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# Active mud volcanoes and potential gas hydrate in the near shore of SW Taiwan

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Multibeam echo sounder, deep-towed sidescan sonar and sub-bottom profiler surveys are carried out in the near shore area off SW Taiwan. Thirteen mud volcanoes are recognized by using multibeam bathymetry. The high-resolution sub-bottom profiler data show the existence of more than one hundred gas seeps and one pockmark distributed in the study area. These mud volcanoes are situated at the summit of mud diapiric structures identified by multichannel seismic reflection (MCS) profiles. It indicates that the growth of mud volcano is closely related to mud diapiric structure. The fluid source of mud volcanoes come from the diapiric structure and fluid migrates upward along fractures to the seafloor. For the first time, ROV survey for mud volcano observation is applied in the near shore area off SW Taiwan in 2011. The results of ROV observation reveal three active mud volcanoes with eruption from seafloor. The eruption cycle of mud volcanoes MV1 and MV5 are about every 3∼5 minutes, and MV12 is about every 3∼10 seconds. The high methane concentrations (100∼550 nL/L) of seawater have been found in the water column above the mud volcanoes, are much higher than the average seawater value ( < 50 nL/L), indicating the high methane fluxes beneath the mud volcanoes area. In addition, obvious BSR distribution has been observed based on MCS profiles in the study area. It infers a wide distribution of gas hydrate within sediments off SW Taiwan region.