



Stable isotope record of Holocene precipitation changes from Lake Nuudsaku in southern Estonia

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Radiocarbon dated, finely laminated lake sediments record Holocene precipitation changes from southern Estonia. Modern water isotope data suggest that Lake Nuudsaku is a mostly open system that is primarily fed by winter precipitation and groundwater, and summer precipitation plays only a secondary role in the overall hydrologic balance. Initial results indicate that changes in insolation likely drove the overall Holocene pattern with relatively wet conditions during the early Holocene, followed by arid conditions during the middle Holocene and a return to wetter conditions during the late Holocene. However, there is pronounced millennial and centennial-scale variability that cannot be explained by insolation forcing alone. Notably, there is a trend toward wetter conditions from ~ 4.0 to 2.0 ka, followed by a trend toward drier conditions during the last 2 millennia. This late Holocene pattern diverges from the pattern observed in records from north-central Estonia that suggest an overall trend of wetter conditions for the last ~ 4 ka. These initial results thus indicate that the Lake Nuudsaku sediments have the potential to yield a unique near-annual to decade-scale record of past precipitation changes from the southern Baltic region.