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Choice of observation type affects Bayesian calibration of Greenland Ice Sheet model simulations

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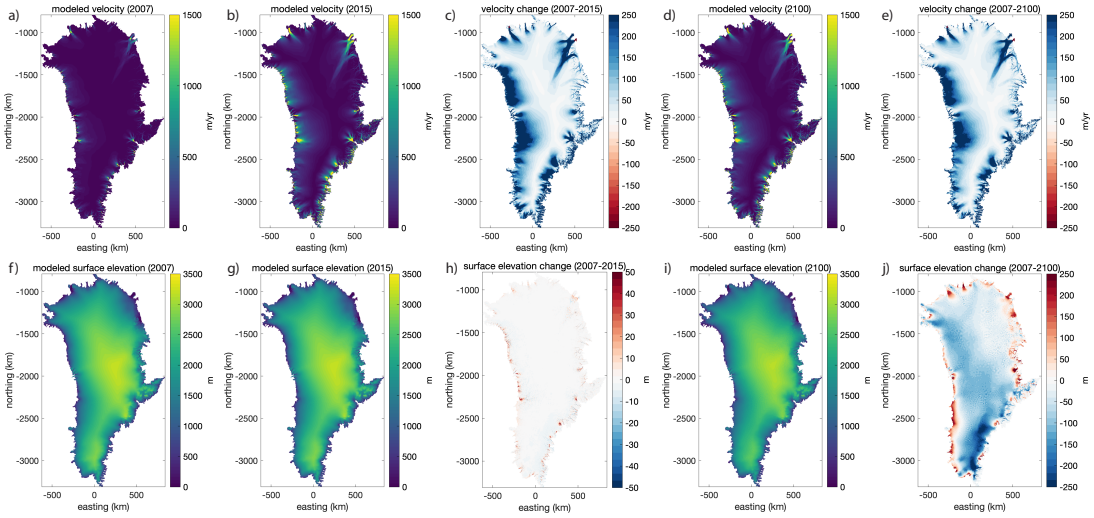

Figure S1: Modeled velocities and surface elevations for lowest-weighted ensemble member from mass change calibration. Initial velocity (a), velocity in 2015 (b), velocity change from 2007 to 2015 (c), velocity in 2100 (d), and velocity change from 2007 to 2100 (e) are shown along the top row. Bottom row shows the same quantities for surface elevation (f-j).

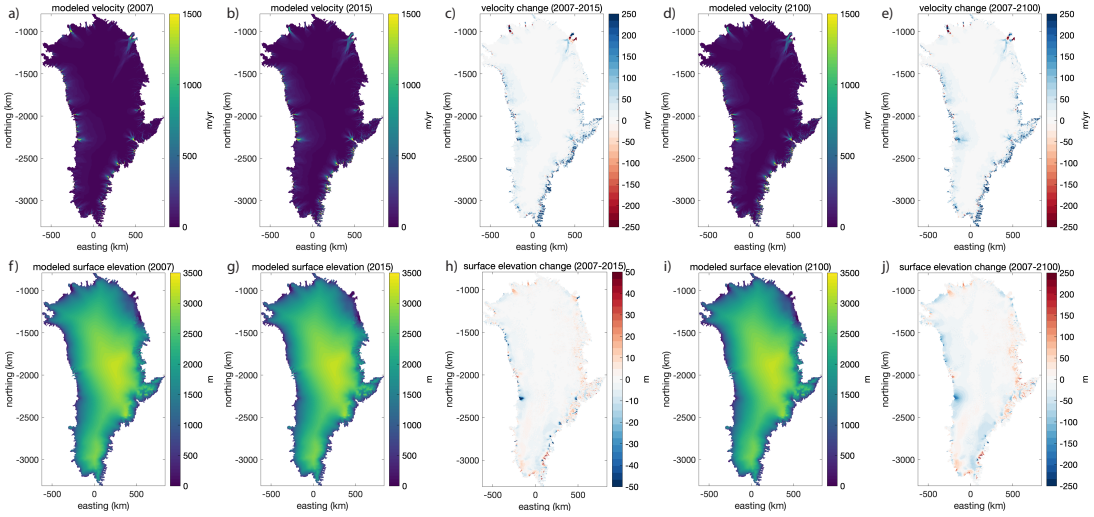

Figure S2: Modeled velocities and surface elevations for heighest-weighted ensemble member from mass change calibration. Initial velocity (a), velocity in 2015 (b), velocity change from 2007 to 2015 (c), velocity in 2100 (d), and velocity change from 2007 to 2100 (e) are shown along the top row. Bottom row shows the same quantities for surface elevation (f-j).

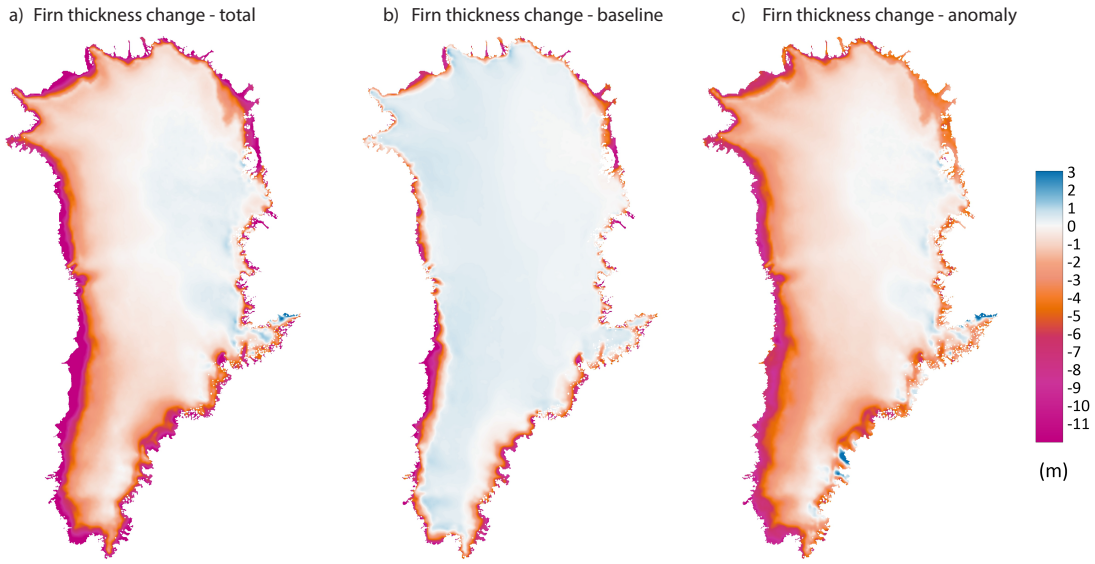

Figure S3: Estimate of firn thickness change anomaly over the 2007–2015 calibration time period, used to calculate observed dynamic ice thickness change. Total firn column thickness change, including changes due to firn densification and surface mass balance (a), baseline firn column thickness change calculated using the 1970–1989 average (b), and firn column thickness change anomaly (c), calculated as the difference between (b) and (a), are shown.

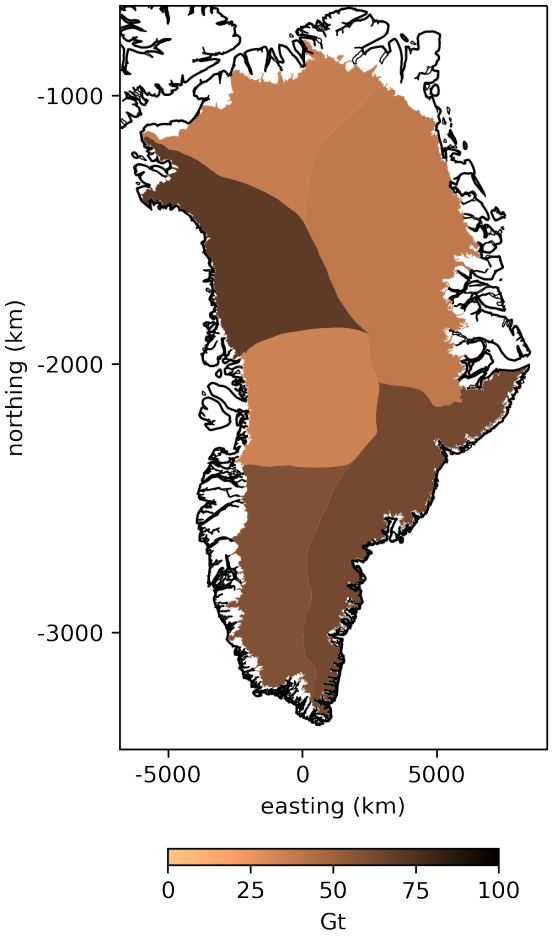

Figure S4: Basin-scale uncertainty in observed mass change for the 2007-2015 calibration time period, calculated using the method in Loomis et al. (2021).

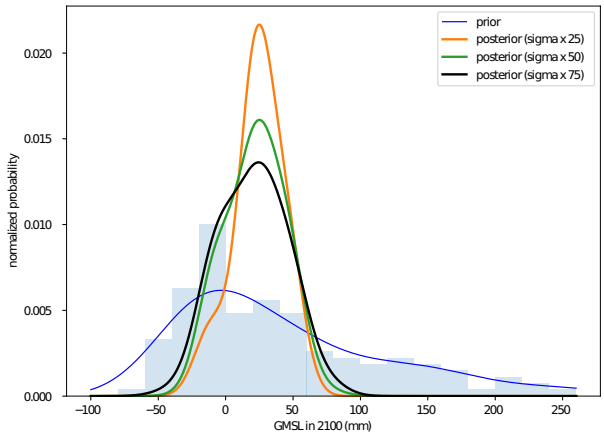

Figure S5: Posterior probability distributions of Greenland's committed contribution to global mean sea level (GMSL) in 2100 from Bayesian calibrations using velocity change observations and three values for the multiplier, k, used to calculate structural model uncertainty from observational uncertainty: 25 (orange), 50 (green), and 75 (black). Prior distribution shown as a blue curve and the histogram of the prior population is shown as a blue bar graph.

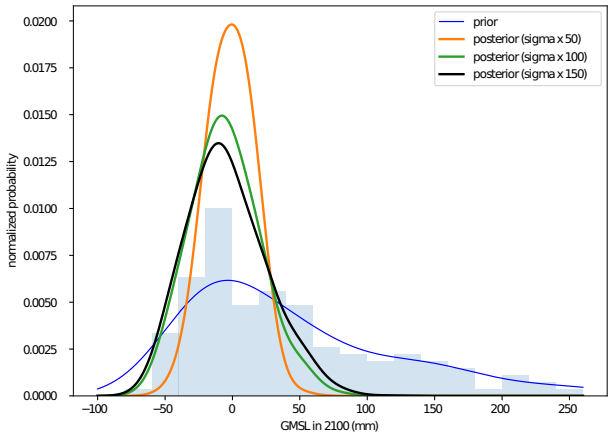

Figure S6: Posterior probability distributions of Greenland's committed contribution to global mean sea level (GMSL) in 2100 from Bayesian calibrations using dynamic ice thickness change observations and three values for the multiplier, k, used to calculate structural model uncertainty from observational uncertainty: 50 (orange), 100 (green), and 150 (black). Prior distribution shown as a blue curve and the histogram of the prior population is shown as a blue bar graph.