The Greenland ice sheet is currently experiencing a net mass loss. There are however large discrepancies between the published qualitative mass loss estimates, based on different data sets and methods. There are even large differences between the results based on the same data sources, as is the case with those estimated from GRACE data. In this chapter we have used a generalized inversion method to estimate the Greenland ice sheet mass change from the monthly global gravity solutions, provided by three different GRACE processing centers; CSR, JPL and GFZ. In order to derive mass change from these monthly global gravity models, we first calculate the gravity trend from these. When isolating the gravity trend signal, which is caused by the ice mass change, we first subtract the signal produced by the postglacial rebound (PGR) in Greenland. This is done by a simple method based on the ice history model ICE-5G and on ground measurements made in Scandinavia. We find that the PGR signal corresponds to a mass change signal of approximately -4 Gt per year. We conclude that there are large differences between these estimated mass change models. We find a total mass loss of 189, 146 and 67 Gt/year based on the CSR, GFZ and JPL solution respectively.