

## Commentary

# The Paris Agreement & the Arctic Region

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Climate change is occurring at a faster rate and with more severe impacts in the Arctic than in the rest of the world. According to the Arctic Council's Snow, Water, Ice and Permafrost ([SWIPA](#)) report, the Arctic region is being forced to shift into a new state.

Changes in the Arctic are also global: they affect weather in mid-latitudes, influence the Southeast Asian monsoon, cause acidification of oceans and increase the rate of global sea-level rise, just to mention a few examples. What happens in the Arctic is critical for the rest of the world.

A recent paper for the Arctic Science Ministerial ([A 5°C Arctic in a 2°C World](#), 2017) suggests that if the Paris Agreement on climate change is fully implemented and succeeds in limiting the increase in average global temperatures to 2°C above pre-industrial levels, or preferably 1.5°C, it would translate into an average temperature increase from 3.75°C to even 5°C in the Arctic. This means that the Arctic will continue to experience remarkable warming and substantial ice loss for at least the next 20-30 years, and the Arctic Ocean could be free of summer sea ice already by the late 2030s.

A study published by Nature Climate Change ([An observation-based constraint on permafrost loss as a function of global warming](#)) suggests that the Arctic permafrost is more sensitive to global warming than previously estimated. When permafrost thaws, it releases greenhouse gases such as carbon dioxide and methane, which in turn increase global temperatures. A worrying finding of the study is that thawing permafrost releases more methane than previously predicted. Methane traps heat about twenty times as efficiently as carbon dioxide. It will very likely worsen a climate feedback loop in the Arctic: increased greenhouse gas emissions cause greater warming and greater warming causes faster thawing of the Arctic permafrost, which again releases more emissions.

The study also suggests that nearly 4 million km<sup>2</sup> of permafrost could be lost for every additional degree of global warming. This means that the stabilization at 1.5°C above pre-industrial levels

instead of 2 C° would ideally save approximately 2 million km<sup>2</sup> of the total area of permafrost. In case the 2 C° target is missed, even more permafrost will be lost.

The melting of the Arctic – or its progress over the years – can very much be affected by the implementation of the Paris Agreement. Climate change in the Arctic is a global problem, which requires a global solution. We have only a few years to take action to turn the trajectory around. The Arctic environment can be stabilized by the mid-century, but only if more ambitious climate targets met.

The world must take urgent and increasingly ambitious steps to implement the Paris Agreement and seek to limit global warming to 1.5 C°.