Geophysical Research Abstracts,
Vol. 10, EGU2008-A-07288, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-07288
EGU General Assembly 2008

Holocene and Eemian sapropel sedimentation in the anoxic basin of the Black Sea

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As the most distant arm of the Atlantic Ocean, the Black Sea demonstrates an unparalleled feature: it oscillates between lacustrine and marine stages following, respectively, glacial-interglacial sea level changes. Coring efforts during the last years rather suggested an extensive glacial sediment cover on most of the Black Sea slope areas not reachable with conventional gravity and piston coring devices. Here we present new sediment cores retrieved from the tectonically formed Archangelsky Ridge in the southeastern Black Sea during the last year's RV Meteor cruise M72/5, which provide a first view into an almost complete and undisturbed sedimentary unit covering the last ˜140 kyrs. Initial results from continuous XRF scanning on the split sediment cores suggest strong and immediate responses of the glacial Black Sea freshwater lake to the abrupt D-O climate oscillations of the last glacial period. Each abrupt warming initiated, like during Termination I, inorganic carbonate precipitation in the lake system. Subsequent stadials are marked by increasing detrital input. At the base of one of the cores the almost complete marine unit deposited during the last global sea level highstand in Marine Isotope Stage 5 - the "Eemian" sapropel - is exposed. The intercalation of dark organic-rich intervals with light layers of aragonite precipitates and coccolith ooze in this unit demonstrates that the last marine stage of the Black Sea must have had a more complex history than we know from the Holocene. Despite the fact that the exact dating of this sequence will be challenging, the "Eemian" sapropel provides the opportunity for a comparative study to the Holocene sapropel units, which started to

deposit after the latest reconnection with the Mediterranean Sea around 9000 years BP ago. Furthermore, detailed thin section analyses and ultra-high-resolution micro-XRF scanning of the finely laminated "Eemian" sapropel provide insights into interannual to decadal-scale climate variability of the previous interglacial.