

Research activities for future scientific drilling in large submarine landslide group in Sanrikuoki Basin

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A great number of large slump deposits have been identified in the Pliocene and younger formations in the north Sanrikuoki Basin off Shimokita Peninsula, NE Japan. The slump units and their slip planes have very simple and clear characteristics, such as layer-parallel slip on very gentle slope, regularly imbricated internal structure, widespread dewatering structure, and low-amplitude slip plane layer. So, we recognize the large slump deposits group in this area is an appropriate target for a scientific drilling to determine "Submarine Landslide Mechanism", that is one of the subjects on the IODP new science plan for 2013 and beyond. In 2012, we started some research activities to examine the feasibility of the future scientific drilling.

The slump deposits were recognized basically by 3D seismic analysis. Further detailed seismic analysis is being performed for better understanding of geologic structure of the sedimentary basin and the slump deposits, that is to extract suitable locations for drill sites.

Typical seismic features and some other previous studies imply that the formation fluid in this study area is strongly related to natural gas, of which condition is strongly affected by temperature. So, detailed heat flow measurement is going to be performed in the study area. For that purpose, a long-term water temperature monitoring system was deployed on the seafloor in October, 2012. The collected water temperature variation will be applied to precise correction of heat flow values, which will be measured next year. Vitrinite reflectance analysis is also being carried out using sediments samples recovered by IODP Expedition 337, which is conducted in a part of the study area from July through September in 2012. The values of vitrinite reflectance will be available for modeling thermal history in the sedimentary basin.

In September, a science meeting and a field trip were held in Miyazaki Prefecture. These are aimed at identifying the issues for planning the scientific drilling and at developing a science community on this subject. At the field trip, we observed typical geologic structures related to slumping and dewatering in Nichinan Group, which are good onshore objects so as to share the aspects of the slump deposits in the Sanrikuoki Basin among the community.

This study uses the 3D seismic data from the METI seismic survey "Sanrikuoki 3D" in 2008. The seismic analysis, the vitrinite reflectance analysis, and the science meeting and the field excursion in Miyazaki were supported by the foundation of feasibility studies for future IODP scientific drillings by JAMSTEC CDEX.

Keywords: submarine landslide, slump, layer-parallel slip, dewatering, slip plane, IODP