

Sea Level Rise by 2100

In his News and Analysis piece reporting on the newly released fifth assessment report (AR5) by Working Group I of the Intergovernmental Panel on Climate Change (IPCC), Richard Kerr highlighted three fundamental conclusions about climate change that were assessed with equal or greater confidence than in previous IPCC reports (“A Stronger IPCC Report,” October 4, p. 23). At the same time, he pointed to three “contentious points” on which he stated the AR5 “took a moderate line.” Kerr included sea level projections among these points, and reported “a rise of 40 to 60 centimeters by late in the century and a worst case of 1 meter by 2100 [which is] higher than in 2007 but far below the meter or two of sea-level rise that some expect.”

We wish to clarify that for the highest emission scenario considered (RCP8.5), the AR5 reported a *likely* range of 0.45 to 0.82 m for sea level projections for the late 21st century (average over 2081-2100) and of 0.52 to 0.98 m by 2100. The difference in sea level between these two periods is large because in 2081-2100 the *likely* rate of rise is 8 to 16 mm per year, which is up to about ten times the average rate of rise during the 20th century. In the calibrated uncertainty language of the IPCC, this assessed likelihood means that there is roughly a one-third probability that sea level rise by 2100 may lie outside the *likely* range. That is, the AR5 did not exclude the possibility of higher sea levels, but concluded that “only the collapse of marine-based sectors of the Antarctic ice sheet, if initiated, could cause global mean sea level to rise substantially above the *likely* range during the 21st century,” and that “there is *medium confidence* that this additional contribution would not exceed several tenths of a meter of sea level rise during the 21st century.” This possible contribution is not defined more precisely because “there is currently insufficient evidence to evaluate the probability of specific levels above the assessed *likely* range”.

The upper boundary of the AR5 *likely* range should not be misconstrued as a “worst-case” upper limit, as was done in Kerr’s reporting as well as elsewhere in the media and blogosphere. For policy and planning purposes it may be necessary to adopt particular numbers as an upper limit, but according to our assessment, the current state of scientific knowledge cannot give a precise guide.

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