

Climate sensitivity estimated from temperature reconstructions of the Last Glacial Maximum

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Assessing impacts of future anthropogenic carbon emissions on Earth's systems and human welfare is impeded by uncertainties in our knowledge of the equilibrium climate sensitivity to a doubling of atmospheric CO₂. Previous studies suggest 3 K as the best estimate, 2 to 4.5 K as the likely range and non-zero probabilities for much higher values, implying the possibility of unavoidable catastrophic climate changes in the coming decades. Here, using extensive syntheses of land and ocean surface temperature reconstructions from the Last Glacial Maximum in combination with model simulations, we estimate a significantly lower median (2.4 K), reduced uncertainty (1.4-3.5 K likely range), and <5% (0%) chance of sensitivities larger than 4.2 K (6 K), suggesting little possibility of catastrophic climate changes in the immediate future.