



Recent and future contributions from the ice sheets to sea-level rise

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Changes in the volumes of the Greenland and Antarctic ice sheets have by far the largest potential impact on global sea-level rise (SLR). Comparatively low rates of SLR over the last two or three thousand years indicate that such changes have been slow, whereas recent measurements reveal quite rapid changes coincident with an increase in SLR rates. These measurements, from three independent techniques, indicate that the ice sheets might now be contributing almost 1 mm/yr to SLR, and that this contribution is increasing with time. Despite this, IPCC and other model simulations of future ice-sheet contributions are quite modest, primarily because they do not include the possibility of major changes in ice discharge along outlet glaciers and ice streams, changes which observations clearly show are already happening. A different approach, assuming SLR to be proportional to increasing global temperatures, yields a far more rapid future SLR. Here, I review available estimates of ice-sheet mass balance, and I assess the implications for future ice-sheet behaviour if these higher predictions are correct.