

## THE BLACK SEA AS A RECORD OF THE YOUNGER DRYAS CLIMATE CHANGE

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### Abstract

The north-western Black-Sea continental shelf was revisited from April 23<sup>rd</sup> to May 23<sup>rd</sup> 1998 within the French-Romanian BlaSON (Black-Sea Over Neoeuxinian) survey on Board the French RV *Le Suroît*. More than 4500 km of multichannel (24) High Resolution (HR) seismic reflection data were acquired in parallel with multibeam echo-sounding (EM1000), monochannel Very High Resolution seismic and Chirp Xstar data. Several hundred of kilometres of seismic have been shot also over the Danube deep sea fan, in strike and dip direction in order to have a general understanding of the sediment supplies from the delta over the Quaternary periods.

*Keywords* : Black Sea; Rapid transgression; Younger Dryas; Climate variability

The transition of the Black Sea system from a fresh-water lake to a marine environment was perhaps one of the most dramatic Late Quaternary environmental events in the World. It has been proposed (1) that 20,000 years ago the Black Sea was a giant freshwater lake. Till recent studies, the generally accepted picture was that the postglacial warming and melting of ice caps which started 15,000 yr ago, generated a general rise of the sea level. As the Black Sea was in a very close vicinity to the Scandinavian-Russian ice cap, the supply of the melting water from the glaciers into the Black Sea was supposed to be sufficiently important that at approximately 12,000 yr B.P., the level rose up to the Bosphorus sill and even higher (much quickly than in Mediterranean basin). Thus, a large flux of fresh water flowed through the Bosphorus-Dardanelles towards the Aegean Sea and the two-way water exchange was established, starting so the process of transformation of the Black Sea in anoxic brackish sea. Based on results collected on the Ukrainian shelf in 1997, American scientists (2) proposed another theory to comment the re-connection between the Mediterranean Sea and the Black Sea. For these authors, the sill of the Bosphorus was breached by about 7,150 yr B.P. and a catastrophic flooding of the continental shelf of the Black Sea was inferred in the course of global sea-level rise. Saltwater poured through this spillway to refill the lake and submerged more than 100,000 km<sup>2</sup> of its previously subaerially exposed continental shelf.

In August 2002, the French research vessel *Le Suroît* equipped with a EM 300 multibeam echosounder and a TritonElics Chirp Sonar mapped the Bosphorus outlet at the shelf edge.

The results show the existence of an important retrogressive canyon incised on the platform and two more recent canyon heads, the incision of which can be followed landward on the shelf in front of the Bosphorus outlet. The direction of these canyon heads being West-East is puzzling. One suggestion is that they may follow a tectonical direction. Coring realized on the platform and then in the canyon itself revealed some meggaripples made of shell debris and witnessing a very recent activity.

The results presented here confirm that the Holocene climate modifications in the intercontinental setting of Eastern Europe had a significant implications on the behaviour of the Black Sea sea-level fluctuation. Rare preservation of an intact regression surface, two-way exchange of water through the Bosphorus and Dardanelles Straits, and impact on the Neolithic population are the major consequences related to reconnection between the Marmara Sea and the Black Sea.

### References

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