

1 Integrated sediment transport and provenance in Mesozoic environments:
2 evidence from the Lower Jurassic, UK

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9 Mesozoic OAEs, which are well evidenced by the significant occurrence of black shale, multiple
10 large isotopic anomalies, and global sea-level change, have been extensively studied in
11 sedimentary successions in Europe that were laid down in shallow marine environments. Very
12 good chemostratigraphic and biostratigraphic control for this region allows for high resolution,
13 super-regional, correlation of successions and assessing potential causes and expressions of
14 OAEs in these environments. However, the understanding of the sedimentary structures,
15 lithologies, depositional processes and provenance has barely improved since these events were
16 first identified on the basis of their organic carbon rich nature. For the purposes of the study of
17 sediment provenance and transportation mechanisms during the Early Jurassic - which may also
18 put constraints on the palaeogeography, hydrological cycle, and consequently weathering and
19 runoff conditions - an integrated stratigraphic analysis of mudrock is being carried out on a major
20 Early Jurassic succession, the Mochras borehole (Cardigan Bay Basin, UK).

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22 To obtain a comprehensive understanding of sediment provenance and how these different
23 processes interacted to produce the various rocks, it is important to interrogate sedimentary
24 features from the macro-scale (e.g. color, bed and lamina thickness, depositional structures) to the
25 micro-scale (e.g. mineral composition, grain-size variability, diagenetic textures) which requires
26 accurate and more detailed description of mudrock. Based on sequence stratigraphy, with the
27 constraints of magnetostratigraphy, and combined with complementary geochemical data (e.g.
28 XRF, C, O, Sr isotopes), a comprehensive dataset is currently being generated. In addition, data
29 from a planned new borehole from the Cheshire Basin, at Prees, UK, recovering the lower part of
30 the Jurassic, will provide a complementary sediment record. The detailed geochemical analysis of
31 mineralogy and petrology of mudrocks from Pliensbachian will be presented.