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Natural analogue for diffusion of CO₂ gas bubble emitted from seafloor

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At seafloor hydrothermal systems, natural CO₂ is diffused into the ocean as a hydrothermal plume and low pH/high CO₂ environment is appeared around natural CO₂ vents. Natural analogue of the hydrothermal CO₂ would provide an opportunity of understanding CO₂ leakage from seafloor in the sub-seafloor CO₂ storage for CCS. In the Kagoshima Bay, CO₂ gas bubbles are erupted from seafloor at 200m depth. The result of mapping survey of CO₂ gas bubbles at the Wakamiko Caldera in the Kagoshima Bay indicated only localized pH depression (pH 6.5 to 7.2) below 120m depth because CO₂ in gas bubbles dissolved to seawater during ascent of the gas bubbles. The flux of gas CO₂ in the Wakamiko Caldera was estimated to be 1,509 μmol/cm²/second.

Keywords: CCS, Sub-seafloor storage, CO₂ leakage, Detection and monitoring, Natural analogue