



The gas-hydrate-related seabed features in the Palm Ridge off southwest Taiwan

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The offshore area of the SW Taiwan is located in the convergence zone between the northern continental margin of the South China Sea and the Manila subduction complex. Our study area, the Palm Ridge, is located in the passive continental margin. According to the geophysical, geochemical and geothermal data, abundant gas hydrate may exist in the offshore area of SW Taiwan. In this study, we will study the relation between the seabed features and the gas hydrate formation of the Palm Ridge.

The data used in this study include high-resolution sidescan sonar images, sub-bottom profiles, echo sounder system, multi-beam bathymetric data, multi-channel reflection seismic and submarine photography in the Palm Ridge. Our results show the existing authigenic carbonates, gas seepages and gas plumes are mainly distributed in the bathymetric high of the Palm Ridge. Numerous submarine landslides have occurred in the place where the BSR distribution is not continuous. We suggest that it may be because of rapid slope failure, causing the change of the gas hydrate stability zone. We also found several faults on the R3.1 anticline structure east of the deformation front. These features imply that abundant deep methane gases have migrated to shallow strata, causing submarine landslides or collapse. The detailed relationship of gas migration and submarine landslides need further studies.