

Dense sampling of submarine landslide deposits

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Abstract

Studies on sediment properties in a submarine landslide slope by dense and wide sediment samplings and borehole monitoring can provide new knowledge of process of submarine landslide. Temporal change of sediment properties even if it is small is important information for further understanding of landsliding. To implement this research, non-disturbed sampling and detail acoustic imaging are crucial techniques.

Introduction

Submarine landslide deposits in a slope provide opportunities to understand past episodic geological events such as earthquakes. Collection of these records around a seismogenic zone has been performed using a conventional piston corer, and their spatiotemporal distribution has been studied. This information is quite important to predict future geologic event empirically, and this type investigation should be continued.

Proposed study

Another issue to be studied is “process” of submarine landslide. If we could understand its nature clearly, it is more useful for our life on the basis of disaster prevention. But because our present knowledge does not allow to predict when landsliding takes place, it is definitely difficult to observe landsliding directly. One of roads to understand the process is to study spatiotemporal variation of sediment property in a slope. The area where past-submarine slides develop is possible target. It means that the slope is certainly under the geological setting which induces submarine landslide. Variation of sediment property can be clarified by wide and dense shallow sediment sampling and measuring spatial variation of properties in the slope sediment. Because a submarine sliding generally occurred in the restricted portion in the slope, some heterogeneities in the slope sediment may exist before triggering.

Second step is a continuous monitoring of sediment property at all depth using drilled holes. It is realistically difficult to observe the episodic event during the experiment. But

if some temporal change of sediment condition could be detected, it means some part of process of sliding. Such information can contribute to further understanding of submarine landslide process.

Key issues to implement this study

- Multi-hole coring strategy at one area with precise positioning should be designed to describe the property variation in the sediment slope.
- Non disturbed sampling technique is indispensable to obtain in-situ geologic status. For this purpose, conventional approach is not sufficient to scrutinize the submarine landslide body. New sampling technique which dose not alter sediment physical properties should be required.
- Precise and detail shallow acoustic image in the target before sampling is necessary to select sampling position.