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Impact of terrestrial biosphere on the atmospheric CO_2 concentration across Termination V

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Depth (cmcd)	Age (kyrs BP)	Sed. rate (cm/kyr)
136	401	31
138,5	405	63
144,17	431	22
172,17	508	36

Table S1: Tie points used to build U1386 age model (from (Kaboth et al., 2017)).

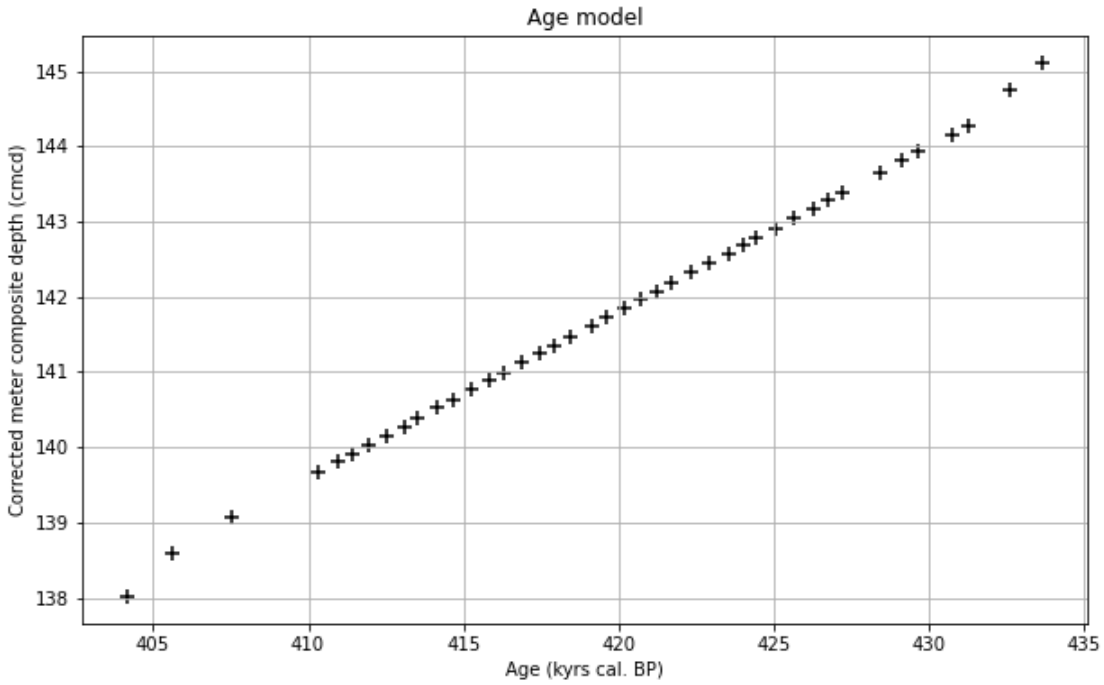

Figure S1: Age model for U1386 pollen record. Each cross corresponds to an analysed pollen sample.

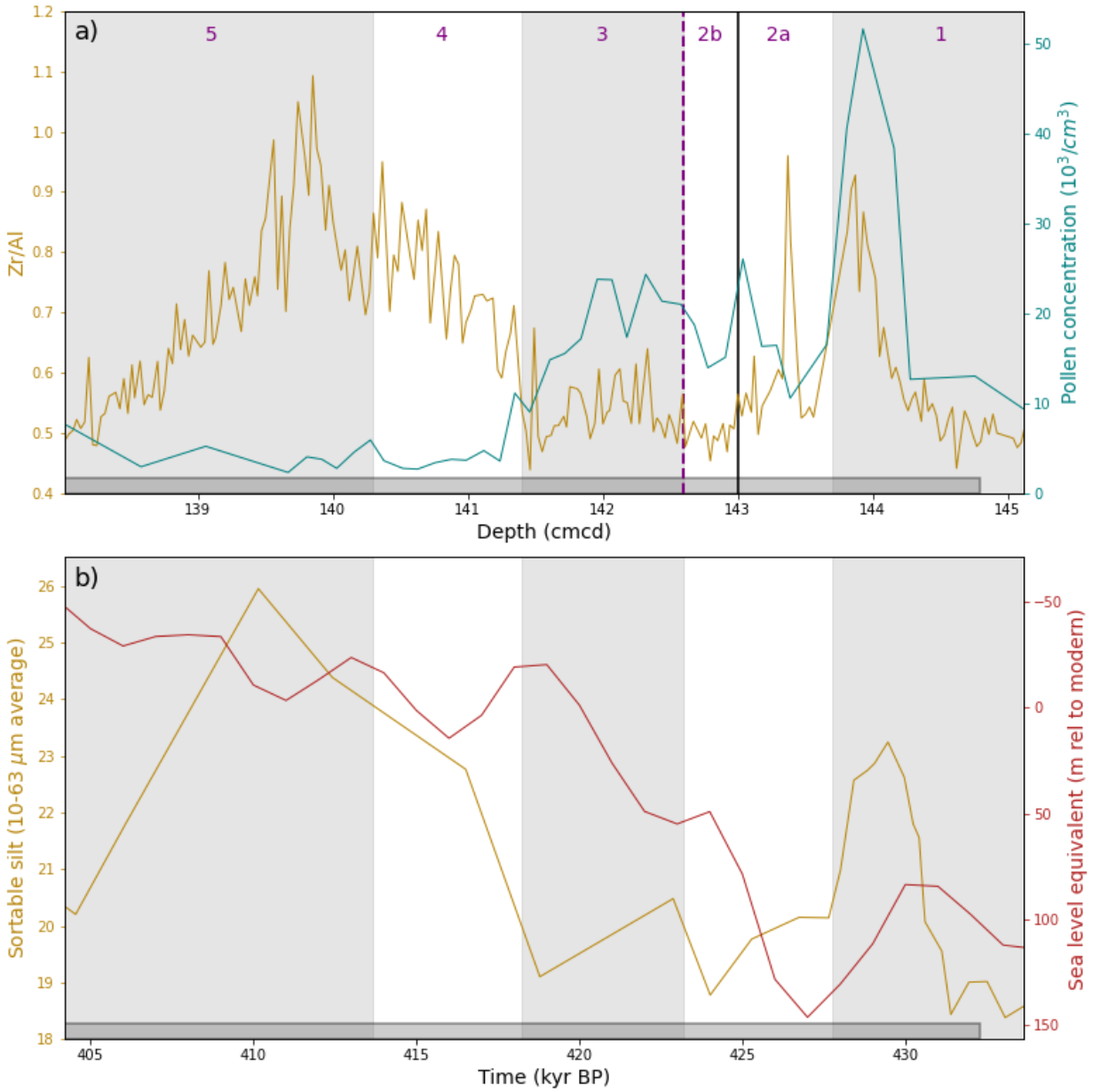

Figure S2: a) Zr/Al ratio (golden line, Moal-Darrigade et al., 2022) and reconstructed pollen concentration (10^3/cm^3, cyan line) as a function of depth (cmcd) at site U1386. The pollen concentration is computed as follows: $\frac{Pollen\ counts * Added\ Lycopodium\ number}{Lycopodium\ counts * Sample\ volume}$.

Numbers and corresponding shadings refer to the pollen zones defined in Section 3.1. Sub-zones U1386-2a U1386-2b are delimited by a black line. The purple dashed line indicates the onset of the regional terrestrial interglacial (SINES). b) Sortable silt from U1386 (golden line, Moal-Darrigade et al., 2022) and sea level rise as a function of time (red line, Elderfield et al., 2012). The grey horizontal bar indicates the Termination V period.

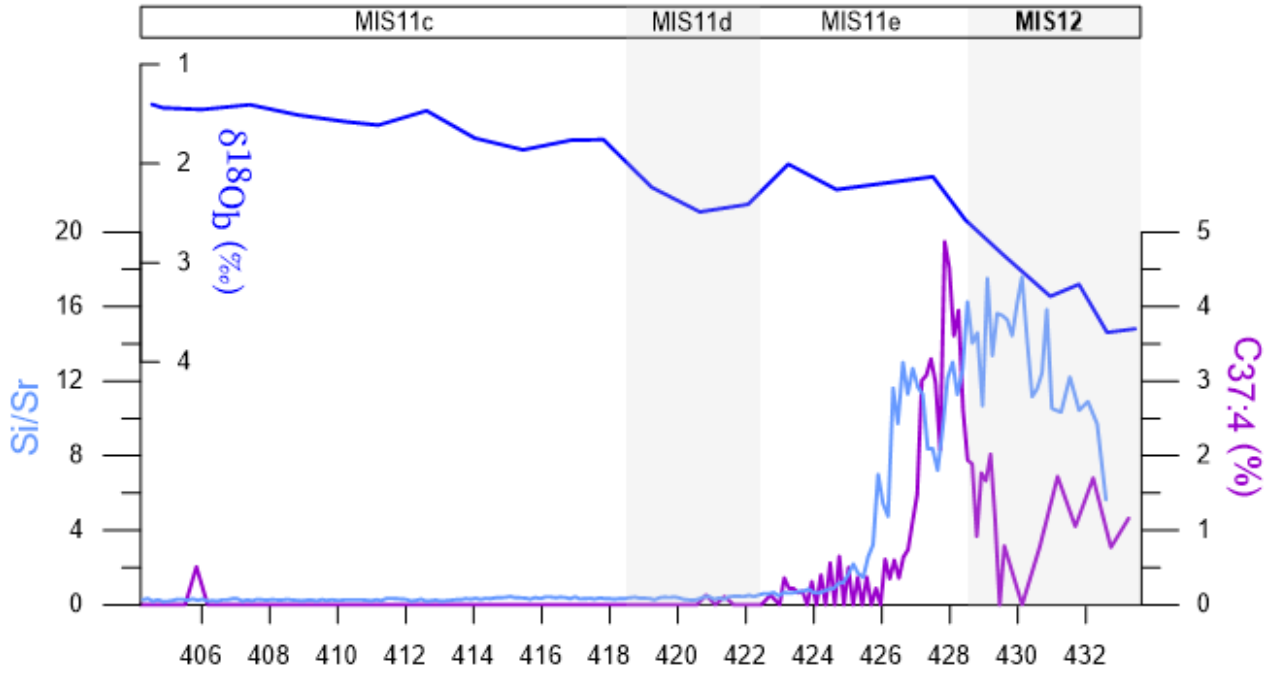

Figure S3: Comparison of ice melt proxies from different records. $\delta^{18}O$ at Site U1386 (Kaboth et al., 2017) measures ice volume. $C_{37:4}$ at site MD03-2699 (Rodrigues et al., 2017) indicates freshwater input resulting from iceberg melting and Si/Sr (Hodell et al., 2008) driven by detrital silicate deposition (European ice sheet sources) depicts arrival of IRDs at Site U1308

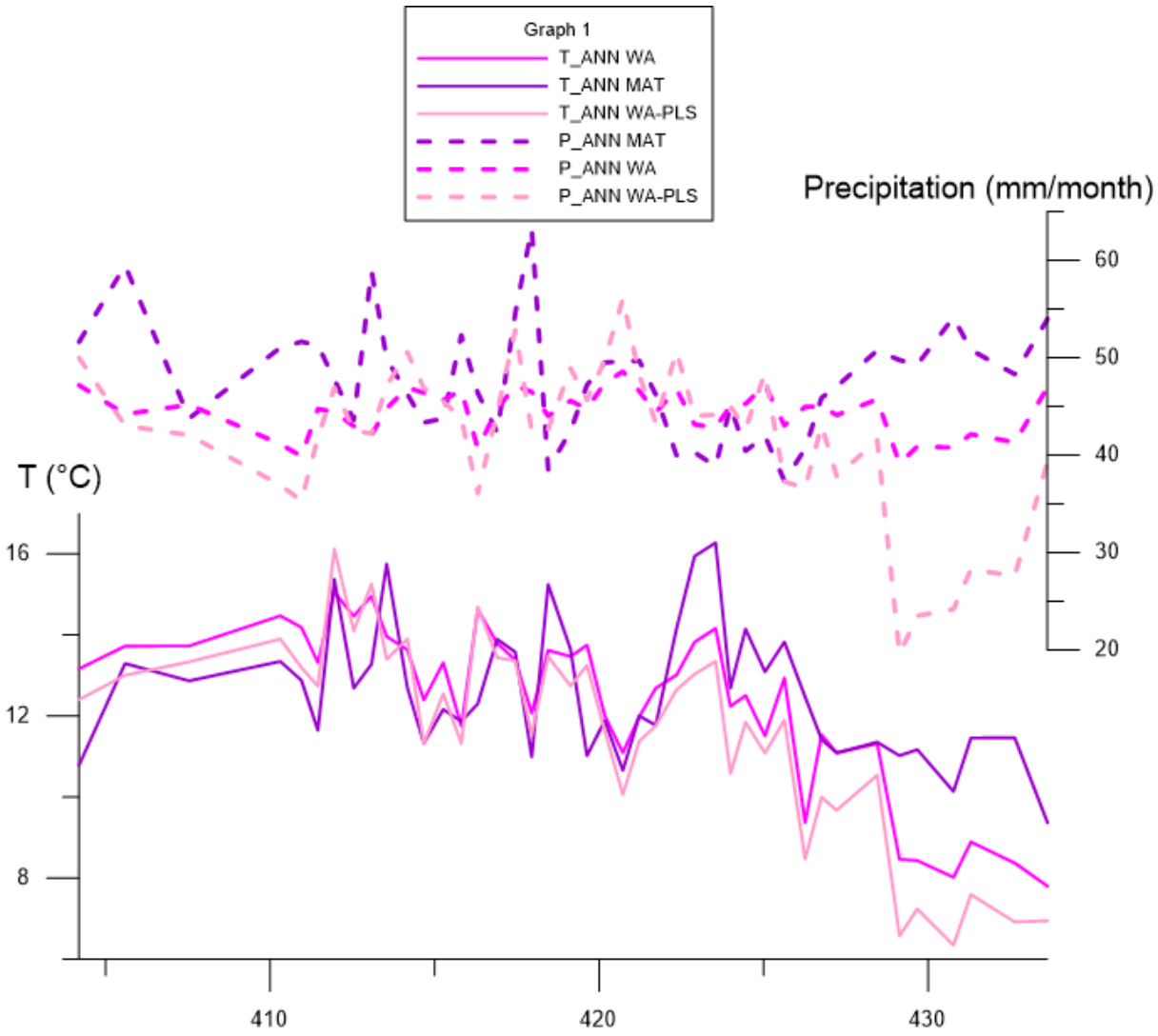

Figure S4: Reconstructed atmospheric surface temperature (bottom) and precipitation (top) from comparison between U1386 pollen record and the European Modern Pollen Database using 3 different statistical algorithms: MAT, WA and WA-PLS (see Material and methods)

Quantitative climatic reconstructions: Paleoclimate reconstructions from fossil pollen is based on the Actualism principle whereby past terrestrial biosphere had the same ecological and climatic requirements as present ones. The underlying hypothesis, which is fulfilled for the studied period (Gould, 1965; Birks and Birks, 1980) is that fossil pollen species still exist nowadays. We obtain three quantitative estimates of Termination V climate (temperature and precipitation, Fig. S4) by selecting the modern climate tolerances of the nearest living relatives of the fossil taxa present in the pollen assemblage with different reconstruction methods applied to each sample: Modern Analogue Technique (MAT), Weighted Averaging (WA) and Weighted Averaging-Partial Least squares (WA-PSL) (Salonen et al., 2012). We use the extensive European Modern Pollen Database (Davis et al., 2013) which includes 3813 pollen assemblages.

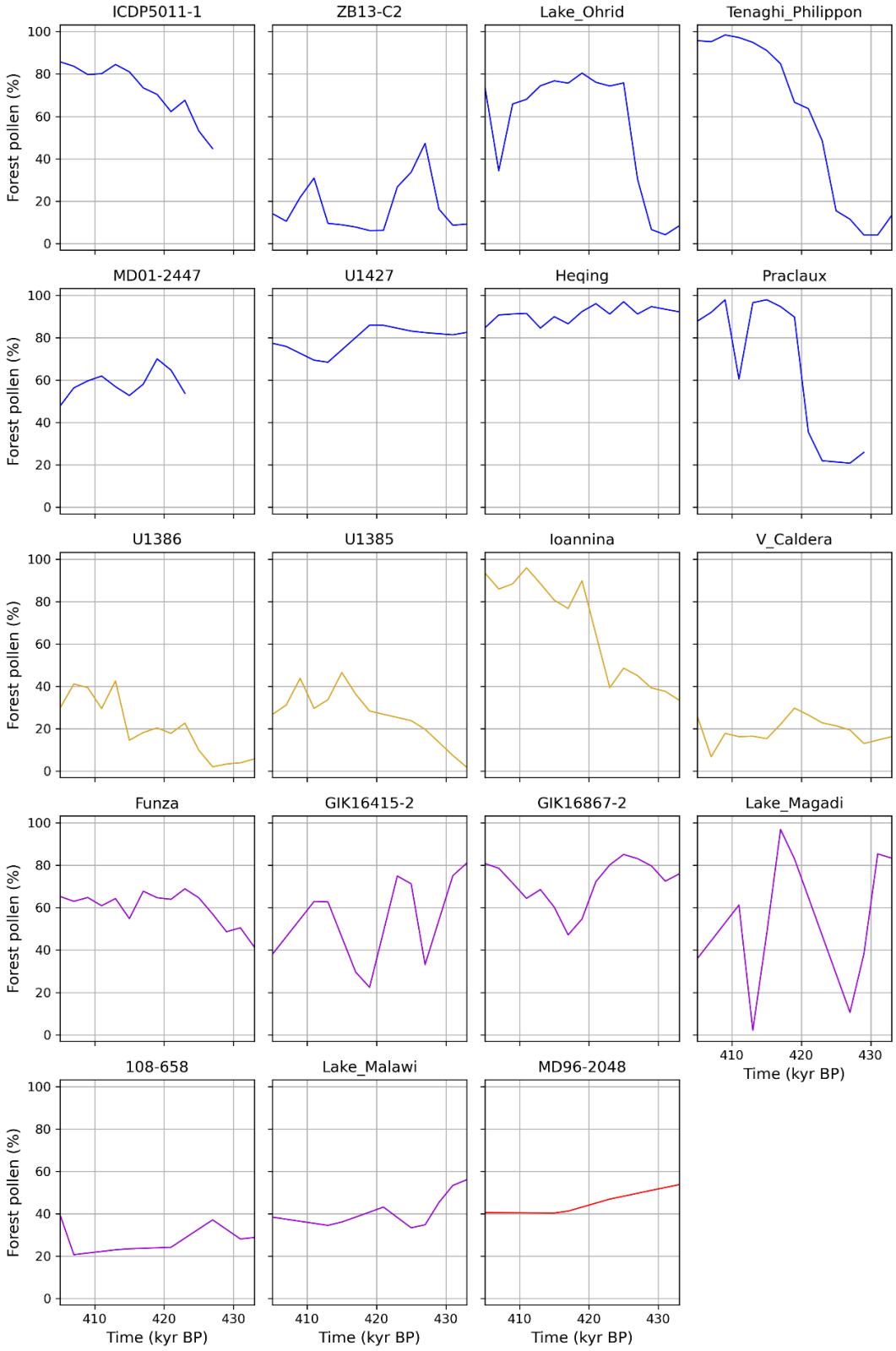

Figure S5: Forest pollen percentage time series for all compiled pollen records across TV (time in kyr BP).

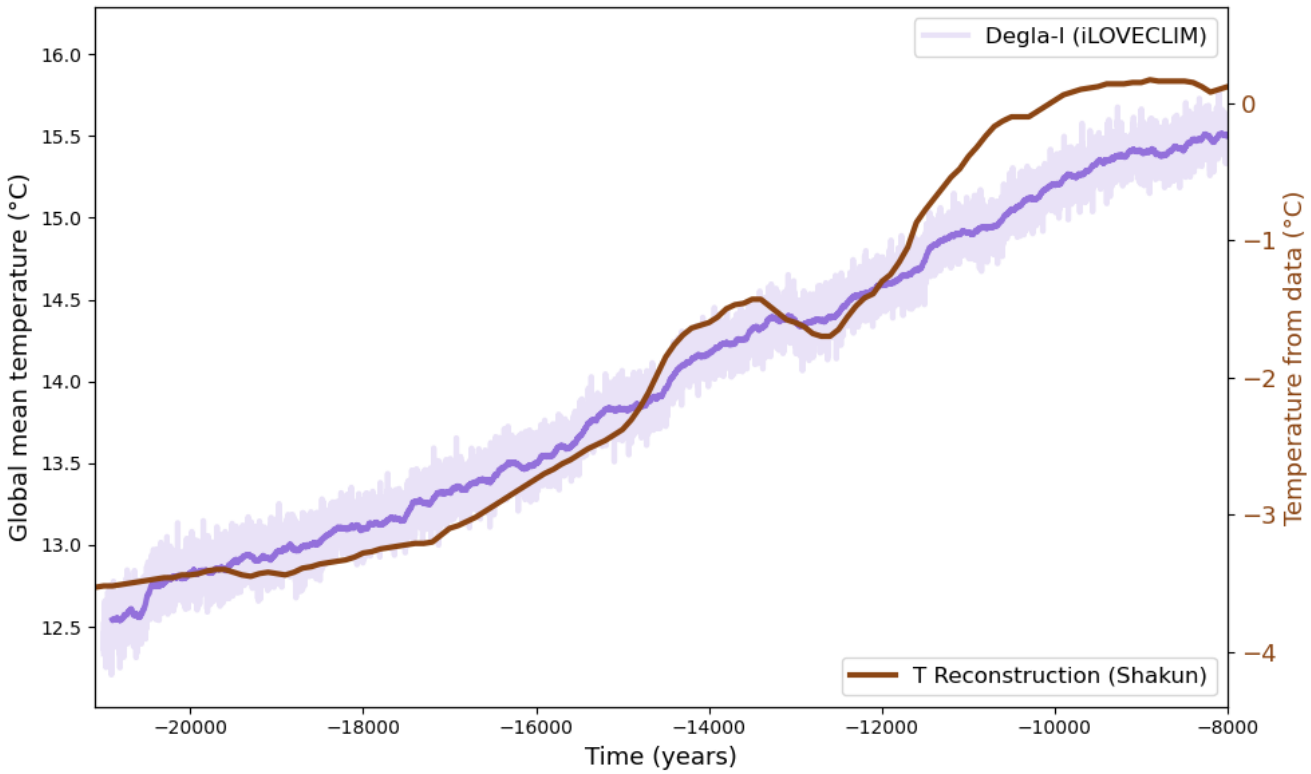

Figure S6: Simulated temperature (light purple, current Degla-I experiment) and temperature reconstruction (brown, by (Shakun et al., 2012) across termination I. The moving 100 yr-window average of the simulated temperature is shown in dark purple. For more analysis of the simulated changes across T1 we refer to (Roche et al., 2011).

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