# On the computation of mass-change trends from GRACE gravity field time-series

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Time-variable GRACE (Gravity Recovery and Climate Experiment) gravity field solutions are routinely exploited to derive secular and seasonal mass changes on and near the Earth's surface. However, the quantification of mass redistribution from space gravimetry is not a straightforward process. For instance, published linear deglaciation rates of the Greenland ice sheets vary from $\approx 100$ Gt/yr to $\approx 300$ Gt/yr; the discrepancies are subject to applied methodologies, the considered gravity field time-series and the period of investigation. Furthermore, in the recent past discussion has come to the fore whether the temporal behavior of mass variation might be better represented by a second-order polynomial rather than a linear regression model. In summary, the degrees of freedom inherent to GRACE analysis make the detection of mass trends to become a delicate topic. This contribution sensitizes for a more critical and profound examination of trends derived from GRACE mass-variation time-series. We point to possible misinterpretation and propose "rules" to improve the consistency of results.