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Bureau of Meteorology

# COSIMA

*...at the coalface...*



# Recommendations on how COSIMA can improve services in the sea ice zone

1. Enable more safe and efficient shipping by characterising sea ice breaking strain;



2. Improve ice edge forecasting to assist ice avoidance;

# Recommendations on how COSIMA can improve services in the sea ice zone

- 3. Improve characterisation of marine and atmospheric lee eddies as many operations are conducted in those variable environments;**

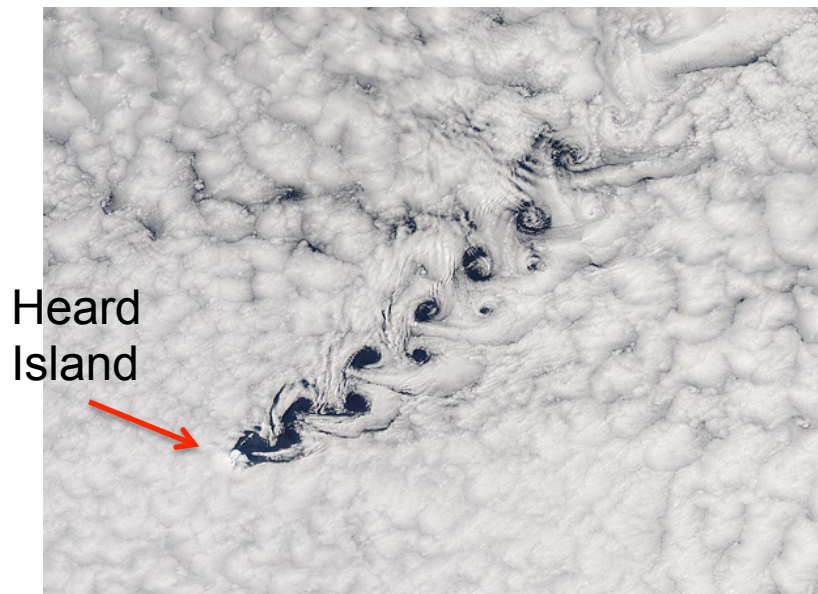


Image Credit: Jeff Schmaltz, MODIS Land Rapid Response Team, NASA GSFC

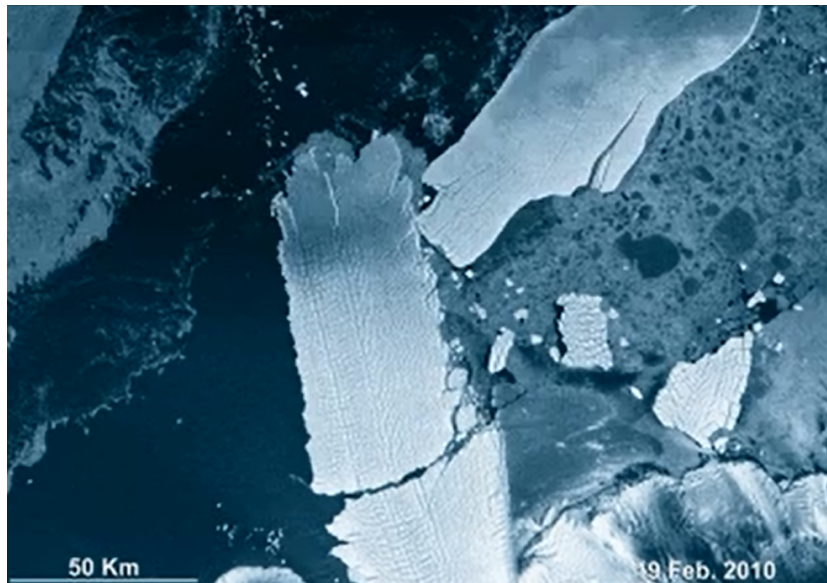
Image Credit: HeliRes



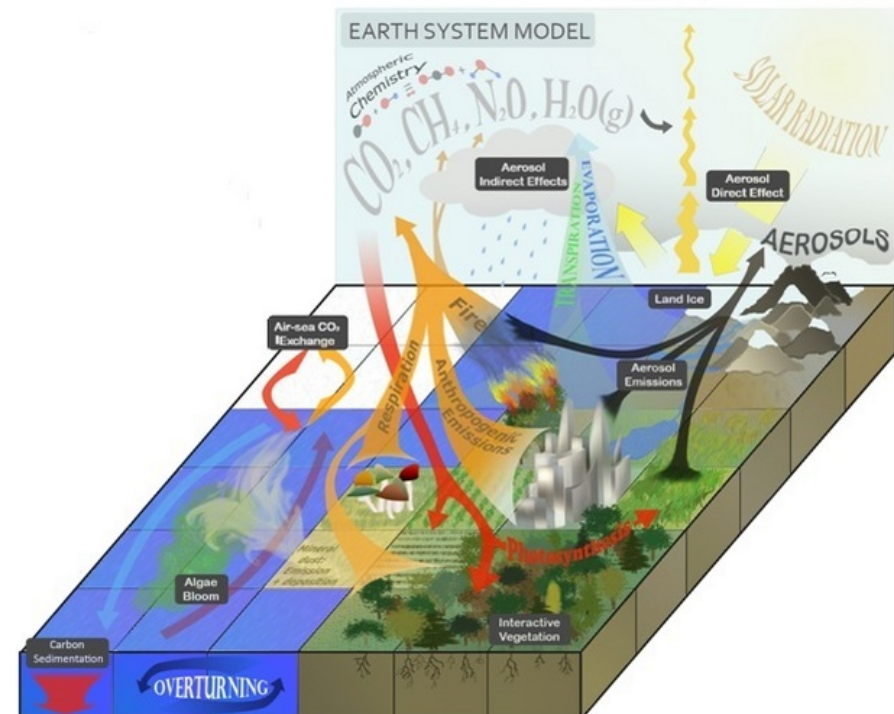
- 4. Improve low cloud and fog forecasting as low visibility is a danger to both shipping and aviation;**



# Recommendations on how COSIMA can improve services in the sea ice zone



5. Improve sea ice, iceberg, ice shelf, glacier, ocean wave and tsunami interactions at NWP and GCM timescales to assist seasonal operational planning, disaster mitigation and earth system modelling;

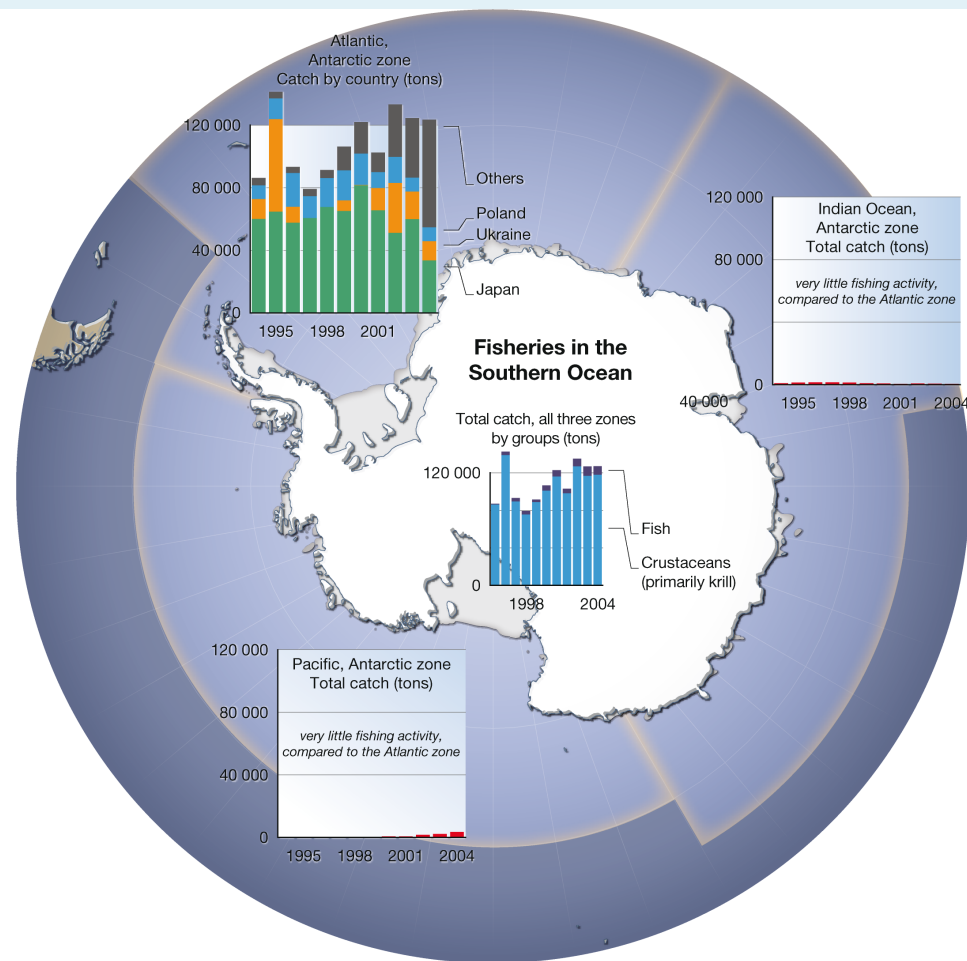




# a whistle stop tour of the communities you service



# Southern Ocean Fisheries Activity

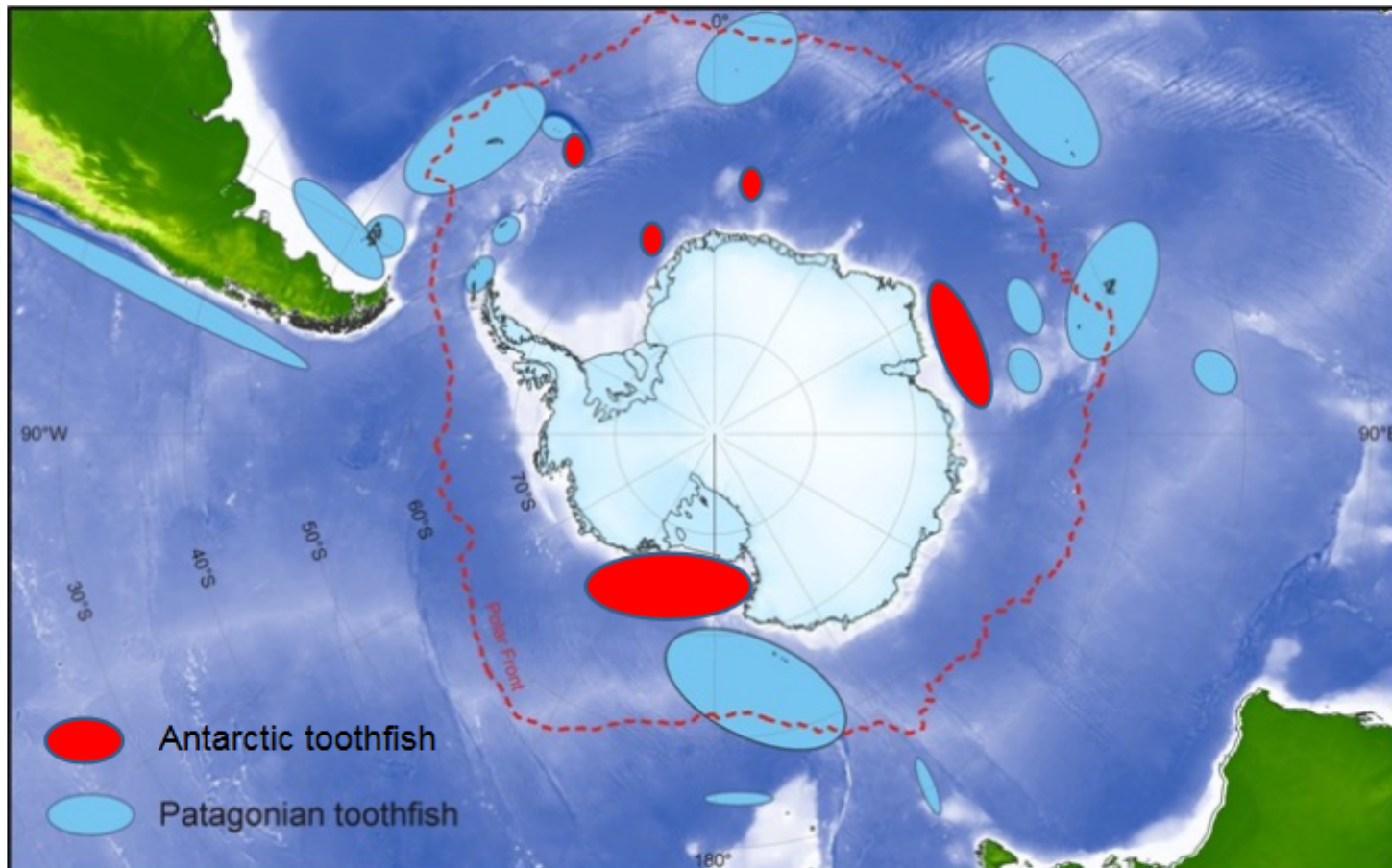


Credit: Heather Main and Hugo Ahlenius, GRID-Arendal



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# Deepwater fisheries

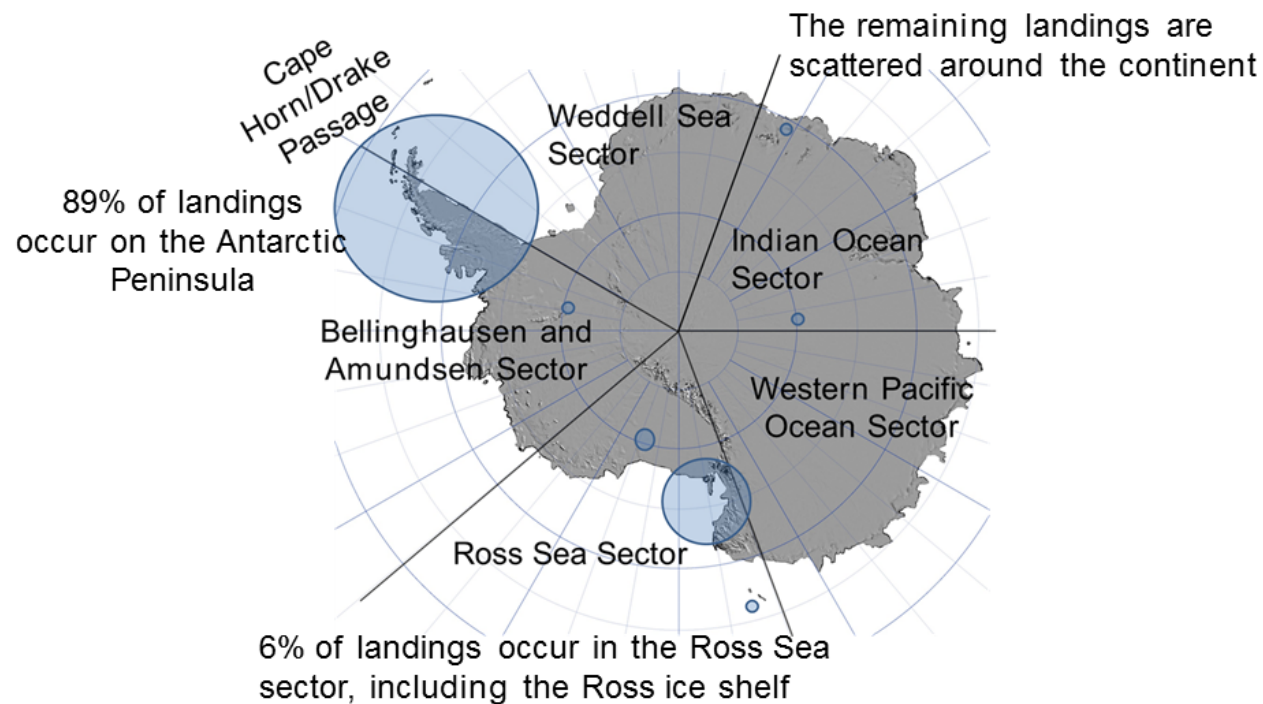


Credit: ccamlr



# Tourism

## Areas of operation of IAATO members



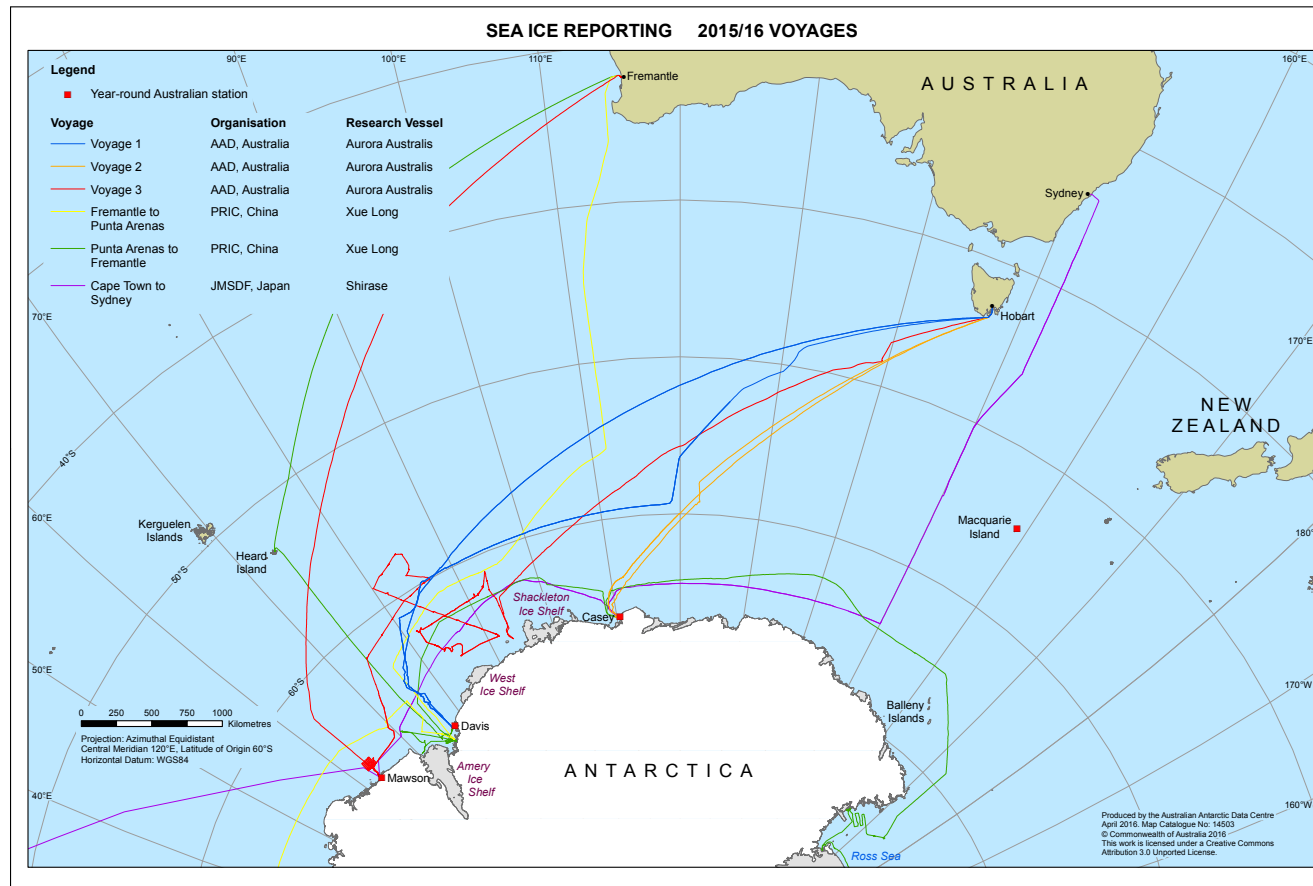
Total tourists for the 2013/2014 season: 37,405  
Total landing sites: 220

Credit: IAATO website <http://iaato.org/tourism-statistics>



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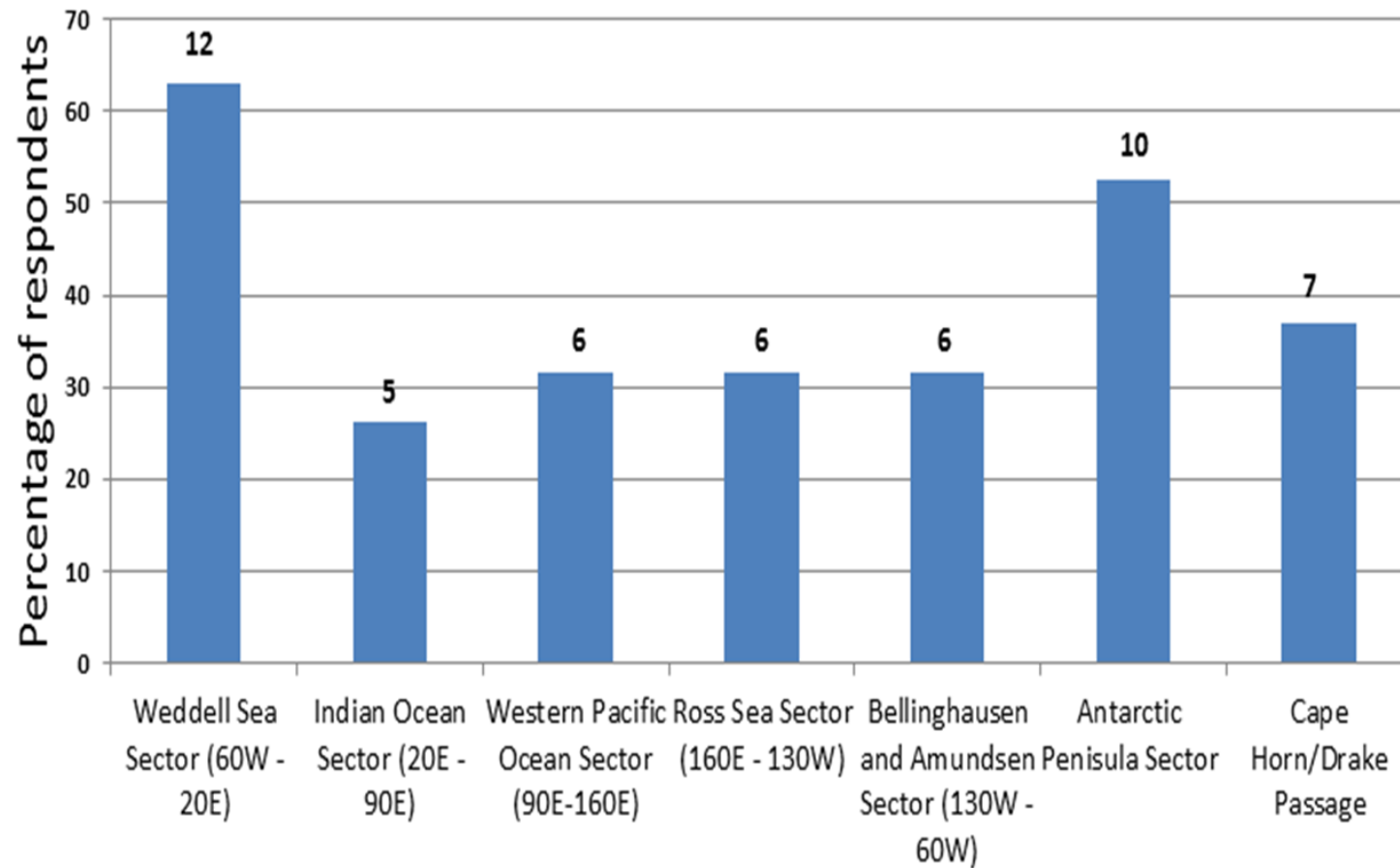
# Ships supported by ACE CRC



Credit: Jan Lieser ACE CRC



## Areas of marine operation CONMAP



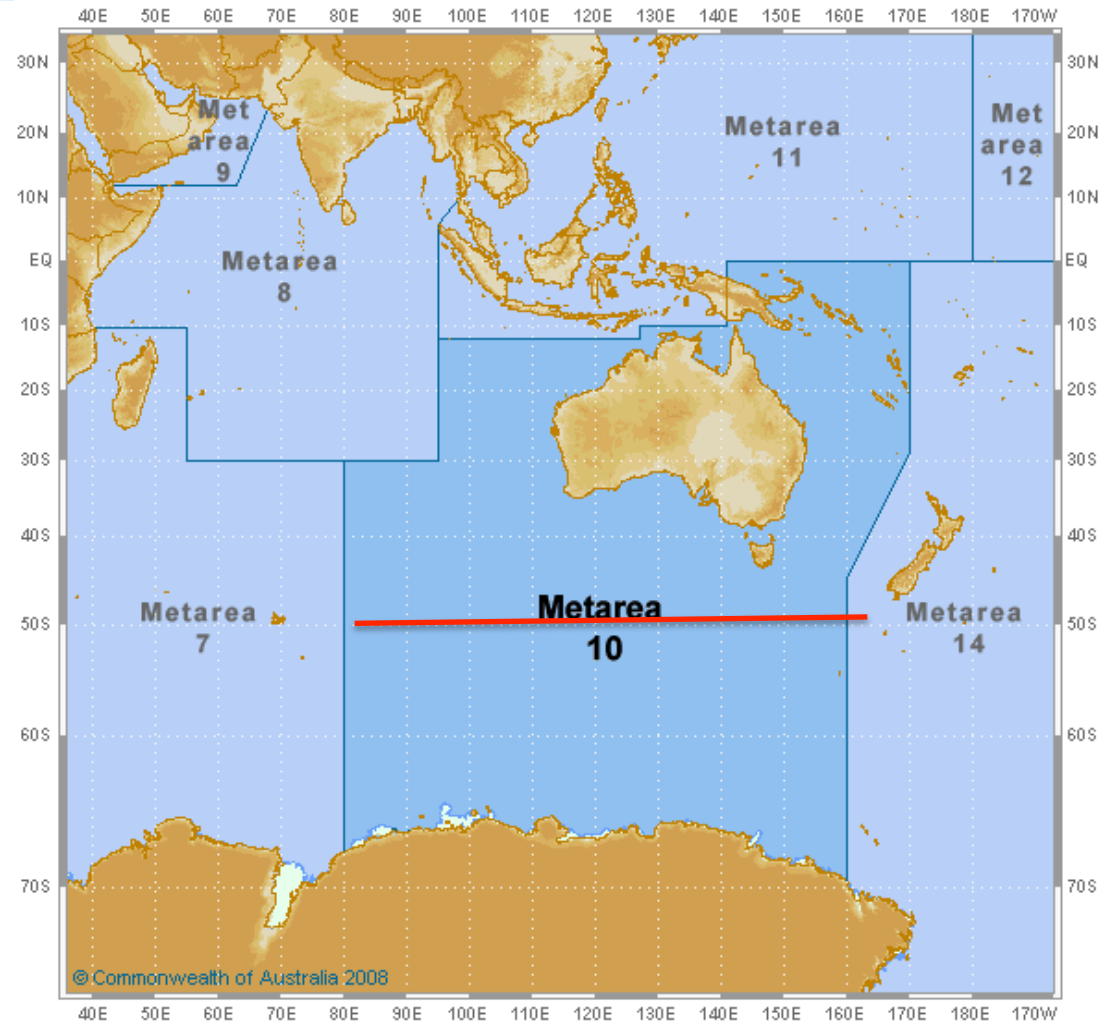




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# METAREAs

## The Bureau's commitment

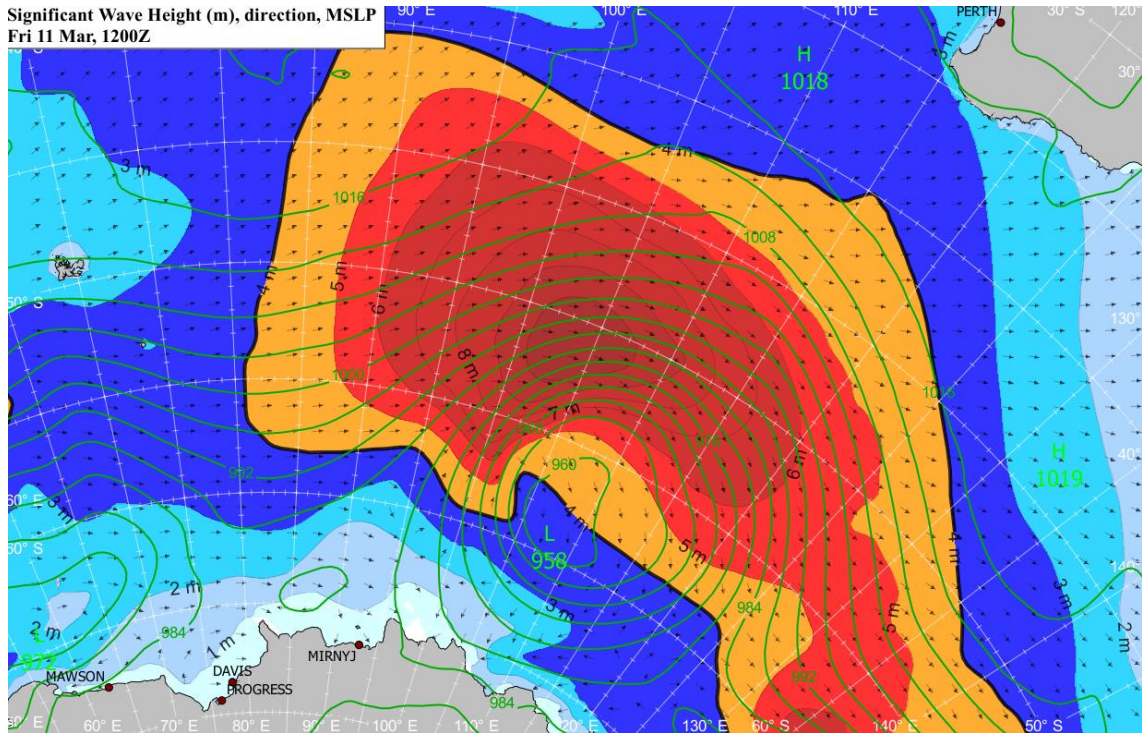




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# What we do do

Significant Wave Height (m), direction, MSLP  
Fri 11 Mar, 1200Z



## Significant wave height maps tailored to threat



Aurora Australis Forecast  
Issued: 00:00 UTC, Wednesday 9th March 2016 Issuing office:  
Hobart  
Valid: Wednesday 9th March to Saturday 12th March 2016

### Weather Situation:

A slow moving low to the northwest extends a trough through the ship's position. The trough is absorbed into a cold front moving from the southwest, overtaking the ship early on Thursday. A ridge pushes in behind the front staying just to the south of the ship's position. A tighter pressure gradient exists closer to the continent between the ridge and an inland heat trough.

Remainder of Wednesday 9th March near 40 04'S 99 10'E at 04Z

Weather: Overcast with showers.

Winds: SW 15/25 knots shifting W/NW 20/30 knots, gusty near showers.

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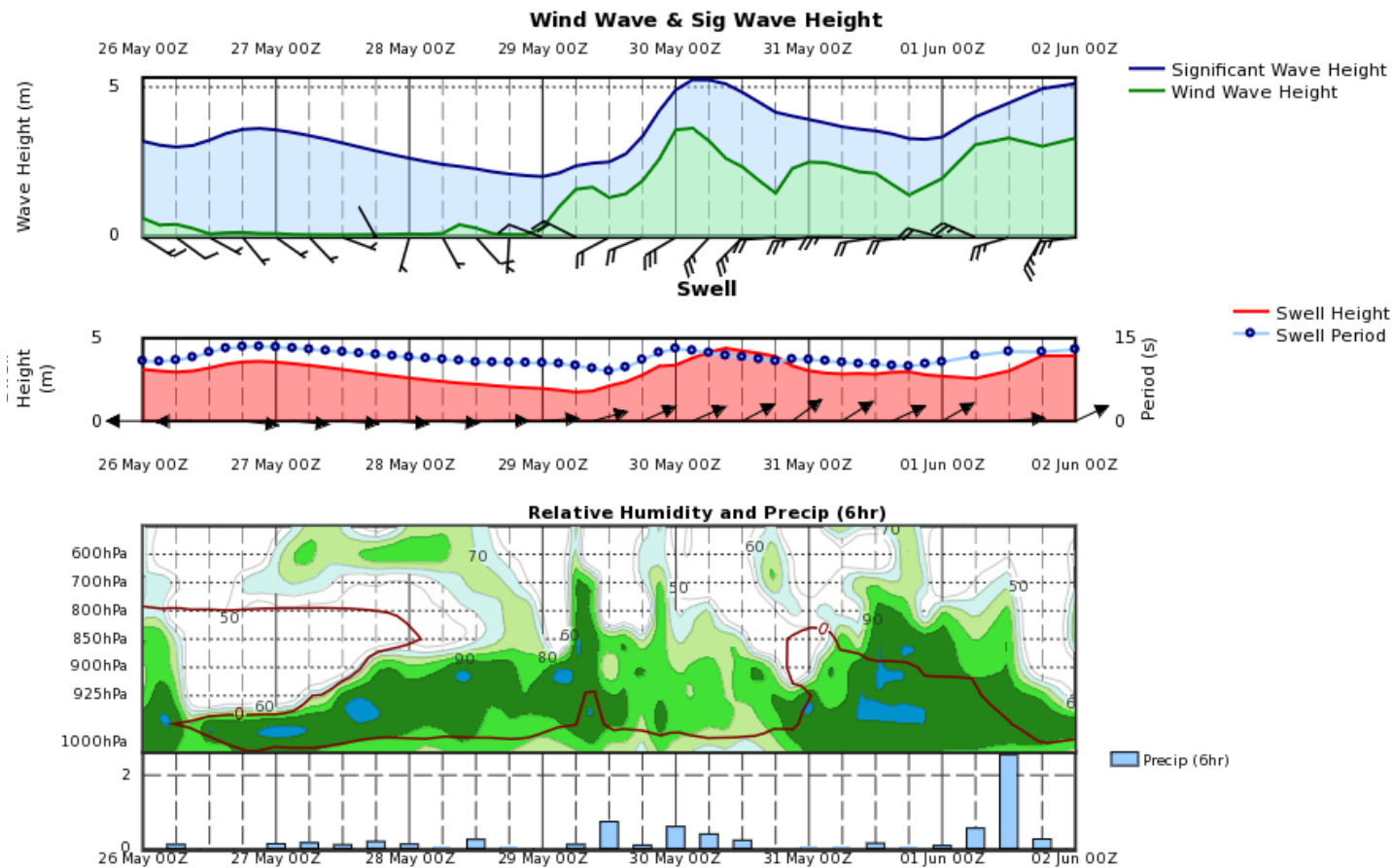
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# Marine forecast with heli ops considerations

## 54°59'06"S 158°57'06"E Marine Time Series

**Model:** ECMWF Marine and EC Atmosphere Deterministic/(default)

**Valid:** 26 May 2016 0000UTC - 02 Jun 2016 0000UTC





# Sea Ice Reports by the Antarctic Gateway Partnership Sea Ice Service\*

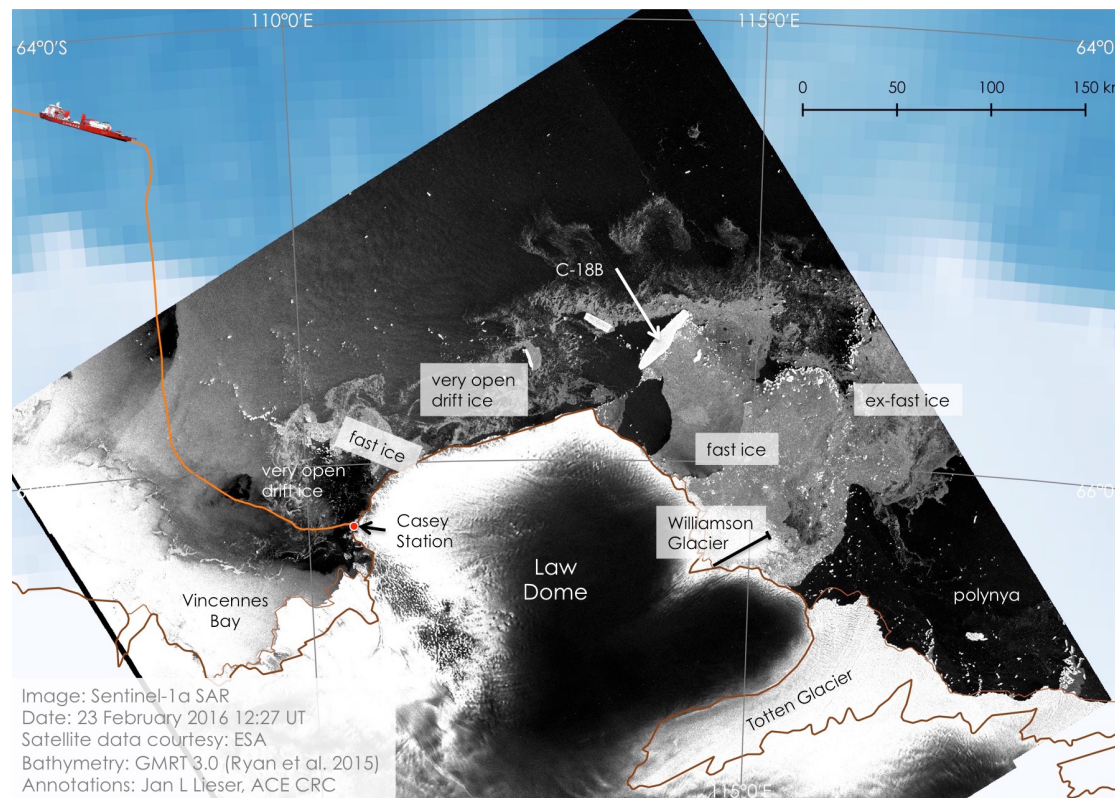


Figure 3: Sentinel-1a SAR scene, acquired 23/02/2016 and provided by PolarView.

## Casey Station

Figure 3 shows a high resolution SAR scene of Law Dome. North of Casey Station, a patch of fast ice attached to the northwestern side of Law Dome is still breaking up and floes of ex-fast ice are drifting as very open pack into Vincennes Bay.

Off Totten Glacier, the polynya continues to grow and roughly 17.5 km of coast are exposed to the ocean, north of the glacier.

## Tactical Considerations you could include in funding submissions:

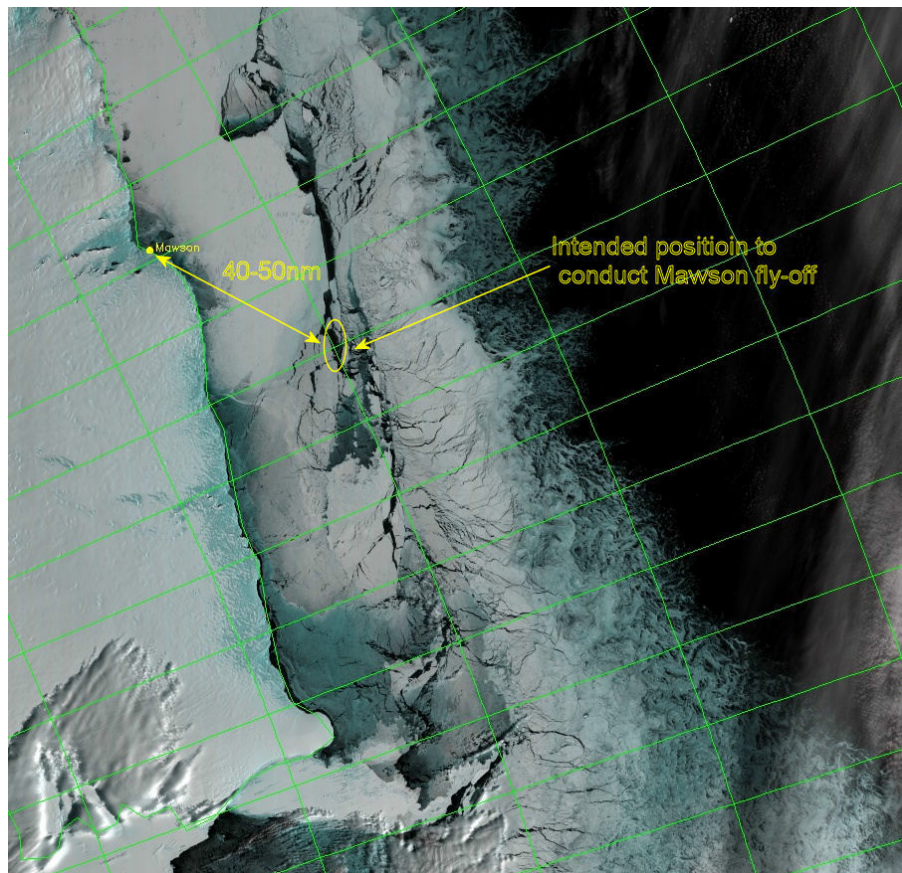


Mawson Harbour  
Credit: Robb Clifton – COMNAP Sea Ice workshop



# Resupply contingencies

## Mawson Helicopter Resupply



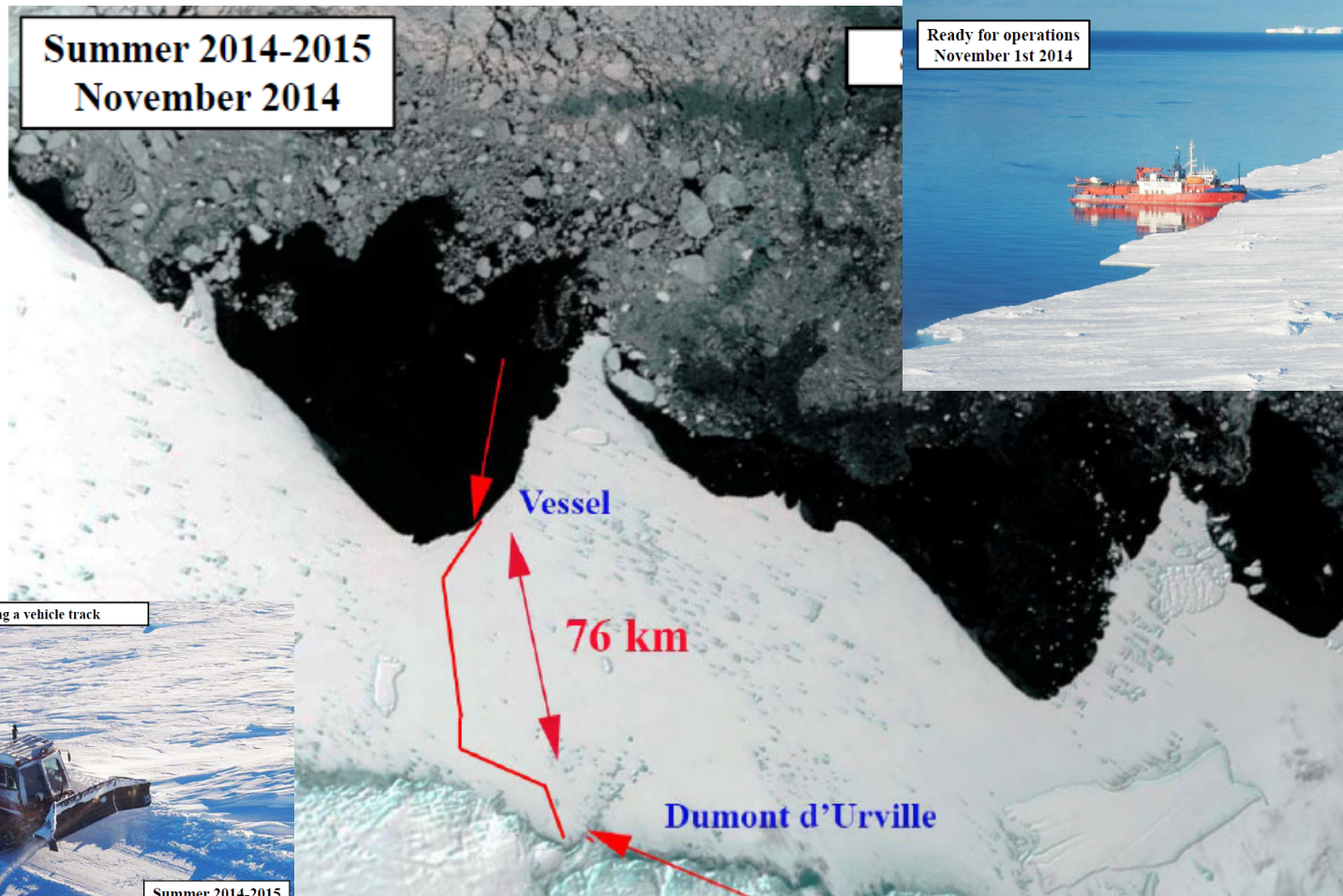
Credit: Robb Clifton – COMNAP Sea Ice workshop





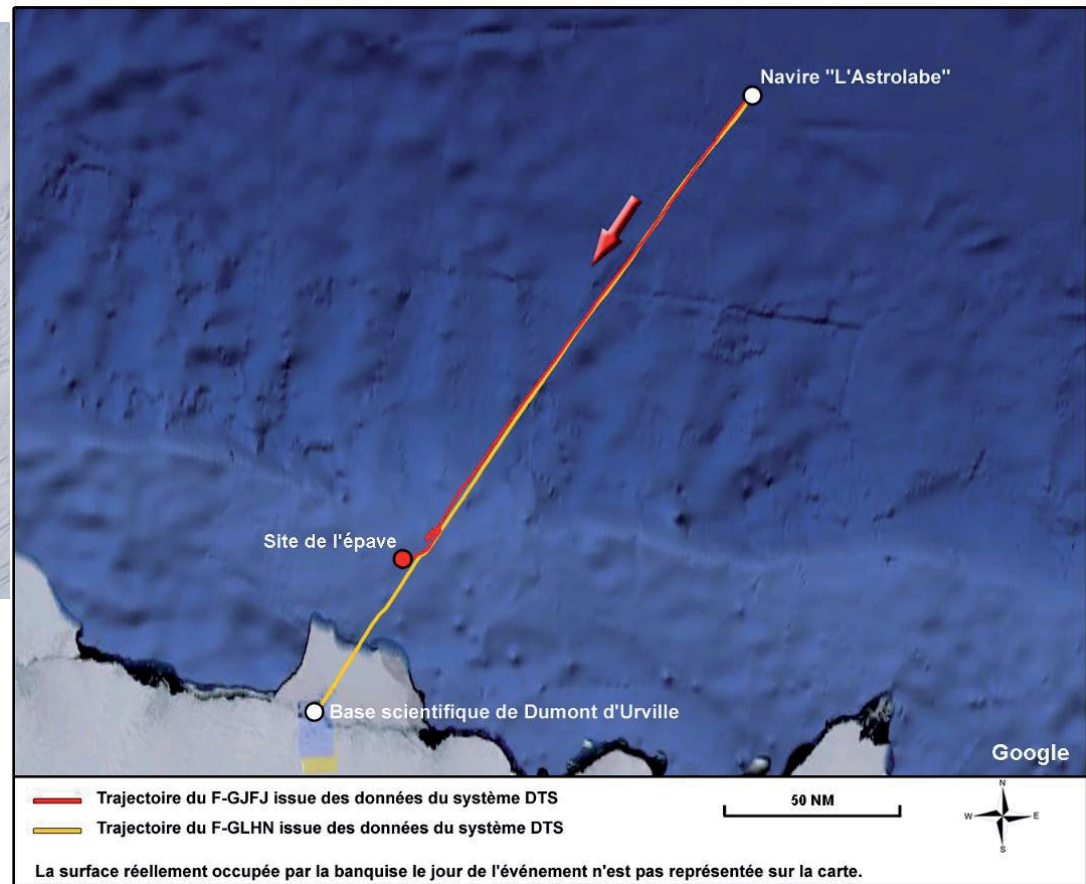
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# Dumont d'Urville over-ice resupply



Credit: IPEV – COMNAP Sea Ice workshop

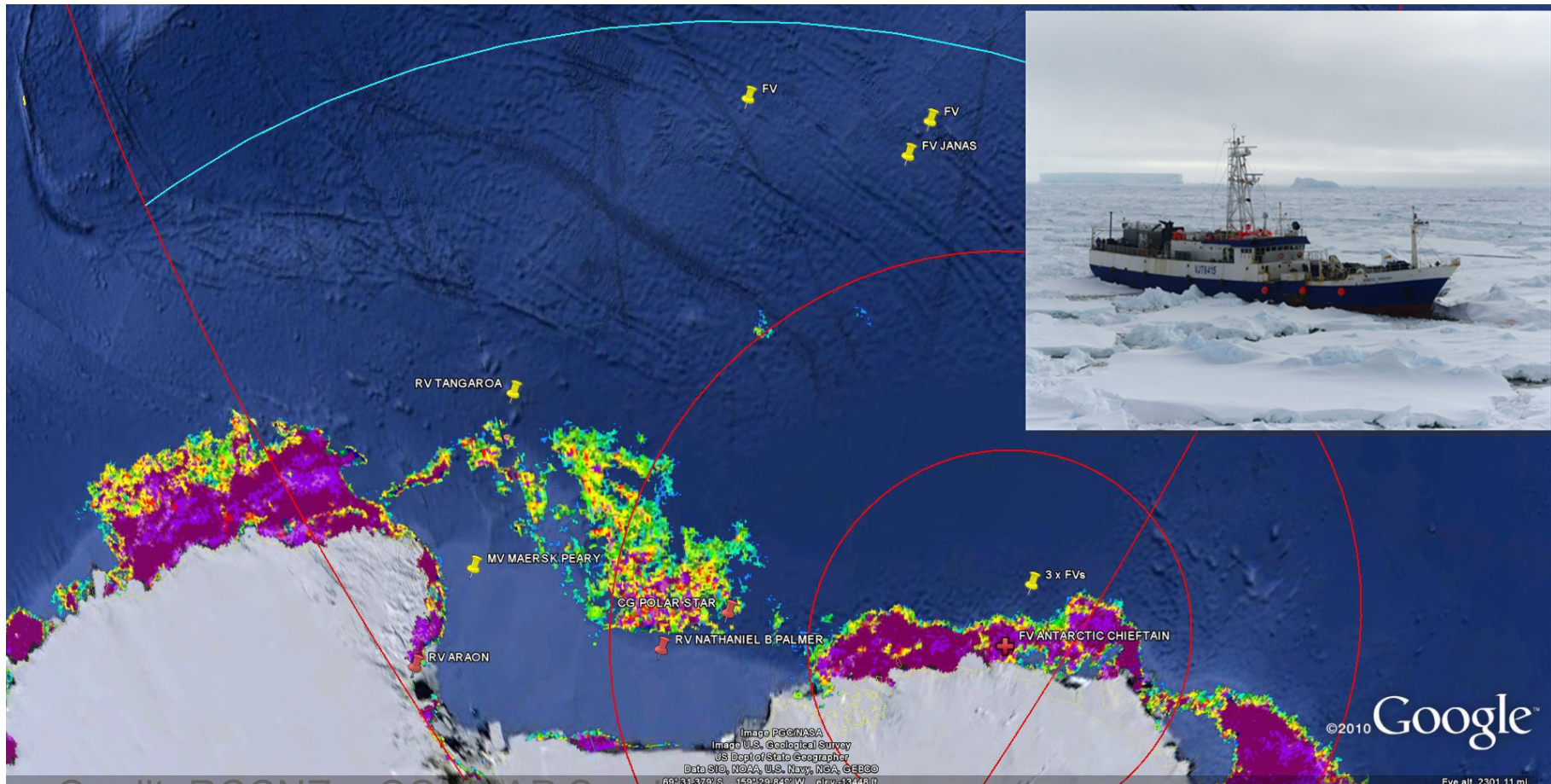
# Ship-to-shore helicopter operations



Helo crash over sea ice off Dumont d'Urville in 2010



# NZ RCC considerations for the Antarctic Chieftain



Credit: RCCNZ – COMINAP Sea Ice workshop

## Recent Local Maritime Incidents



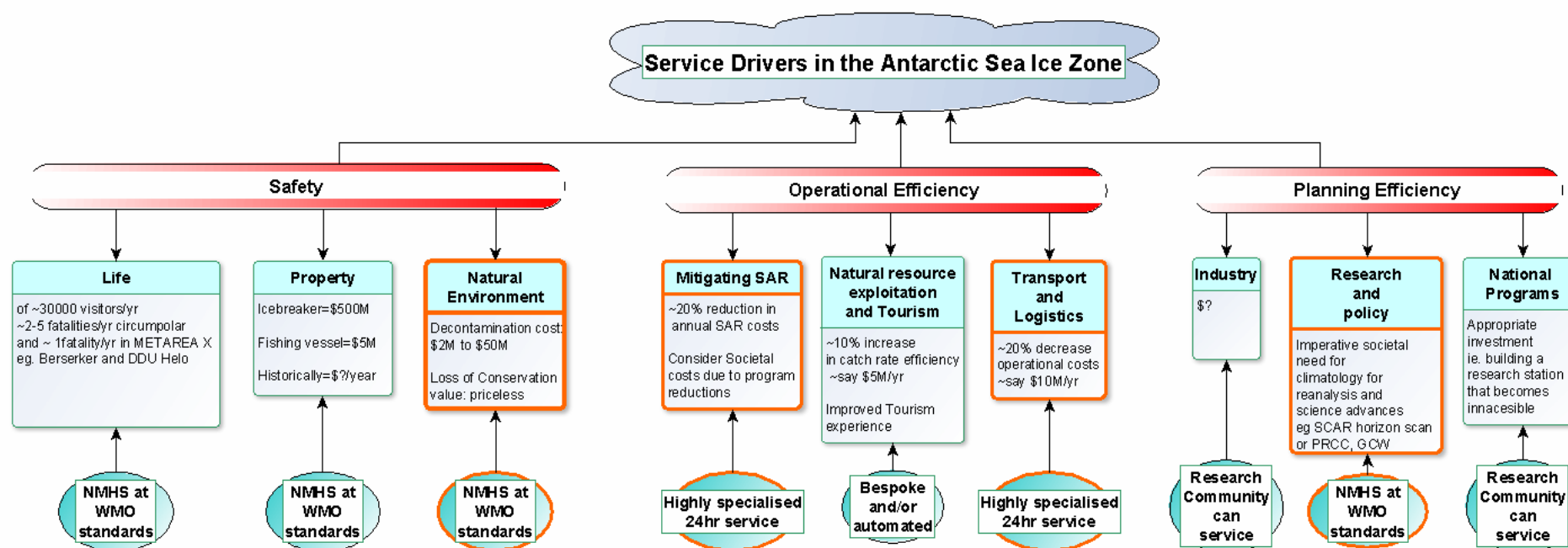
Akademik Shokalskiy  
(China (Xue Long), France  
(l'Astrolabe), US (Polar Star),  
Australia (AA), Russia)



Aurora Australis  
(Japan (Shirase), Australia (RAAF),  
US (LC130))



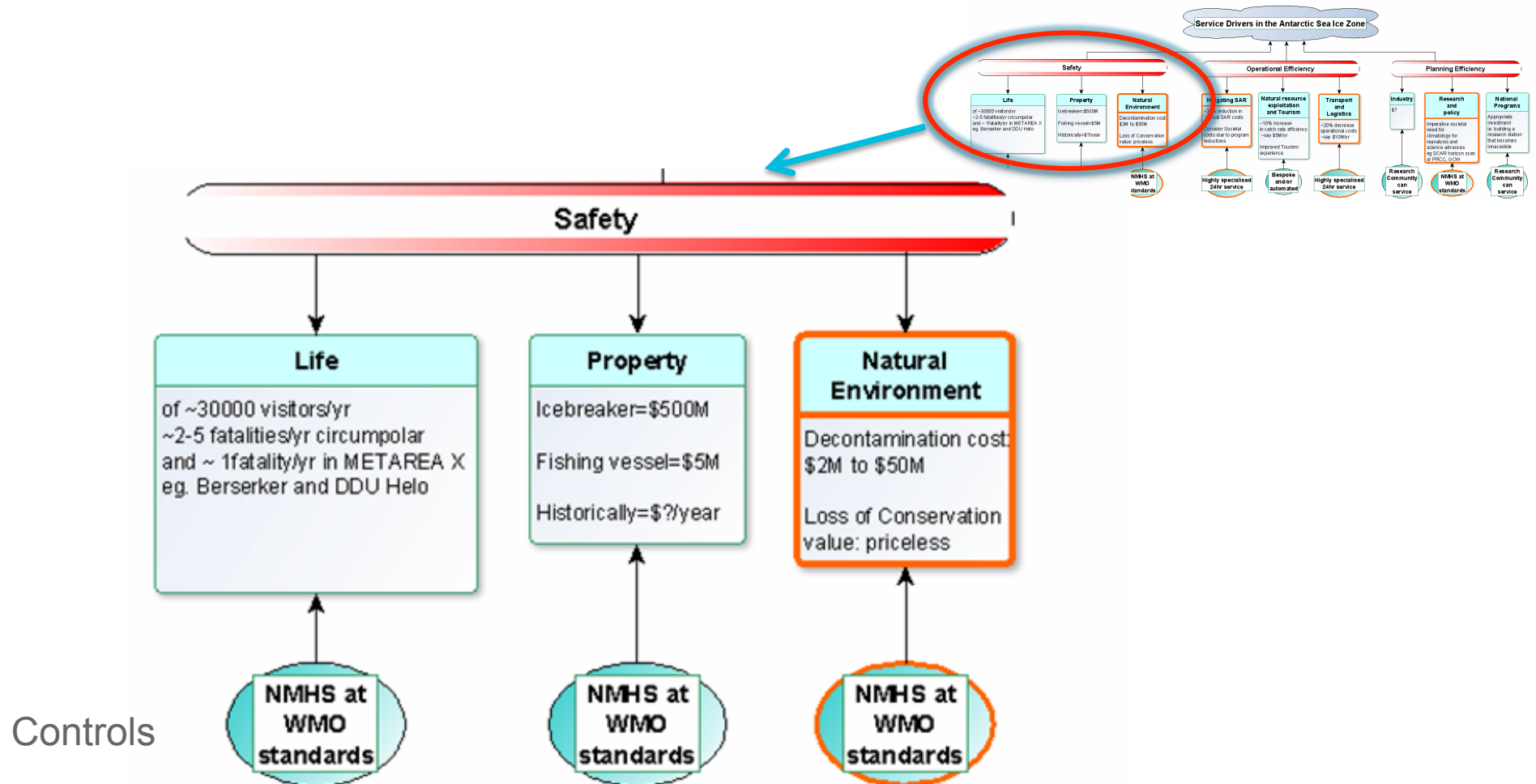
# Weather Service Drivers in the Antarctic Sea Ice Zone





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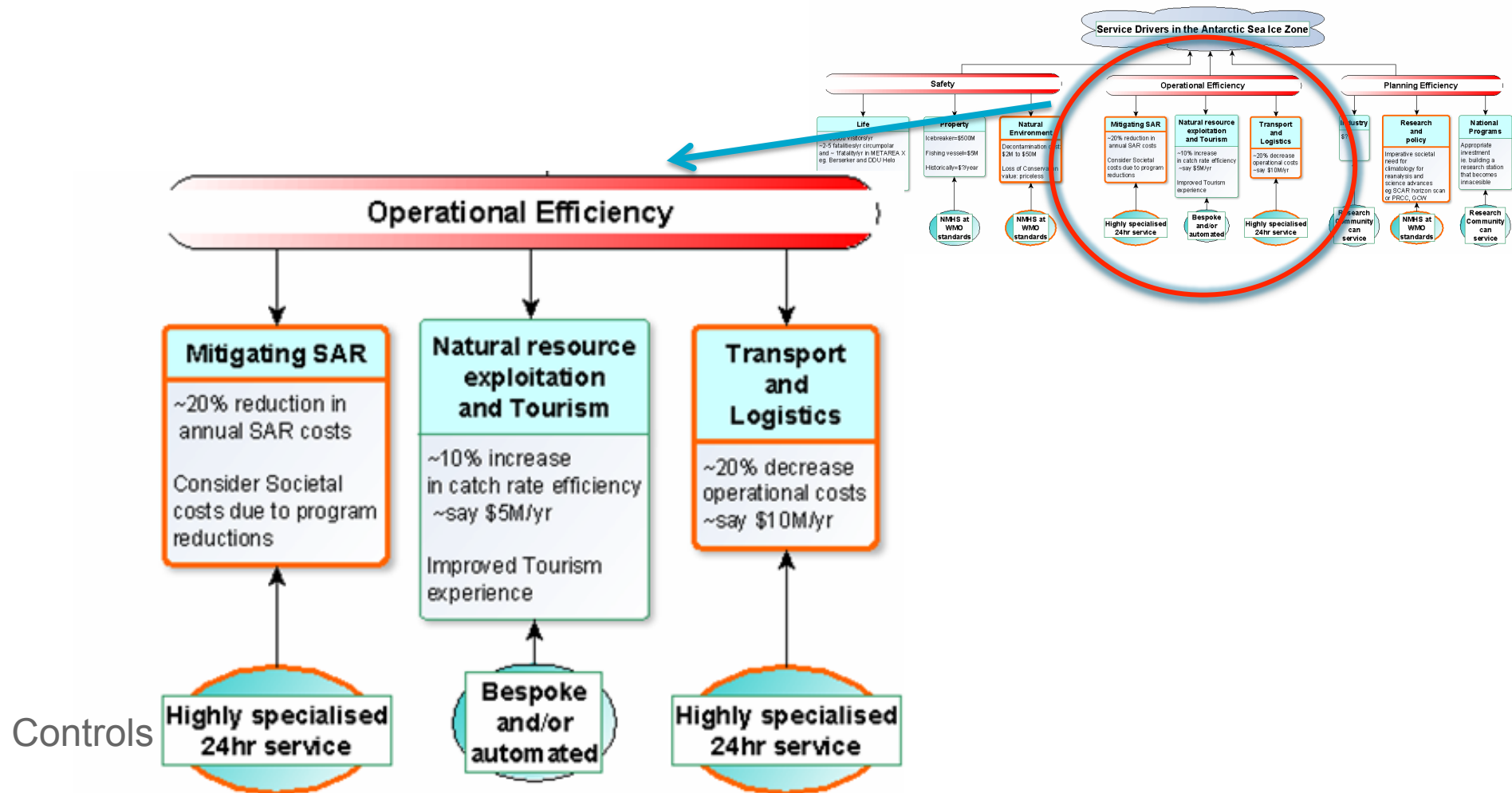
# Weather Service Drivers in the Antarctic Sea Ice Zone





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# Weather Service Drivers in the Antarctic Sea Ice Zone







## Where is the Bureau now?

- We are evaluating opportunities;
- We recognise our responsibilities to METAREA X and to the Aap;
- We are framing our initiatives via:
  - risk exposure/mitigation;
  - Low hanging fruit;
  - Sustainable development.

## In Summary *Your work can:*

### 1. Mitigate Disaster:

- Maintain conservation values,
- Mitigate decontamination costs;
- Save on SAR costs and flow on National program impacts;

### 2. Promote efficient and safe running of transport operations;

### 3. Fill a significant Earth System knowledge gap.



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# Thank You



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