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# Century-long probabilistic forecasts of sea-level contribution from the Amundsen Sea Sector of West Antarctica, constrained by mass balance data.

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The Amundsen Sea sector of West Antarctica has the potential to contribute significantly to sea-level change. We calculate century-long probabilistic forecasts of sea-level contribution for different melt scenarios over the coming century. We use the state-of-the-art WAVI ice-sheet model with realistic initial conditions to investigate the sensitivity of this region to prescribed basal melting, varying both the basal melt rate under newly formed cavities and the initialised melt rate under existing cavities. Previously 'unresolved' ice rises with non-zero drag on the shelves are required to match the surface observations, and we explore the effect of either partially or fully removing this drag at the start of the run. Present-day climate and calving fronts are prescribed throughout the runs. We then use Bayesian methods together with mass balance data over the first decade of the model run to constrain predictions of sea-level contribution over the 21st Century, giving precedence to parameter combinations that best match the mass balance data. Our probabilistic approach reduces uncertainty in future predictions of sea-level contribution for different melt scenarios, but as the results are very sensitive to the prescribed basal melt, a method to calculate melt rates is key to providing more robust predictions.