

Lower Jurassic organic matter preservation events, an oceanic anoxic events, and carbon cycle perturbations

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Along the Central-Northern Atlantic Margin, the Lower Jurassic includes several organic-rich intervals with source rock potential. These are particularly expressive in the European areas and African margin, where they crop out extensively in several onshore basins, such as the Lusitanian Basin (Portugal), Basque-Cantabrian and Asturian basins (Spain), and Middle Atlas (Morocco). These intervals are also seen in several offshore areas, such as the Slyne Basin (Ireland).

These units materialize Sinemurian to Pliensbachian organic matter preservation intervals (OMPIs) and the Toarcian oceanic anoxic event (T-OAE), relative to global paleobiological and paleoenvironmental changes. However, the local response (production and preservation of organic matter) depends on local paleogeography, paleoclimate, and depositional setting.

Today, it is still unclear which mechanisms are behind the changes that occurred at a global scale and, conversely, which factors controlled local conditions leading to these organic-rich intervals. Here, we will discuss the interrelationship of these OMPs and the T-OAE with the carbon cycle and the dominant environmental processes during each interval. Understanding how these events affected an area is relevant for the petroleum industry because they are usually associated with high-quality petroleum source rocks.

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