

Vantastic Varves: Decoding Annual Signals in Lake Van

Lake Van, the world's largest soda lake, is highly sensitive to hydrological balance, and past lake-level changes directly reflect variations in the precipitation-to-evaporation ratio. During the transition from MIS 6 to MIS 5e (the Last Interglacial), sediment proxies record rising lake levels and environmental shifts are preserved in varved deposits. These annually deposited sediments allow high-resolution reconstructions of climatic variability on seasonal time-scales. Such studies are essential, as MIS 5e is widely regarded as an analogue for ongoing global warming. However, despite their importance, detailed sedimentological analyses of these laminations are still lacking.

Here we present the first microscopic description of Lake Van sediments from Termination II. Initial micro-facies and XRF analyses reveal that laminations are more complex than previously assumed, consisting of alternating detrital calcite, authigenic aragonite, and diatoms, with shifts reflecting both external climate forcing and internal lake dynamics.

These results demonstrate the potential of combining sedimentology and geochemistry to refine high-resolution climate reconstructions, providing new insights into environmental variability during the onset of the last Interglacial.

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