

# CLIMATE CHANGE FACTS

Visit  
Svalbard



For a long time, Svalbard has been a symbol of untouched nature and ice-covered landscapes. Unfortunately, science now reveals a different reality. Here are 8 facts uncovering the alarming climate crisis unfolding in Svalbard:

- 1. Human-caused global warming:** The climate crisis in Svalbard is caused by human climate gas emissions with global warming as the predominant factor.
- 2. Svalbard's vulnerable position:** The archipelago is extremely susceptible to global climate impacts due to its geographic position which allows for increasingly warmer Atlantic Ocean water to propagate into the region location and the currents bringing warm Atlantic water to the region.
- 3. The role of the ocean:** 90% of the excess heat generated by human greenhouse gas emission is absorbed by the world's oceans, with serious consequences for Svalbard's natural environment and the animals living in and of off the sea. Changes in sea surface temperatures are a major driver of climate change globally, and especially in Svalbard. The ocean around Svalbard is experiencing warming eight times faster than the global average, with potentially devastating effects on the area's ecosystems. The melting of all glaciers in Svalbard will contribute to a global sea-level rise of 1.5 cm.
- 4. Loss of sea ice:** Sea ice is crucial for regulating the global climate and is a key factor for Svalbard's climate. Svalbard's fjords are warming due to Atlantification. The northernmost part of the Gulf Stream brings warm ocean water from the more southern parts of the Atlantic Ocean to Svalbard. The warmer Atlantic water spills into fjords around Svalbard, which leads to a statistical trend of increasing sea surface temperatures and loss of sea ice. Together with increasing and highly variable local air temperatures in Svalbard, this leads to large annual variations in sea ice cover around the archipelago, with the overall trend being a significant reduction in total sea ice area. This has alarming consequences for Arctic wildlife.
- 5. The Albedo effect and polar amplification:** The loss of sea ice in the Arctic not only affects the local climate but can also contribute to extreme weather worldwide. The loss of snow and ice cover leads to increased absorption of energy from the sun. Snow reflects up to 90% of the sun's energy back into the atmosphere and bare ice reflects 40-60% less of the sun's incoming radiation than fresh snow, while open water absorbs 95-98% of the same energy. The ability of a surface to reflect the sun's energy, is called albedo, and Svalbard is increasingly losing its ability to reflect the sun's energy as temperatures rise both on land and in the ocean, leading to increased melting of ice and snow. This is a self-reinforcing effect called polar amplification that brings enormous consequences.

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- 6. Extreme temperature increases:** Air temperatures in Svalbard have increased dramatically during the past century, especially over Karl XII Island at the northern end of the archipelago, with an increase of 2.7°C per decade since 1981. Climate change on Svalbard is most prominent in winter, with the highest rates of temperature and precipitation changes between December through March. The average temperature in January measured at the meteorological station at Svalbard airport in Longyearbyen, has increased by 8°C between 2015 and 2023 compared to the period 1975-1984. Temperatures recorded at Svalbard Airport reached above the polar climate definition for the first time in June 2023 with an average temperature of 10.1°C.
- 7. The state of the glaciers:** An area of approximately 34,000 km<sup>2</sup> of Svalbard is covered by glaciers, but and they are rapidly melting due to climate change. By 2100, it is estimated that Svalbard will have lost 50% of its glacier mass. Every year, a total of 8 gigatons (8000 bill. kilos) of glacier ice is lost in Svalbard, and this trend will continue to increase as air and sea temperatures continue to increase.
- 8. Climate gases in the permafrost:** Unknown large amounts of methane and CO<sub>2</sub> are stored in the ground on Svalbard. These potent climate gasses are released into the atmosphere at an increasing rate from Svalbard as glaciers retreat and permafrost temperature gradients are rising. The release of these climate gasses from Svalbard increases the effects of climate change and increases global warming. The amount of methane emissions from the ground on Svalbard measured from around 100 different points currently corresponds to about 8% of Norway's annual greenhouse gas emissions.

