

## Distribution of methane seeps and relative amount of gas in offshore Joetsu, Sea of Japan

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Methane hydrate (MH) is drawing attention as one of the domestic energy resources of the next generation in Japan. Two types of naturally seeping MH are confirmed to exist, sand-layer type and surface-layer type. Offshore Joetsu, the survey area of this research, is well-known to be the area with massive bearing amount of surface-layer type MH. In addition, due to the thermal power plant located in its vicinity, offshore Joetsu is considered to be one of the promising areas of MH development. Acoustic scattering abnormalities (methane plumes) associated with methane gas seeps from seafloor are confirmed in Umitaka Spur, typified by these seeps. Methane seep from seafloor is significant due to its environmental impact and it is promising as an energy resource. However, methane seeping points vary in the sea area (300 m to 800 m range) and at times, they are not confirmed in the MH bearing areas. For these reasons, the conditions of gas seeps are still uncertain.

The purpose of this study is to determine the distribution of methane seeping points and its backscattering strength (SV) by analyzing acoustic data collected in wide area survey using multibeam echosounder (MBES), in order to help determine methane seeping conditions.

Observations were made using EM302 (Kongsberg). Survey lines were directed to north-south direction and drawn every two minutes in the east longitude, at the vessel speed of 6 to 7 knots. From these data, longitude, latitude, and depth of methane plumes were confirmed using Qimera (terrain analysis software developed by QPS) and SV of methane plumes using Echoview (acoustic analysis software).

Based on the obtained data, the author calculated the following. The correlation between depth of plumes and SV, and horizontal change of its SV in large and small scale areas. Data of geological faults and coring from seismic surveys were also examined.

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