

## 3D seismic velocity structure below mounds and pockmarks in the deep water southwest of the Sado Island: the extended discussion

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The METI 'Sado-oki Nansei' 3D seismic survey was carried out in deep sea southwest off the Sado Island, Japan Sea. The survey area covered the Umitaka Spur having mounds and pockmarks where the recovery of massive methane hydrate samples beneath the sea floor, the discovery of methane bubble plumes rising into the water, and high resistivity anomalies below the sea floor were taken through some previous surveys.

We applied 3D pre-stack time migration and the continuous velocity analysis method to the 3D seismic data and investigated the geological and P-wave velocity structure below the sea floor of the Umitaka Spur and its surroundings.

It revealed high velocity anomalies suggesting methane hydrate occurrence below mounds and pockmarks. On the other hand, P-wave velocities below the sea floor remaining areas in the Umitaka Spur were lower than propagated in water layers. Therefore, it suggested that concentrations of methane hydrates were limited below mound and pockmark though some amount of gas may be contained in low velocity zones.

Within both of high and low velocity areas, numerous small faults, which may be fluid migration paths, were distributed. The situation may be caused by the localization of methane supplies from deep layers.