Greenland ice sheet mass balance: a review - DTU Orbit (24/03/2018)

Greenland ice sheet mass balance: a review
Over the past quarter of a century the Arctic has warmed more than any other region on Earth, causing a profound impact on the Greenland ice sheet (GrIS) and its contribution to the rise in global sea level. The loss of ice can be partitioned into processes related to surface mass balance and to ice discharge, which are forced by internal or external (atmospheric/oeceanic/basal) fluctuations. Regardless of the measurement method, observations over the last two decades show an increase in ice loss rate, associated with speeding up of glaciers and enhanced melting. However, both ice discharge and melt-induced mass losses exhibit rapid short-term fluctuations that, when extrapolated into the future, could yield erroneous long-term trends. In this paper we review the GrIS mass loss over more than a century by combining satellite altimetry, airborne altimetry, interferometry, aerial photographs and gravimetry data sets together with modelling studies. We revisit the mass loss of different sectors and show that they manifest quite different sensitivities to atmospheric and oceanic forcing. In addition, we discuss recent progress in constructing coupled ice-ocean-atmosphere models required to project realistic future sea-level changes.

General information
State: Published
Organisations: National Space Institute, Geodesy, University of Alaska Fairbanks, University of Copenhagen, University of Colorado
Authors: Khan, S. A. (Intern), Aschwanden, A. (Ekstern), Bjørk, A. A. (Ekstern), Wahr, J. (Ekstern), Kjeldsen, K. K. (Intern), Kjær, K. H. (Ekstern)
Number of pages: 26
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information
Journal: Reports on Progress in Physics
Volume: 78
Issue number: 4
Article number: 046801
ISSN (Print): 0034-4885
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 12.39 SJR 6.125 SNIP 5.017
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 7.289 SNIP 5.081 CiteScore 12.65
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 8.61 SNIP 5.232 CiteScore 13.01
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 8.919 SNIP 4.308 CiteScore 11.31
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 8.87 SNIP 5.448 CiteScore 12.14
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 9.01 SNIP 7.296 CiteScore 14.29
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 8.401 SNIP 6.778
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 7.626 SNIP 6.688
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 7.823 SNIP 7.357
Scopus rating (2006): SJR 6.293 SNIP 5.131
Scopus rating (2005): SJR 6.053 SNIP 5.428
Scopus rating (2004): SJR 5.548 SNIP 4.86
Scopus rating (2003): SJR 5.365 SNIP 4.497
Scopus rating (2002): SJR 6.523 SNIP 5.221
Scopus rating (2001): SJR 8.011 SNIP 5.999
Scopus rating (1999): SJR 8.173 SNIP 5.167
Original language: English
Remote sensing, Glaciers, Mass balance, Ice-sheet modelling, Greenland ice sheet, Climate change, Sea-level changes
DOI:
10.1088/0034-4885/78/4/046801
Source: FindIt
Source-ID: 274422678
Publication: Research - peer-review › Journal article – Annual report year: 2015