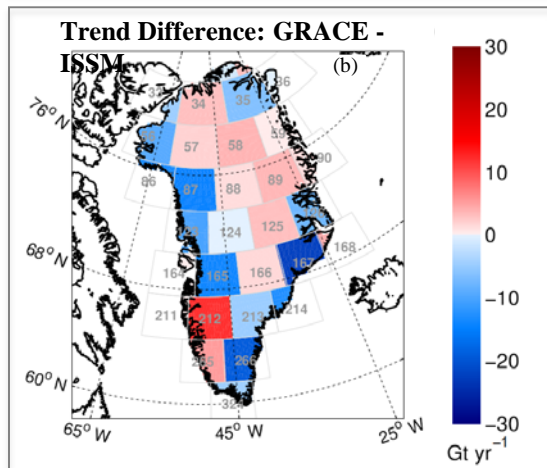
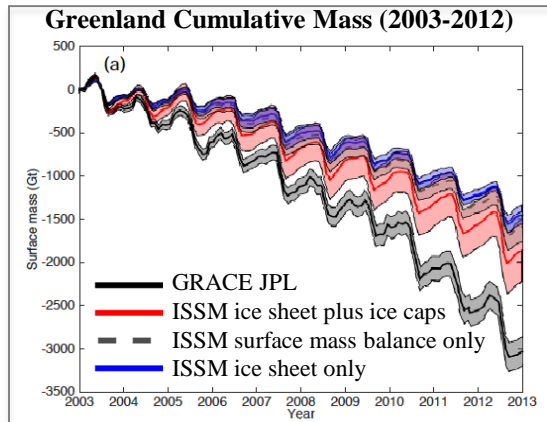


# Utility of GRACE in assessing model estimates of Greenland mass change (Nicole-Jeanne Schlegel)



**Problem:** Model estimates of Greenland ice mass change differ from observed. In order to improve these estimates, it is crucial to characterize model uncertainty.

**Finding:** In the Southwest and Northeast, model uncertainty is dominated by errors in surface climate, particularly during the summer. In the Northwest and Southeast, GRACE observes consistent mass loss due to short-term increases in ice loss during the spring. These events are not modeled, therefore ISSM underestimates mass loss.

**Significance:** Results indicate that in order to improve models of the Greenland Ice Sheet, it is necessary to observe ice sheet processes that occur on monthly timescale (such as melt events, basal hydrology, and ice-ocean interaction) and to physically represent these processes in the models.

*Ice Sheet System Model (ISSM) simulations of Greenland mass and JPL's GRACE mascon solution, compared (above) as time series and (below) spatially by mascon.*

Schlegel, N.-J., Wiese, D. N., Larour, E. Y., Watkins, M. M., Box, J. E., Fettweis, X., and van den Broeke, M. R.: Application of GRACE to the assessment of model-based estimates of monthly Greenland Ice Sheet mass balance (2003–2012), *The Cryosphere*, 10, 1965-1989, doi:10.5194/tc-10-1965-2016, 2016.

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