Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02317, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02317
EGU General Assembly 2008

3D Marine Seismic Investigations of the Batumi Seep Site, Eastern Black Sea

N. Fekete (1), V. Spiess (1,2), H. Keil (2), G. Bohrmann (1), H. Güney (3)

(1) Research Centre Ocean Margins, Bremen, Germany; (2) Department of Earth Sciences, University of Bremen, Germany; (3) Department of Exploration, Türkiye Petrolleri Anonim Ortakligi, Ankara, Turkey

The Batumi site offshore Georgia gained scientific attention through its gas seepage activity from the sub-surface to the water column. In April 2007, a 3D grid of 72 multichannel seismic profiles was acquired during R/V METEOR Cruise M72/3 in a study area of 1.7 nm x 1 nm, with 25 m line separation.

This data set was part of an interdisciplinary survey, aiming to answer the following questions: What is the small-scale sub-surface structure of the seep site? How are free gas and gas hydrates distributed beneath and at the seafloor? Which are the migration pathways and feeder channels that enable the gas seepage?

On our poster, we present first results from the 3D data set. Seismic data reveal a clear BSR (bottom simulating reflector) approximately 200 ms (approx. 150 m) below the seafloor. It is interpreted to be caused by free gas trapped below the gas hydrate stability zone and appears to be restricted to the close vicinity of the seepage area. This gas pocket is thought to feed the gas flares observed at the seafloor.

High-amplitude reflections are also seen 10-40 ms (8-30 m) below the seafloor, interpreted to indicate either a shallow gas reservoir, or massive gas hydrate accumulations. A columnar blanking or amplitude decrease is observed beneath these structures. A possible explanation for the lack of strongly decreased seismic amplitudes may be the presence of limited amounts of free gas within the gas hydrate stability zone.

Preliminary seismic results from the Batumi gas seep site indicate a connection be-

tween the location and reflection amplitude of BSR, the occurrence of shallow, high-amplitude reflectors, and the regional tectonic pattern. We suggest that free gas accumulating at the base of gas hydrate stability field escapes upwards along tectonically opened pathways, to form gas hydrates in the shallow subsurface and/or to vent directly into the water column.

This work is a first step towards a joint interpretation with other data from the Batumi area, such as side scan sonar and parametric sediment echosounder profiles, flare imaging in the water column, and geological - geochemical information from shallow cores, aiming to broaden our understanding of the nature and mechanism of gas seeps.