

Reaching international climate change goals can halve rising sea levels by the end of the century

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The IPCC report heavily draws on five pieces of research by the University of Southampton. Credit: University of Southampton

Research by scientists at the University of Southampton has revealed the extent by which achieving the ambitions the 2015 Paris Climate Change agreement could protect coastal communities from rising sea levels.

A new special [report](#) on the impacts of [global warming](#) of 1.5 °C above pre-industrial levels is being published today by the Intergovernmental Panel on Climate Change (IPCC), and heavily draws on five pieces of

research by the University of Southampton team.

The University's studies indicated that measures to limit global warming to 1.5°C could halve the amount by which sea levels rise by the end of the century, reducing it to 40cm as opposed to 78cm if no action to mitigate for [climate change](#) is taken. If global warming is kept to 2.0°C, sea-levels are projected to rise by 46cm. Beyond 2100, the impact of the 1.5°C aspiration grows substantially as the studies indicate it could reduce [sea-level rise](#) by over 3m by 2300.

The scientists also found that by the turn of the century, 740,000 km² – an area three times the size of the UK—could be exposed to flooding without mitigation. However this figure would reduce by 130,000 km² over the same period if Governments succeed in hitting the Paris Agreement goals. By the year 2300, 1,600,000 km² could be exposed to flooding without mitigation, but [climate](#) change mitigation could more than halve this, reducing the total land at risk to 700,000 km².

Dr. Sally Brown, lead author on the IPCC report's chapter '[Impacts of 1.5°C of Global Warming on Natural and Human systems](#)' and a researcher at Southampton and Bournemouth Universities, said: "Climate change mitigation will make a substantial difference to the inevitable impacts of sea-level rise over very long time scales, with between 1.5% and 5.4% of the world's population exposed to flooding in 2300 depending on how well we mitigate for climate change."

Other findings from the University's research cited in the IPCC report indicate that by the end of the 21st century, the differences in land and people exposed to flooding between 1.5°C or 2.0°C increases are relatively small, compared with a no mitigation scenario. Taking account of projected population change, 6 million more people will be exposed to flooding in 2100 under a 2.0°C increase compared with an increase of 1.5°C.

The studies also indicated this importance of adapting to sea-level rise. Professor Robert Nicholls, Professor of Coastal Engineering at the University of Southampton, commented: "Collectively, these analyses show that the best societal response to sea-level rise is [climate change mitigation](#) to reduce the risk to manageable levels, and adaptation in response to the residual unavoidable rise."

The team will present their findings on the day the report is launched. Co-author Dr. Ivan Haigh, Associate Professor in Ocean and Earth Science at the University of Southampton, commented: "These results indicate the importance and benefits of [climate change mitigation](#) on fragile and vulnerable environments, such as small islands or low-lying highly populated deltas."

The research also highlighted how quickly global warming could reach the 1.5 degree limit under existing emission levels. Dr. Philip Goodwin, lecturer in Ocean and Earth Science at the University of Southampton and lead author in two of the studies cited in the IPCC report, added: "Our results indicated there is an extremely narrow window of time to reduce carbon emissions. A carbon-neutral society is required by the 2040s to prevent warming exceeding 1.5 °C, or else we must prepare for the increased impacts of climate change on the coasts."

Provided by University of Southampton

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