



## **Submarine Landslide: A Case Study from Palm Ridge, Southwestern Taiwan Offshore**

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Submarine landslides not only regulate the shape of the seafloor and transport sediment into the deep-water environment but also have a significant influence on human life. Palm Ridge is an area located between passive and active continental margin. According to previous studies, there could be a submarine landslide occurred in this area. That event also considered highly related to the 1781/1782 tsunami event described in the historical records. However, the occurrence of that submarine landslide is still not well-studied. Based on the high-resolution multi-beam bathymetric, reflection seismic profiles and sub-bottom data, this study aims to reconstruct the 3D geometry model of the proposed ancient landslide. In addition, an infinite slope stability analysis method will be applied to evaluate the possible magnitude of an earthquake and the amount of excess pore pressure resulting from possible gas-hydrate dissociation. Utilizing the common use of ArcGIS and Fledermaus techniques, the range of landslide is predicted and mapped and then the identified range is validated by the geophysical prospecting data. The present topography is also reconstructed by using Topo to Raster interpolation algorithm. The preliminary result shows that there is a huge submarine landslide occurred in the study area with the dimension of roughly 22 km length, 6 km wide and covering a total area of 90.76 km<sup>2</sup>. The maximum depth of the failure surface along the representative cross section is about 296 m and the average depth is 162 m. This submarine landslide released and deposited a huge amount of sediment with an estimated volume of 4.02 and 4.9 km<sup>3</sup>, respectively. The infinite slope analysis indicated that the required amount of excess pore pressure to trigger the failure of slope is 1044 kPa and the required Peak Ground Acceleration ranges from 0.11 to 0.28g.