Supporting Information for
“Non-monotonic Response of the Climate System to Abrupt CO₂ Forcing”

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Figure S1. Radiative forcing calculation comparison of the y-intercept from the Gregory regressions (black), the logarithmic approximation (green), and 30 year fixed SST experiments (red) for a) GISS-E2.1-G and b) CESM-LE.
Figure S2. Gregory regression plots for a,b) fully coupled (FOM) and c,d) slab-ocean (SOM) runs using annual averages for both GISS-E2.1-G (left) and CESM-LE (right). Intercepts are shown with larger black dots.
Figure S3. Time evolution of the Atlantic Meridional Overturning Circulation (AMOC) in a,b) abrupt CO$_2$ forcings in fully coupled (FOM) GISS-E2.1-G and CESM-LE; c,d) abrupt 4×CO$_2$ runs in CMIP5 and CMIP6 models. Time series are smoothed with a 5 year running mean.
Figure S4. As in Fig. 4 except shown here using output from the slab-ocean runs.
Figure S5. NH subtropics response to abrupt CO$_2$ forcing. Edge of dry zones ($\phi_{P-E}$, red) and specific humidity ($q$, light blue) for a) GISS-E2.1-G and b) CESM-LE fully coupled (FOM) models. $q$ is averaged over 30$^\circ$N to 45$^\circ$N. Error bars denote 95% confidence intervals calculated using Student’s $t$-distribution.