

Global Warming in Geologic Time: Messing with the Planetary Habitability Thermostat

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Prof. David Archer
University of Chicago

The global warming climate event will (would) take place within the context of a climate-maintaining negative feedback from igneous rock weathering called the weathering CO₂ thermostat. The limits to the functioning of this thermostat probably set the habitability limits of a planet around a star, and the recent detection of multitudes of exoplanets is motivating earth scientists to think more broadly about these limits. Our perturbation of the CO₂ thermostat by fossil fuel combustion will ultimately be rectified by the thermostat, but unfortunately on a time scale which is long enough (hundreds of thousands of years) to allow time for the the melting of the great ice sheets, potentially raising sea level by tens of meters, over thousands of years. We also have the capacity to derail the next half-million years of glacial / interglacial climate cycles, which are driven by wobbles in Earth's orbit around the sun.