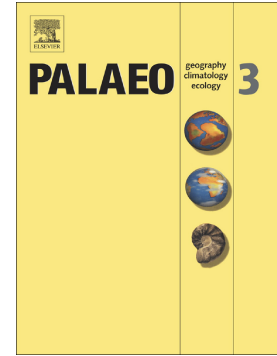


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Global temperature response to century-scale degassing from the Siberian Traps Large Igneous Province

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Abstract

The Siberian Traps Large igneous province was a key player in the end-Permian extinction and climatic change due to degassing from lavas and heated sedimentary rocks. Although the specific degassing scenarios from the province are debated, this implies that gas release on a timescale tuned to the cooling of lava flows and subvolcanic intrusions (i.e. decades to centuries) must have been sufficient to affect the atmospheric chemistry. Here we test this assumption by using simple box model calculations to constrain century-scale degassing of CO₂ and CH₄ from high-end volumes of individual lava flows and sills from the Siberian Traps. The model includes gas fluxes of CH₄ and CO₂, their atmospheric lifetimes and radiative forcing, as well as the climate sensitivity in a global average climate system calibrated to end-Permian time. The fluxes are estimated based on lava degassing and contact

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