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GAS AND HYDRATE OCCURENCES IN THE WESTERN BLACK SEA

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Here we present the preliminary results of the ongoing project ŞAssessment of the gas-bearing sediments in the north-western Black SeaŤ supported through a EC Marie Curie Fellowship. The project aims to integrate information from geophysical and geomorphological data in order to define a general characterization of the gas accumulations in the recent sediments of the Black Sea. Investigation is based mainly on high-resolution seismic reflection data and swath bathymetry acquired during the BlaSON and BlaSON 2 surveys by IFREMER (France) in cooperation with GeoEcomar (Romania). Sub-bottom profiles (3,5 KHz) acquired by GeoEcoMar have been also used, as well as seismic and bathymetric data from the CRIMEA EC project.
The western margin of the Black Sea contains evidence of abundant subsurface gas accumulations that appear in a complete suite of settings from the coastal zone to the deep basin. Considering the variation of their features from one setting to another, we defined several distinct gas provinces:
- the coastal zone in front of the Danube Delta and along the Bulgarian shore is marked by the presence of a shallow gas accumulation that causes a widespread acoustic mask up to 1-3 m depth below the seafloor.
- on the shelf the typical gas facies is represented by acoustic columns from a deep source (below the penetration limit of our profiles), either reaching the seafloor or being buried under the upper shelf deposits.
- the shelf-edge zone (including the external shelf and the upper slope down to about 750 m water depth) shows significant gas discharge and numerous gas seeps have already been mapped. Gas escape zones are commonly associated with subsurface

acoustic turbidity and acoustic columns.
- on the slope below 750 m depth, bottom simulating reflectors (BSR) were detected and indicate the probable presence of gas hydrates. A remarkable BSR pattern consisting of multiple BSR-type reflectors occurs in the Danube fan.
Zones of significant gas accumulation (especially the coastal zone and the shelf edge) seem to be associated with high sedimentation rates, which may indicate a possible biogenic origin for this gas. Nevertheless, there is evidence that deep thermogenic gas sources could have contributed as well.