Abstract
The sudden dissociation of gas hydrate within sediments at continental margin due to ocean warming and/or sea level drop has been suggested as a possible cause of global climate change as well as extensive slope failure. In the northeastern continental slope of the Sakhalin Island (Sea of Okhotsk), numerous gas hydrate-related manifestations in addition to gas hydrates have been reported, which include observed hydroacoustic anomalies through the water column, seafloor gas hydrate samples and gas hydrate-related structures in the sub-seafloor. The gas hydrate found at 385 mbsl is the shallowest occurrence ever reported in the Sea of Okhotsk. BSR depths match well with the base of gas hydrate stability zone (BGHSZ) estimated under the assumption of hydrothermal water temperature and the background geothermal gradient. The formation mechanism of gas hydrate in terms of thermal structure, an important distinction can be made between seafloors containing the seepage structure or none. We explore the timing of a large slope occurred in the northern Sakhalin continental slope in the study area using new stratigraphic evidence from subbottom profiles. The timing of the failure seems to be much younger, 12 ka roughly corresponding to the last stage of the Last Glacial Maximum, than the previous estimate, older than 350 ka. The extent of the slope failure occurs up to much shallower depth than the intersection depth of BGHSZ with the seafloor at 20 ka, possibly indicating complexity of natural landliskes. Furthermore, this region has witnessed a rapid sea water temperature increase in the last 50 years. If such a trend continues, additional slope failure can be expected in the near future, considering that the region is not far from a transform plate boundary where shallow seismicity occurs.

1. Marine Surveys in the Sakhalin Continental Slope

Hydro-Carbonate Accumulations in the Sea of Okhotsk (2007-2012)

Focal on the northeastern Sakhalin continental slope and several sites of gas hydrate, the water column, gas fluid seepage structures on the seafloor, gas hydrate samples and gas hydrate-related structures in the sub-seafloor, the northern Sakhalin Sea of Okhotsk projects. The PM13020', funded by the MOF, Korea as well as PE14061. We thank the captain and participants of the CHAOS 2005 expedition, 2007-2012.

2. Intereting Phenomena Related to Gas Hydrate in the Study Area

3. Estimated and Measured Heat Flow

4. Possibility of Past and Future Slope Failure due to Change of Gas Hydrate Stability Zone

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References