

An 8,000-year climate record from Lake Motosu, Japan: Implications for the East Asian Monsoon

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The East Asian Summer Monsoon controls the timing and amount of rainfall for around a third of the world's population. An understanding of past changes in monsoon strength is thus crucial for placing current events in context and for characterising future climate risk. Whilst many monsoon records have been developed for continental Asia, fewer records exist from the north-eastern edge of the monsoon region. We present a new monsoon record for central Japan based on an 8,000-year lacustrine sedimentary sequence from Lake Motosu, located at the northern foot of Mt Fuji. Lake Motosu is a hydrologically closed lake and is therefore expected to be sensitive to changes in monsoon strength. Additional macrofossil radiocarbon dates are used to refine an existing high-fidelity age model. This age model is then applied to constrain the timing of changes in bulk sediment geochemistry (TC, TN, C/N, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$) and the oxygen isotopic composition of sedimentary cellulose ($\delta^{18}\text{O}$). Changes in sediment chemistry reflect shifts in the sources of organic matter to the sediments, variations in lake hydrology and changes to the local catchment. In turn, these changes are linked to regional variations in monsoon strength. However, their interpretation is complicated by the impact of local seismic and volcanic activity.

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