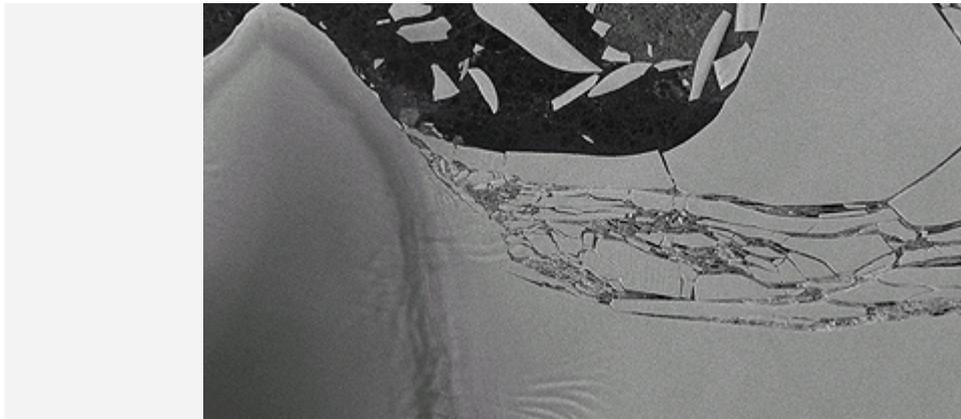

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Northern ice front of Wilkins Ice Shelf is becoming unstable

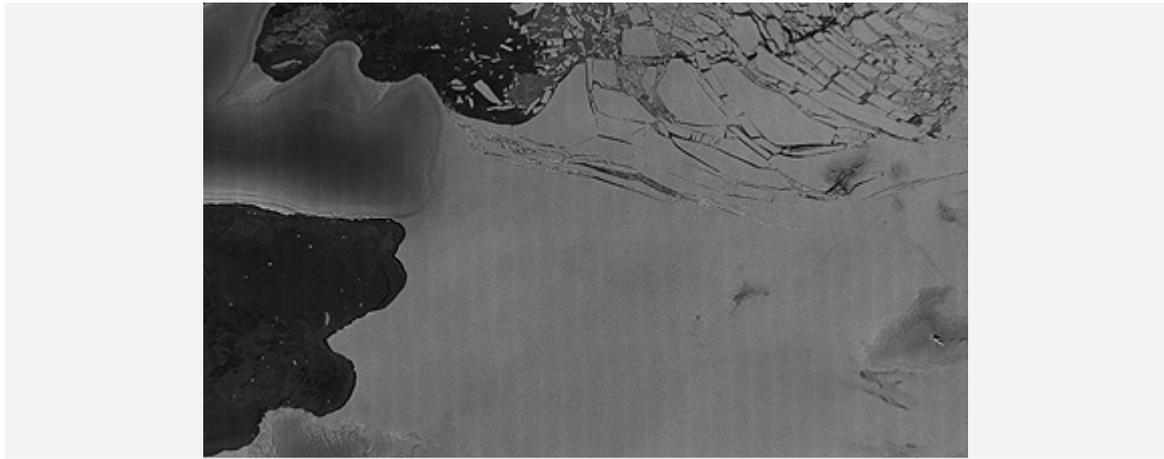
28 April 2009



Calving icebergs on the Antarctic Wilkins Ice Shelf

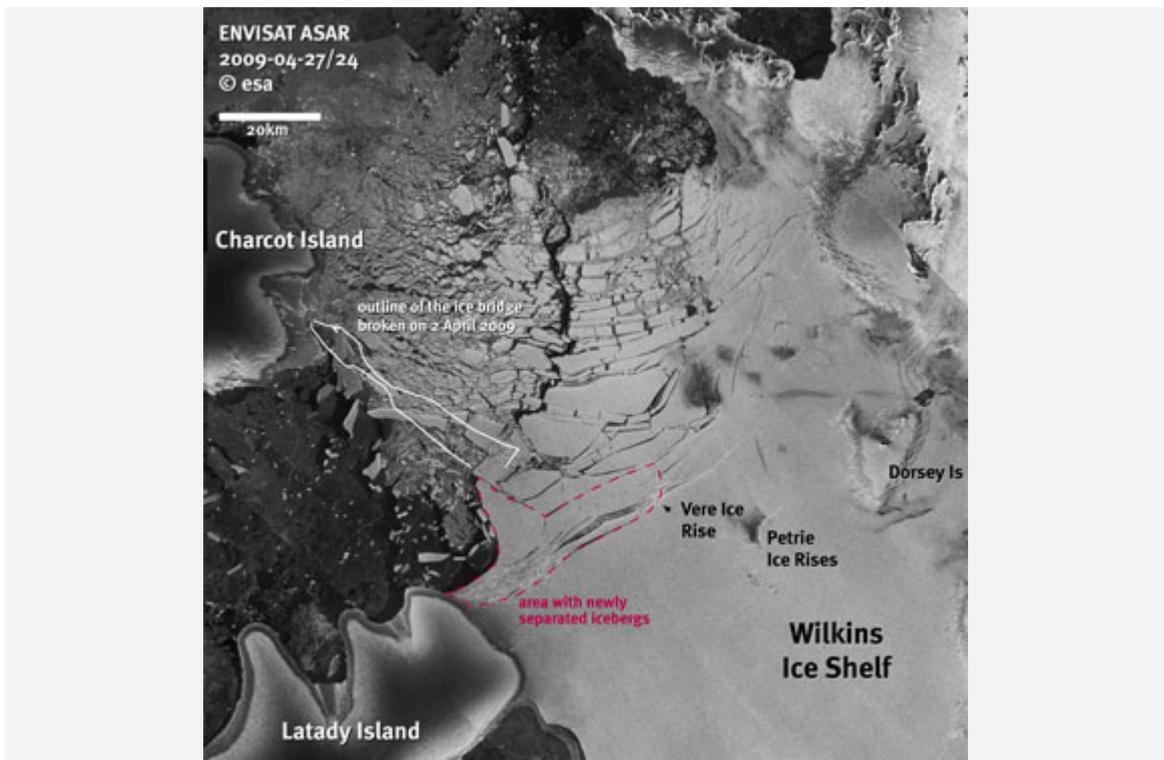
Following the loss of an ice bridge on the Antarctic Wilkins Ice Shelf, the northern ice front is now becoming unstable. The first icebergs broke off at this point on 20 April 2009. This was observed by scientists using the TerraSAR-X Earth observation satellite operated by the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR). "We anticipate that, over the next days and weeks, an area of 570 to 3370 square kilometres will break away before – hopefully – a new and more stable northern ice front will form", states Dr Angelika Humbert, a glaciologist at the University of Münster's Geophysics Institute.

The TerraSAR-X images from 23 and 25 April 2009 show these 'calved' icebergs. These icebergs are breaking away at the failure zones which have gradually formed over the past 15 years. "The high resolution of TerraSAR-X satellites enables us to observe deformations in the Wilkins Ice Shelf, down to the range of approximately 100 metres," says Dr Humbert, and she goes on to add: "This information enables we glaciologists to describe distortion more precisely with the help of models."



Icebergs broken away from the Antarctic Wilkins Ice Shelf

Newly formed cracks are very narrow during their initial stages and are therefore not visible on images taken at a lower resolution, such as those supplied by the older generation of satellites. To reconstruct the chronological sequence of events, the kind of high-resolution images supplied by TerraSAR-X are necessary. Through an analysis of the chronological development leading to the point where cracks start to appear, an insight into the 'stress conditions' at work in the ice can be gained. Since it started work in 2007, the German Earth observation satellite TerraSAR-X has been supplying scientists with a range of images of the Wilkins Ice Shelf. "It is in particular the combination of high-resolution TerraSAR-X images and the more frequent, lower-resolution images taken by the European Earth observation satellite ENVISAT (ENVIRONMENTAL SATELLITE) which has provided such a substantial step forward for science, enabling us to gain unique insights into the process of disintegration of an ice shelf," states Dr Humbert.

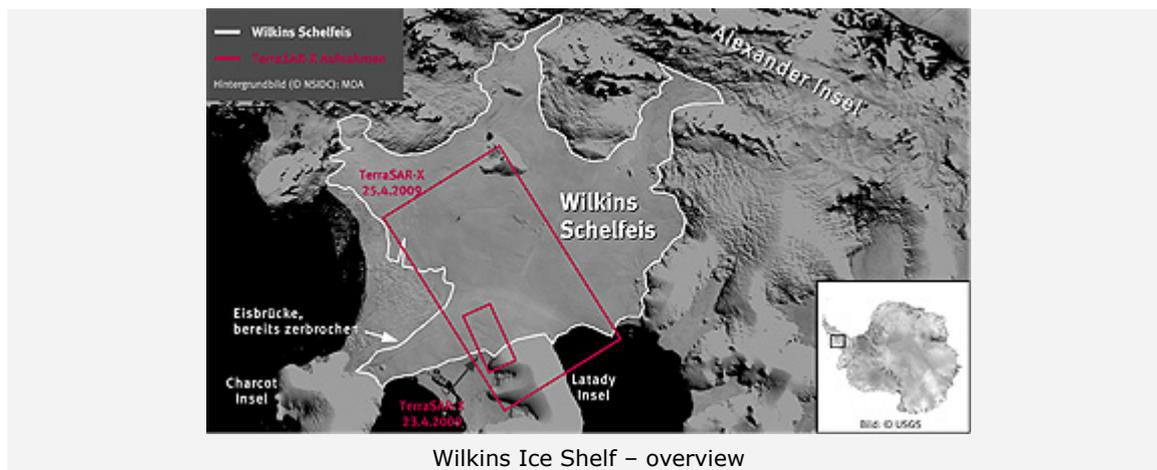


Wilkins Ice Shelf: northern ice front becomes unstable

The Wilkins Ice Shelf is a focal point of the 'Antarctic Background Mission' set up by DLR. The aim of this is to observe changes in the Antarctic ice shelves and to seek to classify the root causes on the basis of all the collated information.

The spectacular break-up events on the Wilkins Ice Shelf in 2008 caused the ice bridge between Charcot and Latady Island, measuring some 40 to 50 kilometres in length, to be cut to a width of just 900 metres at its narrowest point. This plate of ice, only 250 metres thick, finally broke off on 5 April

2008. Ice shelves are stabilised by the islands adjacent to them, which to a certain extent hold them in check. The loss of this link to Charcot Island will inevitably give rise to instability in the northern ice front of the Wilkins Ice Shelf.



Ice shelves are the floating masses of ice that surround the continent of Antarctica. Some 90 percent of inland ice flows down ice streams and glaciers into these ice shelves. Scientists are of the view that these ice shelves hold back the ice streams and glaciers. However, the precise role played by ice shelves has not yet been fully explained. The disintegration of the ice shelves reduces this restraining force, causing the movement of ice masses lying behind them to accelerate. This in turn causes more ice to flow into the ocean, causing sea levels to rise. Over the last 30 years, seven ice shelves have retreated across large areas or have completely broken away, causing a loss in surface area amounting to 25,000 square kilometres. All these ice shelves were located on the Antarctic Peninsula, a region in which temperatures have risen by 2.5 degrees Celsius over the last 50 years – a significantly higher increase than the global average. The Wilkins Ice Shelf, also located on the Antarctic Peninsula, reduced in size during the course of 2008 by some 1800 square kilometres (which equates to about 14 percent of its total area). In March 2009 – which was prior to the loss of the ice bridge and the current breakup – its area measured 11,200 square kilometres. However, due to the fact that the catchment area further inland is comparably small, this reduction in the size of the Wilkins Ice Shelf will have only a marginal impact on sea level.

The TerraSAR-X mission

TerraSAR-X is the first German satellite that has been manufactured under what is known as a Public-Private Partnership (PPP) between DLR and EADS Astrium GmbH in Friedrichshafen. The satellite travels around the Earth in a polar orbit and records unique, high-quality X-band radar data about the entire planet using its active antenna. TerraSAR-X works regardless of weather conditions, cloud cover or absence of daylight, and is able to provide radar data with a resolution of down to one metre.

DLR is responsible for using TerraSAR-X data for scientific purposes. It is also responsible for planning and implementing the mission as well as controlling the satellite. Astrium built the satellite and shares the costs of developing and using it. Infoterra GmbH, a subsidiary company founded specifically for this purpose by Astrium, is responsible for marketing the data commercially.

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