

Slope failures induced by methane hydrate dissociation: a case of submarine slide in the southwestern Oki Trough, Japan Sea

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A huge submarine slide in the Oki Trough, Japan Sea, was examined from the viewpoint of methane hydrate dissociation due to BGHS (Base of Gas Hydrate Stability) fluctuation. The submarine slide, which occurred 34 ka, is located in the southwestern slope of the Oki Trough having a 1.6 degrees slant. Geothermal gradients were measured at the 700 m and 1000 m water depths by the side of the slide as 83.13 mK/m and 99.42 mK/m, respectively. Based on our simulation, the BGHS was situated just below the landslide masses at the time of the slope failure. The response of BGHS to the external factors, e.g. sea-level change, sedimentation, etc., is prominently involved in methane hydrate disassociation, which makes the submarine ground unstable. Relation between the slope failure and the methane hydrate disassociation is strongly suggested in the study case.

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Keywords: base of gas hydrate stability, submarine slide, shallow-type methane hydrate, Oki Trough, Japan Sea