More ambitious climate targets could save coastal ecosystems

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Credit: Institute of Physics

The difference between the Paris climate agreement's two alternative temperature targets – 1.5°C (2.7°F) and 2.0°C (3.6°F) above pre-industrial levels – may be the difference between life and death for some

coastal ecosystems threatened by sea-level rise.

That is a key finding of new research from Tufts University, Rutgers University–New Brunswick, and the Potsdam Institute for Climate Impact Research, published today in the journal *Environmental Research Letters*.

"Although the 2015 Paris Climate Agreement aims to hold global average temperature to 'well below 2°C above pre-industrial levels, and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels', projections of global average sea-level rise usually focus on scenarios with a high probability of warming exceeding 1.5°C," said lead author Dr Klaus Bittermann, from Tufts University.

The researchers used statistical modelling to project sea-level changes between now and 2150, under a variety of temperature scenarios that satisfy one of the two Paris Agreement temperature targets.

The team found that stabilising the temperature at 1.5°C instead of 2°C would reduce global average sea-level in 2150 by about 7 inches (17 cm), and reduce peak rates of rise by about 0.7 inches per decade (1.9 mm per year) – more than the average rate of rise over the last century.

Their results showed that delaying the year of peak temperature had little long-term influence on GMSL, but did reduce the maximum rate of sea-level rise significantly.

Dr Bittermann said: "Even among futures that satisfy the 1.5°C or 2°C targets set out in the Paris accord – both of which require very quick reductions of greenhouse gas emissions – there is still significant variation in how sea level responses.

"Although both temperature targets reduce the amount and the rate of

sea level rise significantly compared to a future in which we continue to burn fossil fuels, faster reductions in fossil fuels can significantly reduce the peak rate of rise."

Co-author Professor Andrew Kemp, from Tufts University said: "The difference in peak rates of sea-level rise between the scenarios is large enough that it could represent the difference between drowning and survival for some vulnerable ecosystems."

More information: Klaus Bittermann et al. Global mean sea-level rise in a world agreed upon in Paris, *Environmental Research Letters* (2017). DOI: 10.1088/1748-9326/aa9def

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