The Early Jurassic Earth System and Timescale project (JET)

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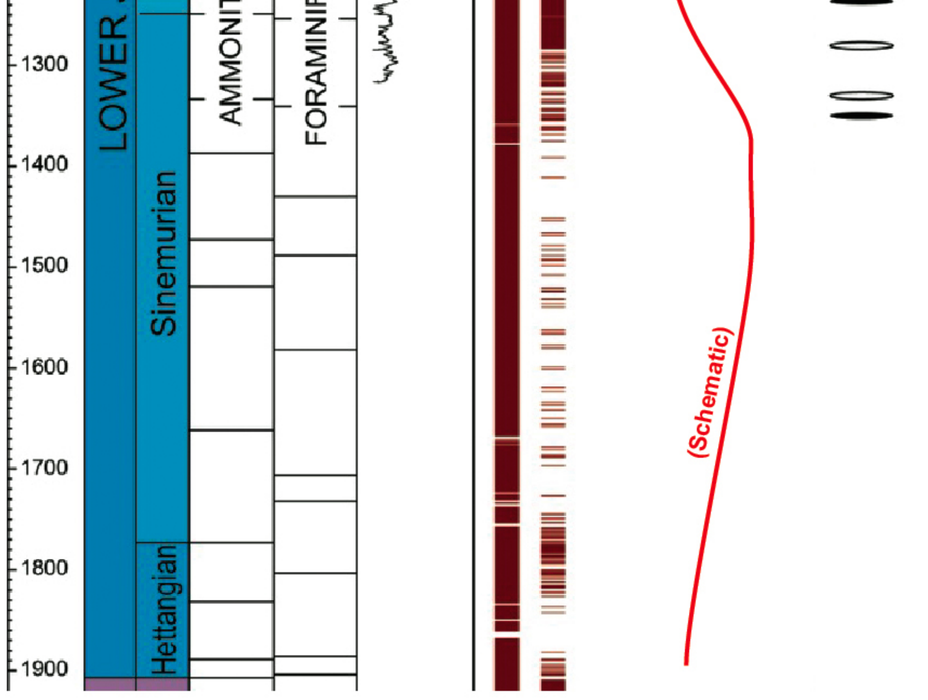
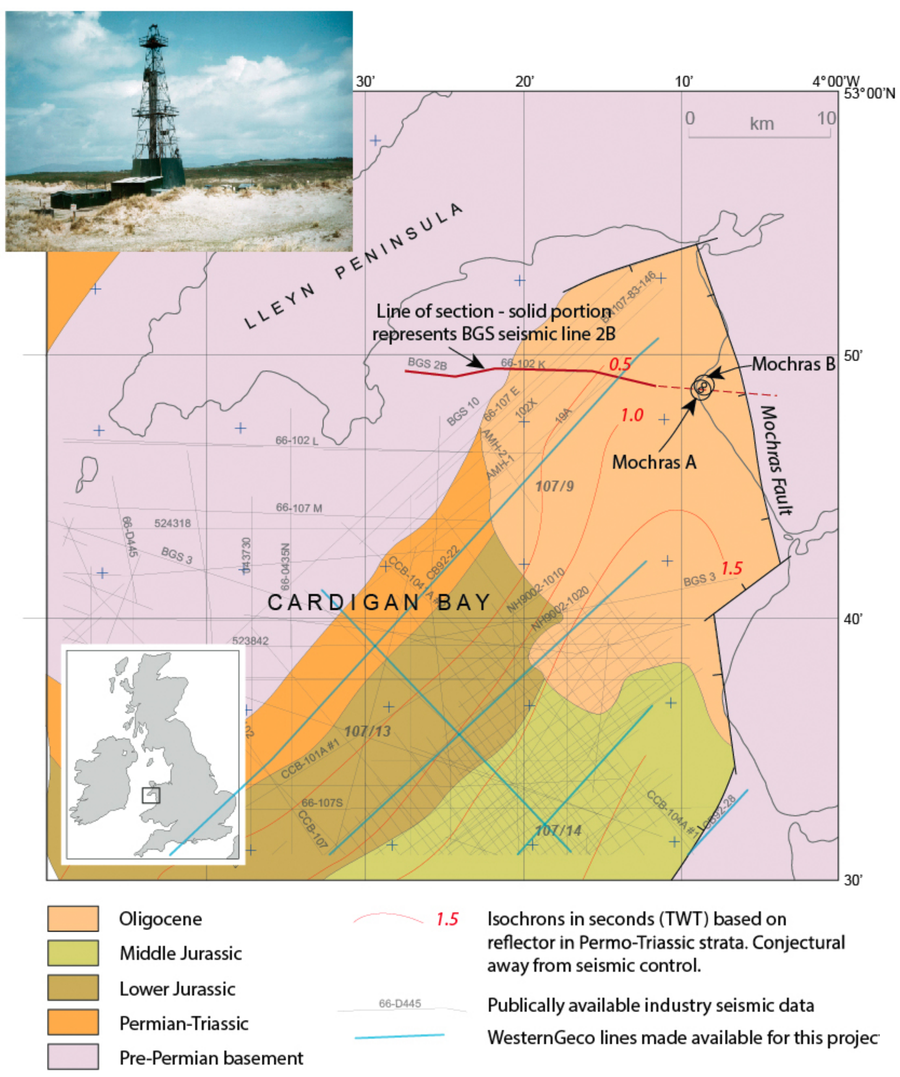
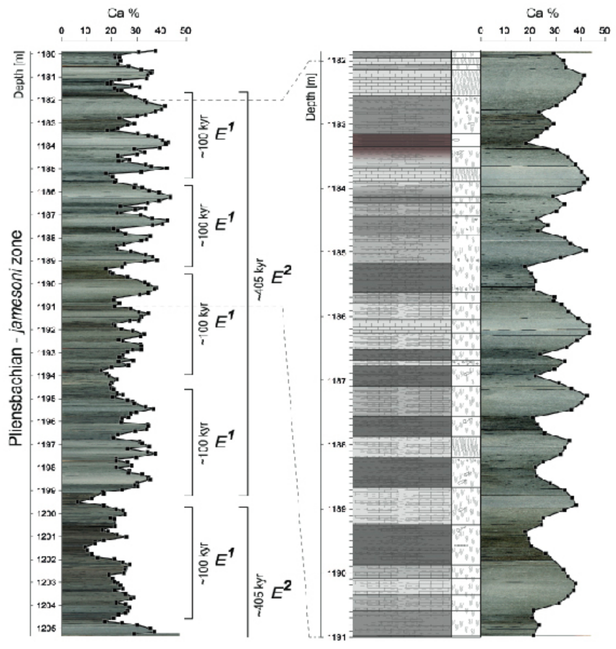
Through JET, we will generate large-scale, high-resolution, stratigraphic, sedimentological, geochemical and geophysical data that will be understood through a comprehensive numerical modelling programme. The project is based around re-drilling the Llanbedr (Mochras Farm) borehole, Wales, on the edge of the Cardigan Bay Basin. The project is funded principally by the International Continental Scientific Drilling Programme (ICDP) and NERC, and the total project value is on the order of $11.5M. Coring operations are planned for 2018 and the programme of analyses will continue until 2021. This time period is globally significant for source rock formation during a so-called oceanic anoxic event and related palaeoenvironmental changes.



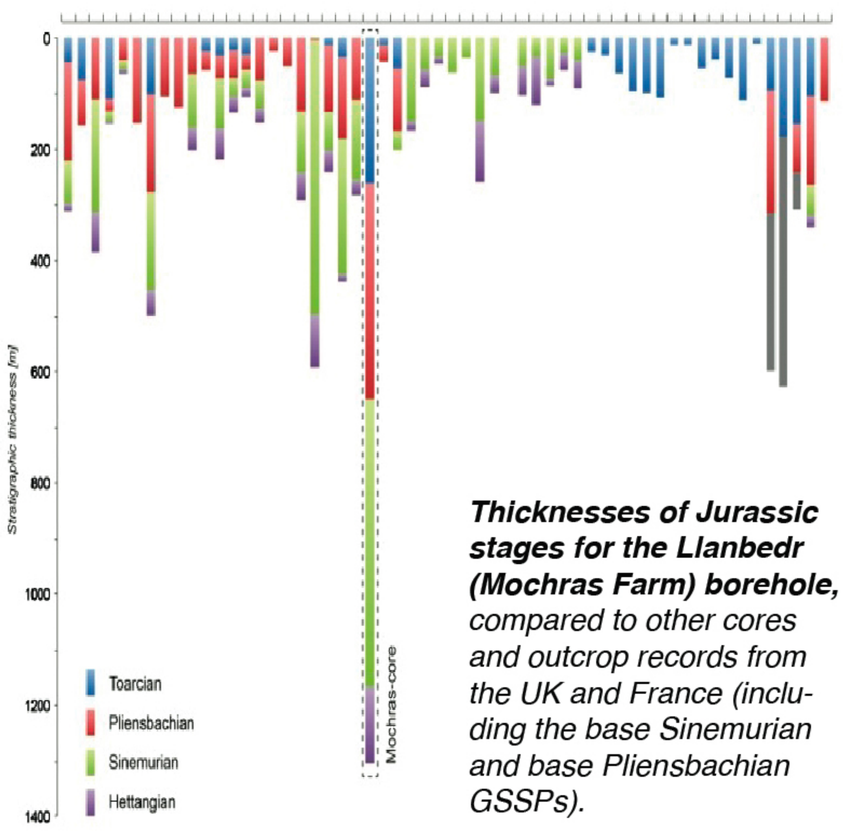
***Stratigraphic summary of the original LLanbedr (Mochras Farm) boehole drillied 1967-1970. A**; existing biostratigraphic resolution based on ammonites and forams. High resolution palynostratigraphy and nannofossil biostratigraphy will be added. **B**: Limited downhole geophysical logs were generated and a new comprehensive suite will be run in the new borehole. **C**: original core recovery versus archived core slabs. A principal target for the new core will be the Hettangian-Sinemurian interval. **D**: Carbon-isotope chemostratigrahy (Storm et al. in prep.). Data for the lower half of the core were generated from interval-averaged fragmented core. **E**: Potential for magnetostratigraphy. A new magnetic polarity reversal timescale has been generated from existing core and will be extended to the base of the Jurassic in the new core.*



***Location map for the Llanbedr (Mochras Farm) borehole** on the eastern margin of the Cardigan Bay Basin. Mochras A is the original borehole, and Mochras B is the planned re-drilled borehole.*



***Stacked corephotos and elemental concentration data** of 25m of Pliensbachian stratigraphy in Mochras A show clear astronomical forcing of depositional processes, providing excellent potential for the development of astrochronological age-models.*



***Thicknesses of Jurassic stages for the Llanbedr (Mochras Farm) borehole,** compared to other cores and outcrop records from the UK and France (including the base Sinemurian and base Pliensbachian GSSPs).*

Key project deliverables of interest to offshore Ireland exploration:

- A fully integrated high-resolution globally-applicable stratigraphy and age model for this critical interval of source rock formation, calibrated by radio-isotopic dates
- Detailed characterisation of changes in redox and nutrient related geochemical proxies including iron and phosphorous speciation to understand the controls on organic matter accumulation in mudstones
- Full characterisation of the basin history at this location, including mudstone sequence stratigraphy based on innovative petrographic methodology

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