Antarctica mass global energy

Atmospheric rivers (ARs) transport large amounts of moisture from the mid- to high-latitudes and they are a primary driver of the most extreme snowfall events, along with surface melting, in Antarctica. In this study, we characterize the climatology and surface impacts of ARs on West Antarctica, focusing on the Amundsen Sea Embayment and Marie Byrd Land and analyze an ...

Using revised inventories, improved thickness mapping, and time series of velocity and SMB, we present four decades of mass balance in Antarctica that reveal a mass loss during the entire period and a rapid increase over the last ...

Ice flow models of the Antarctic ice sheet are commonly used to simulate its future evolution in response to different climate scenarios and assess the mass loss that would contribute to future sea level rise. However, there is currently no consensus on estimates of the future mass balance of the ice sheet, primarily because of differences in the representation of ...

The Antarctic Ice Sheet stores water equivalent to 58 m in global sea-level rise. We show in simulations using the Parallel Ice Sheet Model that burning the currently attainable fossil fuel resourc...

1480 J. M. van Wessem et al.: RACMO2.3p2 Antarctica ciated contribution to global sea level change (Rignot et al., 2011c;Shepherd et al.,2012). Over Antarctica, precipitation is the dominating compo-nent of the SMB, contributing 91% to the total (the sum of the absolute fluxes) mass budget (Van Wessem et al.,2014b).

Solar energy (global, absorption, scattering, reflection, losses in the atmosphere, etc.) and all kinds of atmospheric constituents (absorbing, scattering), as well as their long-term changes, were analyzed to investigate the physical and chemical processes in the atmosphere, the climate and climate change at Dome C, Antarctica.

The Antarctic Ice Sheet"s reaction on the continuing global warming is crucial to project the future sea level rise. The increasing air temperature causes both accelerating mass loss on the ...

Research based on observations from the Gravity Recovery and Climate Experiment (GRACE) satellites (2002-2017) and GRACE Follow-On (since 2018 -) indicates that between 2002 and 2020, Antarctica shed approximately 150 gigatons of ice per year, causing global sea level to rise by 0.4 millimeters per year.

And it was, for 120 years. But even as the wall was being built, human-caused climate change was getting under way, piling new heat and energy into the global climate system which would push the ...

Abstract. Earth system models (ESMs) allow us to explore minimally observed components of the Antarctic

Ice Sheet (AIS) climate system, both historically and under future climate change scenarios. Here, we present and analyze surface climate output from the most recent version of the National Center for Atmospheric Research"s ESM: the Community Earth ...

The Antarctic ice sheet"s mass has changed over the last decades. Research based on satellite data indicates that between 2002 and 2023, Antarctica shed an average of 150 billion metric tons of ice per year, adding to global sea level rise.

In this paper, we review the mechanisms leading to ice sheets" mass changes and describe the state of the art of the satellite techniques used to monitor Greenland"s and Antarctica"s mass balance, providing an overview of the contributions of Earth Observations to our knowledge of these vast and remote regions.

Research based on observations from the Gravity Recovery and Climate Experiment (GRACE) satellites (2002-2017) and GRACE Follow-On (since 2018 -) indicates that between 2002 and 2020, Antarctica shed approximately 150 ...

In Part II, we continue our large, collaborative study by analyzing the widespread and diverse impacts driven by the AR landfall. These impacts included widespread rain and surface melt, which was recorded along coastal areas, but this was outweighed by widespread, high snowfall accumulations, resulting in a largely positive surface mass balance contribution ...

This small thickening, sustained over thousands of years and spread over the vast expanse of these sectors of Antarctica, corresponds to a very large gain of ice - enough to outweigh the losses from fast-flowing glaciers in other ...

Shortwave radiation receipt tends to be highest at low latitude glaciers in high altitude mountain ranges (e.g. the Andes and Himalayas) where the sun angle is high and the thin, relatively cloudless air at high altitude limits ...

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