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# Quantifying ambiguity in sea-level projections

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Coastal impacts of climate change and the related mitigation and adaptation needs requires assessments of future sea-level changes. Following a common practice in coastal engineering, probabilistic sea-level projections have been proposed for at least 20 years. This requires a probability model to represent the uncertainties of future sea-level rise, which is not achievable because potential ice sheets mass losses remain poorly understood given the knowledge available today. Here, we apply the principles of extra-probabilistic theories of uncertainties to generate global and regional sea-level projections based on uncertain components. This approach assigns an imprecision to a probabilistic measure, in order to quantify lack of knowledge pertaining to probabilistic projections. This can serve to understand, analyze and communicate uncertainties due to the coexistence of different processes contributing to future sea-level rise, including ice-sheets. We show that the knowledge gained since the 5th Assessment report of the IPCC allows better quantification of how global and regional sea-level rise uncertainties can be reduced with lower greenhouse gas emissions. Furthermore, Europe and Northern America are among those profiting most from a policy limiting climate change to RCP 2.6 versus RCP 4.5 in terms of reducing uncertainties of sea-level rise.