



GlacierMIP – A model intercomparison of global-scale glacier mass-balance models and projections

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Modelling future glacier changes on a global scale is challenging due to biases in climate data in complex mountainous terrain and the scarcity of data for model initialization and calibration. Only a few global-scale glacier volume projections have been published over the past ten years. The estimated 21st century glacier contribution to sea-level rise from these studies varies greatly, even for the same emission scenario. Since the chosen ensemble of Global Circulation Models (GCMs) providing model forcing differs per study, the effects of differences in climate forcing and model setup cannot be disentangled. The Glacier Model Intercomparison Project (GlacierMIP), a new "Targeted Activity" under the Climate and Cryosphere (CliC) program, aims for a detailed intercomparison of global glacier models. In Phase 1 of the project, future projections from six existing global-scale glacier model studies are compared for individual regions and GCMs. Especially on the regional scale, differences between the studies are large, likely a result of insufficiently constrained model parameters. Furthermore, there are considerable differences in the initial ice volume per region, possibly affecting the future glacier evolution. While Phase 1 allows for a first investigation, the limited overlap in forcing GCMs and emission scenarios hampers a thorough comparison of the results. There clearly is a need for a coordinated intercomparison of global-scale glacier mass change models with predefined climate forcing. This framework is provided by Phase 2 of GlacierMIP, with the ultimate goal to foster model improvements and reduce uncertainties in global glacier projections and associated contributions to sea-level rise.