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Seasonal and interannual export production of coccolithophores in Cariaco Basin (Venezuela): tools for climatic variability.

B. De Bernardi (1,2), P. Ziveri (2), E. Erba (1), R. Thunell (3)

(1)Dept. Earth Sciences, Milano, [bianca.debernardi@unimi.it]; (2) ICTA-Autonomous University Barcelona (UAB), Bellaterra (Spain) and FALW Amsterdam; [patrizia.ziveri@falw.vu.nl]; (3)Dept. Geol. Sciences, USC - Columbia, [thunell@geo.sc.edu]

Cariaco Basin shows marked seasonal and interannual variations in hydrographic properties and primary production. Partially isolated from the open Caribbean Sea by a series of shallow sills, Cariaco Basin is anoxic below ~250m water depth because of restricted water exchange and high oxygen demand created by productive conditions associated with seasonal upwelling along the southern Caribbean margin. Moreover, the strength of the Northeast trade winds varies seasonally, because of the annual migration of the Intertropical Convergence Zone (ITCZ), causing a significant seasonal change in the surface waters of the Cariaco Basin. The combination of high biogeochemical input and the lack of bioturbation at the bottom allow the deposition of laminated sediments that exhibit high sedimentation rates. In this study we track changes in coccolith export production and ecology in sediment trap samples (10,30°N; 64,40°W; from November 1996 to October 1999) and laminated core (CAR7-1) samples from Cariaco Basin, in order to monitor and understand climate and ocean variability in the southern Caribbean region during the last 1000 years. During a three-year sediment trapping project in Cariaco Basin significant changes in coccolithophore fluxes occurred in response to changes in hydrography. Seasonal coccolith fluxes are observed with flux maxima in late-fall and winter, when the hydrographic conditions are relatively stable. In particular, coccolithophore patterns suggest that these trends are driven by both annual and interannual changes in the upper water column associated with El Niño conditions. The coccolith flux recorded in core CAR7-1 was dominated by E. huxleyi, G. oceanica and F. profunda, the same species that dominated the sediment trap samples. We will show the significant changes occur-

ing down-core, reflecting hydrographic and climatic variation in ITCZ position over the Caribbean region. Moreover, C. leptoporus in this basin may indicate an increase in cool water due to intensification in trade winds and upwelling intensity. Total coccolith fluxes show evidence of centennial scale variability, suggesting solar modulation.