



Fluid escape features and gas hydrates in the Southern Black Sea

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During a recent (15.10 - 4.11.04) cruise to the Black Sea onboard RV Poseidon three areas in the southern Black Sea offshore Georgia and Turkey have been mapped with multibeam bathymetry and sidescan sonar in order to identify sites of near-surface gas hydrates and sites of active fluid seepage. The geoacoustic data have been calibrated through seafloor observations with a towed video sled and through gravity coring. Offshore southern Georgia several active gas seeps have been discovered on the continental slope and some others mapped in detail for the first time. In this area, the slope is heavily incised by active canyons and gas plumes have been observed on the sidescan sonar records from several areas on the flanks of one of the canyons. In addition, one ridge bounded by canyons showed fractures associated with high backscatter anomalies and gas plumes in the water column. Coring of the site revealed the presence of gas hydrates associated with carbonates in the central high backscatter zone and gas hydrates associated with fine-grained sediments in the surrounding medium backscatter zone. Areas of low backscatter did not reveal any presence of gas or gas hydrates. Sidescan sonar data from the seaward extension of the Kozlu High in northern Turkey also revealed several sites of active gas seepage. In this area the continental slope shows areas of alternating broad, sometimes flat-topped ridges and broad depressions. In most of the area gas fronts indicate the presence of gas in the shallow subsurface. Sites of active gas seepage have been discovered on several of the ridges in the area in water depths ranging from 1000 to 1800 m water depth. These seepages are either shown by gas plumes or by areas of high backscatter associated with an updoming of the gas front in the subsurface. Commonly these areas of high

backscatter are rounded and do not show a relationship to fractures, as in they do offshore Georgia. The data from both offshore Georgia and offshore Turkey show that active fluid seepage is a common feature in the southern Black Sea. This underlines the large amounts of gas in the subsurface of the area and the presence of multiple pathways for the gas to reach the seafloor. These sites of active fluid venting will allow to better understand the mechanisms and controls of gas seepage in the Black Sea, especially in comparison to similar sites in the northern Black Sea.