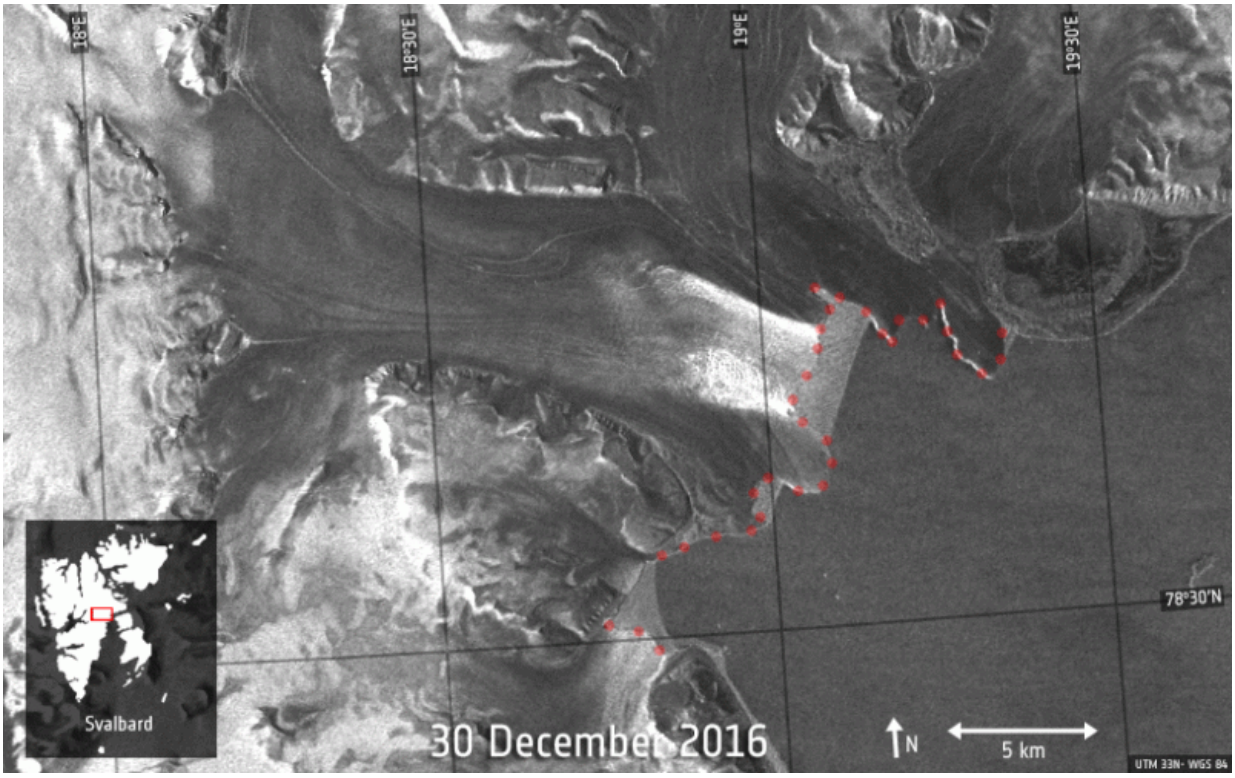
Negribreen glacier on the move

May 15 2017



Radar images from the Copernicus Sentinel-1 mission show the sudden advance of the Negribreen glacier in Norway in early 2017. Credit: contains modified Copernicus Sentinel data (2016–17), processed by T. Strozzi (Gamma)

Rapid acceleration of an Arctic glacier over the past year has been detected by the Copernicus Sentinel-1 satellites.

Sitting on Norway's Spitsbergen island in the Svalbard archipelago, the

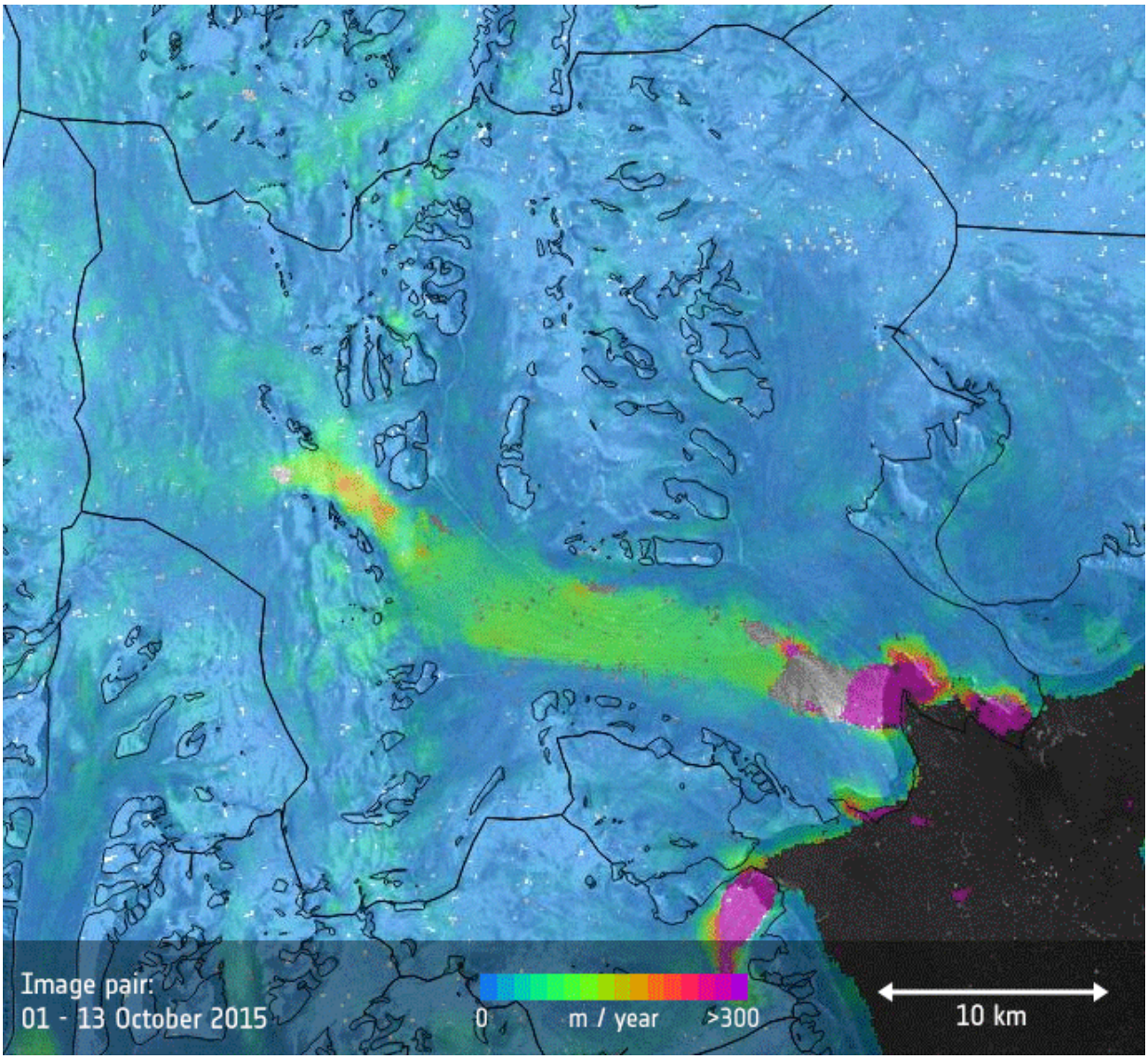
Negribreen glacier has recently seen a surge in ice surface speed, increasing from 1 m to 13 m a day over the winter.

When a glacier 'surges' a large amount of ice flows to the end in an unusually short time. While the causes are not completely understood, they are believed to be linked to changes in the amount of heat or water in the lowest layers of the glaciers.

The last time Negribreen experienced a surge like this was in the 1930s, as documented in aerial photographs. At that time, it advanced almost 12 km into the fjord in one year along a 15 km-wide section of the front. Since then the front of the glacier had been steadily retreating, with large icebergs breaking off.

This latest jump in speed began in July 2016 and has been climbing ever since – even over the cold winter months.

Monitoring glaciers in areas prone to bad weather and long periods of darkness – like the Arctic – was difficult before the advent of satellites. Radar satellites can 'see' through clouds and in the dark, and Sentinel-1 offers frequent and systematic coverage of the Arctic.



Radar images from the Copernicus Sentinel-1 mission were used to create these two ice speed maps of the Negribreen glacier in Norway. In October 2015, only the front of the glacier was moving by more than 300 m a year. By late 2016, the entire glacier was advancing at this accelerated rate. Credit: contains modified Copernicus Sentinel data (2016–17), processed by T. Strozzi

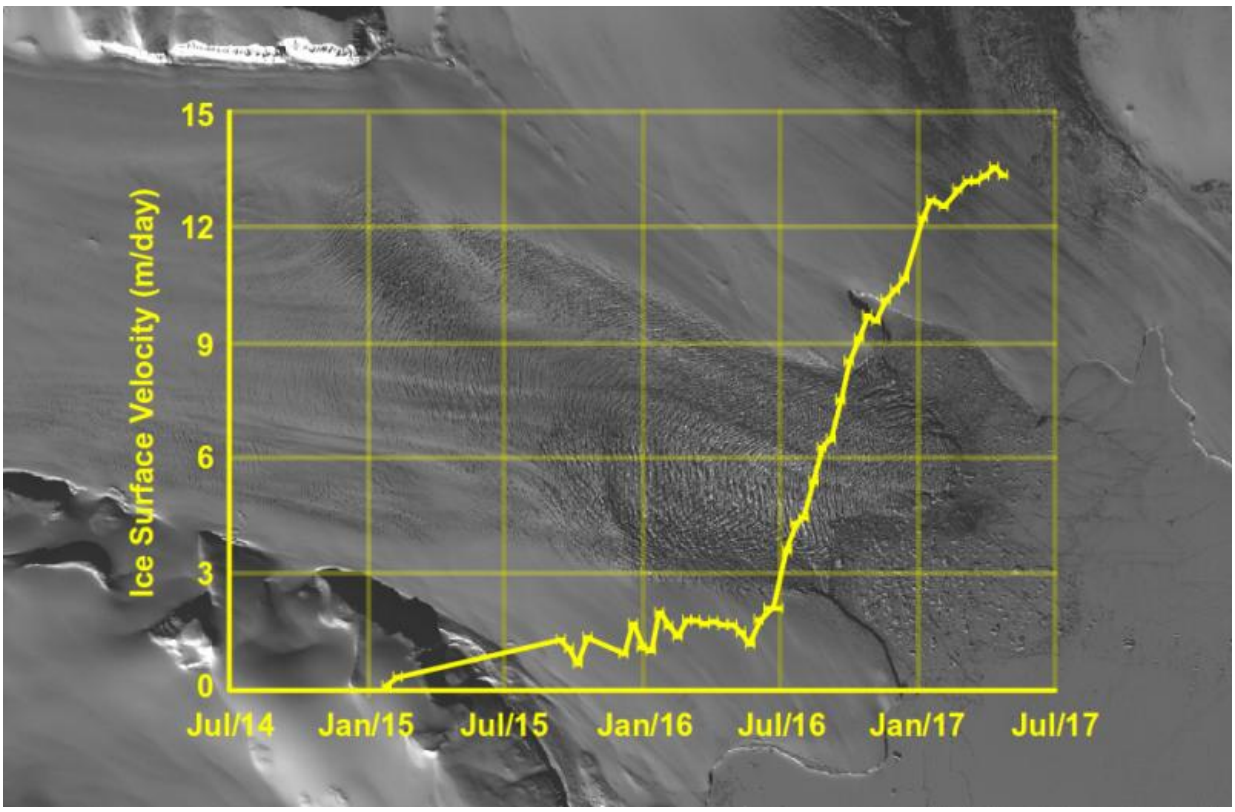
A team of scientists working under ESA's Climate Change Initiative in the Glaciers_cci project are using satellite radar and optical coverage to

map glaciers at different times and determine their changes in extent, elevation and speed.

"Sentinel-1 provides us with a near-realtime overview of glacier flow across the Arctic, remarkably augmenting our capacity to capture the evolution of glacier surges," said Tazio Strozzi from Swiss company Gamma Remote Sensing and scientist on Glaciers_cci.

"This new information can be used to refine numerical models of glacier surging to help predict the temporal evolution of the contribution of Arctic glaciers to sea-level rise."

Sentinel-1 is a two-satellite mission for Europe's environment monitoring programme, Copernicus.



The surface speed of the Negribreen glacier in Norway suddenly increased starting in July 2016. Background image from Sentinel-2, captured in April 2017. Credit: contains modified Copernicus Sentinel data (2014–17), processed by T. Strozzi

Provided by European Space Agency