-JPN will contribute to accelerating large-scale demonstrations and subsequent commercialization of CCS in Japan and help to introduce Japan's innovative technologies into the overseas markets.

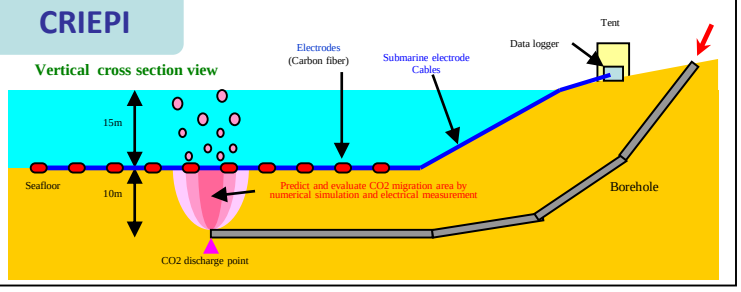
SCOPE

(1) Simulation and monitoring of CO_2 migration

CRIEPI

Numerical simulation of CO_2 migration around a discharge point under seafloor

Electrical monitoring of CO_2 migration on seafloor



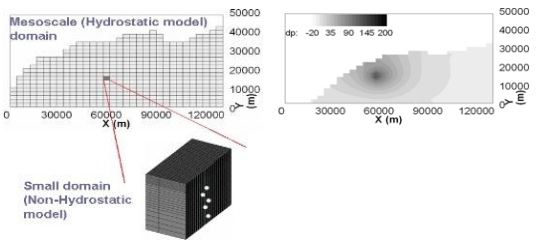
(2) Estimating and modeling CO_2 leak

University of Tokyo

CRIEPI

Numerical simulation of dispersion of CO_2 seeping from seafloor by using multi-scale ocean models

Numerical simulation of flow field by regional ocean models



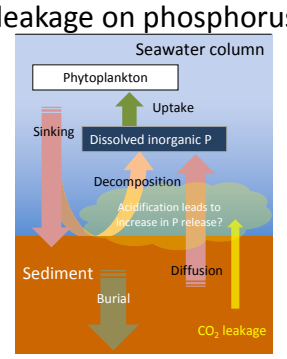
(3) Impact of CO_2 leak on marine biogeochemical cycles

AIST

Kyushu University

- Impacts of CO_2 leakage on phosphorus cycling (by AIST)

Assess the impacts of CO2 leakage on biogeochemistry of phosphorus (P), an essential nutrient sustaining marine productivity, including changes in sedimentary P-pools, P fluxes to/from sediments.



Prediction of phosphorus cycling in the coastal ecosystem under elevated CO_2 condition.

- Impacts of leaked CO_2 in seawater (Kyushu Univ.)

- Mapping survey by AUV installed with chemical sensors
- Vertical observation and long term monitoring of pH and pCO_2

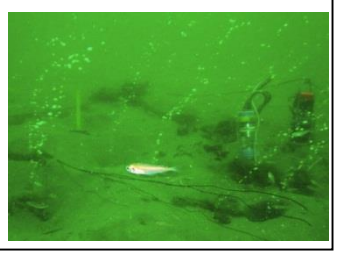
(4) Impact of CO_2 leak on marine ecosystem

RITE

Kanso Technos

Development of safety assessment methods if there should be any CO_2 leakage into the marine environment

- Monitoring techniques of biological impacts
- Evaluation methods of ecosystem impacts



(5) Monitoring CO_2 leak

Kyushu University

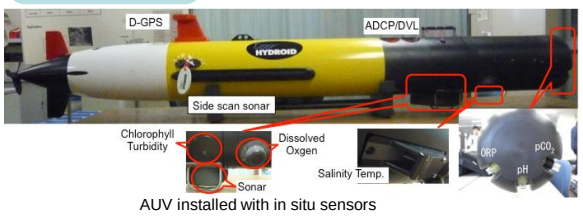
Monitoring of CO_2 leakage in water and sediment

Goals

- Establishment of strategy for detection and monitoring of CO_2 leakage in sub-seafloor CCS.
- Understanding of diffusion and impact of leaked CO_2 into seawater

Procedure

- Monitoring of CO_2 leakage into seawater by sensor moored on seafloor.
- Monitoring of CO_2 behavior in sediment by sensor
- Monitoring of diffusion of leaked CO_2 by AUV installed with in situ sensors



AUV installed with in situ sensors

Sediment pH sensor

(6) Risk assessment & Outreach

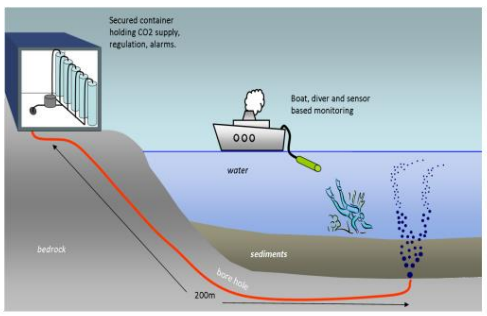
JANUS

RITE

- To promote the dissemination of knowledge on safe implementation of offshore CCS
- To facilitate communication/ engagement of local communities
- To develop best environmental practices guidance
- To analyze public perception
- To promote international collaboration

QICS Project

All Members



The members of CCSEA-JPN has been collaborating with UK researchers in a UK funded **Quantifying and Monitoring Potential Ecosystem Impacts of Geological Carbon Storage (QICS)** project (http://www.bgs.ac.uk/qics), led by the Plymouth Marine Laboratory. The Japanese members have been conducting computational simulation, monitoring, observation and chemical analysis in the project's primary experiment. The test was carried out by releasing moderate levels of CO_2 into shallow sediments in a Scottish Bay in May and June 2012. They have studied the progress and effects of a controlled CO_2 leak and extrapolated these to real-life situations, which might occur in the future, together with their UK partners.

CONTACT

University of Tokyo

Toru Sato
sato-t@k.u-tokyo.ac.jp

AIST

Masahiro Suzumura
suzumura@ni.aist.go.jp

CRIEPI

Hideshi Kaieda
kaieda@criepi.denken.or.jp

Daisuke Tsumune
tsumune@criepi.denken.or.jp

JANUS

Satoshi Suzuki
suzuki-s@janus.co.jp

Kanso Technos

Masatoshi Hayashi
hayashi_masatoshi@kanso.co.jp

Kyushu University

Kiminori Shitashima
shita@i2cner.kyushu-u.ac.jp

RITE

Jun Kita
kita@rite.or.jp

General Enquiry

Ryozo Tanaka
rtanaka@rite.or.jp