

New predictions for sea level rise

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Fossil coral data and temperature records derived from ice-core measurements have been used to place better constraints on future sea level rise, and to test sea level projections.

The results are published today in *Nature Geoscience* and predict that the amount of sea level rise by the end of this century will be between 7- 82 cm - depending on the amount of warming that occurs - a figure similar to that projected by the IPCC report of 2007.

Placing limits on the amount of sea level rise over the next century is one of the most pressing challenges for climate scientists. The uncertainties around different methods to achieve accurate predictions are highly contentious because the response of the Greenland and Antarctic ice sheets to warming is not well understood.

Dr Mark Siddall from the University of Bristol, together with colleagues from Switzerland and the US, used fossil coral data and temperature records derived from ice-core measurements to reconstruct sea level fluctuations in response to [changing climate](#) for the past 22,000 years, a period that covers the transition from glacial maximum to the warm Holocene interglacial period.

By considering how sea level has responded to temperature since the end of the last [glacial period](#), Siddall and colleagues predict that the amount of sea level rise by the end of this century will be similar to that projected by the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

Dr Siddall said: "Given that the two approaches are entirely independent of each other, this result strengthens the confidence with which one may interpret the IPCC results. It is of vital importance that this semi-empirical result, based on a wealth of data from fossil corals, converges so closely with the IPCC estimates.

"Furthermore, as the time constant of the sea level response is 2,900 years, our model indicates that the impact of twentieth-century warming on sea level will continue for many centuries into the future. It will therefore constitute an important component of climate change in the future."

The IPCC used sophisticated climate models to carry out their analysis, whereas Siddall and colleagues used a simple, conceptual model which is trained to match the sea level changes that have occurred since the end of the last ice age.

The new model explains much of the variability observed over the past 22,000 years and, in response to the minimum (1.1 oC) and maximum (6.4 oC) warming projected for AD 2100 by the IPCC model, this new model predicts, respectively, 7 and 82 cm of sea-level rise by the end of this century. The IPCC model predicted a slightly narrower range of sea level rise - between 18 and 76 cm.

The researchers emphasise that because we will be at least 200 years into a perturbed climate state by the end of this century, the lessons of long-term change in the past may be key to understanding future change.
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More information: Constraints on future [sea-level rise](#) from past [sea-level](#) reconstructions. Mark Siddall, Thomas F. Stocker and Peter U. Clark. *Nature Geoscience*: [dx.doi.org/10.1038/NGEO587](https://doi.org/10.1038/NGEO587) .

Source: University of Bristol ([news](#) : [web](#))

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