

GREENEDGE MEETING

NICE, 2016-12-13

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HELLO
my name is

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GREEN EDGE

Physical paper

Working title: **Upper ocean physics of Baffin Bay marginal ice zone**
(Dumont, Houssais, Sévigny, Massicotte, Vladoiu, Bouruet-Aubertot, Rehm)

Tasks

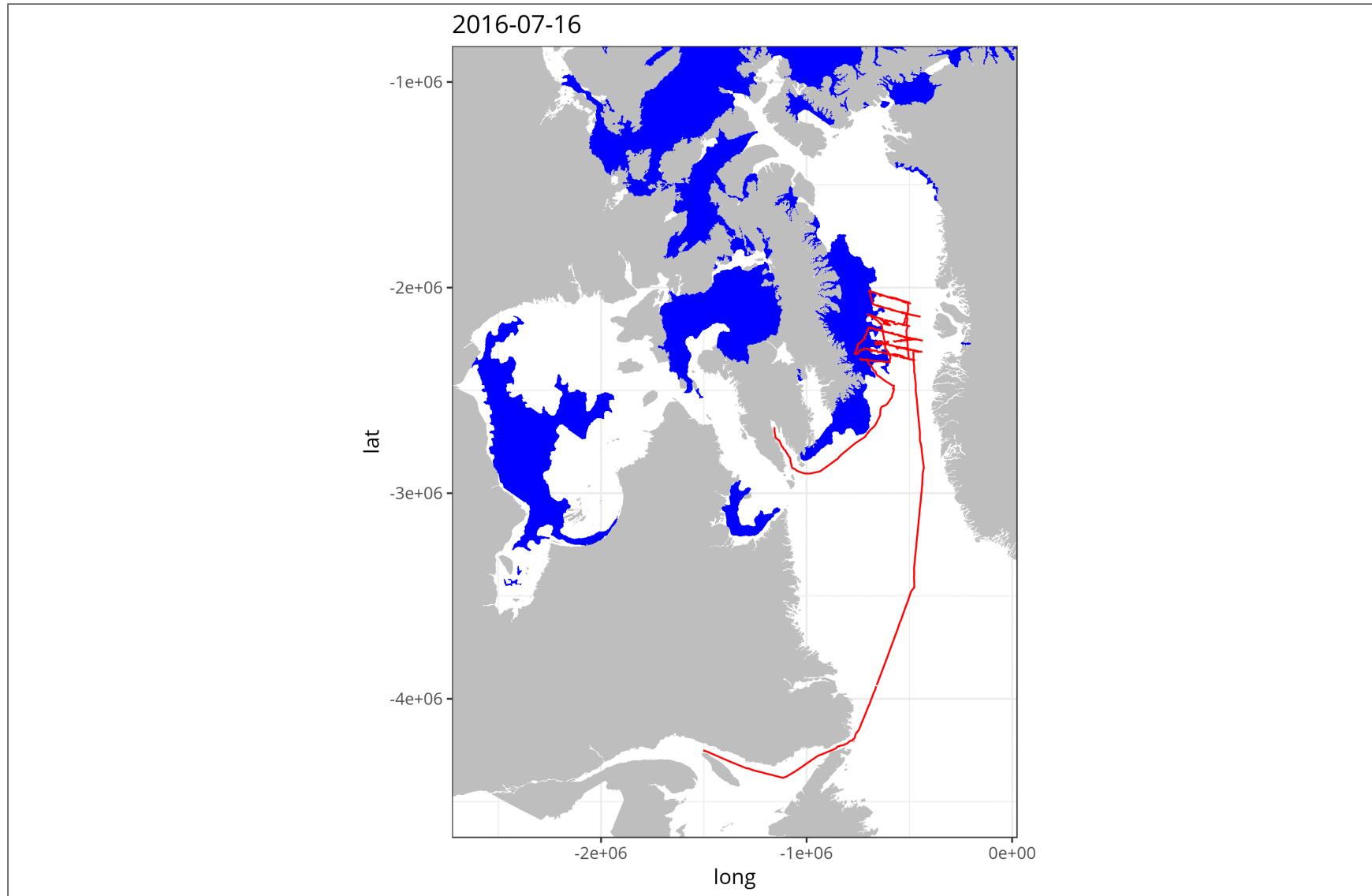
- Use remote sensing products to characterize the state of the atmosphere for both Green Edge missions (194 sampling days).

ATMOSPHERE AND ICE

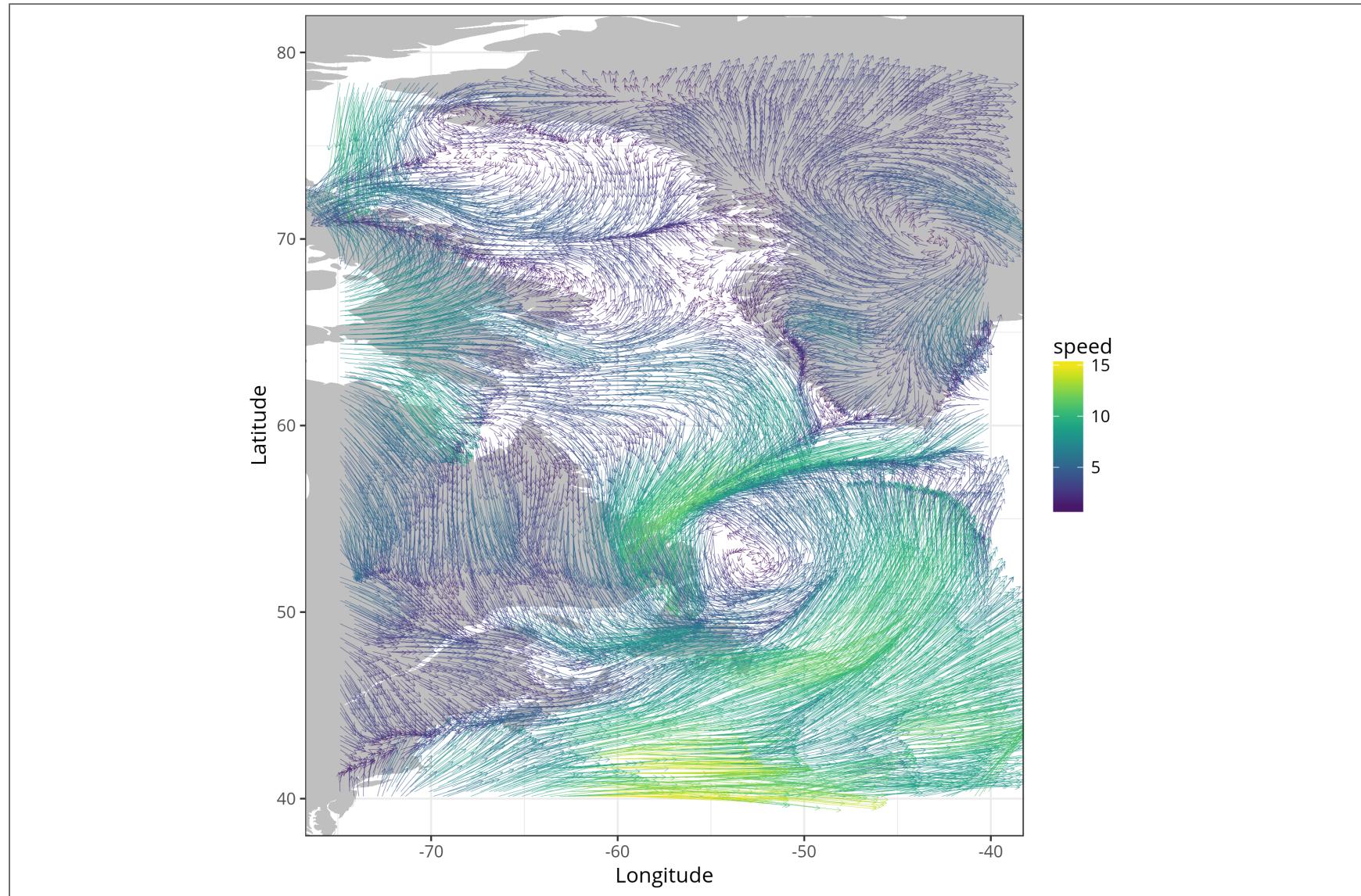
Data available daily:

- Cloud optical thickness (MODIS L3, resolution: 1 x 1 degree)
- Cloud fraction (MODIS L3, resolution: 1 x 1 degree)
- SST (AVHRR, resolution: 0.25 x 0.25 degree)
- Sea ice extent (NSIDC, resolution: 1 km)
- Sea ice concentration (AMSR2, resolution: 3.125 km)
- Windspeed (CCMP, resolution: 0.25 x 0.25 degree)

EXAMPLE: ICE EXTENT



EXAMPLE: WIND SPEED



DATA EXPLOITATION

- Different file formats (netCDF, HDF4, HDF5, etc.).
- Different ways to represent geographical coordinates (mapped, L3BIN, etc.).
- Processed in a way to make it rapidly exploitable (R, Matlab).

latitude	longitude	sst
75.875	23.125	-1.63
76.125	23.125	-1.64
76.375	23.125	-1.66
76.625	23.125	-1.69
76.875	23.125	-1.72
77.125	23.125	-1.74

```
source("download_data.R") # One script to rule them all
```

360 DEGREES ICE-CAM

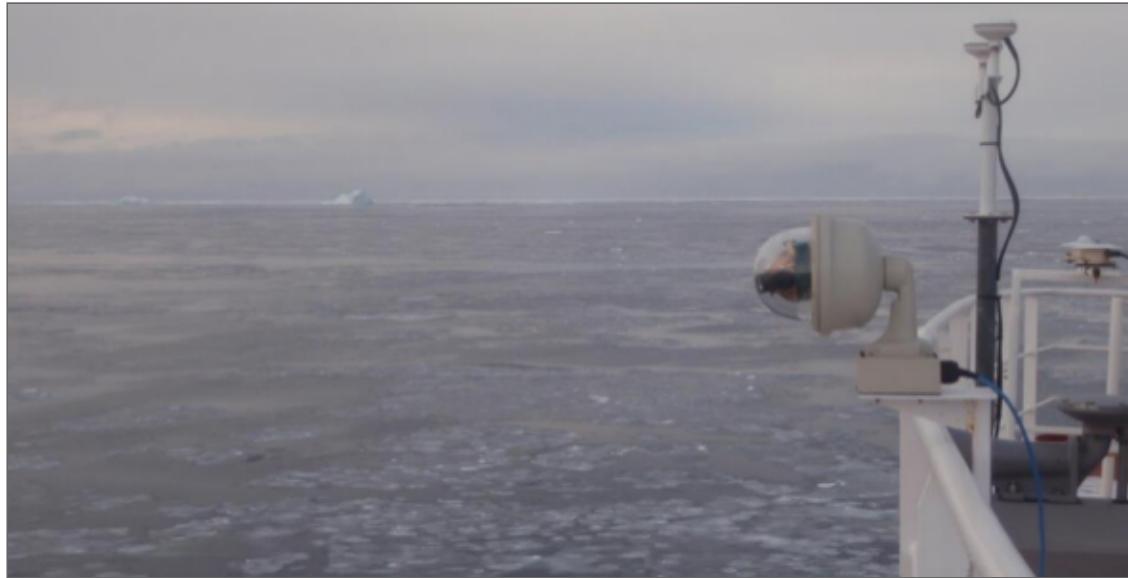
The Canadian research icebreaker CCGS Amundsen is equipped with a numeric photography system which covers the sea surface at 360° around the vessel. His purpose is to estimate the sea ice coverage, his appearance and his distribution within a radius of ~250 meters.

360 DEGREES ICE-CAM



The Arecont camera (model AV20185 IP camera)

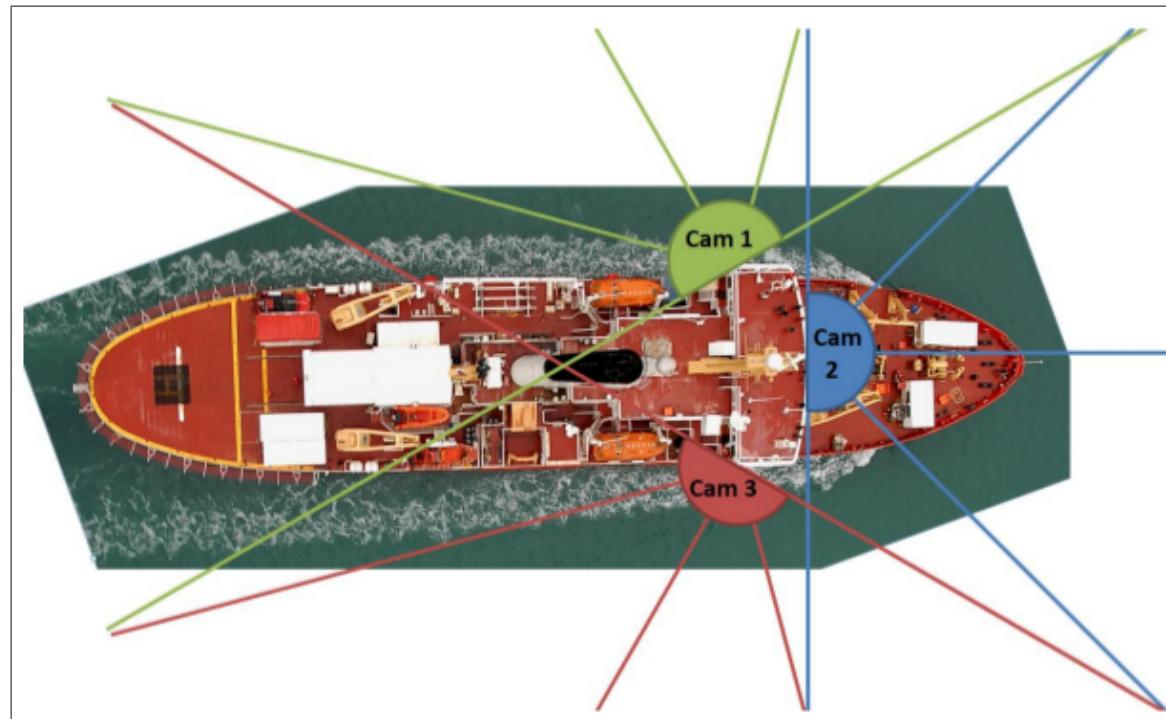
360 DEGREES ICE-CAM



The Arecont camera (model AV20185 IP camera)

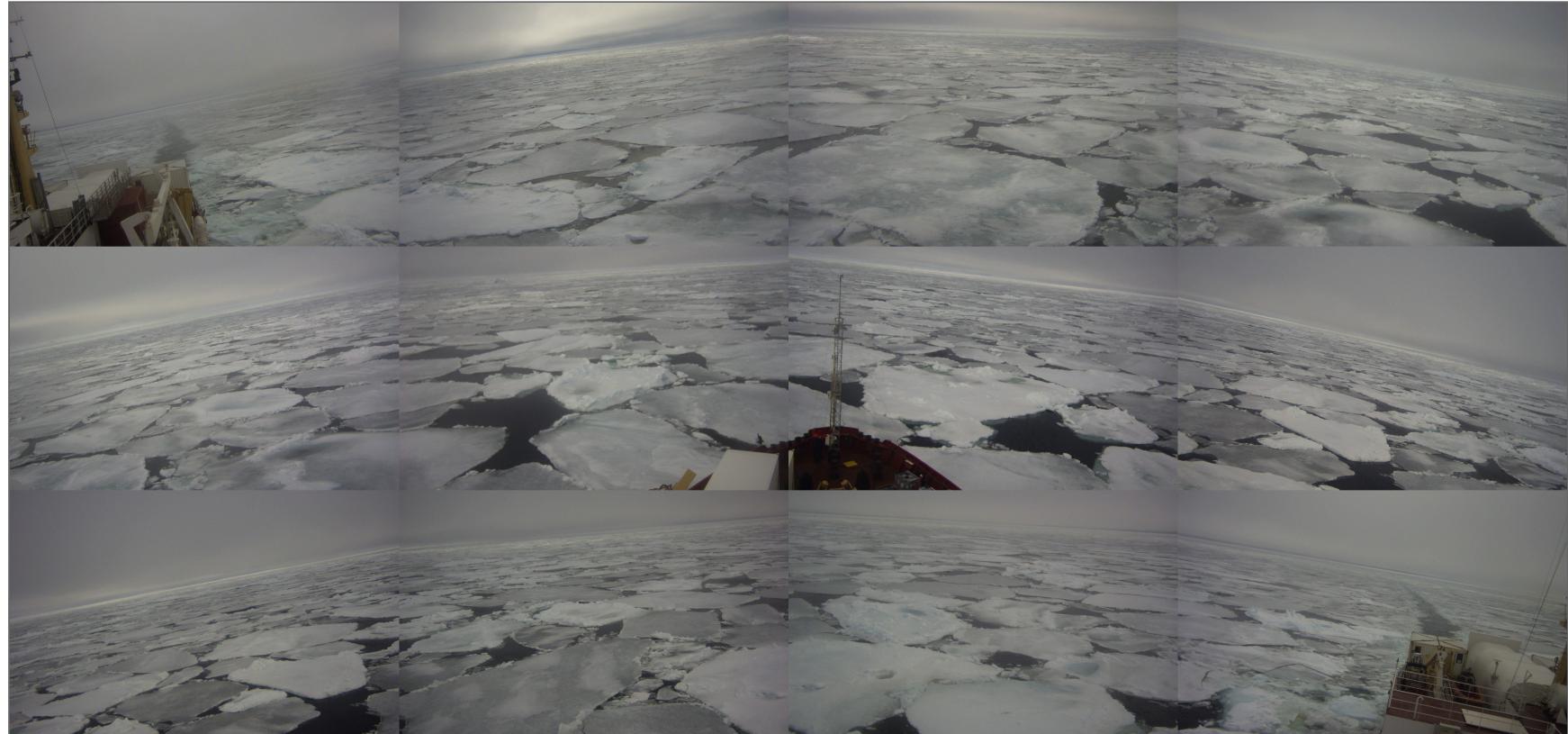
360 DEGREES ICE-CAM

Three of them were installed on the ship

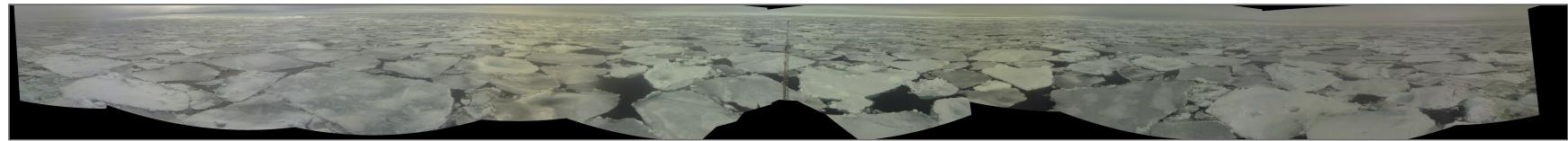


360 DEGREES ICE-CAM

12 images taken simultaneously every 5 minutes from the Amundsen



PANORAMA

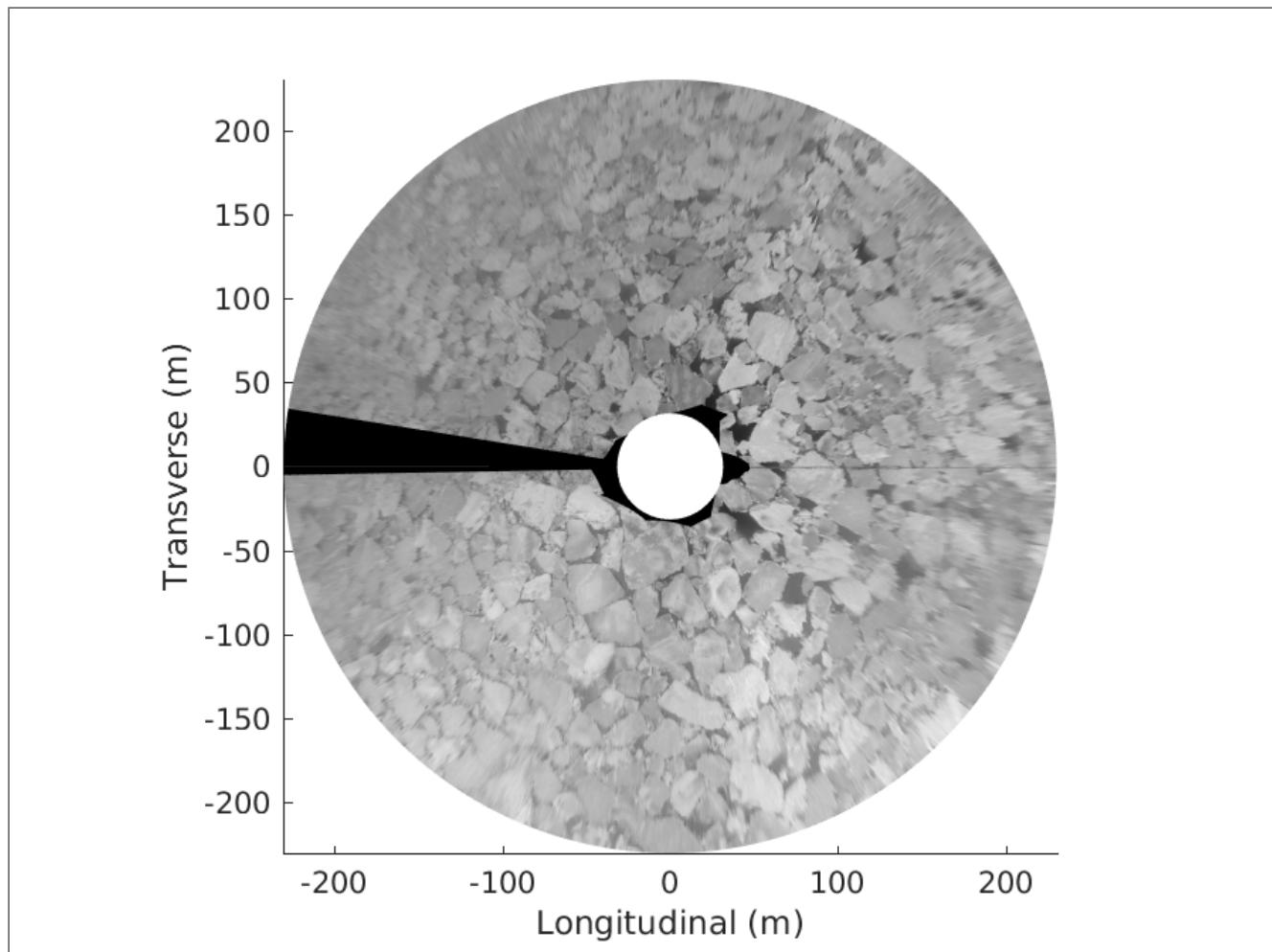


Panoramas: thanks to Simon Morisset (ULAVAL)

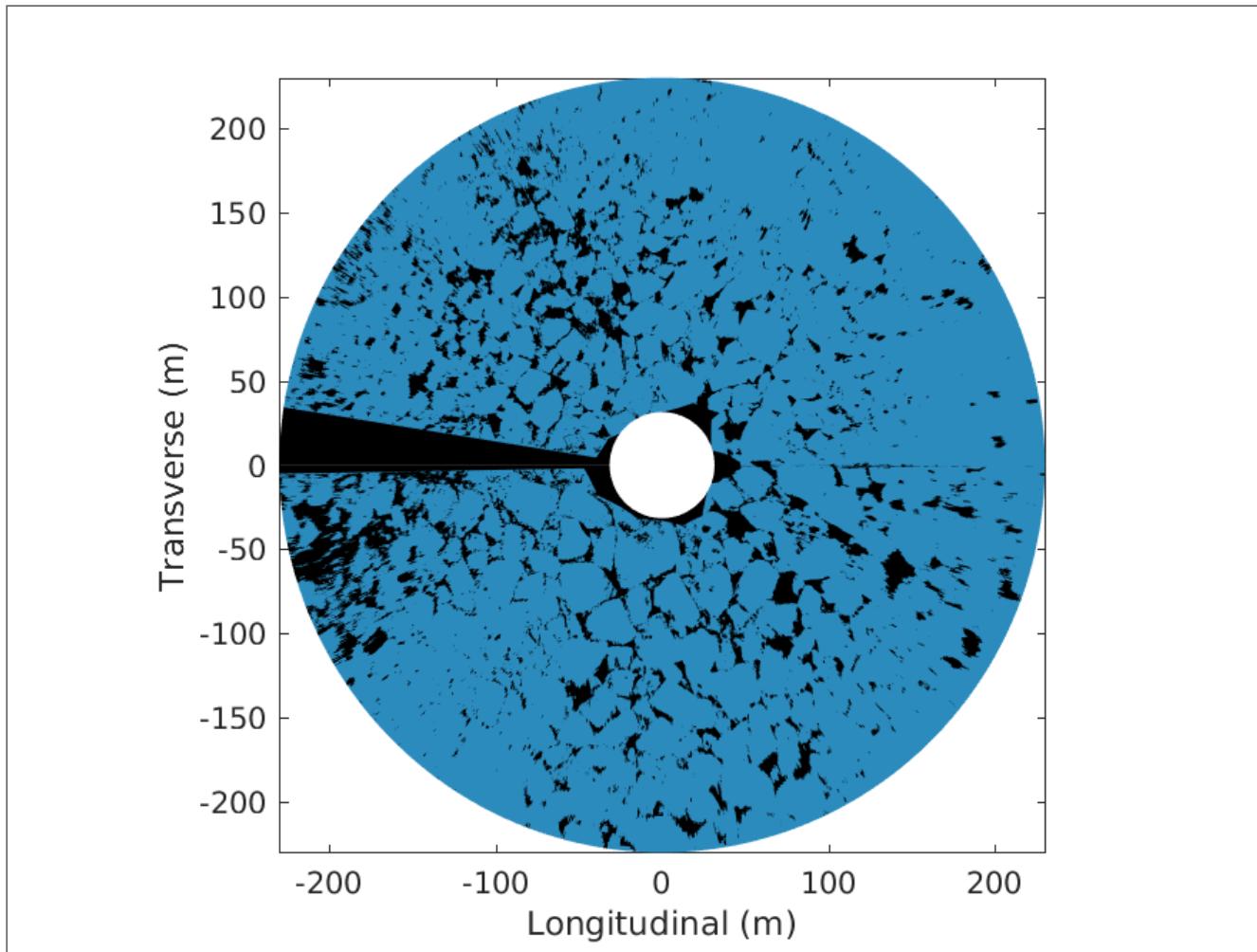
Dimensions: 950 x 13304 pixels ($n = 12\ 638\ 800$)

Spatial resolution: ~45 cm

SPATIAL PROJECTION



ICE DETECTION



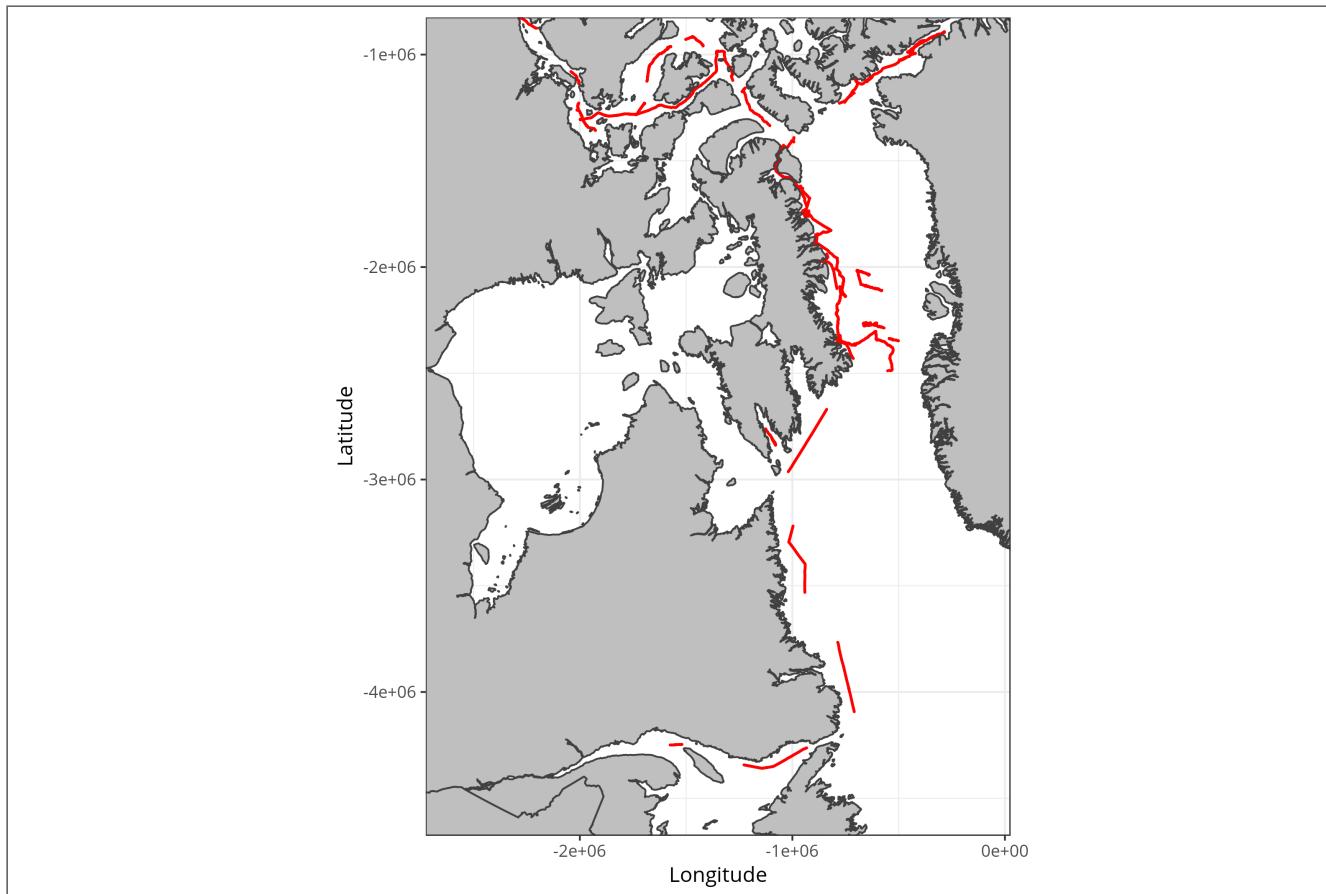
360 DEGREES ICE-CAM

Each image is georeferenced

parameter	value
cruise_number	Amundsen_2016001
acquisition_number	20160611_134049
original_filename	Camera360_20160611134049_*
start_time	1465666849
latitude	68.4941
longitude	-58.95248
altitude	32
roll	-1.24
pitch	0.37
heading	289.8
track	285.5

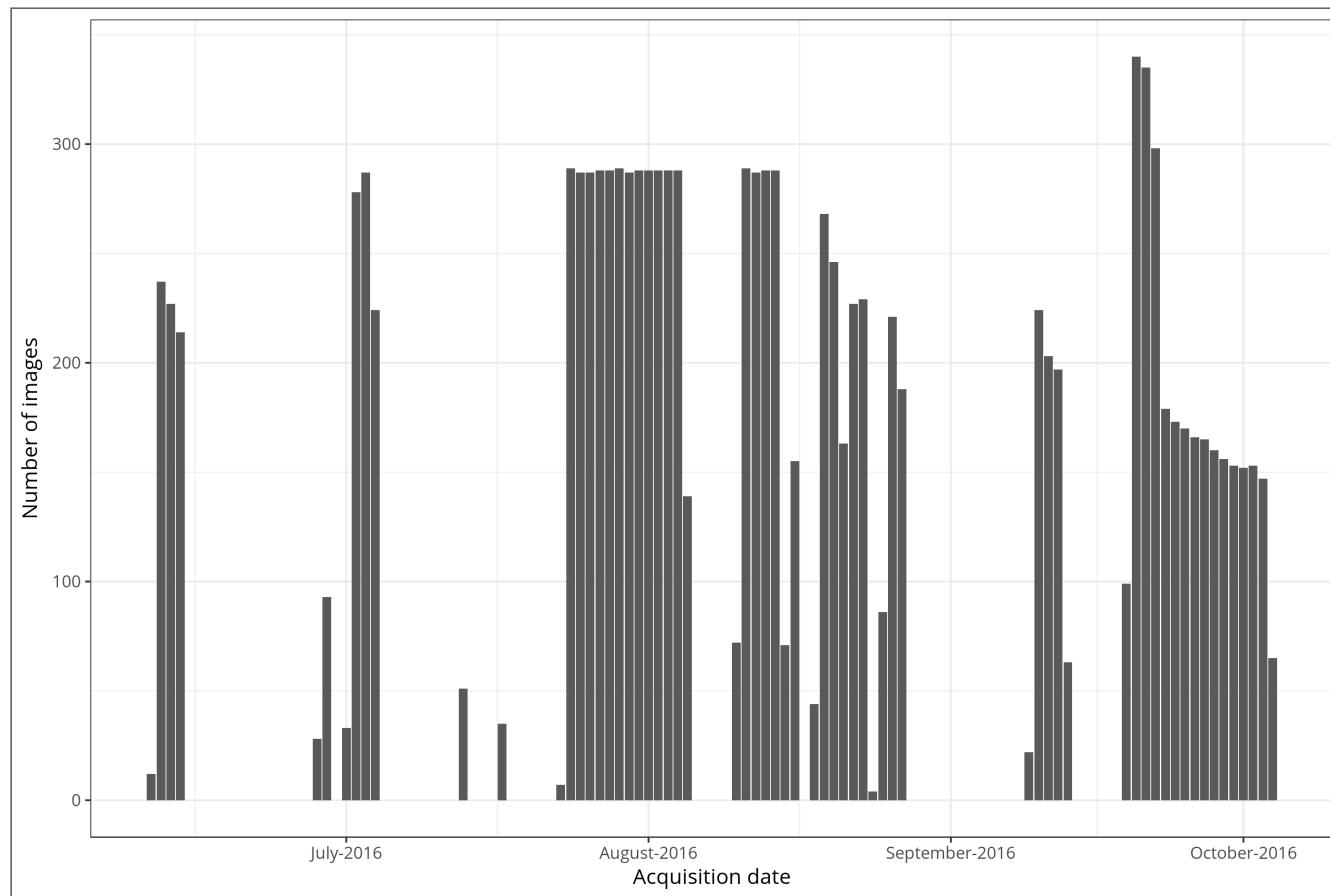
360 DEGREES ICE-CAM

Map of available observations ($n = 12\,066$)



360 DEGREES ICE-CAM

Number of daily observations (gap in the)



WHATS NEXT?

- How do we want to exploit the extracted data in the physic paper?
- Better algorithm for ice detection (help?)
- Contributions are welcome
(<https://github.com/PMassicotte/green-edge>)

THANK YOU!

Credits:

- Ice cam panorama assembly: Simon Morisset
simon.morisset@arcticnet.ulaval.ca
- ArcticNet data coordinator: Colline Gombault
colline.gombault@arcticnet.ulaval.ca

Amundsen Science Data Collection. 360° landscape imagery collected by the CCGS Amundsen in the Canadian Arctic. 2016. Processed data. Version 1. DOI: [10.5884/12710](https://doi.org/10.5884/12710). Archived (<https://doi.org/10.5884/12710>).