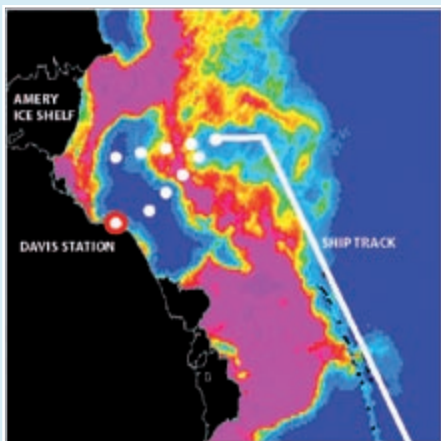


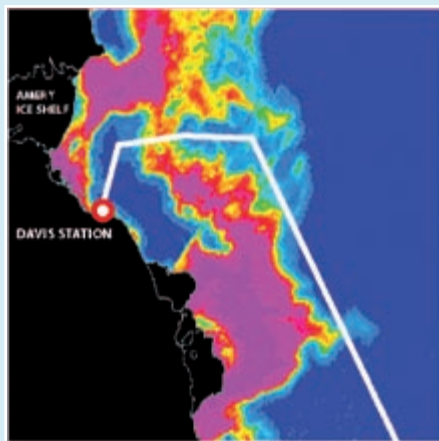
Viewing the poles with PolarView

Polar view *amsr.s.comb* images of the approaches to Davis station

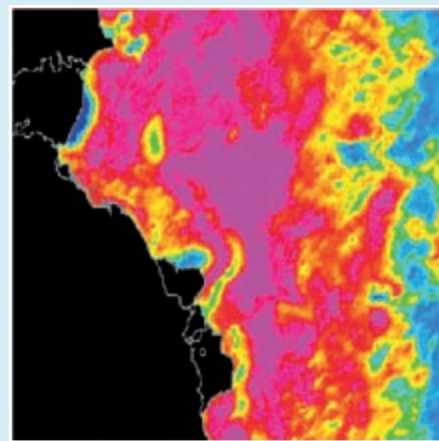
The *amsr.s.comb* product is a satellite passive microwave product, derived from NASA Advanced Microwave Scanning Radiometer/EOS data, with an enhanced pixel size of three kilometres. It shows sea ice concentration, not thickness. The concentration is colour-coded, with pink signifying the highest concentration, followed by reds and yellows, with shades of blue being low concentration.



15 December 2006 – The *Aurora Australis* was approaching Davis, avoiding the areas of greatest ice concentration. The ship was nearing a band of higher concentration ice and a decision was required to head directly south or south east. The Voyage Leader consulted with Dr Ian Allison, leader of the Ice, Ocean, Atmosphere and Climate programme of the AAD. Ian had access to the same images and advised that the southern route was likely to be best due to the patterns of expansion and contraction of the ice normally experienced in the area.



18 December 2006 – Ian's advice was correct and the ship made it through to the clearer water with minimal delay. Note the differences to the image of only a few days earlier as the sea ice constantly shifts.



01 November 2006 – This image shows ice conditions much earlier in the season and is an interesting comparison with the conditions encountered by mid season voyages. This image was taken about the time the ship was approaching Mawson and Davis. In these conditions, products like this would be consulted extensively to identify routes of least resistance.

DAVID TONNA/JESSICA FITZPATRICK

Safe navigation of sea ice is a uniquely challenging activity that is routinely undertaken in Antarctica by icebreaker ships.

It can be slow and laborious and there is an ever-present risk of besetment in the constantly shifting pack ice surrounding the Antarctic continent. Even without becoming trapped, ships are slowed considerably by sea ice. Avoiding the greatest concentrations of ice can save valuable days, allow scientists to be delivered to Antarctica sooner, and reduce fuel and charter costs.

While the Australian Antarctic Division (AAD) has previously used satellite imagery to assist sea ice navigation, we have recently begun using a new system that enhances our capabilities.

Known as PolarView, it is a product of the European Space Agency. Every day, satellites passing overhead collect radar and passive microwave images of the Antarctic sea ice.

These instruments penetrate the ever-present cloud layer, giving a clear picture of the ice below. Using a number of automatic tools

the images are converted into products that graphically illustrate the characteristics of the sea ice on a given day. These products are then distributed to sea ice scientists around the world by e-mail.

Adapting PolarView to support our needs has been a joint venture between the Sea and Air Operations section of the AAD and glaciologists in the Ice, Ocean, Atmosphere and Climate programme, based at the Antarctic Climate and Ecosystems Cooperative Research Centre. The glaciologists developed a browser that can be used to easily view and manipulate the PolarView products.

The process was trialled over three voyages of the RSV *Aurora Australis* in the 2006-07 season. The products were e-mailed directly from Europe to the ship, where the voyage leader could view them on the browser. The voyage leader was then able to assess the ice conditions likely to be encountered, and therefore the best route to

be taken. Back in Hobart, a rostered glaciologist received the same products and remained on call to advise the voyage leader on ice assessment, if necessary.

Sea and Air Operations kept the PolarView team apprised of the ship's movement and, at critical points, satellites were tasked to take higher resolution images of key areas coinciding with the approach of the ship.

The trial was a great success. The PolarView products were easy to use with the browser and they accurately reflected the ice conditions encountered. The system enabled the ship to travel more efficiently than would have been previously possible.

We intend to use PolarView again in the International Polar Year, where it should have a significant effect, particularly on an early season sea ice research voyage (page 10). While PolarView does not eliminate the risk of besetment or delay due to ice, it reduces that risk, and is likely to become a standard part of AAD shipping operations.

David Tonna
Sea and Air Operations, AAD