

EGU2020-10406

<https://doi.org/10.5194/egusphere-egu2020-10406>

EGU General Assembly 2020

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Environmental controls on the magnetic properties of Upper Jurassic black shales on the Norwegian shelf

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This project examines organic rich black shales from the Upper Jurassic on the Norwegian shelf. The aim is to investigate the relationship between the depositional environment as determined from facies descriptions and the magnetic properties of the black shale. An additional aim is to relate cyclicity in the magnetic measurements to the Milankovitch cycles using time series analysis techniques. Cores from four different location on the Norwegian shelf were investigated using sedimentological description, facies analysis, and measuring of bulk magnetic susceptibility. The cores were drilled in the Skagerrak Region in the North Sea (core 13/01-U-01), Møre-Trøndelag Region of the Norwegian Sea (core 6307/07-U-03 A), Lofoten Region of the Norwegian Sea (core 6814/04-U-02), and the Nordkapp Basin in the NE Barents Sea (core 7230/05-U-02).

Based on preliminary results from the sedimentological description and facies analysis, the sediments were separated into facies: (1) massive black mudstone, (2) siderite cemented mudstone, (3) lenticular laminated sandy mudstone, (4) flaser laminated muddy sandstone with silt clasts, (5) heavily bioturbated silty sandstone, and (6) sandstone. Deposits like high-density turbidites, debrites and slump deposits, as well as post depositional processes like bioturbation, pyrite- and siderite-cementation were found in the cores. Deposits from mass movements can be thick, but they are deposited over a short time interval. It is therefore important to remove the mass movement deposits in the cyclostratigraphic analysis. The high iron content in the siderite and pyrite cemented deposits must be taken into account in regard to the magnetic susceptibility measurements. The magnetic susceptibility data will be used to correlate the cores in the homogeneous black shale sections.