

EGU2020-7302

<https://doi.org/10.5194/egusphere-egu2020-7302>

EGU General Assembly 2020

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Estimating global mean sea-level rise and its uncertainties by 2100 and 2300 from expert assessment

Benjamin Horton¹, Nicole Khan², Niamh Cahill³, Janice Lee¹, Tim Shaw¹, Andra Garner⁴, Andrew Kemp⁵, Simon Engelhart⁶, and Srefan Rahmstorf⁷

¹Nanyang Technological University, Asian School of the environment, Singapore, Singapore (bphorton@ntu.edu.sg)

²Department of Earth Sciences and Swire Marine Institute, The University of Hong Kong, Hong Kong.

³Department of Mathematics and Statistics, Maynooth University, Maynooth, Ireland.

⁴Department of Environmental Science, Rowan University, Glassboro, NJ 08028

⁵Department of Earth and Ocean Sciences, Tufts University, Medford, MA 02155, USA

⁶Department of Geography, Durham University, Durham, DH1 3LE, UK

⁷Potsdam Institute for Climate Impact Research, Telegrafenberg A62, 14473 Potsdam, Germany.

Sea-level rise projections and knowledge of their uncertainties are vital to make informed mitigation and adaptation decisions. To elicit expert judgments from members of the scientific community regarding future global mean sea-level (GMSL) rise and its uncertainties, we repeated a survey originally conducted five years ago. Under Representative Concentration Pathway (RCP) 2.6, 106 experts projected a likely (at least 66% probability) GMSL rise of 0.30–0.65 m by 2100, and 0.54–2.15 m by 2300, relative to 1986–2005. Under RCP 8.5, the same experts projected a likely GMSL rise of 0.63–1.32 m by 2100, and 1.67–5.61 m by 2300. Expert projections for 2100 are similar to those from the original survey, although the projection for 2300 has extended tails and is higher than the original survey. Experts give a likelihood of 42% (original survey) and 45% (current survey) that under the high emissions scenario GMSL rise will exceed the upper bound (0.98 m) of the likely (i.e. an exceedance probability of 17%) range estimated by the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Responses to open-ended questions suggest that the increases in upper-end estimates and uncertainties arose from recent influential studies about the impact of marine ice cliff instability on the meltwater contribution to GMSL rise from the Antarctic Ice Sheet.