

TECHNICAL REPORT

Sea ice reports for the Antarctic shipping season 2018 - 2019



**ANTARCTIC
GATEWAY PARTNERSHIP**

A Special Research Initiative of
the Australian Research Council

Prepared by Dr Jan L Lieser



**ANTARCTIC CLIMATE
& ECOSYSTEMS CRC**

Sea ice reports for the Antarctic shipping season 2018–2019

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Executive summary

The sea-ice reports compiled in this document are weekly reports on sea-ice conditions for East Antarctica, including sub-weekly updates. They were prepared to support ship operations in East Antarctica during the 2018/2019 shipping season. These reports were primarily used to inform the Australian Antarctic program, but were provided to other Antarctic operators as well. In particular, we assisted the US National Science Foundation (RVIB *Nathaniel B. Palmer*), Royal New Zealand Navy (HMNZS *Otago*), the French Southern and Antarctic Lands Administration (OPV *l'Astrolabe*), New Zealand's National Institute of Water and Atmospheric Research (RV *Tangaroa*), and the Australian Marine National Facility (RV *Investigator*).

Throughout the shipping season, the focus of individual reports shifts with the main purpose of specific voyages of the Australian Antarctic research and supply vessel *Aurora Australis* and other customer requirements. The Antarctic voyages of RSV *Aurora Australis* in the 2018/2019 season were:

No.	Depart port	Main Purpose	Return to port
V1	25/10/2018	Davis Station resupply	28/11/2018
V2	06/12/2018	Casey Station resupply	07/01/2019
V3	13/01/2019	Mawson Station resupply; Davis summer retrieval	01/03/2019

In 2018, the trend of generally low sea-ice extent and area (relative to the long-term, satellite-based record) continued around Antarctica, while the actual basin-scale anomalies varied. The Weddell Sea and western Ross Sea experienced a shortened sea-ice season (number of days with sea-ice cover in a given area), which previously were regions of lengthened season. Only a small region of the offshore Bellingshausen Sea and eastern Amundsen Sea did show a slightly longer sea-ice season, which again is in contrast to the previous trend. In East Antarctica, only a minor area of slightly longer season is offshore Enderby Land. Elsewhere around the continent, a shortened season of locally more than 60 days was prevalent.

The annual sea-ice extent minimum was 2.15×10^6 km² and observed on 18/02/2018. This was slightly up (roughly 4%) from the record low of 2017. The annual sea-ice extent maximum was 18.22×10^6 km² and observed on 30/09/2018, which was marginally up (roughly 1%) from the previous year as well.

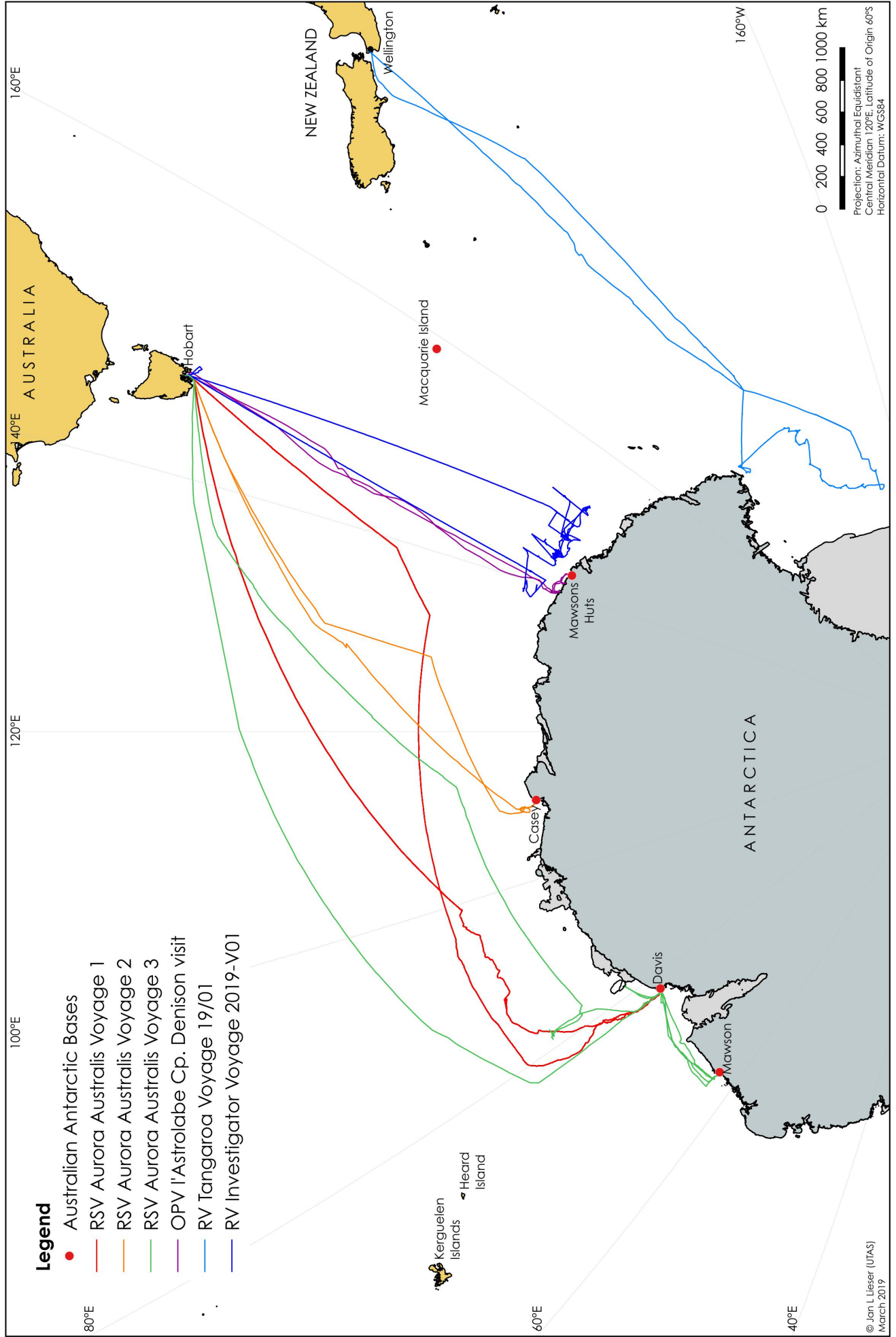
Notable new large, tabular icebergs calved off the West Ice Shelf (D-27 in February), the Ninnis Ice Shelf (C-35 in July), the Crosson Ice Shelf (B-45 in August) and the Pine Island Glacier (B-46 in October). Furthermore, an unusually high number of decaying icebergs (disintegrating into swarms of small bergs) was observed in the southwest Atlantic Ocean with individual bergs drifting as far north as 35° S (off the coast of Buenos Aires).

About this report

This compilation is the eighth volume of sea-ice reports prepared by the University of Tasmania's Sea Ice Service, which is supported by the Australian Research Council's Special Research Initiative for Antarctic Gateway Partnership and by the sea-ice group of the Antarctic Climate & Ecosystems Cooperative Research Centre and the Australian Antarctic Division. The first report of this compilation was issued in calendar week 18 of 2018, after the 2017/2018 Australian shipping season ended in May 2018.

Previous volumes are available from the Antarctic Climate & Ecosystems Cooperative Research Centre (see inside cover for details) and online here:
<http://acecrc.org.au/services/sea-ice-charting/>

SEA ICE REPORTING 2018/19 VOYAGES

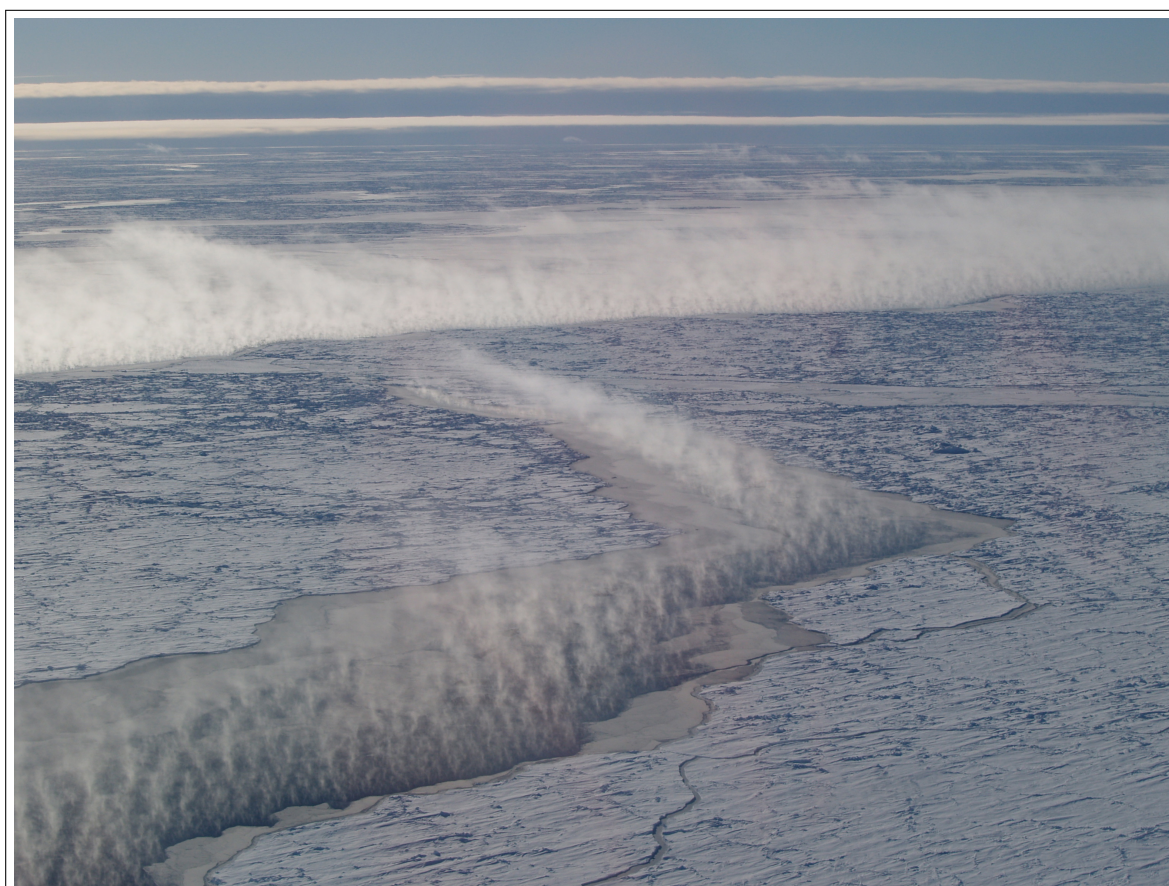


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Frequently used acronyms

AMSR-2 ¹	Advanced Microwave Scanning Radiometer 2
DNB	Day-Night Band (panchromatic VIIRS channel)
ESA	European Space Agency
EW	Extra Wide swath (a SAR mode)
FASB	Call sign: Offshore Patrol Vessel <i>l'Astrolabe</i> (FRA)
GMRT	Global Multi-Resolution Topography
IBCSO	International Bathymetric Chart of the Southern Ocean
ICDC	Integrated Climate Data Centre, University of Hamburg (GER)
IW	Interferometric Wide swath (a SAR mode)
JAXA	Japan Aerospace Exploration Agency
MODIS ²	Moderate Resolution Imaging Spectroradiometer
NASA	National Aeronautics and Space Administration (USA)
NSIDC	National Snow and Ice Data Center (USA)
OLI	Operational Land Imager (scientific payload on Landsat-8 satellite)
SAR	Synthetic Aperture RADAR
Suomi NPP	Suomi National Polar-orbiting Partnership
TIR	Thermal Infrared spectrum
USGS	United States Geological Survey (USA)
VIIRS	Visible Infrared Imaging Radionmeter Suite
VIS	Visible Spectrum
VNAA	Call sign: Research & Supply Vessel <i>Aurora Australis</i> (AUS)
ZMFR	Call sign: Research Vessel <i>Tangaroa</i> (NZ)



¹ The AMSR-2 instrument is onboard the GCOM-W1 satellite, which is operated by JAXA.

² The MODIS instrument is operational on two satellites: AQUA and TERRA, both operated by NASA.

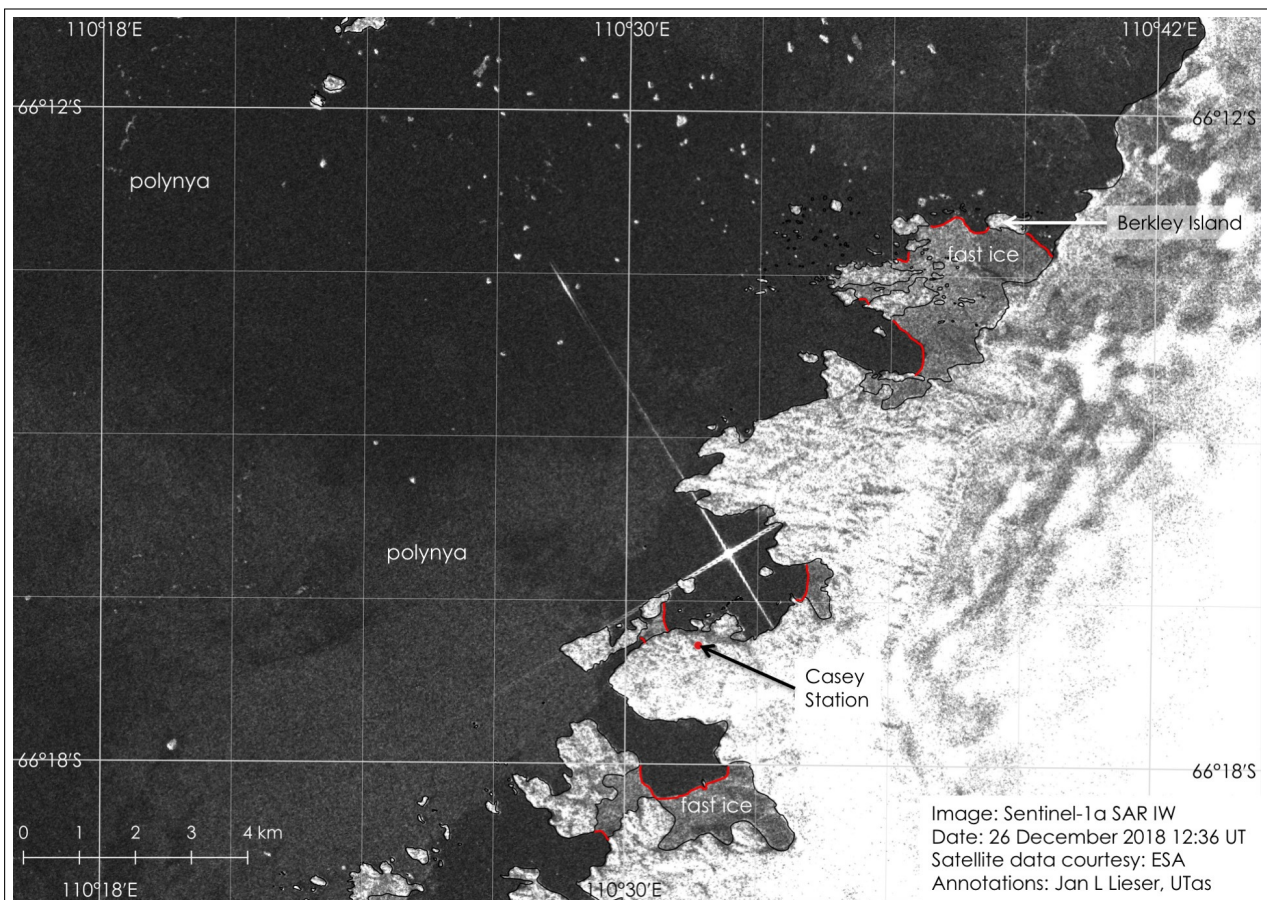
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Jan L Lieser

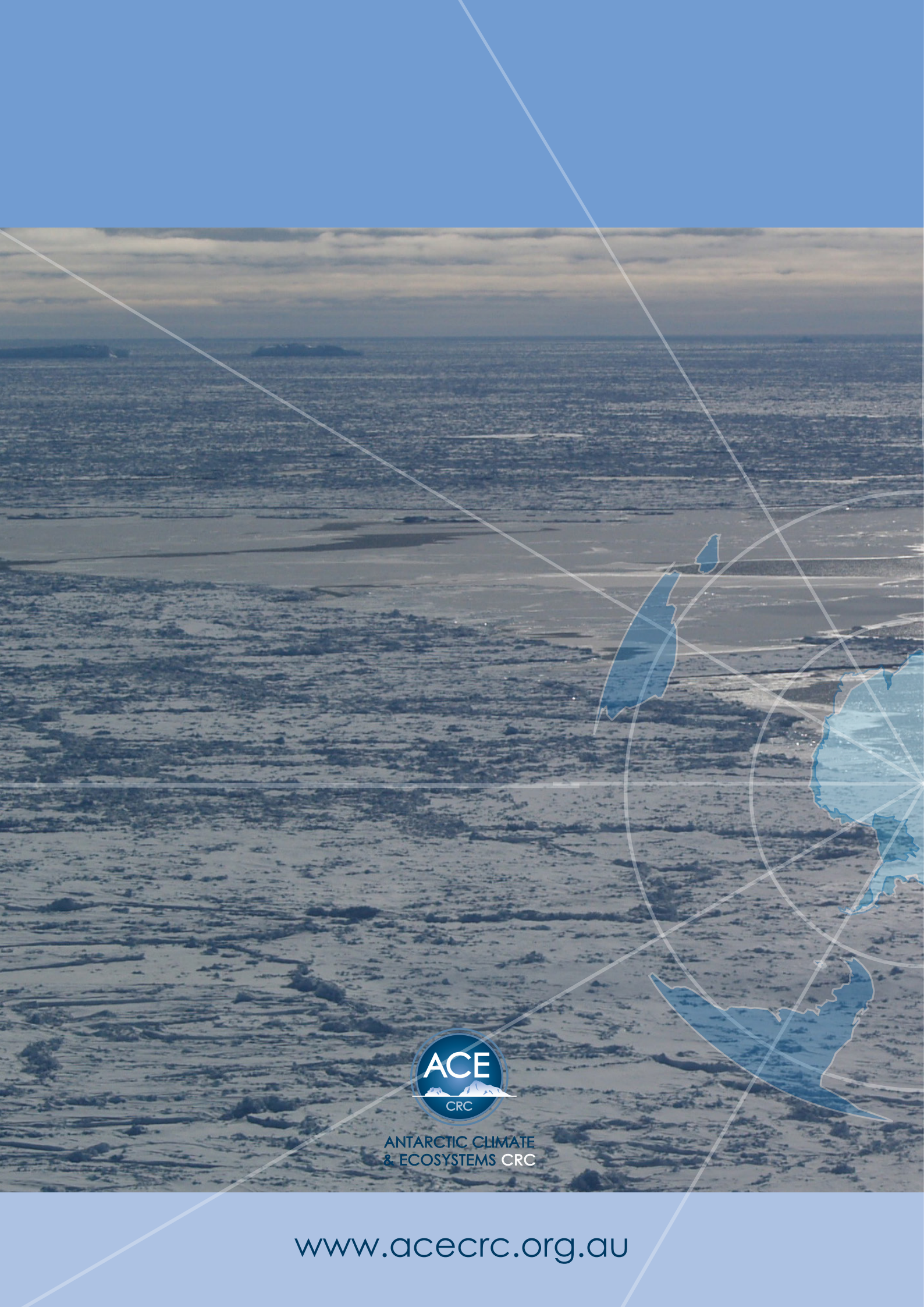


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Jan is the leader of the Sea Ice Service at the University of Tasmania and his research interest is polar remote sensing with a focus on airborne imaging techniques using digital aerial photography and scanning LiDAR to estimate sea-ice thickness. He has also researched on-site polar meteorological observations and sea-ice geophysical properties, as well as numerical modelling of Arctic sea ice and Antarctic subglacial Lake Vostok. He was a wintering scientist at the German Neumayer Station and has participated in several field research programs in both Antarctica and the Arctic Ocean, conducted by the university's research partners, the Australian Antarctic Division and the German Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research. Jan has spent more than 450 days at sea, on-board icebreakers.



In Newcomb Bay (off Casey Station), the star-shaped signature is caused by RSV Aurora Australis and a result of a 'perfect reflector' being hit at an ideal angle (with respect to the space-borne SAR instrument) at the time of the data acquisition. Sentinel-1b SAR IW scene provided by PolarView.



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