

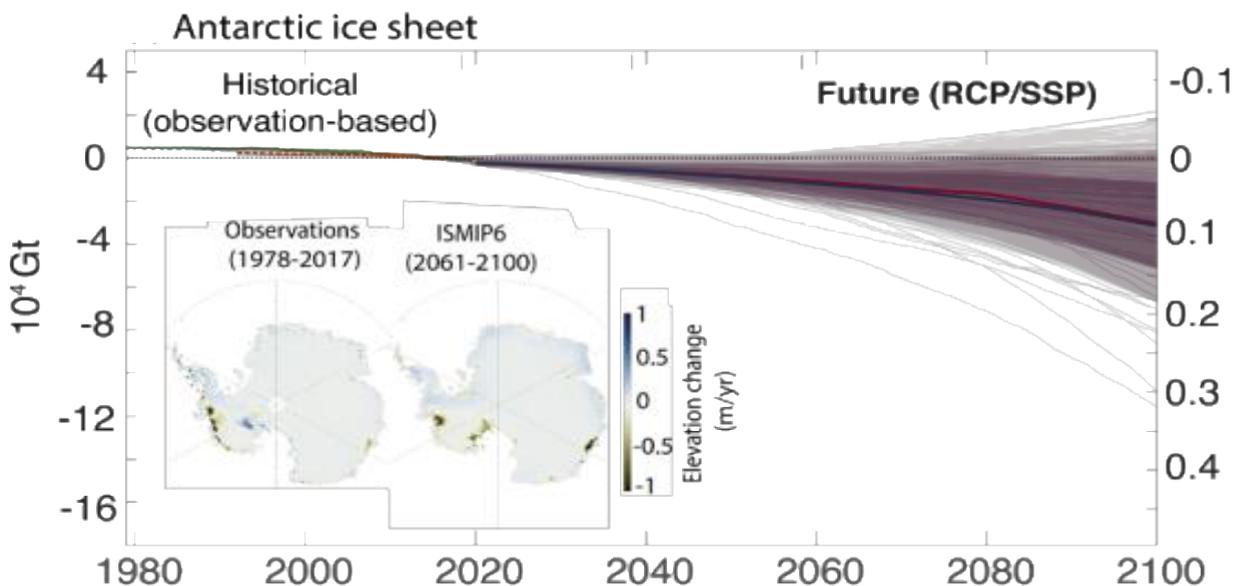
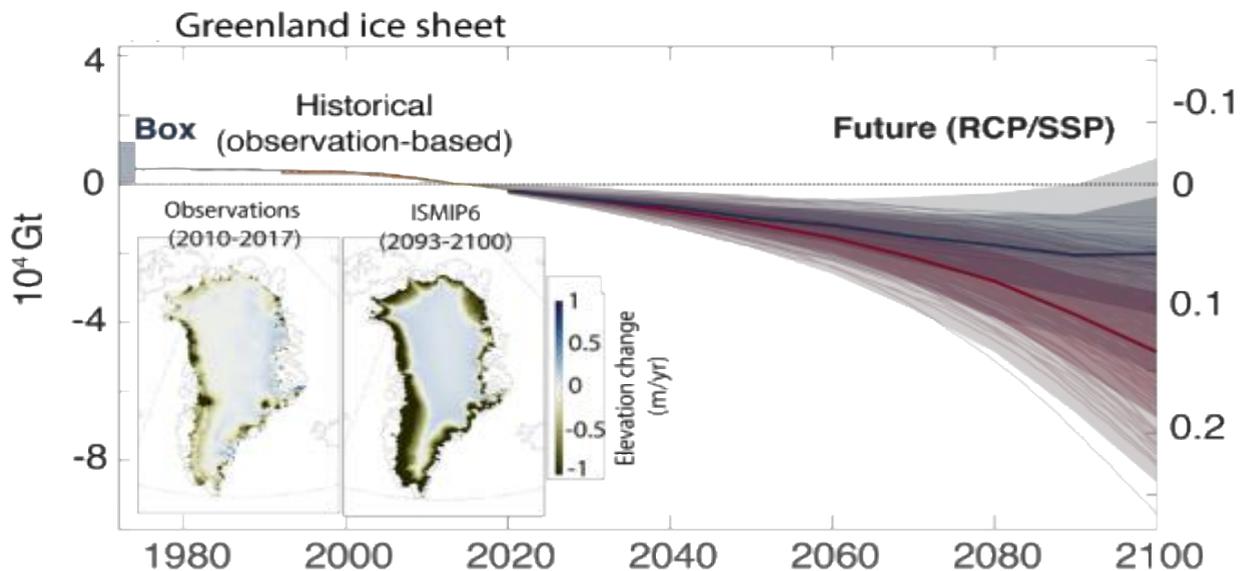
Regional fact sheet - Polar Regions

Common regional changes

-  Annual mean surface air temperatures and precipitation **will continue** to increase during the 21st century under all assessed emissions scenarios in both Polar regions (*high confidence*).
-  There is *high confidence* that mean precipitation and precipitation intensity **will increase**, the Arctic is **projected** to be dominated by rainfall, and in Antarctica rainfall **will increase** over the coastal regions.
-  There is *high confidence* that glaciers **have lost** mass in all polar regions since 2000 and **will continue** to lose mass at least for several decades, even if global temperature is stabilized.
-  Both major ice sheets – Greenland and Antarctica – **have been** losing mass since at least 1990, with the highest loss rate during 2010–2019 (*high confidence*), and they **are projected** to continue to lose mass.

Recent and future changes in ice sheets

Greenland and Antarctic Ice Sheet cumulative mass changes in gigatonnes (recently observed and projected by models under SSP1-2.6 and SSP5-8.5 scenarios) and equivalent sea level change (in meters). Maps show recent elevation changes (meters/year).



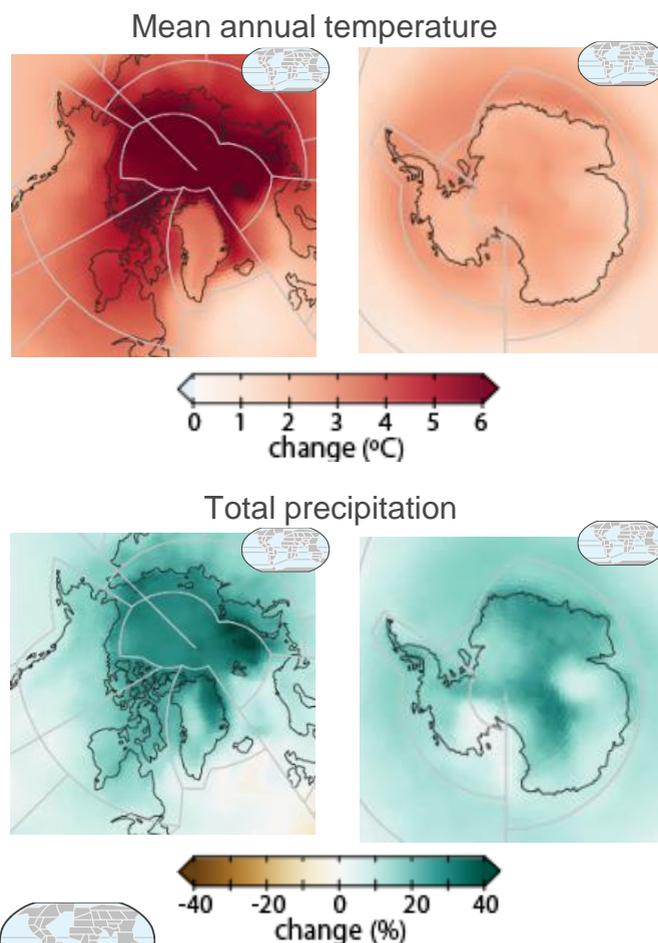
Arctic

- It is very likely that the Arctic **has warmed** at more than twice the global rate over the past 50 years, and it is *virtually certain* that surface warming in the Arctic **will continue** to be more pronounced than the global average warming over the 21st century.
- Extreme heat events **have increased** around the Arctic since 1979, and minimum temperatures **have increased** at about three times the global rate
- The fire weather season **is projected to** lengthen (*medium confidence*), together with encroachment of fire regimes into tundra regions (*high confidence*)
- Permafrost warming and thawing **have been widespread** in the Arctic since the 1980s, and there is *high confidence in future permafrost warming*, decreasing permafrost extent with increased risk of hazardous impacts, including carbon release.
- Reductions in spring snow cover extent **have occurred** across the Northern Hemisphere since at least 1978 (*very high confidence*), and it is *virtually certain* that this reduction **will continue** with further warming, despite a *likely* increase in winter snow amount in the far northern continental regions and central Arctic.
- The **observed** increase in relative sea level rise **is virtually certain to continue** in the Arctic (other than north-eastern Canada and west coast of Greenland) contributing to more frequent and severe coastal flooding and shoreline retreat along sandy coasts
- Current Arctic sea ice cover (both annual and late summer) **is at its lowest level** since at least 1850 (*high confidence*) and **is projected to** reach practically ice-free conditions at its summer minimum at least once before 2050 under all scenarios.

Antarctic

- **Observations** show a widespread, strong warming trend starting in the 1950s in the Antarctic Peninsula. Significant warming trends are observed in other West Antarctic regions and at some stations in East Antarctica (*medium confidence*).
- The Antarctic Peninsula, West Antarctica and some East Antarctic regions **are projected** to continue to warm in the 21st century at a rate greater than global.
- Antarctic snowfall and net snow accumulation **have increased** over the 20th century (*medium confidence*).
- Mass losses from West Antarctic outlet glaciers, mainly induced by ice-shelf basal melt, **outpace** mass gain from increased snow accumulation on the continent.
- At sustained warming levels between 2°C and 3°C, the West Antarctic Ice Sheet **will be lost** almost completely and irreversibly over multiple millennia; both the probability of complete loss and the rate of mass loss increase with higher surface temperatures.
- For Antarctic sea ice, there is no significant trend in **satellite-observed** sea ice area from 1979 to 2020 in both winter and summer, due to regionally opposing trends and large internal variability.

Projected changes (SSP5-8.5 scenario) in mean annual temperature and total precipitation at 2°C global warming compared to 1850–1900 for the Arctic (left) and Antarctic (right).



Links for further information:

TS.2.5, TS.4.3, TS, TS.4.3.2.8, Figure TS.11 2.3, 3.4, 4.3, 8.3, 8.4, 9.3, 9.4, 9.5, 9.6, 11.3, 12.4, Atlas.11, Figure 9.17, 9.18

Results expanded in the Interactive Atlas ([active links](#))



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