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# Sea level could rise more than a metre by 2100, say experts

- Increase much higher than previously forecast
- Change could displace 10% of world's population

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David Adam in Copenhagen  
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Melting water streams from an iceberg in Ililussat, Greenland. Photograph: Paul Souders/Corbis

Global sea levels could rise much higher this century than previously projected, raising the threat level for millions of people who live in low-lying areas, new research suggests.

Scientists at a [climate change](#) summit in Copenhagen say changes in the polar ice sheets could raise sea levels by a metre or more by 2100. The implications could be severe, they warn. Ten per cent of the world's population - about 600 million people - live in vulnerable areas.

The new estimate appears to significantly worsen the predictions of a report in 2007 by the Intergovernmental Panel on Climate Change (IPCC), which said sea level could rise by up to 59cm this century. The IPCC report also said higher increases could not be ruled out, but that not enough was known about ice sheets to predict how quickly they could break up as temperatures increased.

Prof Konrad Steffen, of the University of Colorado, said new studies of ice loss in Greenland showed it had accelerated over the last decade.

"I would predict sea level rise by 2100 in the order of 1m," he said. "It could be 1.2m or 0.9m, but it is 1m or more seeing the current change, which is up to three times more than the average predicted by the IPCC. It is a major change and it actually calls for action."

Dr John Church, of the Centre for Australian Weather and Climate Research in Tasmania, said: "The most recent satellite and ground based observations show that sea-level rise is continuing to rise at 3mm per year or more since 1993, a rate well above the 20th-century average. The oceans are continuing to warm and expand, the melting of mountain glaciers has increased and the ice sheets of Greenland and Antarctica are also contributing to sea level rise."

Prof Eric Rignot, a senior research scientist at Nasa's Jet Propulsion Laboratory, said new studies since the IPCC report showed that melting and ice loss could not be overlooked. "As a result of the acceleration of outlet glaciers over large regions, the ice sheets in Greenland and Antarctica are already contributing more and faster to sea level rise than anticipated."

Prof Stefan Ramstorf, of the Potsdam Institute for Climate Impact Research in Germany said: "Based on past experience, I expect that sea level rise will accelerate as the planet gets hotter."

The IPCC estimate had been based largely on the expansion of oceans from higher temperatures, rather than meltwater and the impact of glaciers breaking into the sea.

Ramstorf said research indicated sea levels rising between 75cm and 190cm by 2100. Even if the world manages to cut the emission of greenhouse gases driving global warming, the "best estimate" was about 1m, he added.

Steffen said: "Different groups may come to slightly different projections, but differences in the details of the projections should not cloud the overall picture where even the lower end of the projections look to have very serious effects."

John Ashton, the special representative for climate change at the Foreign Office, said: "We need to look at what is a reasonable worst case in the lifetime of people alive today."

More than 2,000 researchers from 80 countries are attending the conference, which is intended to spur politicians into taking action on global warming.

"The huge response from scientists comes from a sense of urgency, but also a sense of frustration," said Katherine Richardson, head of the Danish government's commission on climate change policy, which organised the conference. "Most of us have been trained as scientists to not get our hands dirty by talking to politicians."

She said the IPCC report from 2007 was an "invaluable document", but it would be years out of date when negotiators convene in Copenhagen in December to try to agree a new global deal to regulate carbon emissions.

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