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## Hazard Assessment of Earthquake-Submarine Landslide-Tsunami Cascading Events on the Slope Fault Zone of Northern SCS

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The consensus in earlier studies was that the tsunami threat along the coast of south China primarily comes from destructive earthquakes occurring in the Manila subduction zone. However, two seismogenic structures on the continental shelf of the Northern South China Sea, namely the Littoral Fault Zone and the Slope Fault Zone, have been overlooked in these assessments. Both fault zones have a history of destructive earthquakes accompanied by tsunamis. In particular, the Slope Fault Zone, located in the shelf-slope bending zone, is prone to triggering submarine landslides after earthquakes, which can result in devastating tsunamis. This study aims to assess the potential threats posed by earthquake-submarine landslide-tsunami cascading events in the Qiongdongnan segment of the Slope Fault Zone to the coastal regions of Southern China.

To achieve this, we conducted a probabilistic seismic hazard analysis using the latest findings on the fault structure of the Qiongdongnan segment and the comprehensive regional seismic catalog. This analysis provides important information about the likelihood of earthquakes in the region. Based on the seismic hazard analysis results, we assessed the stability of gentle slope areas (submarine landslide gap) using high-resolution bathymetric data, multi-channel seismic profiles, and gravity core samples of seafloor sediments. Finally, we established a model for potential submarine landslide sources in these areas and evaluated the tsunami hazard resulting from earthquake-triggered landslides.

By comprehensively evaluating earthquake-submarine landslide-tsunami cascading events on the continental shelf fault zone of the Northern South China Sea, this study aims to provide a new perspective and understanding for earthquake and tsunami disaster prevention. Additionally, it seeks to establish the scientific foundations for the development of effective tsunami warning and risk management strategies.