Characterization of topography-bottom sediment-benthos in shallow gas hydrate fields of the Japan Sea

*Hitoshi Tomaru[1], Hideki Numanami[2], Ryo Matsumoto[3]

1. Department of Earth Sciences, Chiba University, 2. Tokyo Kasei Gakuin University, 3. Gas Hydrate Laboratory, Meiji University

Wide distribution of mounds and pockmarks that were formed due to the formation and/or dissociation of shallow gas hydrates have been observed in the Mogami Trough, Joetsu Basin, and Oki Trough, Japan Sea. ROV researches have found the outcropping of gas hydrate near the seafloor, gas seepage and distribution of carbonate clasts and bacterial mats on the seafloor which resulted from high gas (methane) flux from deep sediment to the water column in those areas. We also found that the distribution densities of *Zoarcidae* (Genge fish in Japanese) and red snow crab are significantly high in those areas, the distribution of shallow gas hydrate, essentially methane, likely controls the distribution and relationships among topography, bottom sediment, and benthos. In this study, we integrate the bathymetry and backscatter data with the data of seafloor observation using ROV in order to characterize the seafloor environments including shallow gas hydrate deposits.
High backscatter areas are often observed on the summit of mounds or topographic high, rather than within the pockmark and on the flank. Carbonate clasts and bacterial mats distribute in relatively narrow region within the high backscatter area, their distributions, however, do not overlap each other. Methane flux/concentration is not the only process which can constraint the precipitation of carbonate and cultivation of bacterial mats together. The *Zoarcidae* and red snow crab likely live on the high backscatter areas except within the pockmarks, the topography, controlling bottom current, slope angle etc., as well as bottom sediment type may constraint their distributions. Our results show the importance of integrated seafloor data for assessing the effects of gas hydrate formation/dissociation on the seafloor environments.
This study used data collected during the academic researches and expeditions conducted under the commission from AIST as a part of the methane hydrate research project funded by the Ministry of Economy, Trade and Industry, Japan.

