

Past hydrological reconstruction of intermediate and deep-water masses of the Northern Ionian Sea during Sapropel S1 based on Nd isotopic compositions analyzed on foraminifera from deep-sea sediments

GUOHUI GAO¹, CHRISTOPHE COLIN², GIUSEPPE SIANI³, ARNAUD DAPOIGNY⁴, SOPHIE SEPULCRE⁵ AND GERT J. DE LANGE⁶

¹Geosciences Paris-Sud (GEOPS) University of Paris- Saclay

²Université Paris-Saclay

³Université Paris-Saclay, CNRS, GEOPS

⁴Laboratoire des Sciences du Climat et de l'Environnement (LSCE/IPSL)

⁵Université Paris Saclay GEOPS-CNRS UMR 8148

⁶Utrecht University

Presenting Author: gao.guohui@universite-paris-saclay.fr

Holocene eastern Mediterranean Sea sediments contain an organic-rich sapropel S1 layer that was formed in oxygen-depleted waters conditions. It has been demonstrated that sapropel 1 event (S1) is interrupted at about 8.2 cal kyr BP by a re-oxygenation of the water masses above about 1800 m. The re-ventilation of deep water could be induced by deep-water formation of the Adriatic Sea and/or the Aegean Sea. Here, we have analyzed Nd isotopic compositions (ϵNd) of mixed planktonic foraminifera species samples collected on two cores at intermediate (core MP50, 775 m water depth) and deep (core MP37, 1908 m water depth) water depth in the Northern Ionian Sea to constrain hydrological circulation of the Ionian Sea at high temporal resolution over the last 15 cal kyr BP. Foraminiferal ϵNd value records display more radiogenic isotopic composition (about -5) during time interval of sapropel S1a and S1b suggesting a higher contribution of water masses from the eastern Mediterranean Sea Basin which are characterized by more radiogenic Nd isotopic compositions. For both core, there is an obvious decrease in the ϵNd value (about -6.5) at around 8.2 cal kyr BP associated to a re-ventilation of the deep-water masses which reach at least 1900 m water depth in the northern Ionian Sea. Such past seawater ϵNd variations suggests that deep-water of the northern Ionian Sea derives mainly from the Adriatic Sea rather than the Aegean Sea during the time interval of sapropel interruption. For the shallower core (core MP50, 775 m water depth) another interruption of the sapropel S1 at 7.4 cal kyr BP is identified and associated to less radiogenic ϵNd values (about -6). Overall, our new results provide new constraints on vertical water column structure in the northern Ionian Sea during the Holocene.