



Patchy deposits of Cenozoic pelagic sediments in the central Pacific

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Export of pelagic carbonate tests from surface waters and their deposition at the sea floor plays a significant role in the CO₂ cycle and ability of the oceans to absorb atmospheric CO₂. Of importance to these, recent sediment ²³⁰Th and ³He measurements have been interpreted as evidence that significant lateral advection of pelagic material occurs in the water column, leading to marked spatial variations in deposition rates and in particular to significant focusing of deposits on the Pacific equator. We report spatially continuous stratigraphy from two 1000 km seismic lines which do show evidence of depositional anomalies near the equator. They show accumulation rates locally enhanced by a factor of two, similar to the proposed modern sediment focusing factors, but the anomalies are surprisingly patchy over the 20 Ma period analyzed - they are not confined to an equatorial region and they are not necessarily found on adjacent seismic profiles. These intermediate-scale anomalies are >~100 km across and represent areas of seafloor that received more deposits for one period, then less in following periods, and vice versa. Variogram analysis was used to determine how the spatial scales of deposition changed over the Neogene. The period when the spatial scale of depositional variability was largest correlates with hiatuses in drill cores, a correlation that we interpret as caused by enhanced and spatially heterogeneous carbonate dissolution at that time. The study suggests that seismic stratigraphy has the potential to reveal spatial patterns related to unsteady bottom water flow and chemistry.

Reference: Mitchell, NC, and MW Lyle, Patchy deposits of Cenozoic pelagic sediments in the central Pacific, *Geology*, in press.