Supplementary Material

Dynamics of ~100-kyr glacial cycles during the early Miocene

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Same sample reproducability:
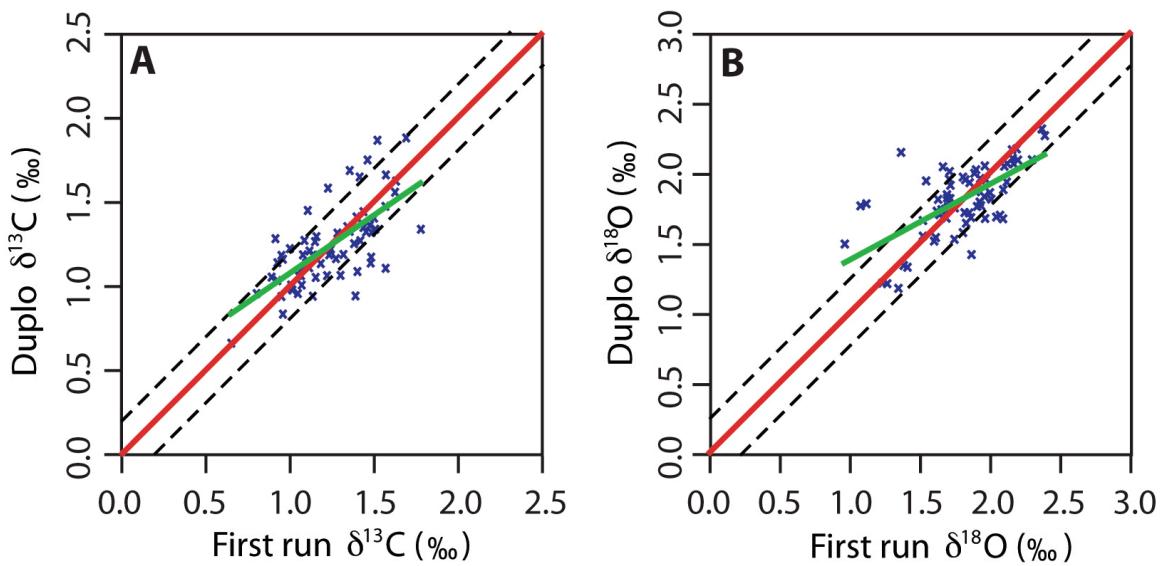
Inter-laboratory comparison:

= Ideal

= 2σ upper and lower boundaries

= Trend
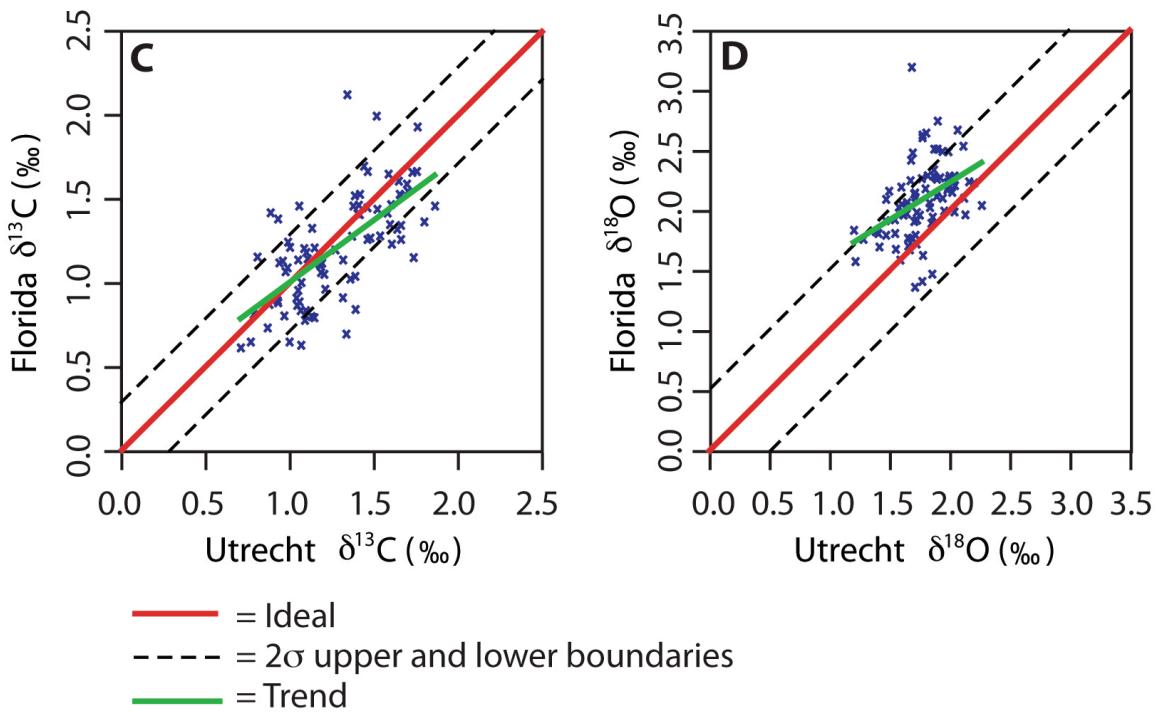
Supp. Fig. 1. Data reproducibility. **(A)** Reproducibility between the first and second run $\delta^{13}C$ of the same samples (not necessarily the same foraminifer) on the three inter-calibrated mass spectrometers. **(B)** As in panel (A), but then for $\delta^{18}O$. **(C)** Reproducibility of $\delta^{13}C$ between measurements done at the University of Florida (UF) and Utrecht University (UU), on specimens from the same sample. **(D)** As in panel (C), but then for $\delta^{18}O$.

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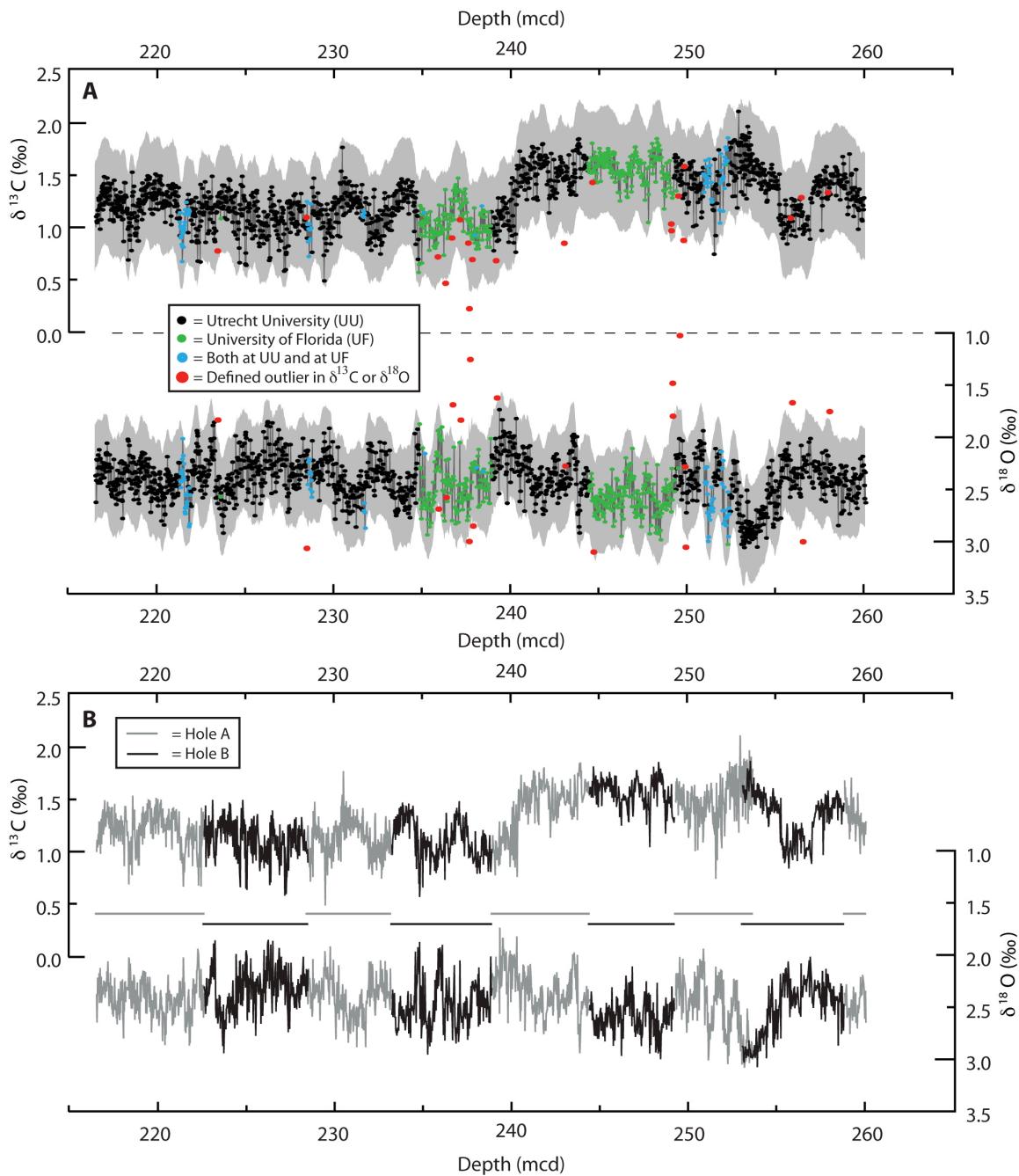
Supp. Fig. 2. Outlier removal and the splice. **(A)** Specification in which lab each stable isotope measurement has been done. Outliers were defined by an upper and lower boundary of 2 standard deviations (of the entire series) added or subtracted from a 13-point moving average (gray areas). Outliers defined in δ^{13}C or in δ^{18}O were removed from both records because of the paired analysis. Depth scale is in meters composite depth (mcd). **(B)** Splice of Site 1264, showing from which hole the samples were taken.
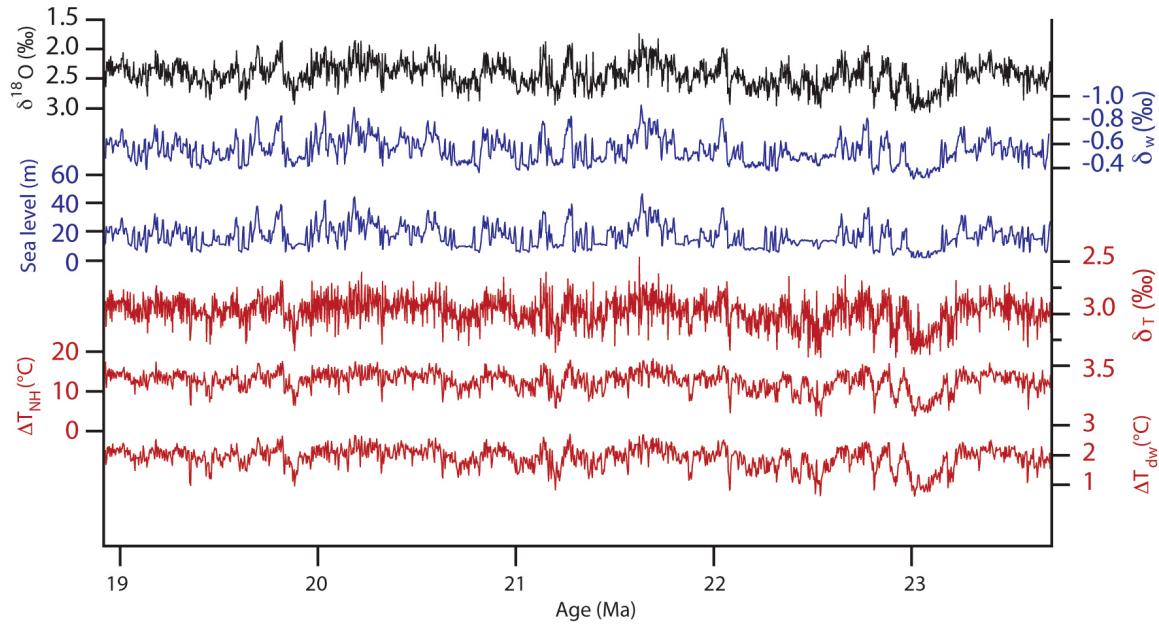
Supp. Fig. 3. 1-D inverse modelling output. The $\delta^{18}O$ record (as measured), δ_w, eustatic sea level, δ_T, Northern Hemisphere (40-80° Latitude) annual average temperature and deepwater temperature calculated by the model, are depicted (De Boer et al., 2010). The δ_w, δ_T, and ΔT_{dw} values all represent oceans average values, because the model cannot resolve single water masses and/or oceans. In Summary: δ_T = Temperature contribution to $\delta^{18}O$, δ_w = seawater contribution (from ice volume) to $\delta^{18}O$, ΔT_{NH} = NH mean (40-80N) temperature relative to present day and ΔT_{dw} = mean deep-water temperature relative to present day.

References

De Boer, B., Van de Wal, R. S. W., Bintanja, R., Lourens, L. J., and Tuenter, E.: Cenozoic global ice-volume and temperature simulations with 1-D ice-sheet models forced by benthic $\delta^{18}O$ records, Ann. Glaciol., 51, 23–33, 2010.