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Oral
We report on the ice mass loss from the Antarctic and Greenland Ice Sheets for 2002-2025. In Greenland, we detect a slowdown in ice mass loss since 2012 due to lower melt runoff production caused by a succession of colder summers, especially in the southwest and northeast sectors. The mass loss averages 251+/-47Gt/year for 2002-2025 with negligible acceleration. A disproportionate portion of the mass loss is driven by North Greenland which includes the two largest marine-based basins, which are most prone to rapid sea level rise.
We use Surface Mass Balance from RACMO2.4p1 to deconvolve the GRACE results. In Antarctica the mass loss averages 101±89Gt/year with negligible acceleration. A disproportionate amount of the mass loss is controlled by the Amundsen Sea Embayment(ASE) of West Antarctica(WAIS) and to a lesser extent by the Wilkes Land sector of East Antarctica(EAIS), which are marine based with a large potential for rapid, multiple meter sea level rise. During 2019-2024, the mass loss paused, which we attribute to an increase in accumulation of snowfall in Queen Maud Land(QML), EAIS and the Antarctic Peninsula(APIS). A similar pause occurred in 2002-2007. We examine the loss in five key subregions. 1-The ASE lost 124±7Gt/yr for the entire period due to the enhanced flow of its glaciers. 2-In APIS, the mass loss averaged 26±5Gt/yr, decreasing in recent years because of more snowfall. 3-Totten, with a mass loss of 23±7Gt/yr. 4-Victoria and GeorgeVI Land, with 2±5Gt/yr. 5-QML, experienced a positive mass balance of 50±9Gt/yr. ASE/APIS/Totten contribute 2,561 Gt, 523 Gt, and 430 Gt of mass loss, respectively, which is partly compensated by a gain of 1,039 Gt in QML. In QML, snowfall increased by +25% starting in 2009 and did not return. We also analyze LRI results using present results for the Pine Island/Thwaites basins.
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