

Regional Sea-level Change Projections: Current State and Applications

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Sea-level change (SLC) is a much-studied topic in the area of climate research, integrating a range of climate science disciplines, and is expected to impact coastal communities around the world. As a result, this field is rapidly moving, and the knowledge and understanding of processes contributing to SLC is increasing. We will discuss noteworthy recent developments in the projection of regional SLC contributions.

For the Greenland Ice Sheet contribution to SLC, earlier estimates have been confirmed in recent research, but part of the source of this contribution has shifted from dynamics to surface melting. New insights into dynamic discharge processes and the onset of marine ice sheet instability increase the projected range for the Antarctic contribution by the end of the century. The contribution from both ice sheets is projected to increase further in the coming centuries to millennia. Updates of the global glacier outline database and new global glacier models have led to slightly lower projections for the glacier contribution to SLC (7–17 cm by 2100), but still project the glaciers to be an important contribution.

Recently, regional projections have been applied to specific regions, countries, and coastal areas, bridging the gap from science to society. We will discuss how regional sea-level projections can be used to compute so-called sea-level allowances. An allowance is the local height displacement at which the frequency of the occurrence of sea-level extremes is maintained under a certain sea-level rise scenario. We explore a range of ice dynamical scenarios with different types of probability density distributions, and show that highly skewed scenarios (low probability – high risk) lead to significantly larger allowances.

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