Geophysical Research Abstracts,
Vol. 10, EGU2008-A-06161, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-06161
EGU General Assembly 2008

Temperature and water column conditions linked to sapropel S1 formation in the Aegean Sea: planktonic foraminiferal, Mg/Ca, and $U^{k'}_{37}$ evidence

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Over the past few million years, the Mediterranean Sea has been very sensitive to orbitally-forced climatic changes, as evidenced by cyclic deposition of organic-rich, laminated sediments (sapropels). The Aegean Sea is one of the most oligotrophic areas of the Mediterranean, characterized by low primary productivity and organic-deficient sediments. Late Pleistocene-Holocene sapropel deposition demonstrates that dramatically different conditions periodically occurred and coincided with changes in North Atlantic thermohaline circulation. The most recent sapropel (S1) has already been identified in the Aegean Sea; however previous research has been inconclusive regarding hydrographic conditions associated with its formation. To address this, we report a variety of temperature proxy and planktonic foraminiferal abundance data to

elucidate upper water column conditions surrounding S1 formation in the SE Aegean Sea.

Core NS-14 was recovered from a water depth of 505m at $36^0$38´ 55´´ N and $27^0$0´ 28´´ E in the western Kos Basin (SE Aegean Sea) in 1998. The 4m-core approximately spans 14.5-2.5ka, exposing the early Holocene S1 event (9.3-6.4ka) at very high resolution compared to most occurrences throughout the eastern Mediterranean. Although a mass gravity flow comprises the lowest 1m of the core, the upper 3m is more chronologically useful and is controlled by 5 AMS ^{14}C dates corrected for Aegean Sea reservoir age effects. SST estimates were made with the alkenone ($U^{k'}_{37}$) proxy, at a comparable sampling resolution for which planktonic foraminifera were also picked and counted from the 150-300 ?m size fraction. Foraminiferal assemblages comprise *Globigerinoides ruber* (white and pink varieties), *Globigerina bulloides*, *Globigerinoides trilobus*, and *Globigerinita glutinata*, and a variety of minor species. Qualitative analyses of SST changes were made with the relative percentages of warm- and cold-water indicator species, and the resulting "climatic curve" agrees well with $U^{k'}_{37}$-basedestimates.

We also present *G. ruber/G. bulloides* ratios that are used to approximate changes in water column stratification, and *G. ruber* Mg/Ca as a further geochemical proxy for SST. Collectively these hydrographic reconstructions will be compared at high temporal resolution ($\sim$ 250yr.), in order to infer detailed upper water column changes before, during, and after S1 deposition in this part of the eastern Mediterranean.

This work is part of a EUROCORES-EUROCLIMATE, Project MERF (Quaternary Marine Ecosystem Response to Fertilization) and is co-funded by IAS.