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Greenland ice sheet could be lost even if CO2 levels are slashed

Global warming could cause the huge Greenland ice sheet to melt past "tipping points" from which it could not fully recover - even if carbon dioxide levels were slashed, a Met Office report has warned.

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Research has shown that the 1.7 million kilometre square ice sheet could melt entirely over several thousand years if temperatures continue to rise unchecked, causing sea level rises of up to seven metres.

Now a study from the Met Office Hadley Centre shows that there could be thresholds in melting which, once crossed, could prevent the ice sheet from re-growing to its former extent even if the carbon dioxide concentrations driving climate change are reduced to pre-industrial levels.

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Met Office scientists urged action to cut CO2 emissions now, to prevent the ice melting past the tipping points and causing large sea level rises in the coming centuries.

Climate modelling combined with a 3D simulation of the ice found that if the sheet melted by more than 15 per cent, which could occur within 300 years, it would be locked into further decline from which it could only recover to around 80% of its current size.

Such reductions in the ice cover would lead to "irreversible" sea level rises of 1.3 metres, the research published in the journal *Climate Dynamics* warned.

And if the Greenland sheet melted to half its current size it would pass another point of no return, with the ice locked into further declines and only stabilising at a fifth of its original extent.

This would cause sea level rises to the tune of five metres.

Once the tipping points had been crossed, the only way to undo the damage would be if global temperatures plunged back into an ice age, making the Earth cool enough for the ice to rebuild itself.

But according to current predictions, this is unlikely to happen for tens of thousands of years, the Met Office said.

Met Office climate scientist Jeff Ridley, who specialises in Polar regions, said: "The effects of the greenhouse gases we emit today will still be felt long into the future so we will need to start taking action now to stop temperature rises that will still be happening at the end of the century.

"Only by tackling warming temperatures now can we prevent the ice sheet melting past these tipping points, and prevent irreversible sea-level rise."

The Met Office Hadley Centre, which researches climate change, said it was now turning its attention to assessing how the Antarctic ice sheet would be affected by warming temperatures.

The Antarctic ice sheet covers an area of 14 million square kilometres and contains around 60% of the world's freshwater - and

melting of the vast expanse of ice could have a significant impact on sea levels.

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