

## Search for fluid seepage structures at sea floor offshore NE Sakhalin Island, the Sea of Okhotsk

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Recently many scientists pay attention to gas-hydrate bearing seepage structures on the seafloor as important pathways to deliver methane from deep depths to the water column. The area of focused fluid venting offshore NE Sakhalin was investigated during the CHAOS (Hydro-Carbon Hydrate Accumulations in the Okhotsk Sea) expeditions onboard of RV, Akademik Lavrentyev in 2003, 2005 and 2006. The International Research Project CHAOS (Russia-Korea-Japan) aimed at the study of gas hydrate formation processes associated with the fluid venting in the Sea of Okhotsk. During the cruises, large hydrate-bearing seepage structures were newly found on the continental slope of the Sakhalin Island at water depths of 400-1,000 m by multi-frequency and high-resolution geophysical surveys including Side-scan Sonar (SSS), 3.5 kHz sub-bottom profiling, sparker seismic profiling, and echo-sounding. In an area of 200 km<sup>2</sup>, SSS survey identified more than 40 seepage structures. Using short gravity core (less than 5 m long), gas hydrate samples including massive pure gas hydrate layers (up to 35 cm thick) were successfully recovered within these seepage structures at very shallow subbottom depths. Gas hydrate sample taken at the water depth less than 400 m during the cruise is believed as the shallowest submarine gas hydrate discovered ever in the world. The total gas accumulations within all seepage structures (4.36 km<sup>2</sup>) in the area may be as much as 3.5 billion km<sup>3</sup>.