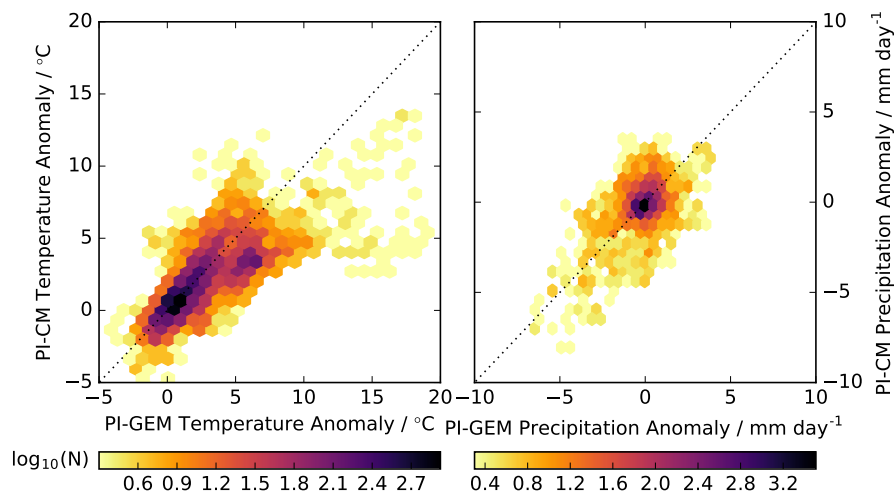Climate
of the Past

Supplement of

Simulating the climate response to atmospheric oxygen variability in the Phanerozoic: a focus on the Holocene, Cretaceous and Permian

David C. Wade et al.

*Correspondence to:* David C. Wade (dcw32.wade@gmail.com) and Alexander T. Archibald (ata27@cam.ac.uk)

Supplementary Figure 1: Hexbin plots of surface air temperature anomaly (left) and precipitation anomaly (right) comparing PI-GEM$_{10}^{35}$ and PI-CM$_{10}^{35}$. Note that there is reasonable agreement between HadCM3-BL and HadGEM3-AO, however HadCM3-BL does not simulate the largest temperature anomalies simulated by HadGEM3-AO.
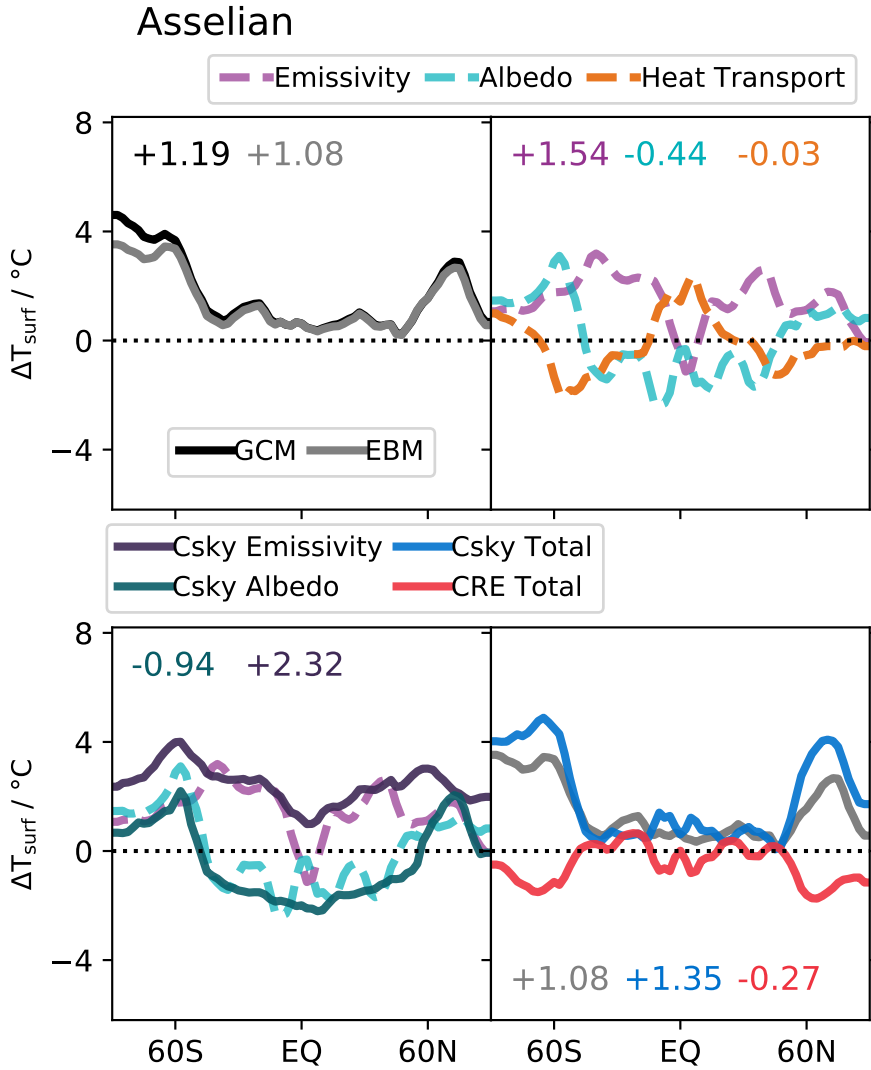
Supplementary Figure 2: 1D-EBM decomposition for As-CM$_{10}^{35}$. Top left: EBM results (grey) vs GCM results (black). Top right: Decomposition of EBM into the emissivity (purple), albedo (green) and heat transport (orange) components of the temperature change. Bottom left: Clear-sky emissivity (dark purple) and albedo (dark green) components of the EBM. Bottom right: Decomposition of EBM into the total clear-sky (blue), cloudy-sky (red) and all-sky (grey) components.
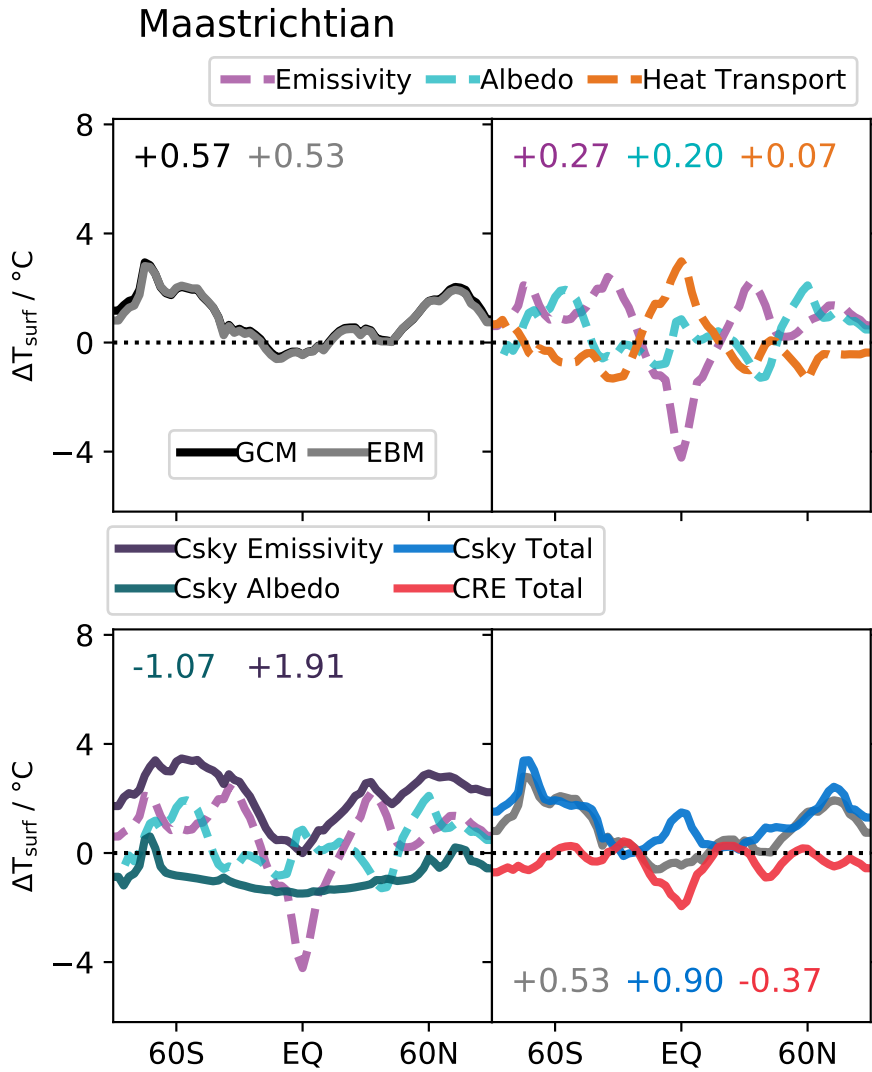
Supplementary Figure 3: 1D-EBM decomposition for Ma-CM$_{10}^{35}$. Top left: EBM results (grey) vs GCM results (black). Top right: Decomposition of EBM into the emissivity (purple), albedo (green) and heat transport (orange) components of the temperature change. Bottom left: Clear-sky emissivity (dark purple) and albedo (dark green) components of the EBM. Bottom right: Decomposition of EBM into the total clear-sky (blue), cloudy-sky (red) and all-sky (grey) components.
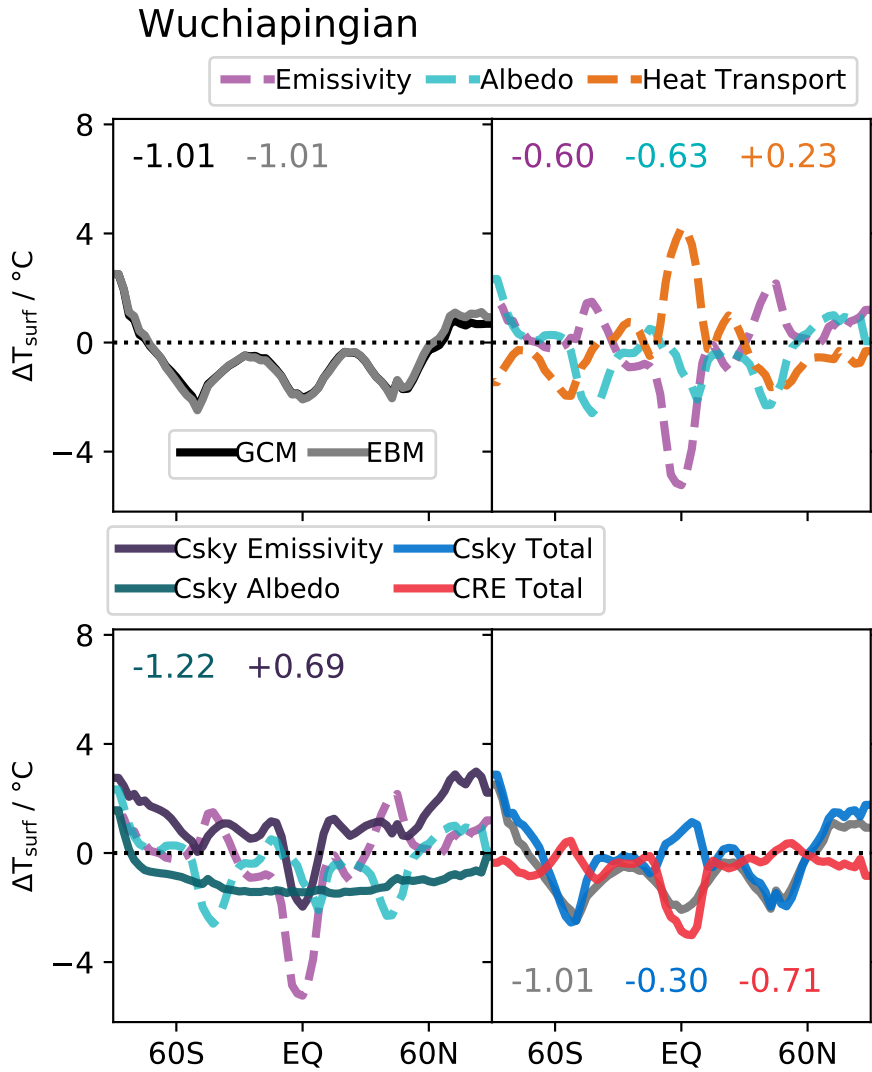
Supplementary Figure 4: 1D-EBM decomposition for Wu-CM$_{10}^{35}$. Top left: EBM results (grey) vs GCM results (black). Top right: Decomposition of EBM into the emissivity (purple), albedo (green) and heat transport (orange) components of the temperature change. Bottom left: Clear-sky emissivity (dark purple) and albedo (dark green) components of the EBM. Bottom right: Decomposition of EBM into the total clear-sky (blue), cloudy-sky (red) and all-sky (grey) components.