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Comparison of heat stress metrics with modern, future, and past greenhouse climates

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Heat stress is a function of temperature and humidity, and is subject to the covariance of the two quantities. One of the robust predictions from climate change is an increase in temperatures across the planet, and therefore heat stress is projected to increase. It has been proposed that in future climate, significant portions of the land surface become subject to life threatening heat stress levels to humans and mammals. We will use past greenhouse worlds and future contexts to show the evolution of these parameters in a suite of greenhouse climates. We map the correlation between relative humidity and heat stress metrics, such as the indoor Wet Bulb Globe Temperature (WBGT), utilizing the National Center for Atmospheric Research (NCAR) Community Earth System Model (CESM). These metrics will be explored using a variety of different boundary conditions: pCO_2 levels at 280, 560, 1120, 2240, and 4480 in conjunction with appropriate modern, Eocene, and Miocene continental configurations. Results will be used for an intercomparison with previous work on heat stress.