Geophysical Research Abstracts
Vol. 15, EGU2013-7544, 2013
EGU General Assembly 2013

Centennial to decadal climate variability in the Adriatic Sea during Sapropel S1

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Enhanced organic matter fluxes to the seafloor and anoxia encourage the formation of organic rich sediment units, known as sapropels, in the Eastern Medditerenean. These sapropels are formed repetitively in response to northern insolation maxima driven by orbital precession since the Miocene. Recent studies have shown that conditions during the sapropel formation are less stable than previously assumed. For example the latest Sapropel S1 is interrupted on both millennial (the 8.2 kyr event, e.g. Rohling et al.2002) and centennial time scales (Jilbert et al., 2010). However, different climatic phenomena (the siberian high and the monsoon, respectively) have been suggested to trigger these ventilation events. The present formation of deep water in the Adriatic Sea is controlled by variability in the Siberian high and therefore an excellent site to study the possible influence of this climate phenomenon on short time scale ventilation of sapropel S1. Here we present a high resolution geochemical study of a sub-milimetric scale laminated sapropel S1, including the 8.2 kyr event, from the southern Adriatic. The duration of the observed laminae appear to be as short as a decade, similar in period to frequencies known from total solar insolation today. By using a novel technique (Laser Ablation ICP-MS) extremely high resolution geochemical profiling of the laminated sediment is possible. This is extremely useful to unravel the forcing mechanisms responsible for generating these distinct laminae. We will compare these ultra-high resolution data with those from other climate records and relate diagnostic elemental ratios and their centennial and decadal frequencies of occurrence to relevant other climate records like the Siberian high, North Atlantic Oscillation and ITCZ.