

## Heat flow measurement around the methane hydrate area, off Naoetsu, Japan Sea

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In the mid-Summer of 2004, methane hydrate was sampled by piston coring using R&T/V Umitaka-maru of Tokyo University of Marine Science and Technology (UT04), from the spur (here called 'Umitaka Spur') off Naoetsu, Japan Sea. There are a number of mounds, large pockmarks (20-50 m deep and 200-500 m across), and gas plumes on the Umitaka Spur. In 2005, two research cruises were carried out around the Umitaka Spur: one is diving surveys using ROV Hyper-Dolphin of JAMSTEC (NT05-09 Cruise), another is piston coring and marine DC resistivity survey using R/V Kaiyo of JAMSTEC (KY05-08 Cruise). We present the results of heat flow measurement in these three research cruises.

From the diving surveys of ROV Hyper-Dolphin and deep-towed camera system, the following evidences are recognized: 1) undulated seafloor, cracks, and depressions are developed within mounds; 2) chemosynthetic communities including bacteria mats and sponges are developed around mounds; 3) film-like methane hydrates are exposed in cracks and depressions within mounds; 4) no cold seeps are present in the bottom of pockmarks; 5) small carbonate crusts and nodules are exposed around mounds.

Heat flow measurement was carried out by two methods. In UT04 and KY05-08, we used the piston corer equipped with several small temperature data loggers. In NT05-09, SAHF (Stand-Alone Heat Flow meter) was used for the measurements during ROV surveys. The measurement of UT04 shows 82-107 mK/m of geothermal gradient and 80-100 mW/m<sup>2</sup> of heat flow around the Umitaka Spur. On the other hand, more than 300 mK/m geothermal gradient was measured by SAHF adjacent to methane hydrate exposed on a seafloor.