

Figure S1. Model orographic configuration for the late Miocene simulations.

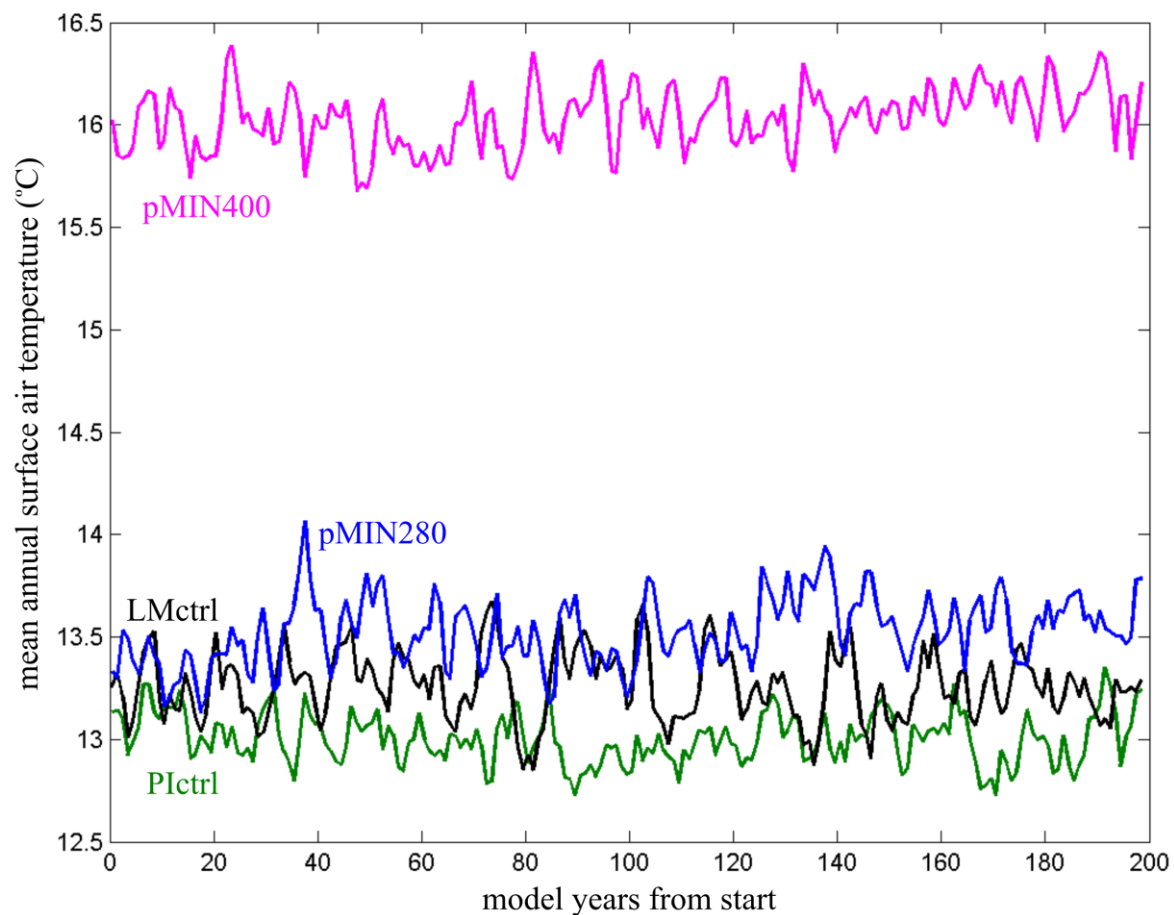


Figure S2. Surface air temperature trends in the 200 years of simulation for the preindustrial control (green line), late Miocene control (black), precession minimum at 280 ppm CO₂ concentrations (blue) and precession minimum at 400 ppm (magenta).

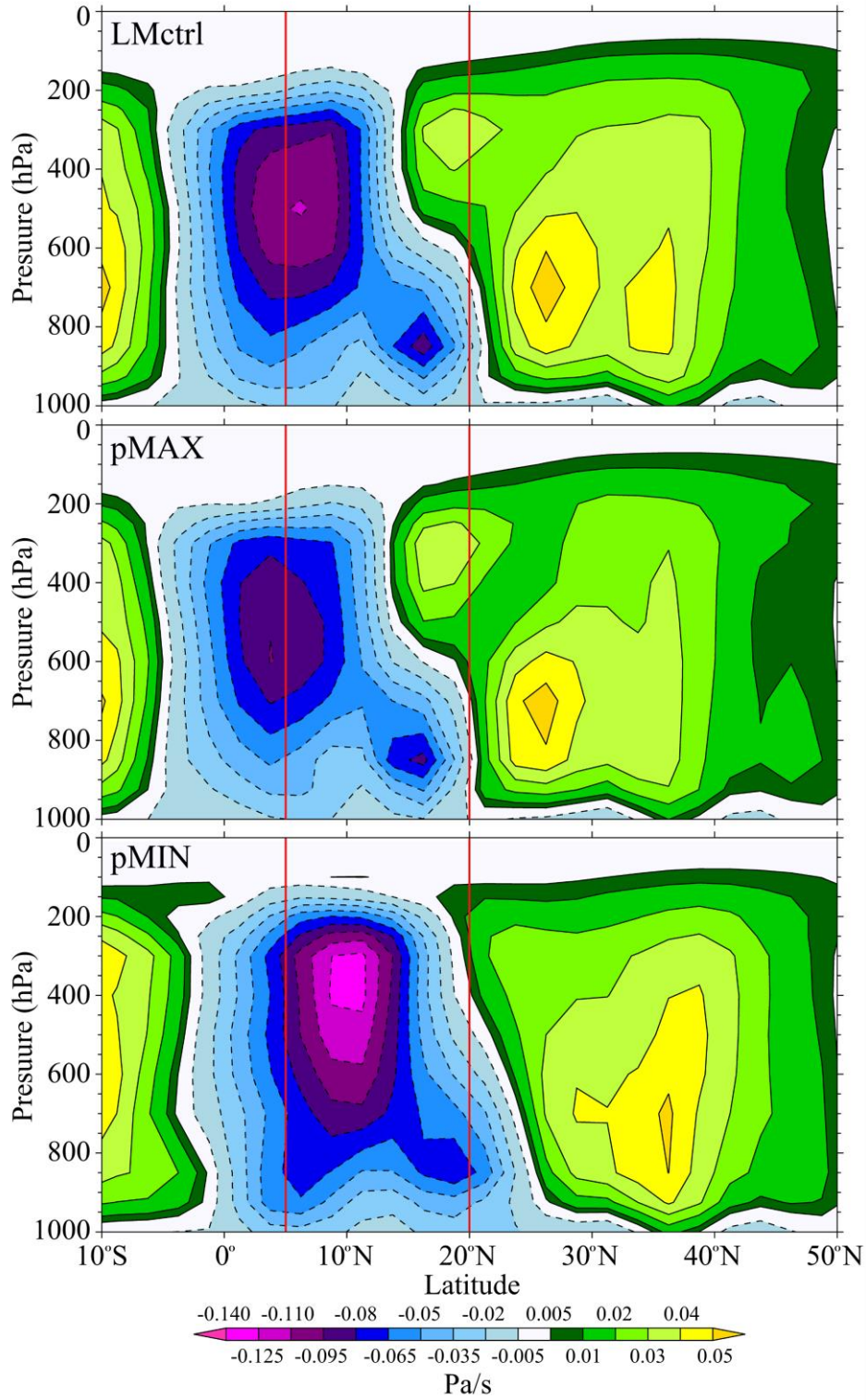


Figure S3. Hadley Circulation. Vertical velocity (ω) in Pa/s averaged longitudinally within the Southern "box" (as defined in Figure 9a). Negative values indicate vertical ascent and positive values indicate vertical descent. Note that the scale varies between positive values, where the increment is 0.01 Pa/s, and negative values, where the increment is 0.015 Pa/s. The red vertical lines indicate the location of the North Africa Southern "box", between 5 and 20°N.