Birth of an iceberg

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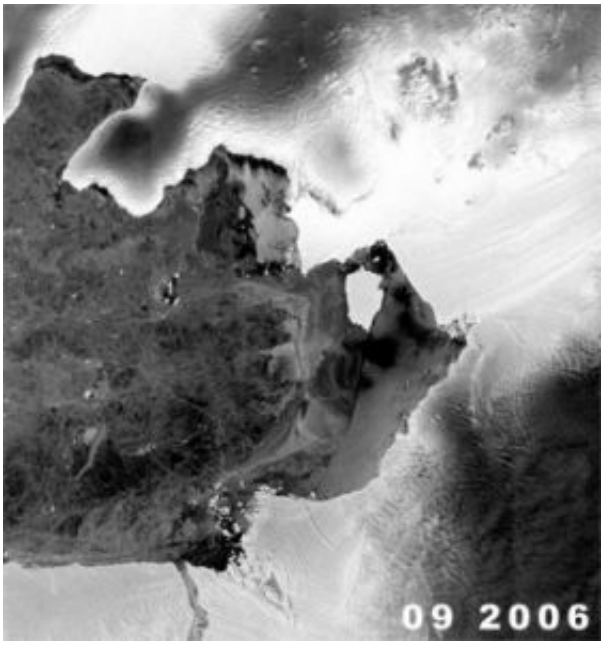

Envisat captures the birth of a giant iceberg that has broken off from the Pine Island Glacier in West Antarctica. Spanning 34 km in length by 20 km in width, the new iceberg covers an area nearly half the size of Greater London. This animation is comprised of images acquired between September 2006 and October 2007 by the Advanced Synthetic Aperture Radar (ASAR) instrument aboard ESA's Envisat satellite. The area covered in the images is approximately 230 by 250 km. Credit: ESA

New images, acquired by Envisat's Advanced Synthetic Aperture Radar (ASAR) instrument, show the breaking away of a giant iceberg from the Pine Island Glacier in West Antarctica. Spanning 34 km in length by 20 km in width, the new iceberg covers an area nearly half the size of

Greater London.

The animation highlights the movement in the area between September 2006 and October 2007. The Pine Island Glacier is visible stretching from the right of the image to the centre. The tongue of Pine Island is shown moving inland between September 2006 and March 2007. Between April and May 2007, the detached iceberg in front of Pine Island moves significantly. Also in May 2007, a crack in Pine Island becomes visible. By October, the new iceberg has completely broken away.

Several different processes can cause an iceberg to form, or 'calve', such as action from winds and waves, the ice shelf grows too large to support part of itself or a collision with an older iceberg. Since Pine Island Glacier was already floating before it calved, it will not cause any rise in the world sea level.

Iceberg calving like this occurs in Antarctica each year and is part of the natural lifecycle of the ice sheet. A 34-year long study of the glacier has shown that a large iceberg breaks off roughly every 5-10 years. The last event was in 2001.

Pine Island – the largest glacier in the West Antarctic Ice Sheet (WAIS) – is of great interest to scientists because it transports ice from the deep interior of the WAIS to the ocean and its flow rate has accelerated over the past 15 years.

The Pine Island Glacier is up to 2500 m thick with a bedrock over 1500 m below sea level and comprises 10 percent of the WAIS. According to a study by scientists at the British Antarctic Survey (BAS) and University College London (UCL) using ESA's ERS satellite data, a loss of 31-cubic km of ice from the WAIS's interior from 1992 to 2001 was pinpointed to the Pine Island Glacier.

The thinning caused the glacier to retreat by over 5 km inland, supporting the argument that small changes at the coast of the Antarctic continent - such as the effects of global warning - may be transmitted rapidly inland leading to an acceleration of sea level rise.

Although these long-term regional changes are a cause for concern, the present iceberg calving event does not in itself signal a significant change in the WAIS. Over the last 15 years, the glacier front has advanced seawards at a rate of 3 km/year, so the calving of a 20 km-wide iceberg has simply shifted the glacier front back close to where it was after the last calving event in 2001.

The new iceberg was spotted by scientists at BAS while studying satellite images collected from Envisat using the Polar View monitoring programme. Since 2006, ESA has supported Polar View, a satellite remote-sensing programme funded through the Global Monitoring for Environment and Security (GMES) Service Element (GSE) that focuses on the Arctic and the Antarctic.

GMES responds to Europe's needs for geo-spatial information services by bringing together the capacity of Europe to collect and manage data and information on the environment and civil security, for the benefit of European citizens. As the main partner to the European Commission in GMES, ESA is the implementing agency for the GMES Space Component, which will fulfil the space-based observation requirements in response to European policy priorities.

The GSE has been preparing user organisations in Europe and worldwide for GMES by enabling them to receive and evaluate information services derived from existing Earth Observation (EO) satellites since 2002.

ASAR acquired these images working in Wide Swath Mode (WSM), providing spatial resolution of 150 metres. ASAR can pierce through

clouds and local darkness and is capable of differentiating between different types of ice.

Source: European Space Agency