



## **Long-term evolution of Cenomanian to Campanian black shale formation at Demerara Rise**

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We present a 20 Million year record of benthic foraminiferal assemblage data spanning the Cenomanian to early Campanian black shale sequence at Demerara Rise, tropical Atlantic (ODP Leg 207). This location is characterized by a continuous formation of organic-rich sediments (black shales) that have mean TOC values of 5-10 %, peaking at the OAE2 event (up to 30%). Interestingly, however, benthic foraminifera are present during a long time within these sediments, suggesting large fluctuations in bottom-water ventilation and oxygenation.

We combine this long-term benthic assemblage record with stable isotope, Nd isotope and TOC records from the same sites and can show that there are several periods of ventilation that occur, interestingly, during major events in the Cenomanian and Turonian: (1) the OAE 2 interval and (2) during a proposed glaciation event in the Late Turonian.

From the Coniacian onwards, there is clear evidence for a stepwise change in bottom-water characteristics towards higher oxygen availability, that we interpret to reflect the beginning influence of opening the Equatorial Atlantic gateway and therefore the inflow of cooler, better-oxygenated water masses.

After a large hiatus in the early Campanian, the middle Campanian shows assemblages typical for the Late Cretaceous Atlantic Ocean, indicating normal marine conditions.