Geophysical Research Abstracts
Vol. 20, EGU2018-11340, 2018
EGU General Assembly 2018

Submarine Landslide and Potential Hazards on the Western Slope of the Okinawa Trough

Qi Li (1), Yujie Li (2), and Cunzi Jia (3)

(1) China University of GeoSciences, Beijing, China (liqi@cugb.edu.cn), (2) China University of GeoSciences, Beijing, China (778120245@qq.com), (3) China University of GeoSciences, Beijing, China (273079143@qq.com)

Submarine landslide is one of the major geologic hazards which affect the morphology of continental margin. Sudden large-scale submarine landslide may trigger tsunami, causing huge losses in property and human life of coastal residents. Okinawa Trough is a tectonically active back-arc basin, which have turbidity deposits been revealed by core samples.

High-resolution multi-channel seismic, multi beam bathymetric data and more gravity cores were collected in the area.We attempted to investigate the development and evolution of continental slope through the comprehensive study of sequence stratigraphy, tectonic geomorphology and seismic sedimentology. Based on our investigation, the total number of submarine landslides identified is 102,The largest landslide is approximately connected with the mud volcanoes. Most landslides occur on the local slopes less than 20º, with the depth of 200-1200m. Four types of occurrence were recognized in seismic reflection patterns. Multi-channel seismic profiles showed that the upper slope had been eroded heavily. Submarine landslide distribute mainly in a belt along the through near the fault zone on the upper slope. Gravity flowing deposits distribute mainly from the lower of the fault zone to the Okinawa Trough bottom.

Submarine canyons have widely developed from early Pleistocene to present on western continental slope of Okinawa trough. The submarine canyons vary from V-shaped erosional to U-shaped depositional-erosional canyons. The location of submarine landslide and type of gravity flowing deposits followed certain rules.

Analyses of these data have shown characteristics of submarine landslide and gravity flowing. The gradient of slope and sediment supply indicates that submarine landslide and gravity flowing deposits are extensive on the west slope. But asymmetric development in the north, south and middle part of the western slope was affected by different factors, such as depositonal rates, tectonic movements, earthquakes, tsunami and so on.

The location of submarine landslide and type of gravity flowing deposits followed certain rules. Submarine landslide often appears the top of slope and downward the slope is the sediments creeping or debris flowing deposits. Lentoid turbidities bodies are often on the foot area of the slope, and turbidity plain appears on the bottom of the trough. In general case, submarine landslide and gravity flowing often happen simultaneously, but in this area, gravity flowing took place more frequently. In overall, the structure of the slope was the result of serial erosion-deposition.

This project was supported by the National Natural Science Foundation of China (41576066) and the Fundamental Research Funds for the Central Universities (2652017136).