



## **THERMAL SIGNATURES AND GAS HYDRATES IN THE SEEPS OF THE SEA OF OKHOTSK; RESULTS FROM KOMEX 2002 CRUISE**

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Hydrate accumulations at the seafloor appear to be restricted to areas of focused fluid discharge. These fluid discharge features are generally associated with significant near-surface thermal anomalies. The thermal signatures can learn us about the process of fluid migrations, but may also reveal characteristics of potential hydrate accumulations.

We present new thermal data from the seeps in the Sea of Okhotsk obtained in 2002 during the Lavrentev29 cruise of the Russian-German KOMEX project. Core temperature measurements and thermal conductivity determinations were performed on seven 4-6m long sediment cores. Measurements were done immediately up on core arrival on deck in order to have a fair estimation of in situ sediment temperatures and heat flow. In the gas vents on the Sakhalin slope where gas hydrates were visually observed at a subbottom depth of 4 m, non-elevated temperatures and very low to negative heat flow values (-13 to 36 mW/m<sup>2</sup>) were recorded in the upper 4-5m of the sediment column. In the seepage area of the Derugin basin, on the other hand, all sampled sites are characterized by concave upward curved temperature profiles and high overall heat flow values (100-243 mW/m<sup>2</sup>). In one sediment core both thermal and water/gas content showed strong signatures of dissociated gas hydrates during core recovery, suggesting that gas hydrates are also present in this area.

The near-vertical temperature profiles in the seeps on the Sakhalin slope suggest that not much heat is transport upward by fluids and probably more pure gas venting is taking place. The lenticular-bedded structure of the observed hydrates supports this scenario. The low temperature may also be a result of the dissociation of gas

hydrates, which previously were observed at the same site but at shallower subbottom depths. In the Derugin seeps the concave temperature profiles suggest relatively strong upward fluid flow (20-60 cm/yr). More massive type hydrates might be formed here by precipitation where infiltrating fluids are sufficiently saturated by gas. These observations will be compared to other seep areas such as Lake Baikal.