



Mochras Revisited: a new global standard for 25 million years of Jurassic Earth history – A drilling proposal for the International Continental Drilling Programme

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The Early Jurassic Epoch (201.4 – 175 Ma) was a time of extreme environmental change. Through this period there are well-documented examples of rapid transitions from cold, or even glacial climates, through to super-greenhouse events, the latter characterized worldwide by hugely enhanced organic carbon burial, multiple large-magnitude isotopic anomalies, global sea-level changes, and mass extinctions. These events not only reflect changes in the global climate system but are also thought to have had significant influence on the evolution of Jurassic marine and terrestrial biota. Furthermore, the events may serve as analogues for present-day and future environmental transitions. Although our knowledge of specific global change events within the Early Jurassic is rapidly improving, a prime case-in-point being the Toarcian Oceanic Anoxic Event (or T-OAE), we have neither documented all the events, nor do we have a comprehensive understanding of their timing, pacing, or triggers. A key factor contributing to our fragmentary knowledge is the scattered and discontinuous nature of the existing datasets. The major goal for this proposed ICDP project is therefore to produce a new global standard for these key 25 million years of Earth history by re-drilling a 45 year old borehole at Mochras Farm on the edge of Cardigan Bay, Wales, and to develop an integrated stratigraphy for the cored material, as well as high-resolution proxy-records of environmental change. The new datasets will be applied to understand fundamental questions about the long- and short-term evolution of the Earth System.