

## Response of coccolith size to paleoceanographic changes during the Pliocene at Site 999A, Southern Caribbean Sea

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Our studies of global Holocene surface sediments have demonstrated that temperature is the dominant factor controlling coccolith size variability in Recent assemblages. However, the role of other parameters, such as salinity, pH and  $p\text{CO}_2$  has not been completely decoded. We have now compared the coccolith size variability with environmental parameters in the Holocene to the response to paleoceanographic changes during the Pliocene Epoch in order to disentangle the multiple environmental dependencies and to possibly identify evolutionary adaptations.

Site 999A in the Caribbean Basin was chosen because of its excellent carbonate preservation and the broad variety of data available on ocean circulation patterns, environmental parameters and nannofossil assemblages. We investigated a period from 5 to 2 Ma with a  $\sim 30$  kyr resolution. The age model used was taken from Steph *et al.* (2006) and re-tuned to the benthic  $\delta^{18}\text{O}$  stack LR04 from Lisiecki & Raymo (2005). Samples were prepared on SEM stubs according to a specific spraying method (Henderiks & Törner, 2006), image frames of coccoliths were captured in a Philips XL30 SEM with an automated scanning module. The frame series were then automatically segmented and the maximum sizes of coccoliths measured.

Our Pliocene study indicates a general decrease of coccolith size between 5 and 2 Ma. Additionally, strong variations in coccolith sizes are recorded during 4.3-3.8 Ma and 2.9-2.5 Ma. The older of these intervals of coccolith size change might be related to the temperature change recorded in benthic  $\delta^{18}\text{O}$  records (Lisiecki & Raymo, 2005). The interval 2.9 to 2.5 Ma equals the period of the closure of the Panamanian Seaway, which was causing a reorganization of paleoceanographical settings in the Caribbean Sea and thus might be reflected in size changes in the plankton assemblage.

### References

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