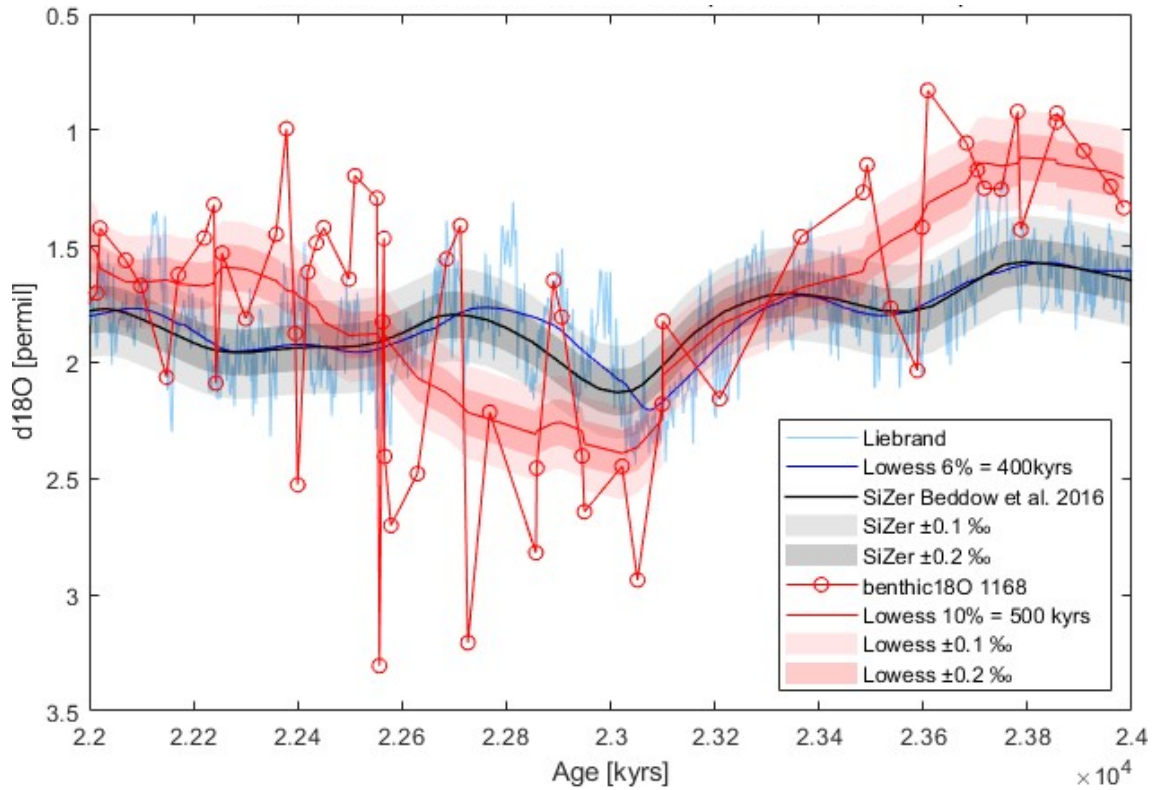
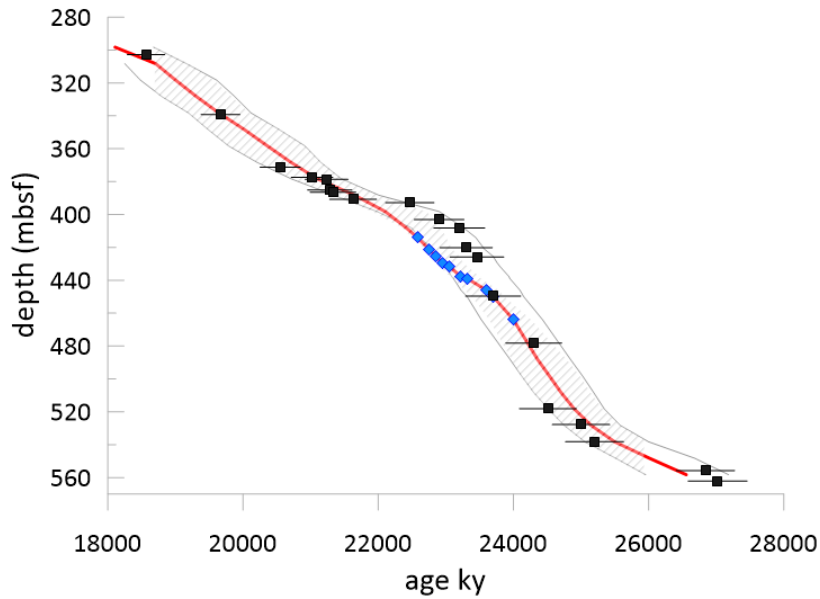


Site	Depth [mbsf]	Age (Ma)	Origin	correlated feature
1168A	368.25	20.708	Sr isotope stratigraphy in BACON, median	
1168A	378.25	21.095	Sr isotope stratigraphy in BACON, median	
1168A	388.25	21.651	Sr isotope stratigraphy in BACON, median	
1168A	398.25	22.104	Sr isotope stratigraphy in BACON	
1168A	408.25	22.418	Sr isotope stratigraphy in BACON	
1168A	414	22.58	isotope tiepoint	Ecc.Cycle 56.3
1168A	421	22.75	isotope tiepoint	Ecc.Cycle 56.1
1168A	425.5	22.85	isotope tiepoint	Ecc.Cycle 57.4
1168A	429.3	22.95	isotope tiepoint	Ecc.Cycle 57.3
1168A	431.6	23.05	isotope tiepoint	Ecc.Cycle 57.2 OMT
1168A	437.6	23.22	isotope tiepoint	Ecc.Cycle 58.4
1168A	439	23.32	isotope tiepoint	Ecc.Cycle 58.3
1168A	446.06	23.6	isotope tiepoint	Ecc.Cycle 59.4
1168A	450	23.7	isotope tiepoint	Ecc.Cycle 59.3
1168A	464	24	isotope tiepoint	Ecc.Cycle 60.4
1168A	488.25	24.358	Sr isotope stratigraphy in BACON, mean	
1168A	498.25	24.532	Sr isotope stratigraphy in BACON, mean	
1168A	508.25	24.703	Sr isotope stratigraphy in BACON, mean	
1168A	518.25	24.899	Sr isotope stratigraphy in BACON, mean	
1168A	528.25	25.148	Sr isotope stratigraphy in BACON, mean	
1168A	538.25	25.497	Sr isotope stratigraphy in BACON, mean	
1168A	548.25	26.011	Sr isotope stratigraphy in BACON, mean	
1168A	558.25	26.557	Sr isotope stratigraphy in BACON, mean	

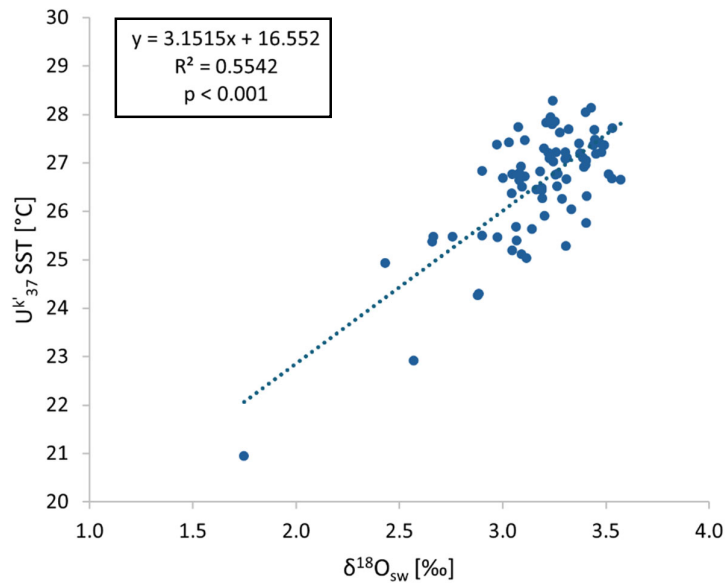
Table S1. Tie points for the age depth model of Site 1168 Hole A.



Supplementary Figure S1. Comparison of the benthic data from Site 1168 (red circles) with the benthic record from ODP Site 1264 shows that there is not much of a difference between lowess smooth and SiZer (blue vs. black trendline). A lowess smooth is very similar with the advantage that it can be applied to the benthic record of Site 1168, which does not have a good/high sample resolution. Because there is a large concentration of samples at 22.5 Ma, these 9 samples would distort the smoothed line and are therefore neglected for this qualitative analysis. Overall, Site 1168 seems to be 0.35‰ lighter prior to the Mi-1 glaciation and 0.4 ‰ heavier at the maximum glacial extend, compared to ODP Site 1264.



Supplementary Figure S2. Proposed age model illustrating Sr isotope stratigraphic points (black squares with uncertainty) from (Stoll et al., 2024) and gray outlines illustrating the 95% confidence interval estimated from BACON based only on the Sr isotope tiepoints. Blue diamonds indicate proposed stable isotope stratigraphy tiepoints based on the $\delta^{18}\text{O}_{\text{benthic}}$ and $\delta^{18}\text{O}_{\text{bulk}}$ record. Hatched shading indicates the BACON 95% confidence interval for age model based on Sr isotope stratigraphy and the isotope tiepoints. The red line illustrates the age model employed in this study, based on linear interpolation through the isotope tiepoints and the BACON mean age model based on the Sr isotope stratigraphy. The tie points for the red line are given in Table S1.



Supplementary Figure S3. U^k_{37} -derived SST versus the surface $\delta^{18}\text{O}_{\text{sw}}$ for Site U1406. The dotted line represents a linear regression fit and the R^2 and p -value are shown in the inset. As described in the Methods section, only relative changes in $\delta^{18}\text{O}_{\text{sw}}$ should be interpreted.