



## **Carbon and oxygen isotope variations in chalk-marl cycles, Upper Campanian - lower Maastrichtian, Stevns, eastern Denmark**

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The 456 m long Stevns-1 core provides the first complete section through the Upper Campanian to lower Danian chalk of NW Europe. The core was drilled at Stevns Klint from near the base of the Danian bryozoan limestone and penetrated an expanded Maastrichtian section before it terminated in Upper Campanian chalk. The basal 150 m of the cored section consists of chalk-marl cycles of late Campanian - early Maastrichtian age. The chalk beds are 30-350 cm thick, separated by thinner 0.5-9 cm thick marl beds.

High resolution carbon and oxygen analyses of the cyclic interval show no systematic difference in carbon isotope values between the chalk and the marl beds. In contrast, oxygen isotope values obtained in the marls are systematically more positive than those in the adjacent chalk beds. The observed variations imply high frequency fluctuations in palaeotemperature of approximately 6°C during deposition of the chalk-marls cycles.

The longer term stratigraphical variations of oxygen isotopes of the chalk and marl parallel each other and indicate a general warming of 2°C in the Upper Campanian followed by 4°C cooling in the lower Maastrichtian. The fact that the same palaeoclimatic signal is preserved in both lithologies suggests limited diagenetic overprint, in accordance with the very shallow burial of the succession.