



## What do we know about climate sensitivity?

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The equilibrium climate response to anthropogenic forcing has long been one of the dominant, and therefore most intensively studied, uncertainties in predicting future climate change. As a result, many probabilistic estimates of the climate sensitivity ( $S$ ) have been presented. Despite improved models and additional observations, however, there has been little or no convergence of estimates over time. In recent years, many estimates have assigned significant probability to extremely high sensitivity, such as  $P(S > 6C) > 5\%$ . Here we investigate some of the assumptions underlying these estimates, and suggest that future progress can be made by bringing together information from recent and paleo climates. We also examine limitations due to state-dependence and nonlinearity in the climate response to external forcing which may prevent us from confidently predicting future changes from historical data.