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The First Holocene Varve Chronology for the UK: based on the integration of varve counting, radiocarbon dating and tepthrostratigraphy from Diss Mere (UK).

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This paper reports the first Holocene varved chronology for the lacustrine sediment record of Diss Mere in the UK. The record of Diss Mere is 15 m long, and shows 4.2 m of finely-laminated sediments, which are present between ca. 9 and 13 m of core depth. The microfacies analysis identified three major seasonal patterns of deposition, which corroborate the annual nature of sedimentation throughout the whole interval. The sediments are diatomaceous organic and carbonate varves with an average thickness of 0.45 mm. A total of 8473 varves were counted with maximum counting error of up to 40 varves by the bottom of the varved sequence. To tie the resulting floating varve chronology to the IntCal 2020 radiocarbon timescale, we used a Bayesian Deposition model (P_Sequencewith outlier detection) on all available chronological data from the core. The data included five radiocarbon dates, two known tephra layers (Glen Garry and OMH-185) with calendar ages based on Bayesian modelling of sequences of radiocarbon ages, and the relative varve counts between dated points. The resulting age-depth model (DISSV-2020) dates the varved sequence between ca. 2100 and 10,300 cal BP and age uncertainties are decadal in scale (95% confidence).