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Having freshly embarked the seismic crew became rapidly integrated into the scientific activities. Only 24 hours after leaving Trabzon the seismic equipment was launched and a first survey started in an yet unexplored area of the Georgian continental margin. Acoustic anomalies (flares) had been detected in the water column during the previous leg 3a when bathymetric profiling was carried out in this area. Further mapping revealed numerous flares on the summit and partly along the flanks of a ridge named Gudauta Ridge. Flare locations and the bathymetric map of the area were used to establish a plan for seismic profiling. Figure 1 shows data from a 0.4 L GI-gun and recorded with an 80-channel streamer in around 800 m water depth. Two areas of active gas release were recorded in the centre of the ridge, where strong attenuation of seismic energy is present (Fig. 1). Distinct higher amplitudes close to the sediment surface document very shallow gas accumulations which feed the gas flares in the water column. Extensive undisturbed sediment structures in the surroundings indicate that the gas is emanating from deeper depth levels which do not influence the sedimentation. The size of the sub-seafloor gas accumulation is very noticeable. It covers several square kilometres and might be responsible for weakening of the stability of the seafloor.

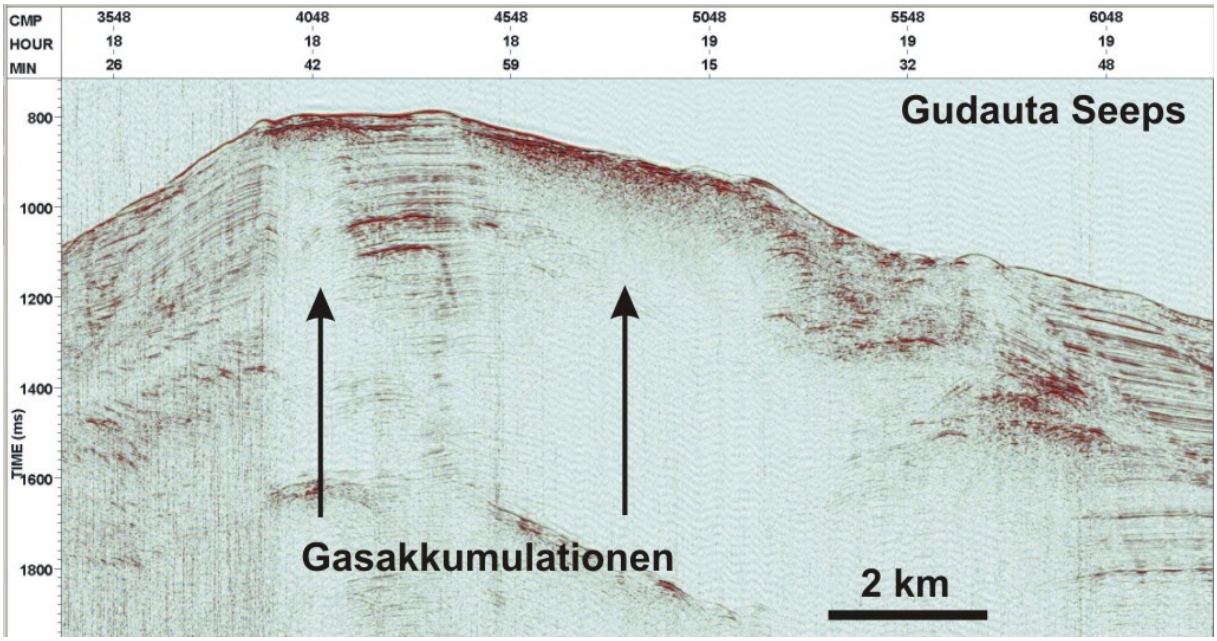

Figure 1: *Multichannel seismic records from Gudauta Ridge on the Georgian continental margin show large-scale zones of gas accumulation in otherwise well-stratified sediments.*

Beside the seismic equipment the deep-towed sidescan sonar from Kiel (DTS-1) was used and showed seafloor anomalies at the flare locations. We also recovered a sediment core highly saturated with gas from 690 m water depth, which based on temperature and pressure is not deep enough to form gas hydrate. Since all flares that have been found occur above the stability conditions of gas hydrates, we left Gudauta Ridge area on Friday evening and started to record an overview multichannel seismic profile on the way to the Batumi seeps.

The gravity corer and both autoclave piston corers were used to sample gas hydrates at distinct locations of flares clusters mapped during leg 3b. Gravity coring during the afternoon on the Iberia Mound was successful. Iberia Mound is a cone-shaped feature that is characterised by oil seepage, which probably rose up from the roof area of the underlying Iberia Anticline. During the night high resolution sidescan sonar mapping using the 410 kHz frequency was carried out in the Batumi seep area. Using this frequency needs extremely careful attention by the watch keepers, because the vehicle is towed only 15 m above the seafloor and can be easily crashed into the seabed. The high frequency allows to image the seafloor with

only minimal penetration (upper 2-3 cm of the seafloor) whereas the second frequency of 75 kHz is approximately integrating the upper 50 cm, which most probably includes the gas hydrate deposits which are not outcropping on the seafloor and occur somewhat deeper. The comparison of the maps recorded by both frequencies shows the difference in the content of seabed information.

On Easter Monday we sampled a further seep area, which is known as Pechori Mound. Pechori Mound is a pronounced seafloor elevation with a diameter of about 3 km and stands approximately 50 m above the seafloor in 1100 m water depth. Four distinct gas seeps are feeding four flares as high as over 500m above the sea floor. Besides gas there is also oil which is leaking from the seafloor forming oil slicks on the sea surface (Fig. 2 left). The analyses of satellite data from the area led to the discovery of the oil slicks and oil seepage on the seafloor, which became of interest to the international oil exploration groups.

Gravity coring succesfully retrieved seep sediments from Pechori Mound in which dispersed gas hydrates have been present. In contrast to pure white hydrate the staining of oil leads to a more yellowish colour of the Pechori hydrates.

Figure 2: *Oil drops released from the seafloor at Pechori Mound reach the sea surface and form oil slicks (left) that can even be observed by satellite images. A gas hydrate layer from Pechori seep sediments is imbued with oil similar in density as the surrounding sediments (right).*

Sediment sampling of areas rich in gas hydrates was performed daily during day time, while seismic and sidescan sonar work was conducted during the night. A detailed, high-resolution seismic survey with profiles only 25 m apart started on Eastern Sunday for 30 hours. Such dense profiling will allow mapping the sub-seafloor structures like gas and hydrate accumulation layers or gas chimneys in great detail. These seismic data will be an important base for a future drilling campaign in the Batumi seep area using the portable mobile drilling device MeBo developed at Bremen University.

Calm weather and sea state during the past week formed ideal working conditions on RV METEOR within the Black Sea. All cruise participants are well and in good spirits.

In the name of all cruise participants

Gerhard Bohrmann FS METEOR, April 12, 2007