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- towards climate change services

Miocene oceanographic changes of the western equatorial Atlantic (Ceara Rise) based on calcareous dinoflagellate cysts

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The middle- and upper Miocene represent a time-interval of major changes in palaeoceanography that favoured the cooling of the climate and culminated in the Northern Hemisphere Glaciation (NHG). The basis for the development of the modern deepwater circulation pattern, e.g. thermohaline circulation, was hereby established. Tectonic events played a key role in the progressing Miocene oceanography, such as the narrowing of the Panama gateway (e.g. Duque-Caro 1990) and the possible linked changes in North Atlantic Deep Water formation (Lear et al. 2003). However, the complex interaction between the closing of the Panama Gateway, the development of NADW, and thus the oceanographic progression towards our present day circulation is far from being fully understood. We want to improve the understanding of these processes by establishing a detailed palaeoceanographic reconstruction of the western equatorial Atlantic Ocean on the basis of calcareous dinoflagellate cyst (dinocyst) associations. Within this study, we investigated sediment samples from ODP Site 926A by defining the calcareous dinocyst assemblage. Site 926A is located at the southwestern flank of the Ceara Rise, an area of highest sensitivity to global deep water circulation changes. At about 12 Ma, when NADW production increased (e.g. Wright et al. 1992), we see a distinct increase in the absolute abundances of the calcareous dinocysts. This might be related to enhanced productivity or to better carbonate preservation. At 11.3 Ma, Leonella granifera, a species known to be strongly related to terrestrial input occurs. This could be a signal for the initiation of the Amazon River as a transcontinental river with the development of the Amazon fan (11.8 – 11.3 Ma; Figueiredo et al. 2009) in relation to Andean tectonism.

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