The study on relations of the methane plume and atmospheric methane concentration

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PurposeWhen methane seeps out to the sea from the seabed, the following need to be observed and confirmed if the water concentration remains the same. High methane concentration in the atmosphere directly above the seeping point and separation of methane hydrate into gas and water. Then, by confirming the impact on the environment, we propose a survey method for environmental impact assessment of surface methane hydrate.**Method**The experimental site of this research was Umitaka Spur in offshore Niigata prefecture where a large amount of surface methane hydrate plumes is confirmed and investigated on the DAIIICHI KAIYOMARU(KAIYO Engineering). The experimental period was two days, August 6 and August 7.Atmospheric methane concentration was measured during this experiment using LI-7700 (LI-COR) which introduced Flux measurement to measure ppm of specific substances present in the atmosphere. Methane concentration was measured by LI-7700 which was attached to the upper bridge so it will not be affected by the exhaust of the ship. We measure the concentration of methane in the atmosphere from departure to arrival and graphed the data every hour.Using a quantitative echo sounder, we also explored if methane plumes exist underwater the atmospheric methane concentration becomes higher.**Summary** Methane concentration in the atmosphere of the sea, the area near directly above, in the sea area where the methane seeps from the seabed to the sea tends to rise. **Proposal for environmental impact assessment** When extracting surface methane hydrate and at experimental stages at sea, it is effective to monitor methane concentration on the sea, not in the seawater to detect sudden seepage of methane into seawater as soon as possible. Even if methane hydrate leaks into the sea, there is no change in sodium concentration, so we do not have be concerned about the influence on the environment.

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