# No oxygen in Eastern Mediterranean bottom-water

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A sediment sample used for this research. The dark-green bed is organic-rich sediment from sapropel S1.

Research from Utrecht University shows that there is an organic-rich bed of sediment in the floor of the Eastern Mediterranean. This bed formed over a period of about 4000 years under oxygen-free bottom-water conditions. A wet climatic period was responsible for the phenomenon. According to climate scenarios, the climate may become wetter in this area, potentially giving rise again to a period of oxygen-

free bottom-water. These results are published in the September issue of *Nature Geoscience.*

Alternating organic-rich and organic-poor beds have been deposited on the floor of the Eastern Mediterranean. These deposits coincide with the alternation of wet and dry climatic periods.

Researchers believe that the organic-rich beds, called sapropels, can originate in two ways: 1. More organisms live in the surface water because, for example, rivers introduce more nutrients. As a result, more organisms sink to the bottom when they die. 2. The organic material is better preserved. If dead organisms sink to an oxygen-free bottom, the organic material breaks down less well.

Gert de Lange investigated the most recently developed bed, sapropel S1. This bed formed between 9800 and 5700 years ago. At that time, an increased influx of fresh water during a wet climatic period led to the formation of this organic-rich bed. This formation occurred simultaneously over the entire Eastern Mediterranean at water depths of more than 200 metres. During this 4100-year period, the deep Eastern Mediterranean was found to be devoid of oxygen at water depths below 1800 metres. Going upward from this depth level, the organic content of sapropel S1 decreases corresponding to an increasing average oxygen content and concomitant breakdown of the organic material.

This research shows that there is a high chance of finding organic-rich deposits in an environment devoid of oxygen. Climate change may contribute to the formation of organic-rich beds. Besides sequestering large quantities of CO2, these separated beds can also be converted into oil over the course of time.

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