

Characteristics of BGHS in shallow methane hydrate fields of Oki Trough, eastern margin of Japan Sea

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Off San'in region, such as Oki Trough and Tsushima Basin, is known as one of the methane hydrate fields in the eastern margin of Japan Sea. This study focuses on BGHS (Base of Gas Hydrate Stability) in the Oki Trough and evaluates the influences on accumulation and disassociation of methane hydrate.

BGHS in the Oki Trough is mainly controlled by geothermal gradient. In the southeastern margin of Oki Trough, the geothermal gradient is comparatively high: 115–124 degrees C/km (e.g., Yasui et al., 1966, 1968). On the other hand, our geothermal investigation in the southwestern margin revealed the geothermal gradient as 71 degrees C/km. BGHS depths were estimated at the site in 727 m water depth in the southeastern margin and at the site in 763 m water depth in the southwestern margin to be 83 mbsf and 157 mbsf, respectively.

BGHS response to the 120 m sea-level fall during the Last Glacial Maximum was simulated. At the southwest slope of Oki Trough, the BGHS becomes 27 m shallower than present, while the variation at the southeast slope is 14 m. The response of BGHSs to the sea-level fall is prominently involved in methane hydrate disassociation, which makes the submarine ground unstable. This study intends to make reference to the relation between topographic deformation, like pockmarks and submarine slides, and methane hydrate disassociation in the Oki Trough.

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