Glacier mass loss is happening at significant rates and a significant contributor to current sea level rises. Understanding the extent that the sea level will rise is critical for understanding our changing planet and societal planning as anthropogenic climate change continues. However, there are still significant uncertainties in the amount of mass glaciers will lose in the future. We propose to perform a rigorous and expansive set of modeling to improve the predictions of glacier mass loss. The modeling will be accomplished by using 11 glacier models and10 general circulation models along with four Representative Concentration Pathways (RCPs) as boundary conditions. Our modeling will provide an improved estimate of glacier mass loss expected by 2100, which is critical to estimating regional and global sea level rise. Furthermore, this work by quantifying glacier ice melt, is relevant to any system that involves glacial melt such as glacial river flow rates and land changes due to the removal of ice.

**Actual Abstract:** Glacier mass loss is recognized as a major contributor to current sea level rise. However, large uncertainties remain in projections of glacier mass loss on global and regional scales. We present an ensemble of 288 glacier mass and area change projections for the 21st century based on 11 glacier models using up to 10 general circulation models and four Representative Concentration Pathways (RCPs) as boundary conditions. We partition the total uncertainty into the individual contributions caused by glacier models, general circulation models, RCPs, and natural variability. We find that emission scenario uncertainty is growing throughout the 21st century and is the largest source of uncertainty by 2100. The relative importance of glacier model uncertainty decreases over time, but it is the greatest source of uncertainty until the middle of this century. The projection uncertainty associated with natural variability is small on the global scale but can be large on regional scales. The projected global mass loss by 2100 relative to 2015 (79 ± 56 mm sea level equivalent for RCP2.6, 159 ± 86 mm sea level equivalent for RCP8.5) is lower than, but well within, the uncertainty range of previous projections.

Marzeion, B., Hock, R., Anderson, B., Bliss, A., Champollion, N., Fujita, K., et al. (2020).

Partitioning the uncertainty of ensemble projections of global glacier mass change. *Earth's Future*. *8*, e2019EF001470. https://doi. org/10.1029/2019EF001470

<https://arizona-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=TN_cdi_doaj_primary_oai_doaj_org_article_d797a8eda9c44580906760a377b60fd8&context=PC&vid=01UA&lang=en_US&search_scope=Everything&adaptor=primo_central_multiple_fe&tab=default_tab&query=any,contains,Partitioning%20the%20Uncertainty%20of%20Ensemble%20Projections%20of%20Global%20Glacier%20Mass%20Change>