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Bio- and chemostratigraphy of the Early Aptian Oceanic Anoxic Event 1a within the mid-latitudes of northwest Europe (Germany, Lower Saxony Basin)

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The Mid-Cretaceous period was characterised by a series of prominent anoxic events, one of these was the late Early Aptian Oceanic Anoxic Event 1a (OAE 1a). The Fischschiefer horizon is the regional sedimentary expression of this event in a small epicontinental sea in northwest Europe (Germany, Lower Saxony Basin). In the present study, two sediment cores of Lower to Upper Aptian age (Hoheneggelsen KB 9 and 40) from the Brunswick area, north Germany, have been investigated in detail with respect to their lithostratigraphy, geochemistry ($CaCO_3$, TOC), biostratigraphy (coccoliths, nannoliths) and high-resolution chemostratigraphy ([U+F064]13Ccarb and [U+F064]13Corg). Together with separately published new planktonic foraminifer data of the cores it was possible to establish a detailed time frame and to recognise the OAE 1a. The [U+F064]13C data enabled us to subdivide the deposits into isotope segments (C2-C7), which are commonly used as stratigraphic markers in coeval sediments around the world. The carbon isotope curves are compared to recently published Aptian curves from other parts of the Lower Saxony Basin, all of which record the prominent carbon isotope anomaly of the OAE 1a. A high-resolution correlation of the typical isotope trends of OAE 1a (segments C3-6) across the Lower Saxony Basin appears difficult due to an early diagenetic overprint of the primary isotope signal. These alterations can be explained by the temporary establishment of euxinic conditions the Lower Saxony Basin during OAE 1a as consequence of an interplay of different factors, such as global warming, restricted palaeogeography, increased fluvial input and intensified stable water stratification, which is supported by several lines of regional evidence.