The ocean's biological carbon pump in a warming world: Insight from the past using marine barite

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As our oceans continue to warm in response to increased global temperatures, questions about the impact on nutrient cycling, primary productivity, and marine ecosystems remain. Looking to records of past change in deep sea sediment is critical to understand how the Earth system responded during prior warm intervals. Proxy records reconstructing the marine biological carbon pump in different regions in the ocean will be explored from three periods of interest including the Miocene Climate Optimum, Early Eocene, and Late Cretaceous. An emphasis will be on understanding biogenic barium proxy records. Pacing and potential drivers of change during these warm intervals differ, but all highlight the dynamic nature of the response of the ocean-atmospheric system in different regions and the importance of multi-proxy records. Special attention to assumptions and limitations of proxy records is necessary when comparing potentially conflicting records, which can ultimately provide invaluable insight into potential changes in carbon export at different depths in the ocean and nutrient cycling and their impact on marine ecosystems when thoughtfully combined.