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Hydrologic cycle during the assembly of Rodinia supercontinent

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Hydrologic cycle is fundamental in regulating climate and biogeochemical cycles and, thus sustaining terrestrial habitability. During the assembly of the Rodinia supercontinent (~1.3–0.9 Ga), the hydrologic cycle likely operated differently, given the distinct paleogeographic configurations, as well as atmospheric composition and solar radiation. Particularly, the unique land-sea distribution and geo-/oro-graphy during supercontinental amalgamation heavily influenced precipitation patterns, evaporation rates, and global moisture transport. Here, we use the Community Earth System Model (CESM1.2.2) to simulate the hydrological cycle at 900 Myr when the supercontinental amalgamation culminated. Our preliminary results indicate a sluggish hydrological cycle during Rodinia's assembly, featured with weaker overall riverine drainage and ocean currents. A less vigorous hydrological cycle would have reduced the efficiency of biogeochemical cycling, potentially delaying the proliferation of complex life in the Neoproterozoic.