

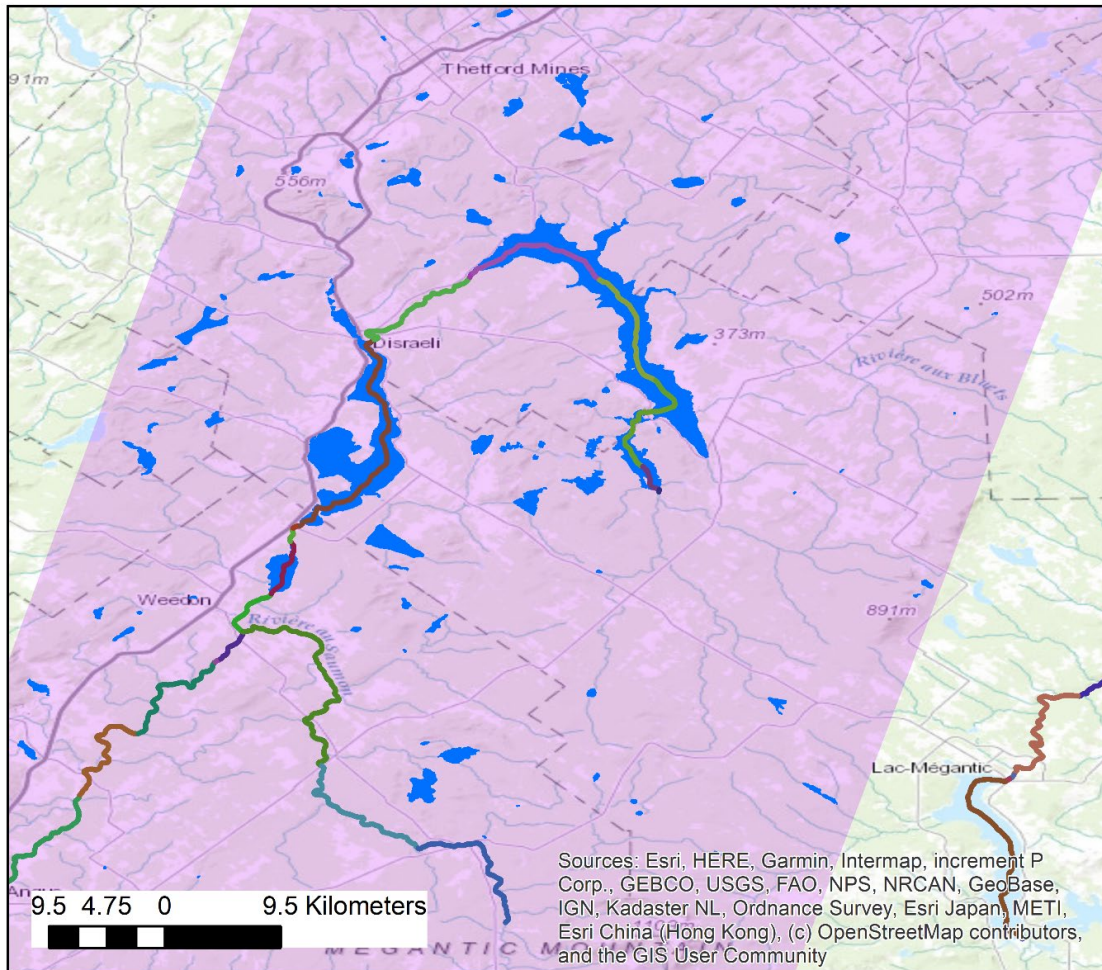
Cal/Val on lakes under ice

Mélanie Trudel, Sylvain Biancamaria, Roger Fjørtoft , and many others

SWOT Science Team Meeting, 19-22 September 2023, Toulouse, France

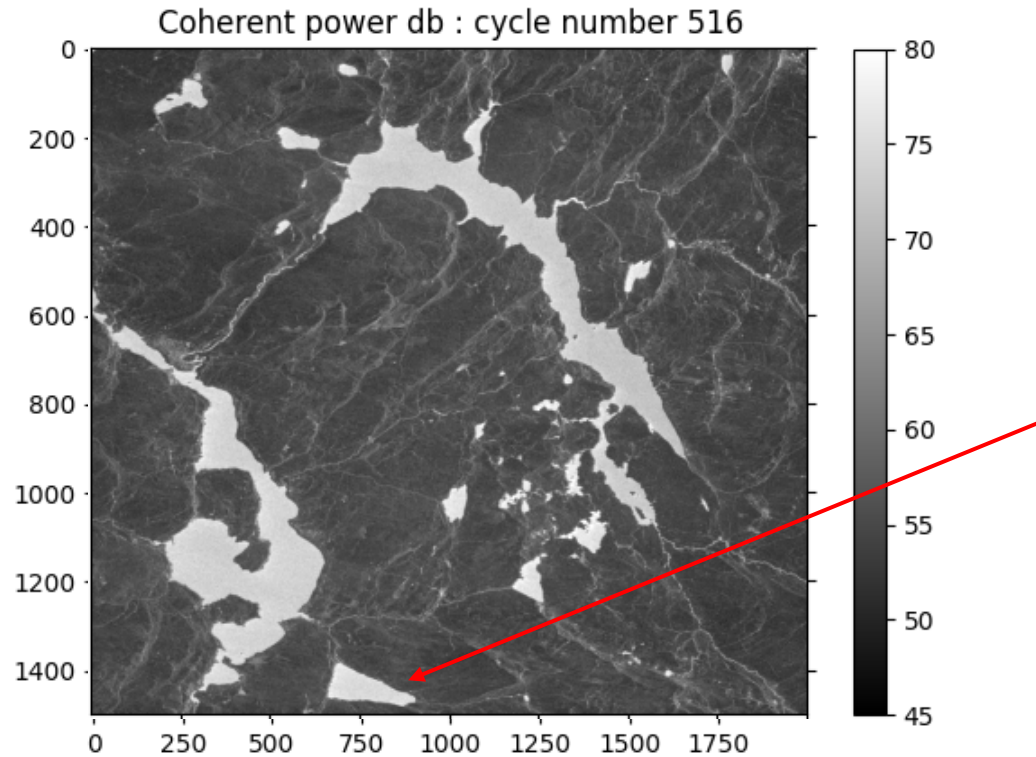


Sherbrooke, Québec, Canada



- Many lakes (> 50) in cal/val orbit
- Different size (6 to 5000 ha), shape, orientation and position in the swath (near and far range)
- Three dams, many small levees, and beaver can affect water level of lakes in this region
- **Covered by ice at the beginning of the CAL/VAL**
- Ice thickness measurements
- Camera
- Sentinel-1,2 and Radarsat Constellation Mission

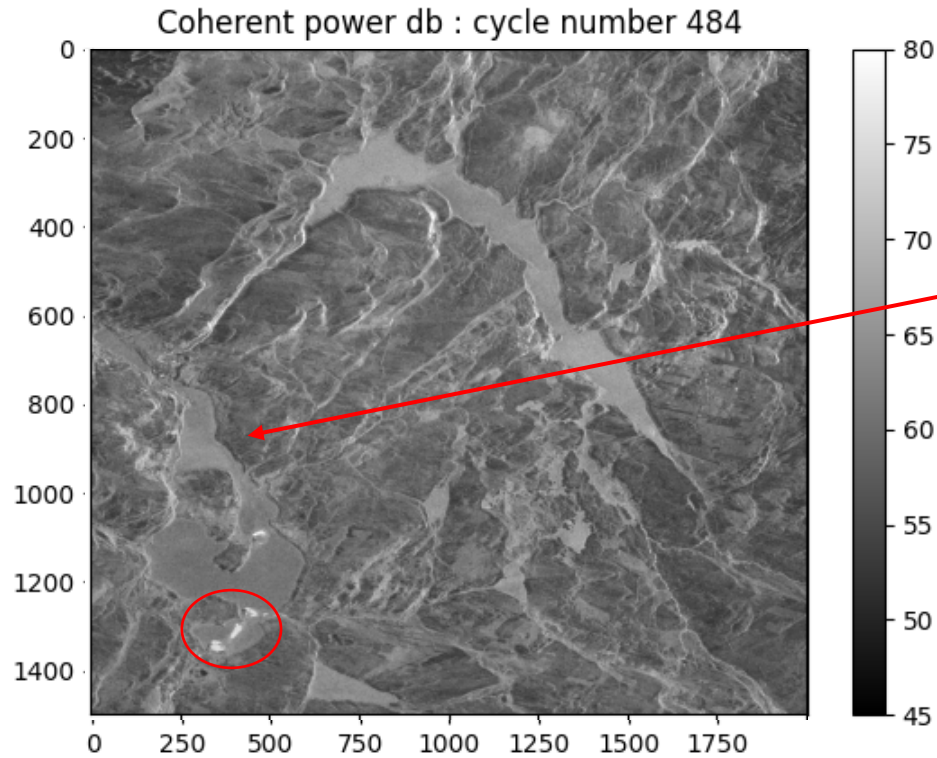
No ice, a little wind, no rain



Lake Elgin

Strong backscatter on lakes
Less than 10% dark water
Areas look good

With an ice cover and dry snow

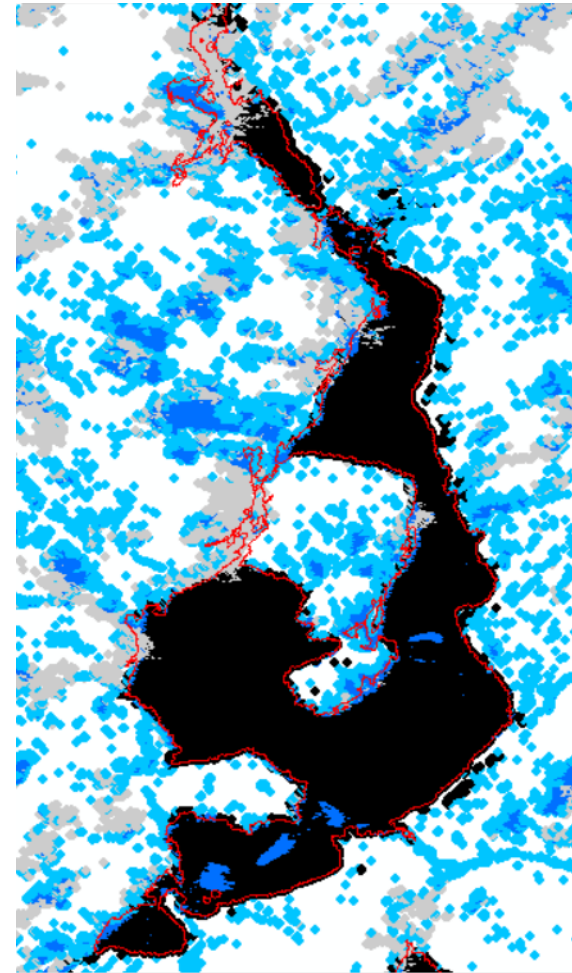
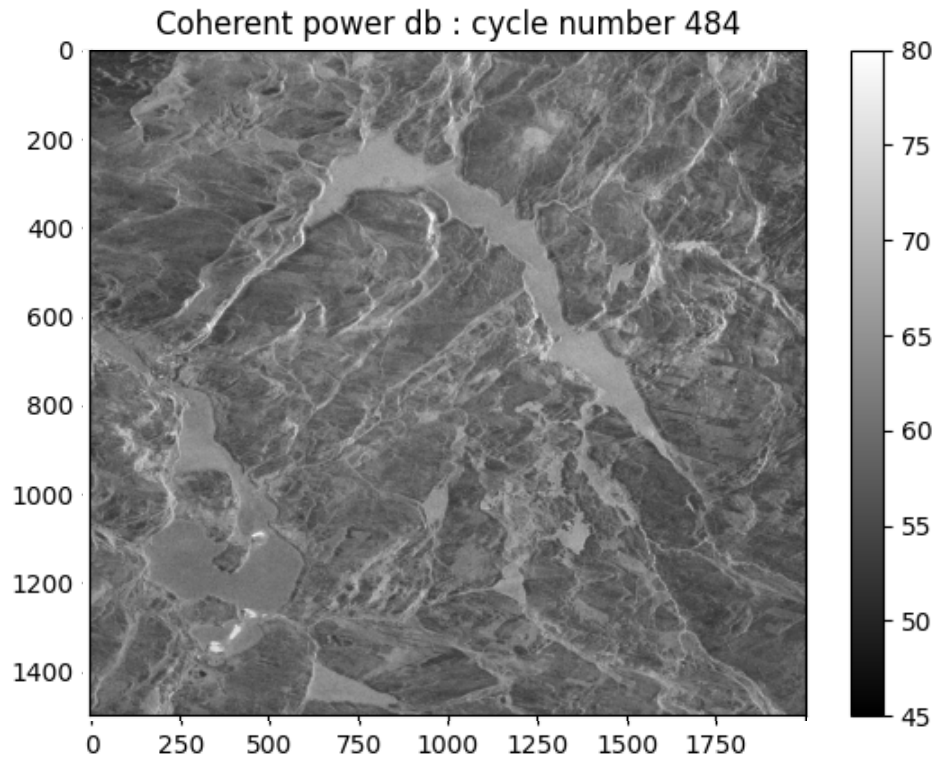


Lake Noir

Decrease of the backscatter

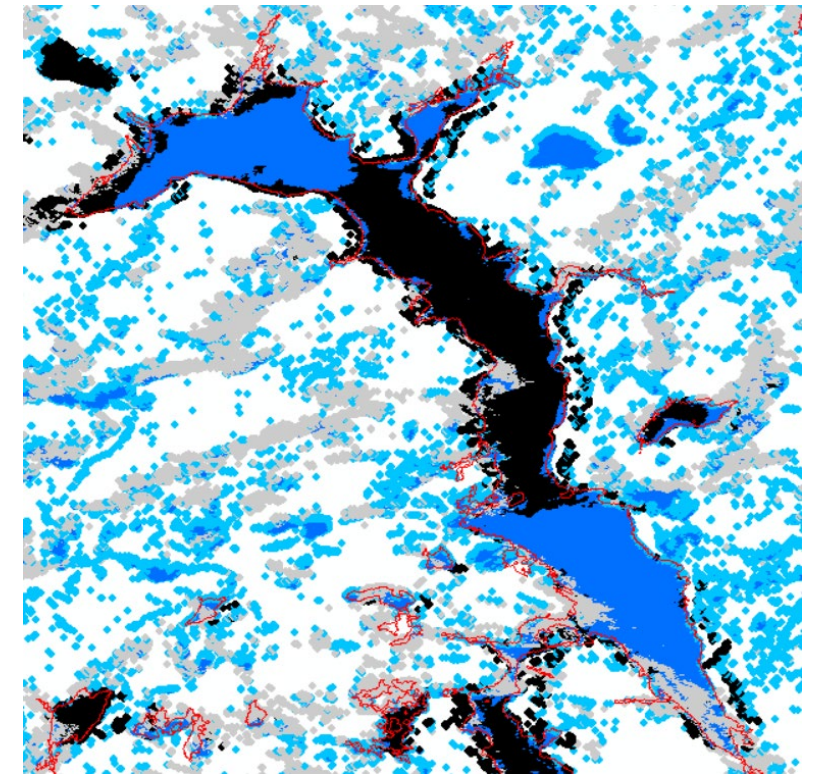
Some areas with strong backscatter are open water

With an ice cover and dry snow



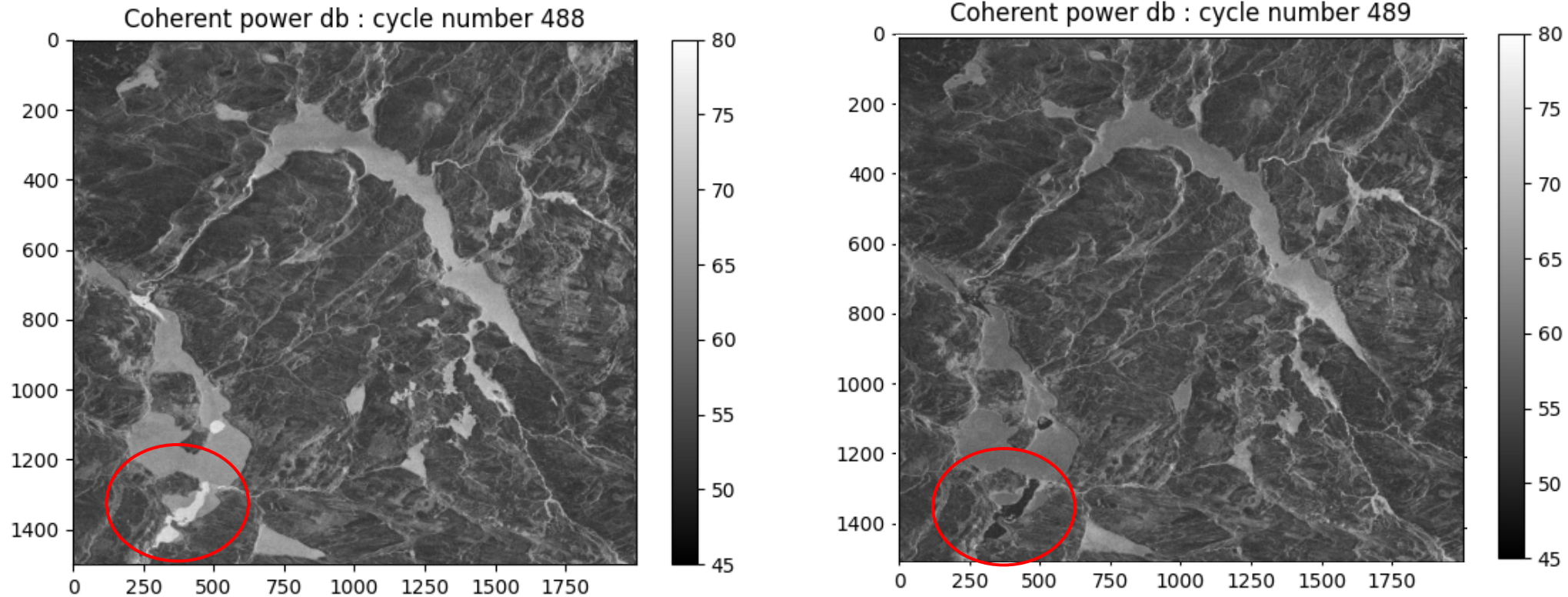
91.08 % Dark Water

- 3
- 4
- 5
- 6
- 7



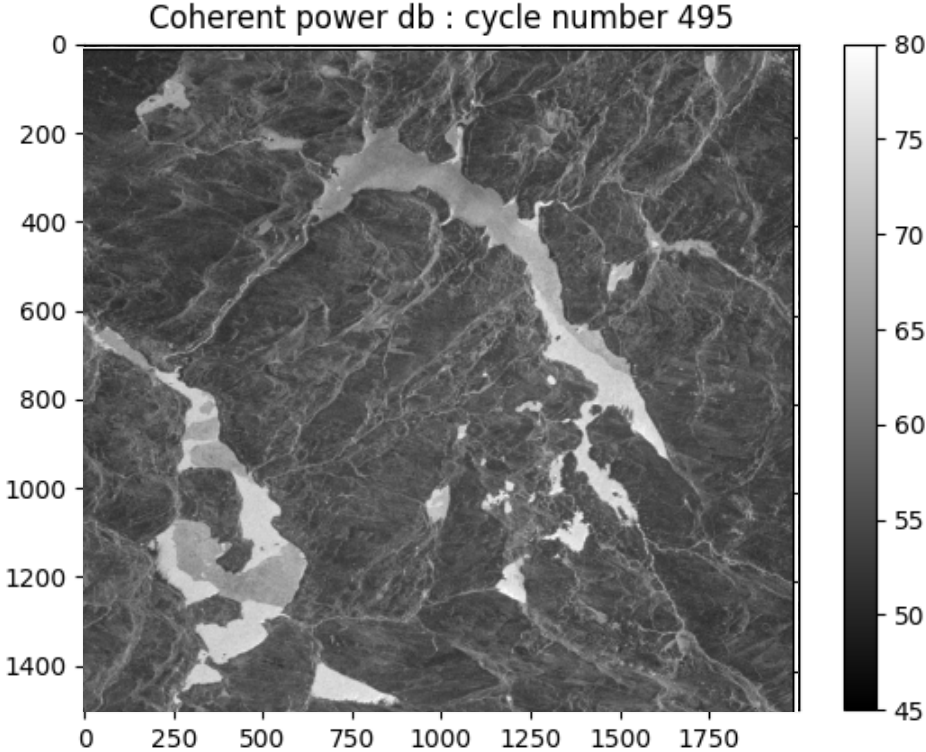
43.85 % Dark Water

Melting begins

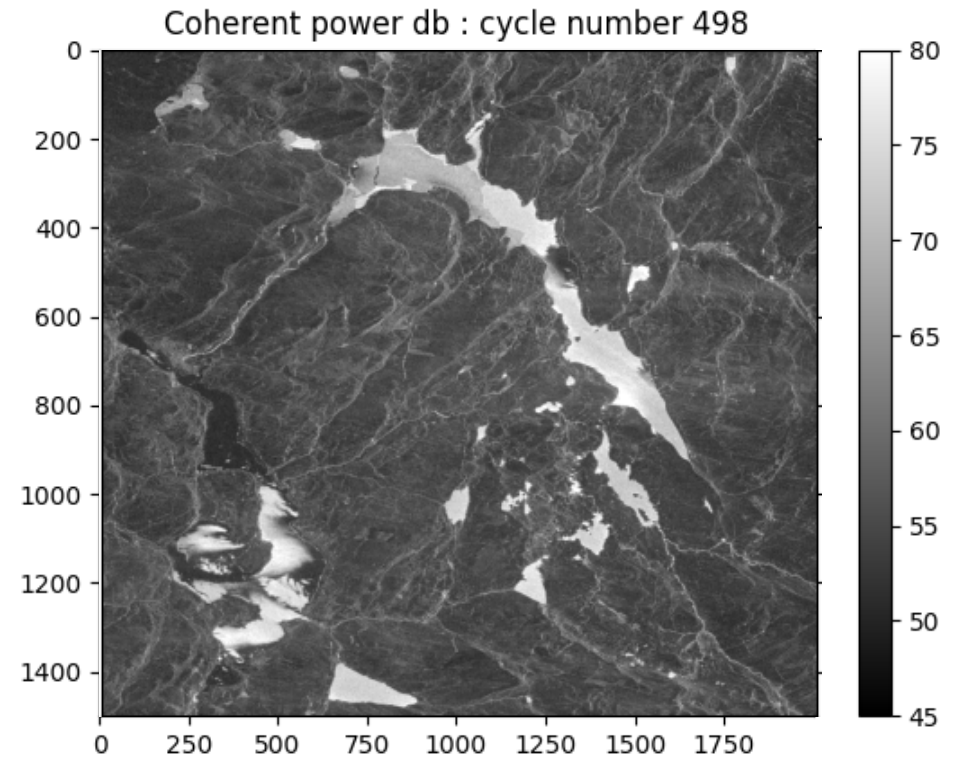
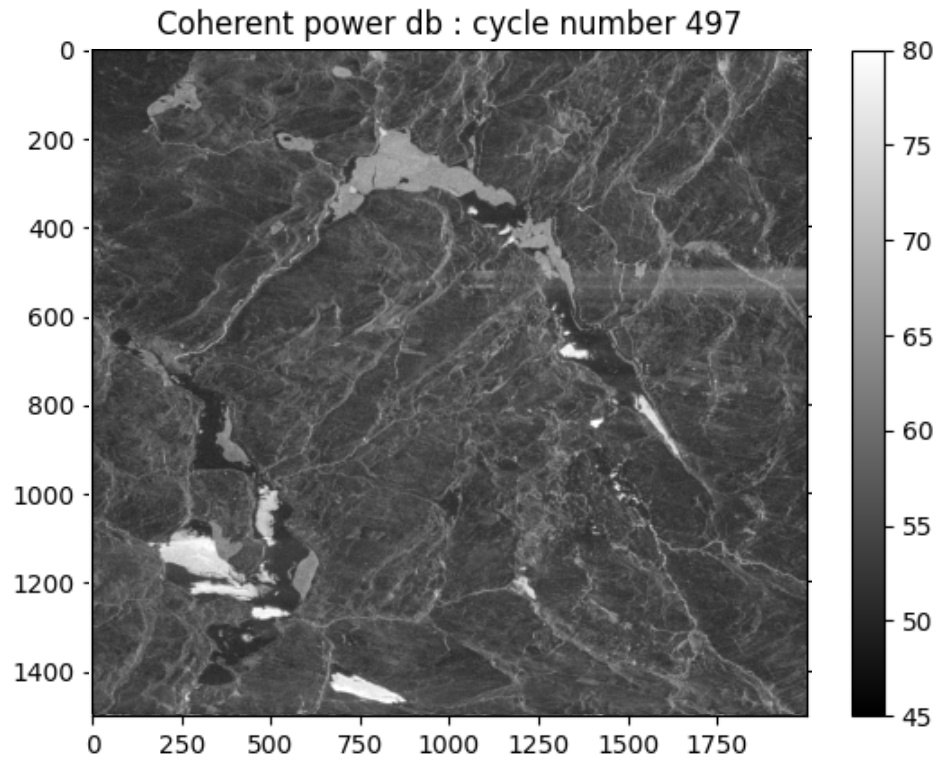


Some areas with strong backscatter are open water, but sometimes also result in dark water.

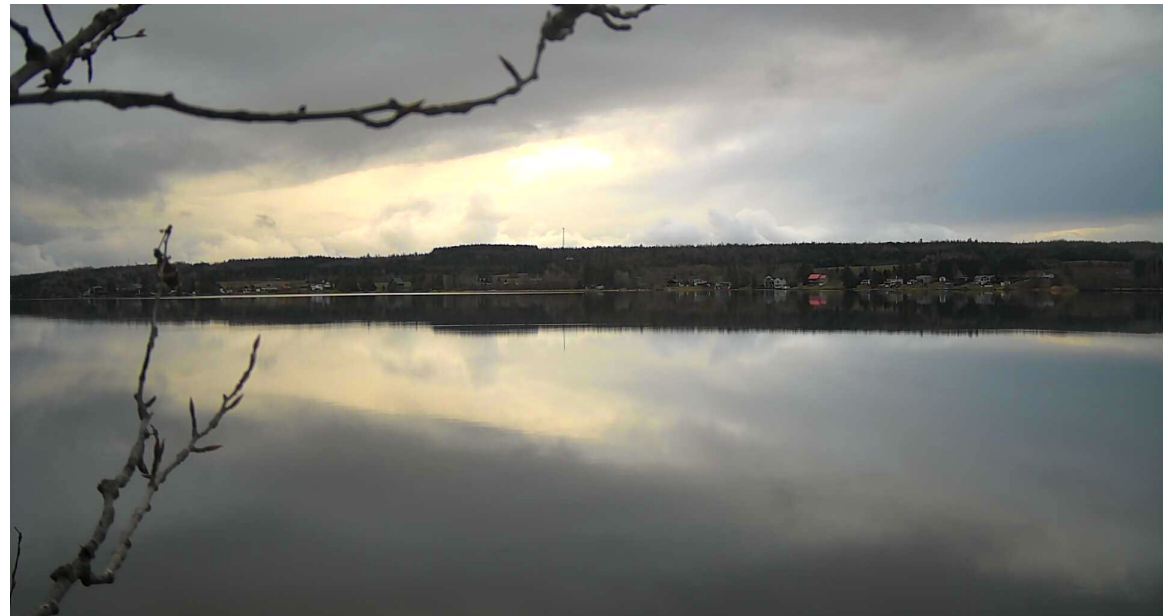
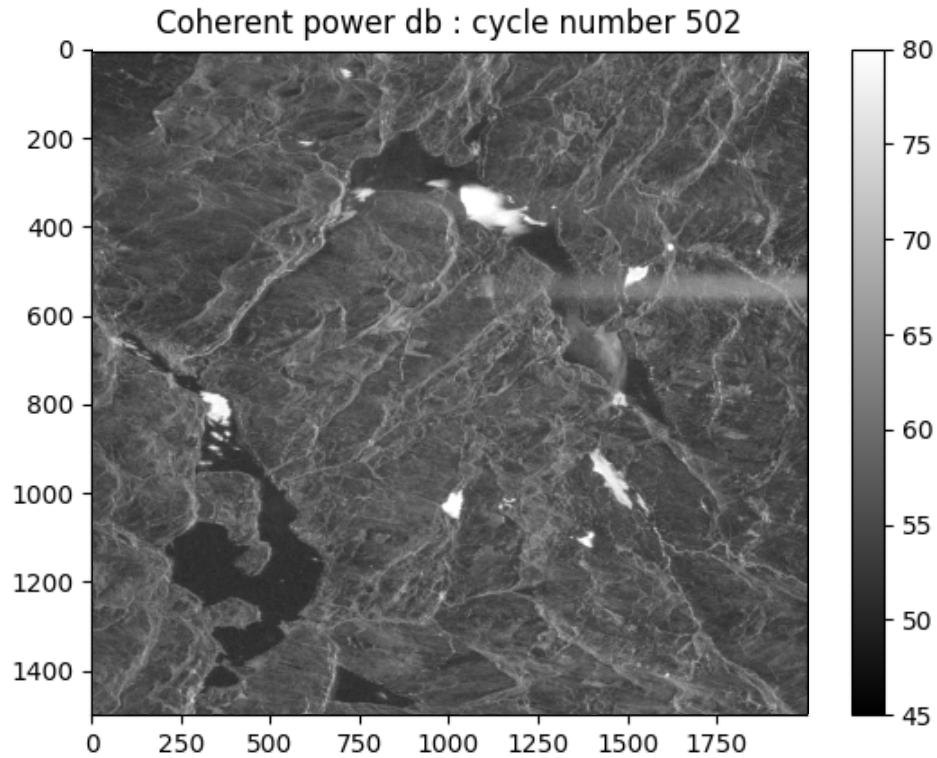
The melt goes on



Last days with ice cover

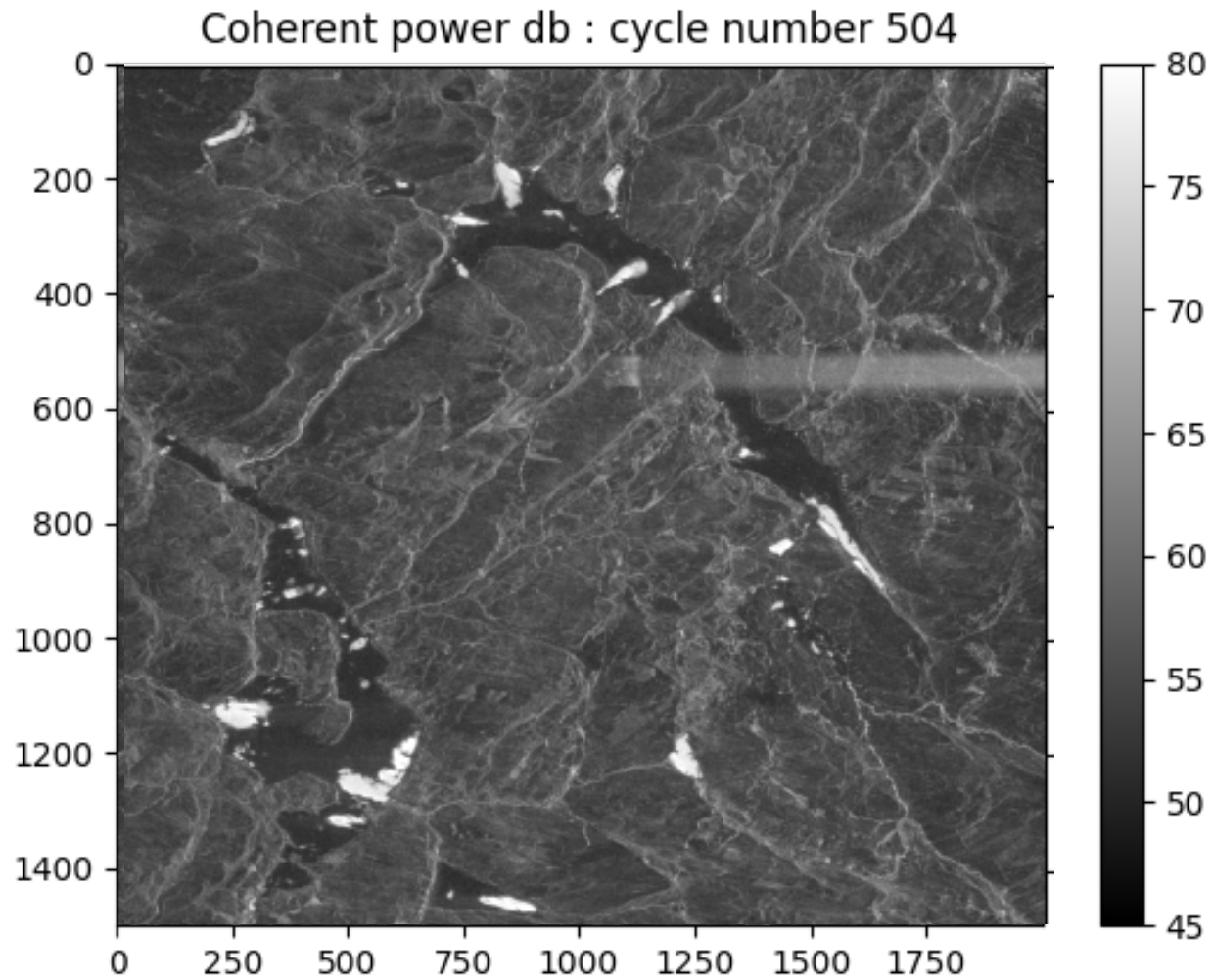


Acquisition on a windless evening



A lot of dark water.

What's happening here on this windless evening?



Conclusion :

- We need to analyze the PIXC product to have information over lake covered by ice, as the darkwater flag doesn't seem to be adapted to these conditions
- Dark water due to wind is more common in the evening, when there is less wind. In many parts of Canada, we have more windless conditions in the evening, at night and in the morning.

Next steps:

Analyzing areas and elevations

Acquiring data for the next winter season

A lot of fun !

