

Figure F1. SAT study region, Expeditions 390/393, 390C, and 395C. A. Bathymetry of the South Atlantic Ocean (Ryan et al., 2009). Inset: regional settings. RGR = Rio Grande Rise, ERGR = eastern Rio Grande Rise, MAR = Mid-Atlantic Ridge, TdC = Tristan de Cunha. B. SAT drilled sites shown above seafloor bathymetry measured during CREST cruise (Reece and Estep, 2019). The sites used in this study are in red.

Figure F2. Carbon and oxygen stable isotope ($\delta^{13}\text{C}$ and $\delta^{18}\text{O}$) bulk carbonate data, Site U1557.

Figure F3. Carbon and oxygen stable isotope ($\delta^{13}\text{C}$ and $\delta^{18}\text{O}$) bulk carbonate data, Site U1558. The data set was obtained by combining data from Holes U1558A and U1558F.

Figure F4. Carbon and oxygen stable isotope ($\delta^{13}\text{C}$ and $\delta^{18}\text{O}$) bulk carbonate data vs. age, Sites U1557 and U1558. The data set was obtained by combining data from Holes U1557B, U1558A, and U1558F. Ages were calculated according to the shipboard age models for these sites (Coggon et al., 2024a; Teagle et al., 2024) and reported according to *Geologic Time Scale 2020* (Gradstein et al., 2020). Pink shading = the part of the record generated by analyzing samples from Hole U1557B, yellow shading = the part of the record generated by analyzing samples from Holes U1558A and U1558F.