



## **Summary of the SeaRISE Project's Experiments on Modeled Ice-Sheet Contributions to Future Sea Level: Linearities and Non-linearities**

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The SeaRISE (Sea-level Response to Ice Sheet Evolution) project achieved ice-sheet model ensemble responses to a variety of prescribed changes to surface mass balance, basal sliding and ocean boundary melting. Greenland ice sheet models are more sensitive than Antarctic ice sheet models to likely atmospheric changes in surface mass balance, while Antarctic models are most sensitive to basal melting of its ice shelves. An experiment approximating the IPCC's RCP8.5 scenario produces first century contributions to sea level of 22.3 and 7.3 cm from Greenland and Antarctica, respectively, with a range among models of 62 and 17 cm, respectively. By 200 years, these projections increase to 53.2 and 23.4 cm, respectively, with ranges of 79 and 57 cm. The considerable range among models was not only in the magnitude of ice lost, but also in the spatial pattern of response to identical forcing. Despite this variation, the response of any single model to a large range in the forcing intensity was remarkably linear in most cases. Additionally, the results of sensitivity experiments to single types of forcing (i.e. only one of the surface mass balance, or basal sliding, or ocean boundary melting) could be summed to accurately predict any model's result for an experiment when multiple forcings were applied simultaneously. This suggests a limited amount of feedback through the ice sheet's internal dynamics between these types of forcing over the time scale of a few centuries (SeaRISE experiments lasted 500 years).