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**ENVIRONMENTAL ROLE OF METHANE HYDRATE FORMATION NEAR  
SEA BOTTOM OFFSHORE SAKHALIN, OKHOTSK SEA**

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Fluid venting from depths of sea sediment will transport a significant amount of methane gas into sea water, and eventually to the atmosphere, contributing to enhance greenhouse gas activity for global warming. Gas hydrate formation near sea bottom may act as negative factor for the global warming by fixing methane gas in a solid crystalline form as gas hydrates. However, the details of this gas seep and fixation processes near the bottom are not understood quite well at present.

Side-scan-sonar survey with high-resolution seismo-acoustic profiling was performed offshore Sakhalin, Okhotsk Sea by the members of CHAOS (hydro-Carbon Hydrate Accumulations in the Sea of Okhotsk) project by Japanese, Russian, German, Belgium and Korean scientists in 2003. The survey results revealed characteristic distributions of gas hydrate accumulations with unique images of gas seepage structures and vertical fluid channel at/near sea bottom. More than 40 seepage structures were found within a 10 x 20 km survey area. The maximum size of seepage structure observed is about 600 m in diameter. Methane gas released from the seepage structures into the above water was detected as flare images by hydro-acoustic profiling. Investigations for an understanding of methane hydrate formation mechanisms and monitoring of hydrate formation activities are required to understand the role of near-bottom hydrate formation for methane gas budget in the atmosphere and to discuss about future actions against long-term trend of increasing greenhouse gas contents.