



Figure S1. (a) Two versions of the deep and intermediate stacks with the AIP stacks plotted in dot-dashed lines, and AP stacks plotted in solid lines. (b) The 95% C.I. half-width for each stack in the legend in panel (a). (c) Comparison of CO<sub>2</sub> and both AP and AIP vertical  $\delta^{13}\text{C}$  gradients. Both volume-weighted vertical gradients closely resemble the spliced atmospheric CO<sub>2</sub> records (red circles) (Köhler et al., 2017), but the AIP  $\delta^{13}\text{C}$  gradient (dashed green-blue line) is more noisy and slightly more depleted than the AP  $\delta^{13}\text{C}$  gradient (solid blue line).